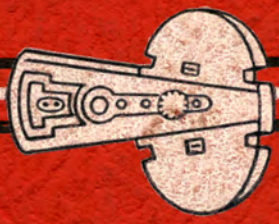
LUFKIN OIL FIELD EQUIPMENT



CATALOG 35

Designed With Large Factors of Safety
and With Conservative Gear Ratings
Insuring Lasting, Efficient Service

J. L. F.

LUFKIN FOUNDRY & MACHINE COMPANY • LUFKIN, TEXAS

LUFKIN EQUIPMENT OF ADVANCED DESIGN

LUFKIN FOUNDRY & MACHINE CO.

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LUFKIN, TEXAS

BRANCH OFFICES AND WAREHOUSES

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Houston, Texas.
806 2nd Nat'l Bank Bldg.

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Los Angeles, Calif.,
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EAST TEXAS DIVISION
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Crim Crest Hill, P. O. Box 516
DALLAS, TEXAS
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Tulsa, Okla.
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New York, N. Y.,
149 Broadway,
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Preface

Prior to the introduction of the first successful geared oil well pumping unit by the Lufkin Foundry & Machine Company, little improvement of value had been made in pumping methods since the earliest days of the industry. These early pioneering days furnished invaluable contact with engineers and production men, and especially the men actually using the equipment in the field. These contacts have been continued throughout the development of LUFKIN EQUIPMENT, and have resulted in the perfection of LUFKIN UNITS of IMPROVED TYPES both from the standpoint of correct engineering principles, simplicity in design, and practical application.

STANDARDIZATION OF LUFKIN UNITS—Those familiar with the development and successful progress of the LUFKIN UNIT will recognize, in this catalogue, a better standardization of well proportioned equipment incorporated in the designs of both single crank and double crank units. Both types of units are built in four sizes with the choice of either single or double reduction gears, and in horsepowers of from 10 to 60.

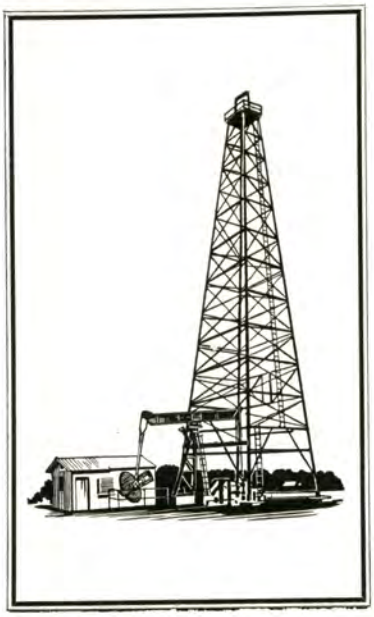
Walking beams, samson posts, and pitmans are all designed in proportion for polished rod loads of 12,000 to 25,000 pounds.

This standardization program does not involve changes in the design of the unit proper, but does include new sizes of single reduction units, and a completed line of double reduction units, and well balanced capacities of 10-20-30-40 and 60 horsepower, meeting any present known requirements.

To meet a popular demand, twin crank units are now made in sizes up to 72″ stroke, and being self contained maintain absolute alignment in operation. They are compact, highly efficient, operate in perfect balance, and are often preferred to the single crank type. Installation costs are a vital factor, and in the twin crank unit this item is held to the minimum.

The complete line of LUFKIN UNITS cover a carefully considered proportional arrangement for general sizes, with all units, beams, posts, and pitmans designed with large factors of safety, and all bearings of every kind having ample capacity with especial attention to correct lubrication.

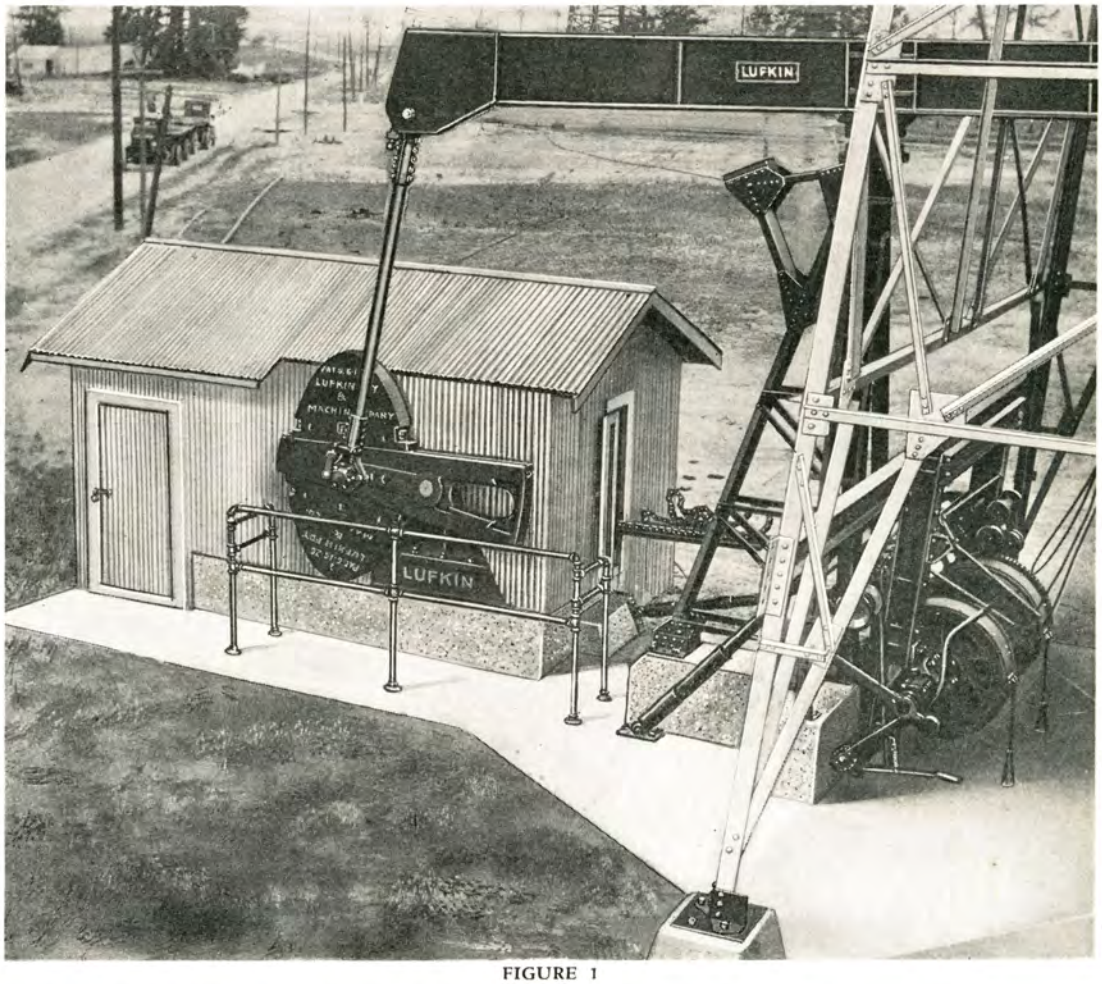
We owe much to the cooperation and constructive criticism of our many friends of the Oil Industry, to whom we express our keenest appreciation.



LUFKIN EQUIPMENT IS DESIGNED WITH LARGE FACTORS OF SAFETY

Lufkin Gear Ratings are Based on WEAR Giving 5 to 10 Years Operation Without Appreciable Loss in Efficiency

TYPICAL LUFKIN UNIT INSTALLATIONS



Typical installation; Lufkin Herringbone Gear Unit — electric motor drive — Lufkin Center line Beam assembly — Lufkin Rod and Tubing Hoist

FIGURE 1

FIGURE 2

Typical installation; Lufkin Herringbone Gear Unit—single cylinder gas engine drive—Lufkin Center-line Beam assembly—Lufkin Rod and Tubing Hoist. View before engine house was erected.

FIGURE 3

Lufkin No. 58 Herringbone Gear Single Crank Unit with "Back-side" crank arrangement for pumping one or two extra wells. Note also Lufkin underslung take-off. The beam assembly is the Lufkin Center-line type—all working points in line and all bearings bronze bushed and either oil-bath or Alemite lubricated, insuring positive oiling and long wearing qualities.

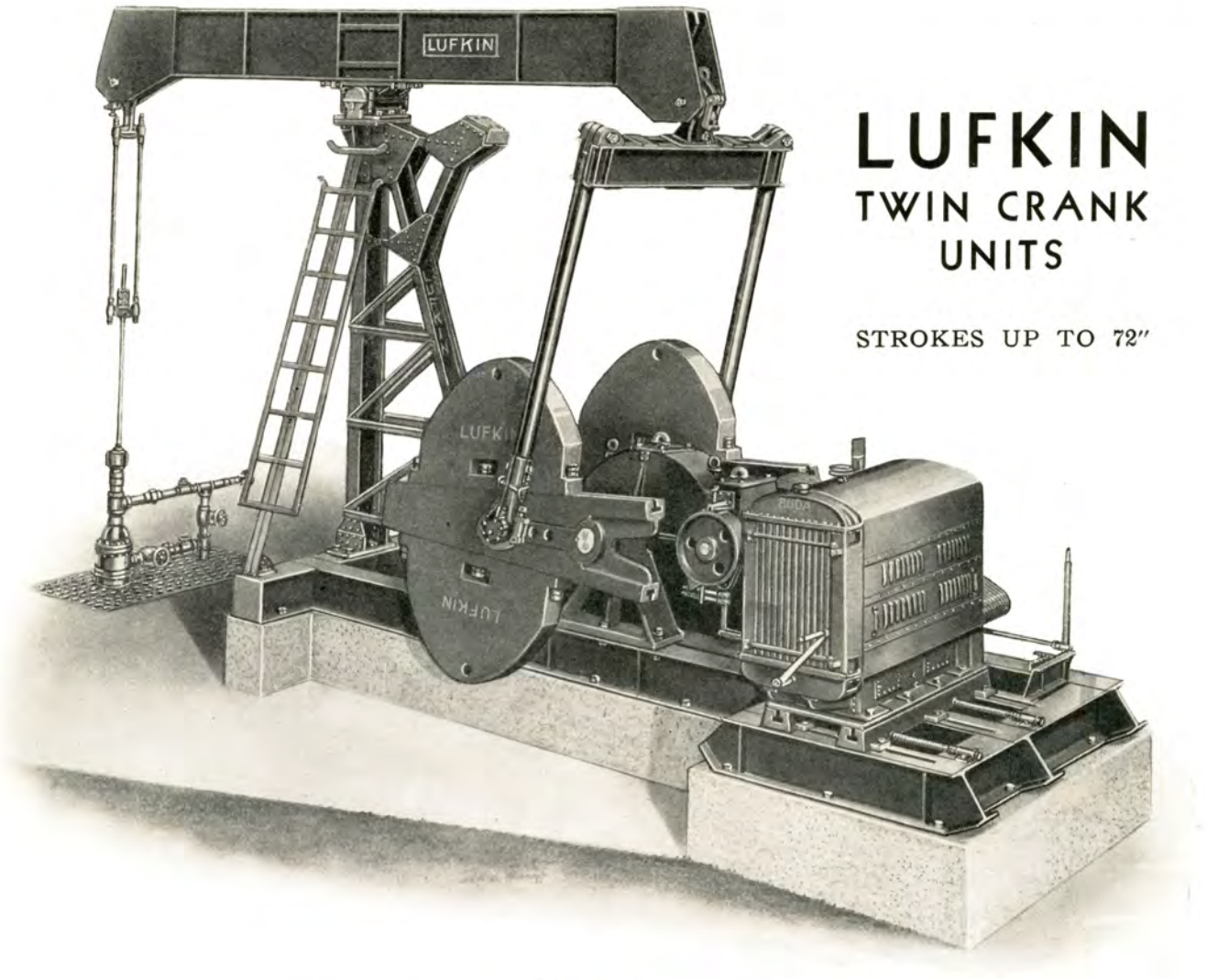


FIGURE 4

The Lufkin Twin Crank Unit assembly arranged for Multi-cylinder gas engine.

LUFKIN TWIN CRANK UNITS

Manufactured in sizes from 10 horsepower to sixty horsepower in both single and double reduction herringbone gears and with stroke lengths up to 72", the Lufkin Twin Crank Units are increasing in demand to the point where many believe they will shortly replace all types of single crank units. While first designed as a small portable unit for derrick floor operation on wells over water, their use for general pumping has proven so practical that the design of heavier units was made necessary. Many of our smaller and general size units have been in use for a long time in both the domestic and foreign fields.

To meet this increasing demand for a heavier Twin Crank Unit we have enlarged our line to include units to handle any present known requirement up to 60 horsepower, with counterbalance capacities ranging as high as 16,000 lbs. and polish rod load capacities to 25,000 lbs.

The Lufkin Twin Crank Unit is adaptable to any type prime mover and can be easily and inexpensively changed from one type to another if at any time desired. Lufkin Twin Crank Units are simple in design, yet very rugged and strong in construction and are well proportioned throughout. Torque strains, due to the twin or dual cranks, are evenly divided in the main shaft and therefore allow for even bearing pressures. All strains on the pitman are equalized by means of the full universal connection to the beam.

Lufkin Twin Crank Units are made with short beams and horse heads as illustrated on pages 16 to 22—also with our regular Center-Line beams shown on pages 22.

PRACTICAL OPERATING ADVANTAGES

Years of experience in actual tests, practical inspection of our own and other makes of gears in actual field operation has led us to the conclusion that the LUFKIN-SYKES WEAR FORMULA FOR HORSE POWER RATINGS is conservative and correct for oil pumping.

LUFKIN - SYKES HERRINGBONE GEARS ARE 96 to 98% EFFICIENT AND WITH OUR RATINGS LUFKIN UNITS WILL OPERATE 5 TO 10 YEARS WITHOUT APPRECIABLE LOSS IN EFFICIENCY WHICH IS ESPECIAL LY IMPORTANT WHEN BUYING POWER.

THEY REQUIRE LITTLE ATTENTION

PRACTICALLY NO REPAIRS.

LARGE USERS REPORT FIFTY CENTS TO ONE DOLLAR PER MONTH MAINTENANCE COST ON COMPLETE RIGS.

DOWN TIME AND ROD TROUBLE REDUCED TO THE MINIMUM.

ACCIDENT HAZARD GREATLY ELIMINATED.

EXCEPTING FOUNDATION THERE IS 100% SALVAGE.

LUFKIN UNITS ARE A PERMANENT INVESTMENT.

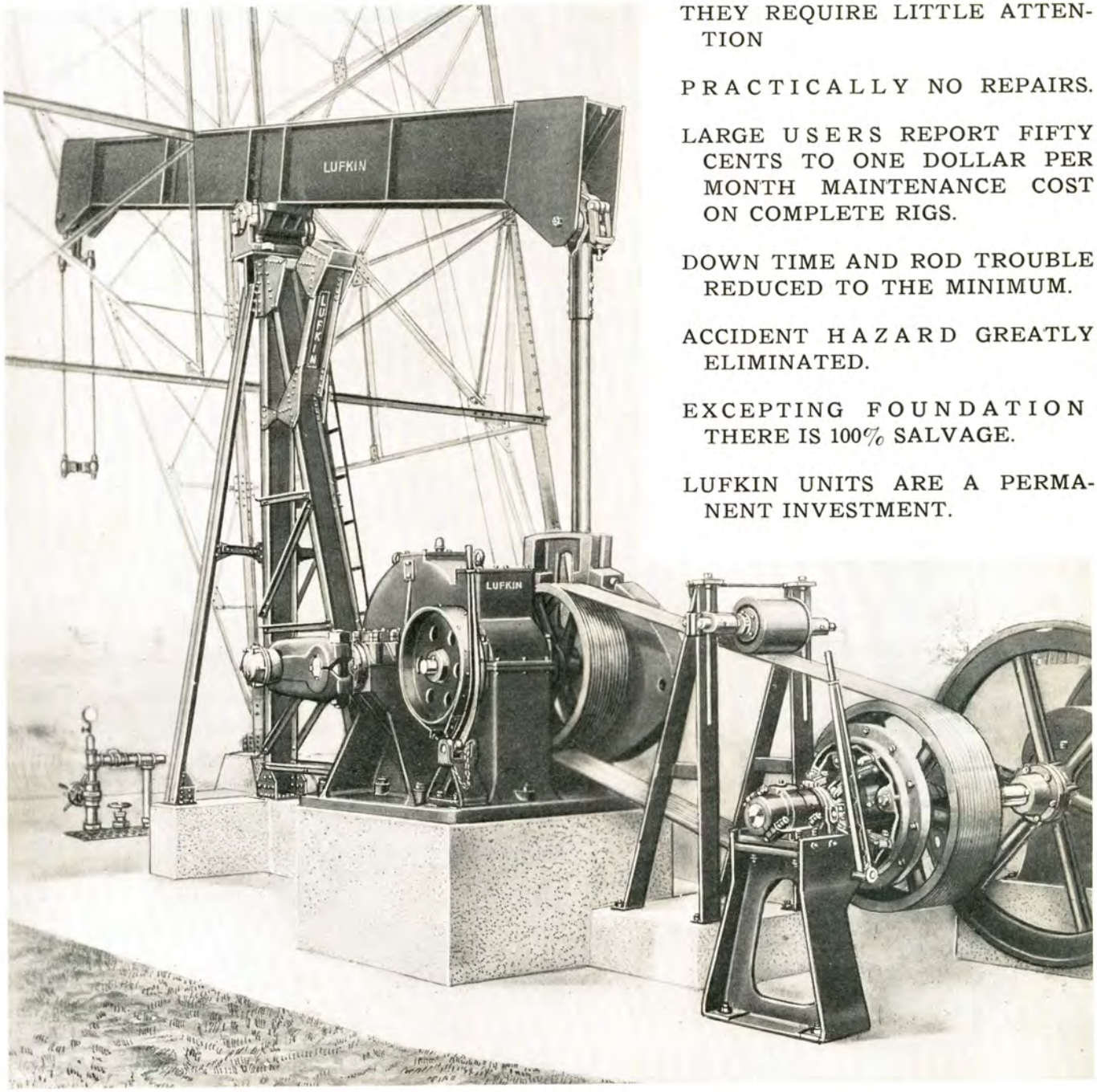


FIGURE 5

Lufkin Single Reduction Unit No. 48 gas engine driven, showing Back Crank 3-Well Hook-up with Lufkin Jacks. For engine room see next page.

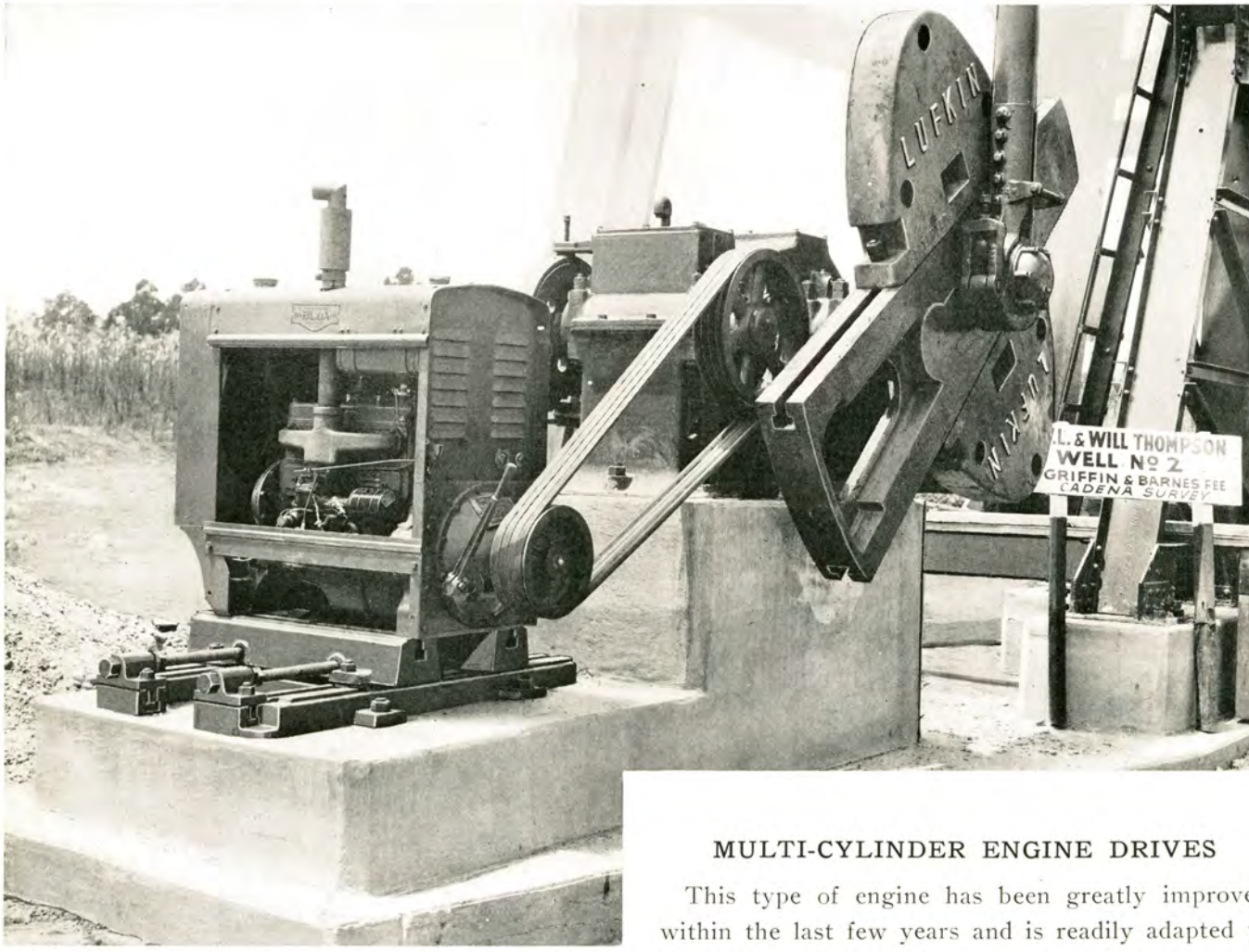


FIGURE 7

Typical East Texas installation. No. 31 Unit with Buda engine mounted on Lufkin Universal Slide Rails.

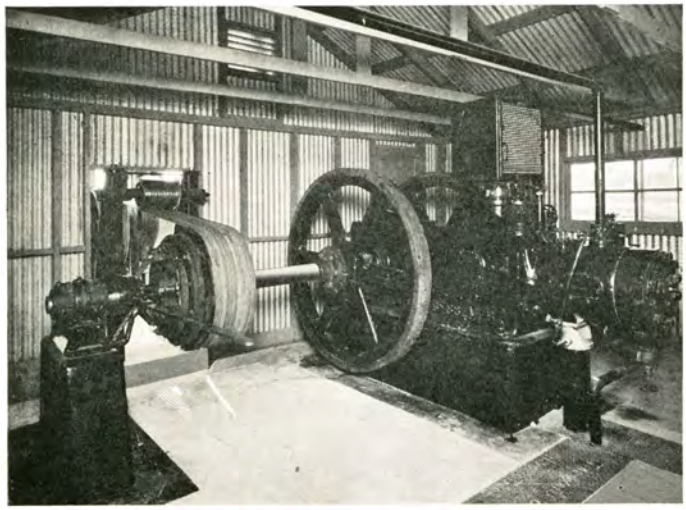


FIGURE 6

Engine Room for unit on opposite page. Showing Lufkin Clutch and Cooper-Bessemer engine.

MULTI-CYLINDER ENGINE DRIVES

This type of engine has been greatly improved within the last few years and is readily adapted to oil well pumping, and when operated at moderate speeds—600 to 900 R.P.M.—will be found to give good service with low maintenance expense. This has been demonstrated by actual experience. However, where engines too small for the job have been used and in addition are run at high industrial speeds disaster has resulted. Having a gasoline rating—when used with natural gas they should be rated at a reduction of 20% and the horsepower determined at 700 R.P.M.

Manufacturers of the more popular types of engines used in oil field pumping have greatly increased the clutch and bearing capacities and are using structural steel bases and on the larger sizes are using bases that extend out under the drive pulley and provide an outboard bearing.

Larger engines operating at moderate speeds will prove good investments.

We are prepared to furnish any standard make of multi-cylinder engine from nearby stocks.

LUFKIN SINGLE CRANK HERRINGBONE GEAR UNITS

Single Reduction—Single Crank

No. 58—formerly 6½" size .....60 H.P.
No. 56—new design .....45 H.P.
No. 48—formerly 5½" size.....36 H.P.
No. 26—new design .....26 H.P.

See table page 13 for complete details.

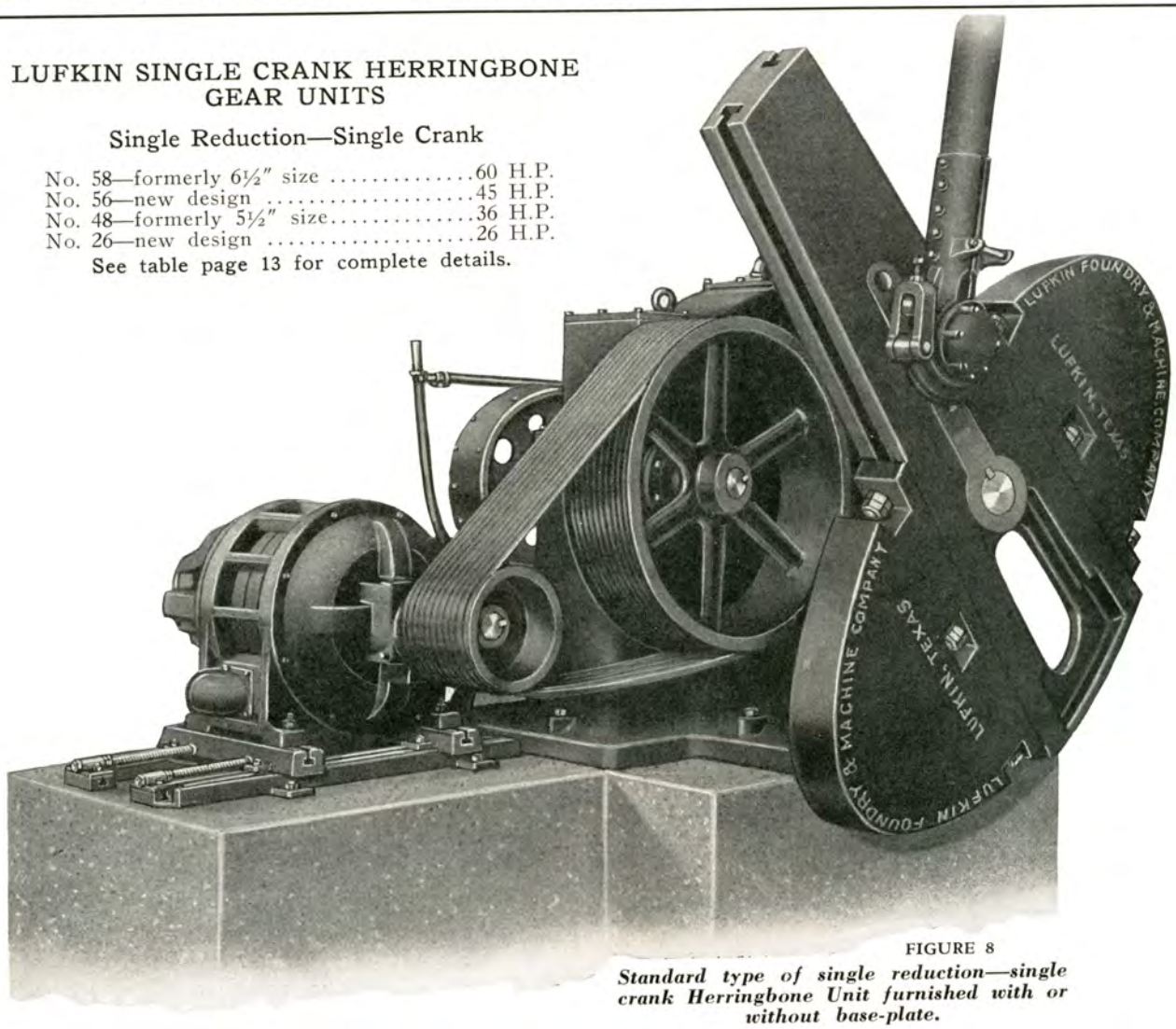


FIGURE 8

Standard type of single reduction—single crank Herringbone Unit furnished with or without base-plate.

LUFKIN SINGLE REDUCTION—SINGLE CRANK HERRINGBONE UNITS

The Lufkin Single reduction—single crank Herringbone units are well known to the oil industry for they were the first to be introduced. Later there appeared a demand for twin crank units and in recent years double reduction units have made their appearance. Both types of these later units are well described elsewhere in this catalogue.

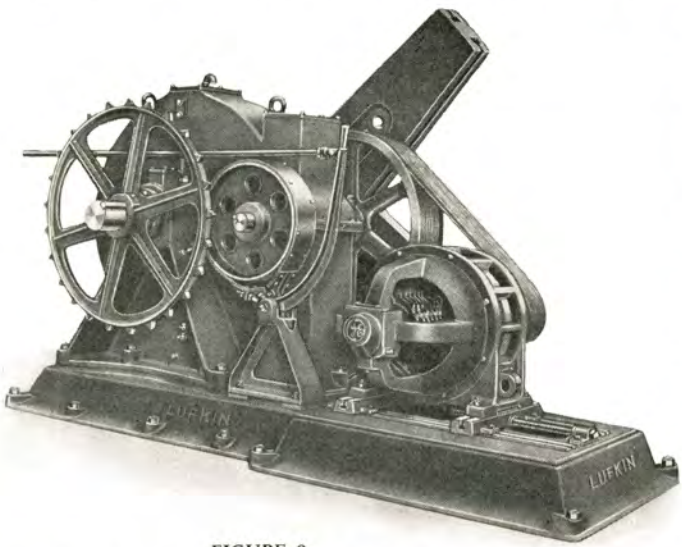


FIGURE 9

Same style of unit as above but showing sprocket side and also base plate which can be furnished upon order.

All Lufkin Units of the herringbone type, whether single or double reduction, are alike in certain mechanical characteristics. The Lufkin-Sykes continuous tooth herringbone gears, used in all Lufkin Herringbone Units, have from 20% to 40% more bearing surface for width of face and at least 60% greater strength than any other type of Herringbone gears with which we are familiar. The teeth are precision cut and ground to match on special generators in our own plant under our control and supervision. They are silent in operation and efficient in the use of power. All gears are of cast alloy steel, and pinions are of forged chrome nickel steel S.A.E. 3245 generated integral with shaft and are hardened and heat treated. **Shafts:** Forged of S. A. E. 3130 alloy steel, turned and polished and of adequate size for carrying loads within rated capacity of unit, with large safety factor. **Bearings: Main Gear shaft bearing** is of renewable bronze; **Pinion shaft,** Hyatt Roller Bearings. **Lubrication:** Bath and splash system—simple and positive. Rotation of gears provide continuous flow of lubricant to bearings and gear teeth.

Lufkin Units are of simple design, permitting easy adaptation to any type prime mover; of strong rigid construction and made of best materials available—precision workmanship and interchangeability of parts are assured through the use of jigs and templates for all machine operations.

Units shown on page 8 and on this page are our No. 58 (formerly 6½"); No. 48, (formerly 5½") and a new unit known as our No. 56, which has been designed especially for 40-50 H.P. jobs for gas engine installations. The Lufkin No. 26 unit is also of the same general design—See table page 15.

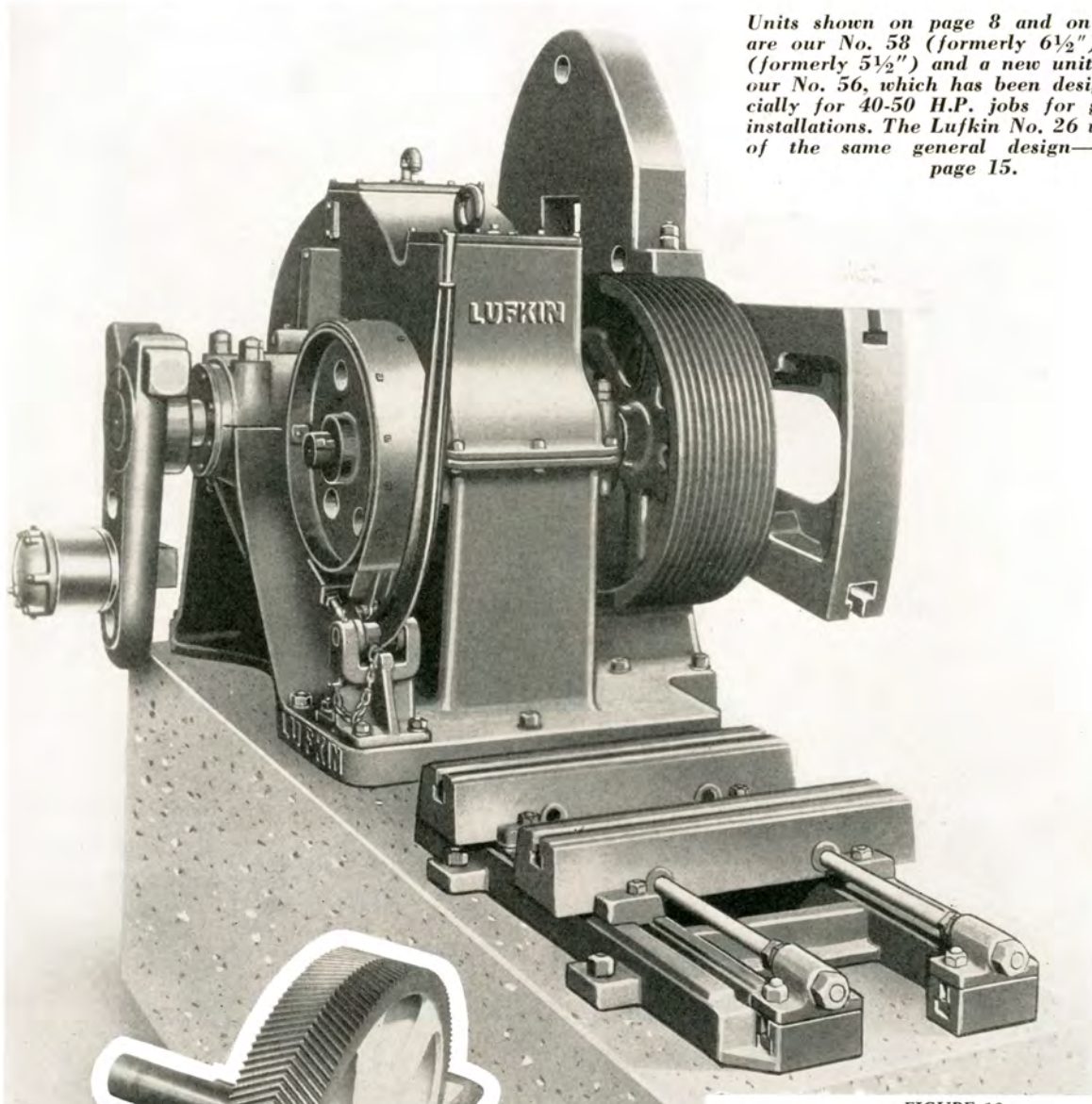


FIGURE 10

GEARS WITH A BACK-BONE

Lufkin-Sykes Herringbone Gears are often called, "The Gears with a Back-Bone." All gears used in Lufkin Units are generated on machines in our own plant under a most rigid inspection system. The gear and pinion are "mated" by a lapping in process that insures absolute elimination of "back-lash".

ADVANTAGES OF HERRINGBONE OVER HELICAL GEARS

1. Stronger teeth—due to arc-like construction, and greater load carrying capacity due to utilization of the full width of face.
2. No axial float necessary as "V" shaped herringbone teeth wedge automatically into mating gear, eliminating all sideways motion and consequent rubbing action of a screw-like nature existing in single helical gears which results in pitting at relatively low loads.
3. Uniform load across face due to balance thrusts of the opposing helices.
4. Better lubrication due to oil film formed by the wedge action of the teeth.
5. Due to the accuracy of their cutting they are more silent.
6. Silent gears cannot be produced by the hobbing process, consequently a superior generating process of absolute accuracy has necessarily to be used. The Sykes process is the answer.

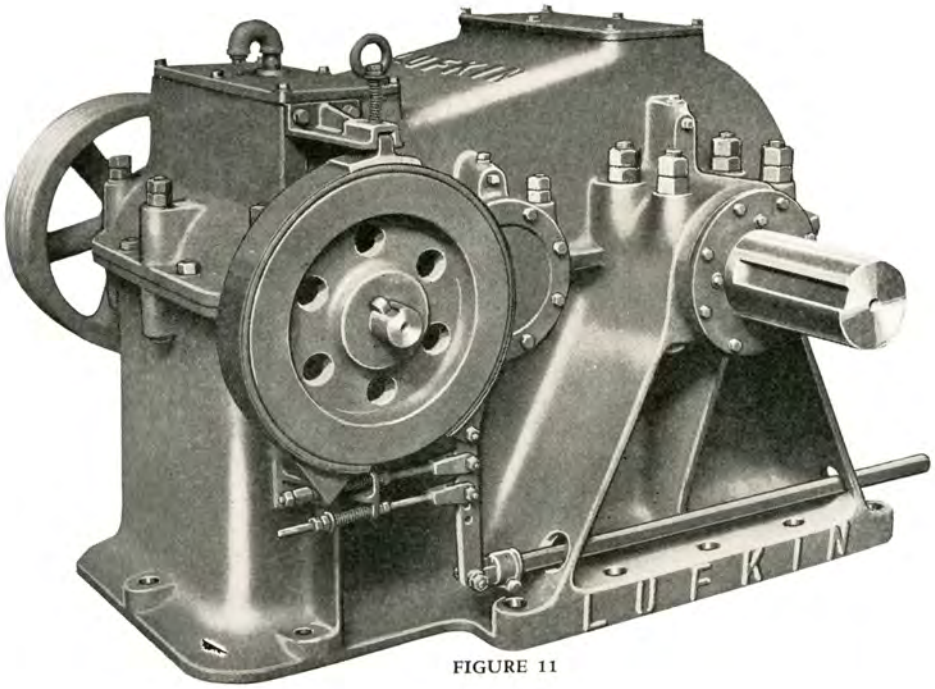


FIGURE 11

LUFKIN DOUBLE REDUCTION GEARED PUMPING UNITS

Mechanical Characteristics

Relying on past experience we have designed these Units along the same general lines as our Single Reduction Units, using two pairs of alloy steel gears, with bronze main bearings, Hyatt bearings on intermediate and high speed shafts; with large alloy steel shafts set into a rugged; well ribbed gear box that insures rigidity and positive alignment.

FULL FLOATING SELF ALIGNING GEARS

In all Lufkin Double Reduction Gear Units the main gear is held stationary by means of bronze thrust plates, the pinion and high speed gears floating into perfect alignment with the main gear, insuring equal pressure and load distribution on gear teeth.

The cantilever load action on the intermediate shaft has a distinct advantage in that the total load at the center of the shaft is less than would be the case if the slow speed pinion was in the center and straddled by single helical gears or a divided herringbone gear, or what is termed as the interleaf design. The loads on gear and pinion on intermediate shaft are in the same direction; likewise the bearing reactions are in the same direction and the slight cantilever action is due to higher tooth pressure on the low speed gears, which is a distinct advantage as the slow speed pinion is closer to the bearing and the resultant force at the center of the shaft is less. This reduces the bending moment and minimizes the undesirable spring action of this shaft under load. Likewise, the load on the high speed pinion is closer to the bearing than would be the case in the interleaf design.

Of paramount importance is the advantage of equal load distribution on the high and low speed gears. There are no two shafts perfectly parallel and, however small the error might be, it is several times less in the Herringbone Gear Units. The error occurs over the width of the gear, whereas, in the divided gears or interleaf design, the error occurs from the outer edge of the one pinion or gear to the outer edge of the other. The same applies to the divided gears that are sometimes used on the slow speed shaft. The result is an unbalanced load on the divided gears and excessive wear will occur on the side where the pitch circle is the shortest. This is almost totally eliminated in the herringbone gear design.

BEARINGS — Previous experience with both bronze and roller bearings on the slow speed shaft has led us to adopt the split bronze bearing as a standard on all types of Lufkin Units. Other than a small fraction of one percent difference in effi-

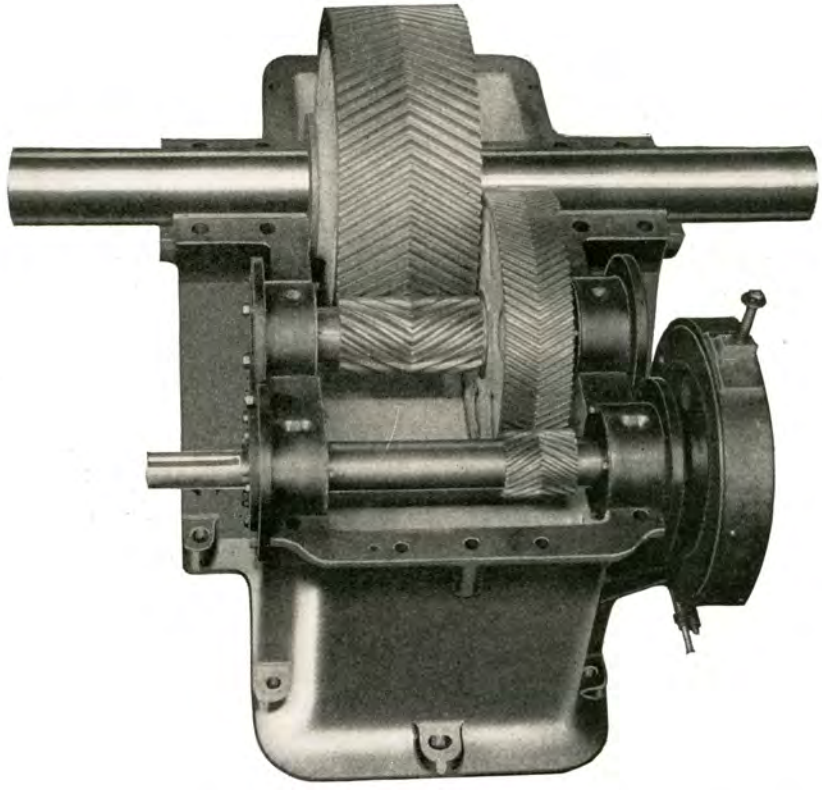


FIGURE 12

GEAR TRAIN—LUFKIN DOUBLE REDUCTION GEAR UNIT

FURNISHED IN EITHER SINGLE OR DOUBLE CRANK TYPES

ciency, the bronze bearing has many advantages. Their ability to stand shock loads, such as a well pounding fluid, when jars are used for cleaning out purposes, etc., are distinct advantages. They are easily renewed in the field, whereas, when a roller bearing has to be replaced because of defective parts or through wear it is necessary to send the shaft to a machine shop to have the crank pressed off and the bearing replaced, and the crank pressed on again. This is a very expensive procedure from several angles—loss of production due to long shut down time, expensive new bearings, and possibility that the average oil well machine shop might not make correct fitting of bearing or refitting of crank.

GEAR BOX—Lufkin Geared Pumping Units are not merely industrial gear units with a crank pressed on the slow speed shaft and called an oil well pumping unit. Gear boxes are especially designed to take care of the shock loads and vibrations of an oil well, and are rugged and ribbed heavily to take care of these loads. Renewable bronze thrust plates are used on low speed shaft to prevent wear on the gear housing due to the thrust of a single crank. This feature is not found in most herringbone gear units; ordinarily the main gear hub rubs iron to iron against gear housing, necessitating replacement of gear box when lateral motion occurs in slow speed shaft.

FLYWHEEL AND BRAKE—The energy developed by flywheels is based on three-fourths rating of gears as most units are operated at under-rated capacity.

The braking can either be handled from derrick floor or from brake lever on unit.

GENERAL—Lufkin Units are built of the very best materials, with the closest possible precision, and are built for service and not for a price. Only time and service will prove the economy in Lufkin Units.

BOILED DOWN FACTS ON LUFKIN EQUIPMENT

LUFKIN UNITS

Twelve years successful experience in designing LUFKIN UNITS, together with a close cooperation with practical field men, has developed a Standardized Product—their generally approved ADVANTAGES being:

1. Simple, rugged, construction, with
2. Large factors of safety in design.
3. Constructed of best material available.
4. Precision workmanship.
5. Interchangeable parts.
6. All wearing parts easily renewable.
7. Main bearings renewable in the field.
8. Ample bearing capacities throughout.
9. Alloy steel shafts, gears and pinions.
10. Lufkin-Sykes Herringbone Gears accurately cut in our own plant.

PRACTICAL OPERATING ADVANTAGES

Years of experience in rigid tests; practical inspection of our own gears and other makes in actual field operation has led us to the conclusion that the LUFKIN-SYKES **WEAR FORMULA** FOR HORSE POWER RATINGS is conservative and correct for oil well pumping.

Lufkin Herringbone Gears are 96 to 98% efficient and with our ratings Lufkin Units will operate 5 to 10 years without appreciable loss in effeciency which is especially important when buying power.

Lufkin Units require little attention.

Practically no repairs.

Large users report fifty cents to one dollar per month as repair costs on complete rigs.

Down time and rod trouble reduced to the minimum.

Accident hazard almost entirely eliminated.

100% salvage value—excepting foundation.

Lufkin Units are a permanent investment.

THE TROUT COUNTERBALANCE CRANK

Rotary counterbalancing (originated by Lufkin)is now universally accepted, the idea not only reducing the power required, but due to the even strain produced on rods and walking beam, as well as the geared unit, rod trouble and beam breakage has been almost eliminated.

Cranks in several forms have since been offered, but our many customers continue to favor the Trout crank. It has ten outstanding mechanical advantages:

1. Simple, practical construction.
2. Easily adjustable from zero to maximum counterbalance.
3. Accurate balance within 2-amps on up and down stroke.
4. Adjustments quickly made. Average not over five minutes, no weights to lift, add or subtract.
5. Lead or lag balance readily obtainable.
6. Safety feature — impossible to slide off — steel safety lug cast in each weight with forged steel bolts insure absolute safety. Unquestionably the safest crank to handle from the operator's standpoint.
7. When servicing well, weights in neutral position, crank has fly wheel effect which is very desirable for quick pick up on rods and tubing.
8. Trout cranks have a short radius of gyration (do not require as high concrete foundations as do those with weights on out end) consequently a better balance at top and bottom of dead center, and due to concentrated weight closer to crank pin, insures less bearing pressure and eliminates excessive strains on crank shaft.
9. Due to gas and other changing conditions frequent adjustment is necessary and advantageous in pumping oil—saving power, etc., which is readily accomplished on a Trout crank, yet very impractical on an "added to," or "subtracted from" drop crank.
10. Sufficient counterbalance proportionate to stroke readily obtainable, and is especially desirable in a three-well hook up, see page 39.

LUFKIN SINGLE CRANK UNITS

SC—No. 1—(See Page 14)

GENERAL SPECIFICATIONS: No. 16 Samson Post—16′ 3″ high; Walking Beams as shown below; Pitman Pipe 5″; No. 1 Pitman; 4″ x 6″ Crank Pin; No. 1B Center Bearing—5″ x 24″ Trunnion; No. 1 Rod Hanger.

Unit No.	Type Gears	H.P. @ 24 S.P.M. Luf-Sykes Formula	H.P. @ 24 S.P.M. Lewis Formula	Ratio	Crank Shaft	Drive Sheave Bore	Sheave Dia. & No. Grooves	Dia. & Face Main Gear	Center Crank to Base Unit
58	Single Reduction	58	229	9.7	6 7/16″	3 11/16″	43″-11-C 43″ Max.	55″x10″	35″
56	Single Reduction	45	190	9.4	6 7/16″	3 7/16″	35″-11-C 35″ Max.	48″x10″	30″
51	Double Reduction	52	205	28.8	6 7/16″	2 11/16″	25″-11-C 52″ Max.	36″x12″	30″
48	Single Reduction	36	154	9.4	5 7/16″	3 7/16″	37″-11-C 37″ Max.	48″x8″	30″
41	Double Reduction	40.6	162	30.15	6 7/16″	2 11/16″	25″-8-C 48″ Max.	34″x10″	28″
31 31-A	Double Reduction	24 29 Special	115	29.3 23.25	6″	2 7/16″	25″-6-C 40″ Max.	28″x10″	24″

Crank	Stroke	Effective C Bal. in Lbs. Reg. Wts.	C.I. Aux. Wts.	Lead Aux. Wts.
7272	32″	18,000	22,000	24,300
	42″	13,700	16,800	18,500
	52″	11,000	13,550	15,000
	62″	9,300	10,400	12,500
	72″	8,000	9,800	10,800
6266	32″	12,200	15,300	17,200
	42″	9,300	11,600	13,100
	52″	7,500	9,400	10,600
	62″	6,300	7,900	8,900

Walking Beam No.	Section	Working Centers	Ratings A.P.I.	Ratings A.I.S.C.
1328-C	24″x14″ 130 lb.	28′	20,350	30,525
1325-C	24″x14″ 130 lb.	25′	23,900	36,000
1028-C	24″x12″ 100 lb.	28′	14,165	21,250
1025-C	24″x12″ 100 lb.	25′	16,830	25,245

NOTE: No. 18 Heavy Duty Post 18′ 3″ high can be furnished if desired. No.1 O B—Oil Bath Dust Proof Center Bearing—5″ x 24″ Bronze Bushed—can be furnished extra if desired. Beams with hinged horse heads furnished extra.

EXAMPLE: The No. 31 Unit, when used with the above Assembly, will be designated SC-1-31-1028C—the 31 being the number of the Unit and 1028C meaning a 100 lb. Walking Beam with 28′ Working Centers. Either 7272 or 6266 Crank will be furnished according to the counterbalance required.

TABLE 13

SC—No. 2—(See Page 15)

GENERAL SPECIFICATIONS: No. 12 Samson Post 12′ 0″ high; Walking Beams as shown below; No. 1 Pitman with 4″ Pipe; 4″ x 6″ Crank Pin; No. 2B Center Bearing 5″ x 18″ Trunnion; No. 1 Rod Hanger.

Unit No.	Type Gears	H.P. @ 24 S.P.M. Luf-Sykes Formula	H.P. @ 24 S.P.M. Lewis Formula	Ratio	Crank Shaft	Drive Sheave Bore	Sheave Dia. & No. Grooves	Dia. & Face Main Gear	Center Crank to Base Unit
31	Double Reduction	24	115	29.3	6″	2 7/16″	25″-6-C 40″ Max.	28″x10″	24″
26 26-A	Single Reduction	26 32 Special	127	10.5 8.0	5 7/16″	2 11/16″ 3 7/16″	32″-8-C 32″ Max.	42″x8″	27″
21	Double Reduction	17	71	30.6	5 7/16″	2 7/16″	25″-4-C 36″ Max.	25″x7″	22″

TABLE 14

Lufkin gear ratings are based on WEAR. 5 to 10 years operation received without appreciable loss in efficiency.

Crank	Stroke	Effective C Bal. in Lbs. Reg. Wts.	C.I. Aux. Wts.	Lead Aux. Wts.
6266	32″	12,200	15,300	17,200
	42″	9,300	11,600	13,100
	52″	7,500	9,400	10,600
	62″	6,300	7,900	8,900
5260	22″	15,000	19,150	21,300
	32″	10,400	13,150	14,600
	42″	7,920	10,000	11,100
	52″	6,400	8,100	9,000

Walking Beam No.	Section	Working Centers	Ratings A.P.I.	Ratings A.I.S.C.
1020-C	24″x12″ 100 lb.	20′	24,890	37,335
8220-C	21″x9″ 82 lb.	20′	14,600	21,900

NOTE: Walking Beams with hinged Horse Heads may be furnished in place of Center Line Beams and will be designated thus—1020 H.

SC—No. 3—(See Page 15)

SPECIFICATIONS: No. 3 Samson Post 8′ 2″ high; Walking Beam as shown below; No. 2 Pitman, 3″ Pipe; 3½″ x 5″ Crank Pins; No. 3B Center Bearing, 4″ x 18″ Trunnion Wire Line Hanger—Hinged Horse Head.

Unit No.	Type Gears	H.P. @ 24 S.P.M. Luf-Sykes Formula	H.P. @ 24 S.P.M. Lewis Formula	Ratio	Crank Shaft	Drive Sheave Bore	Sheave Dia. & No. Grooves	Dia. & Face Main Gear	Center Crank to Base Unit
11	Double Reduction	10	55	30.25	4 7/16″	1 11/16″	25″-4-C 32″ Max.	22″x6″	20″

TABLE 15

Crank	Stroke	Effective C Bal. in Lbs. Reg. Wts.	C.I. Aux. Wts.	Lead Aux. Wts.
4256	22″	12,400	16,000	.....
	32″	8,500	11,000	.....
	42″	6,500	8,450	.....

Walking Beam No.	Section	Working Centers	Ratings A.P.I.	Ratings A.I.S.C.
6414-H	18″x8¾″ 64 lb.	14′	15,675	23,500

NOTE: Headache Posts may be furnished extra on all Samson Posts. Old Style "Plain" Beams with "T" Type Hanger and Stirrup Pitman in same sizes as shown in above tables may be furnished if desired All crank shafts are 1″ diameter larger in gear

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

PROPORTIONATE SIZES LUFKIN SINGLE CRANK UNITS

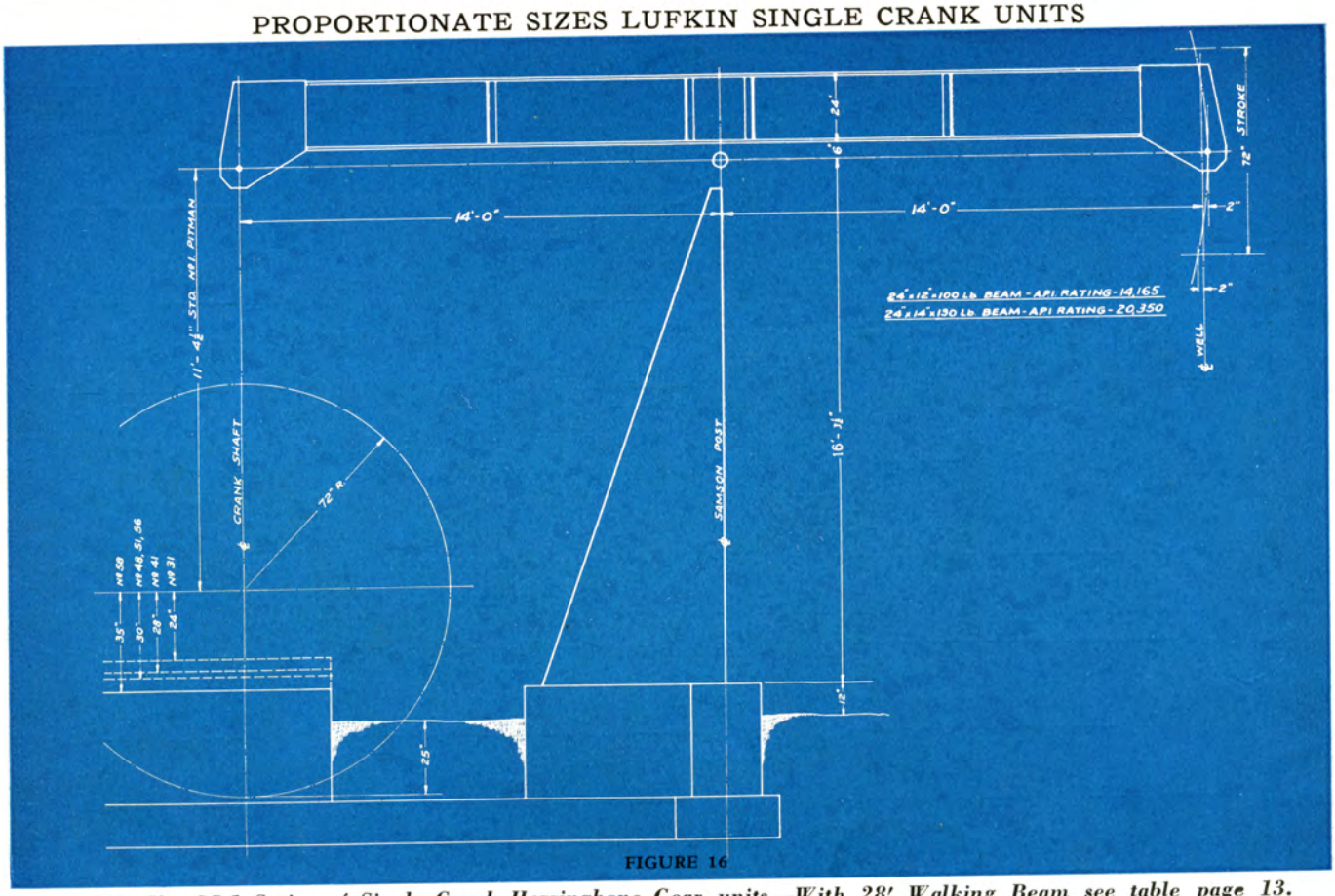


FIGURE 16

Lufkin No. SC-1 Series of Single Crank Herringbone Gear units—With 28′ Walking Beam see table page 13.

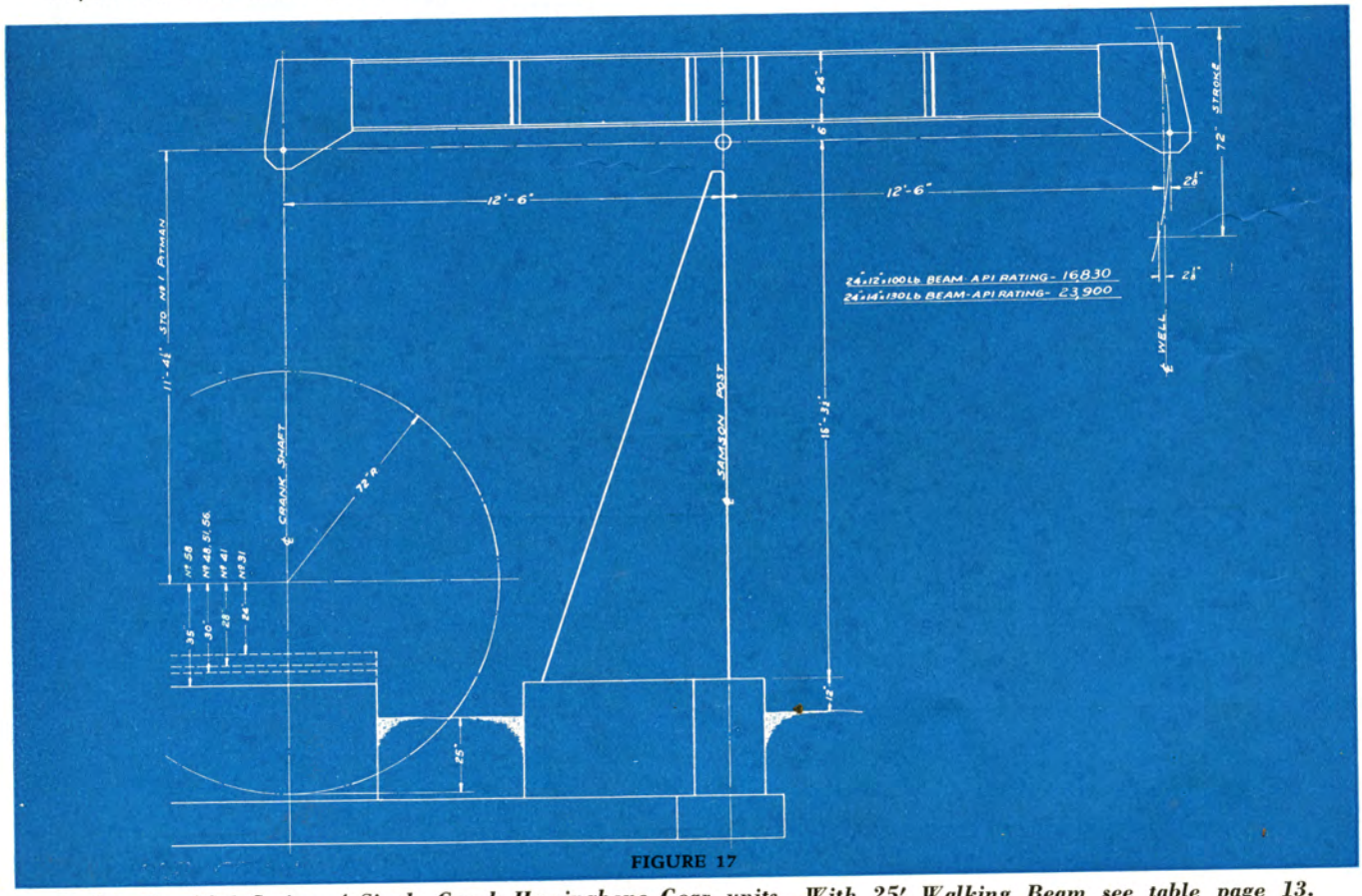


FIGURE 17

Lufkin No. SC-1 Series of Single Crank Herringbone Gear units—With 25′ Walking Beam see table page 13.

PROPORTIONATE SIZES LUFKIN SINGLE CRANK UNITS

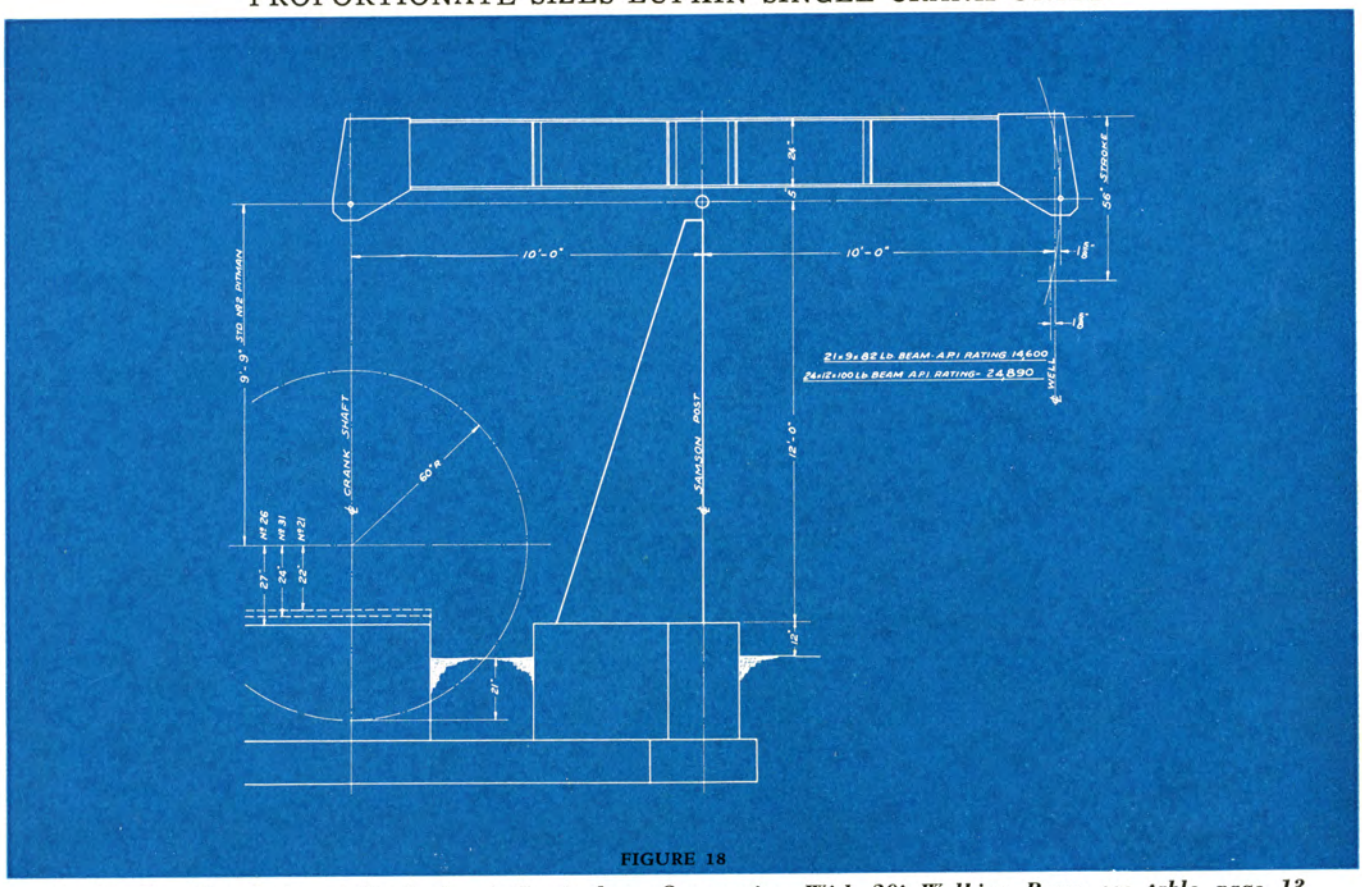


FIGURE 18

Lufkin No. SC-2 Series of Single Crank Herringbone Gear units—With 20′ Walking Beam see table page 13.

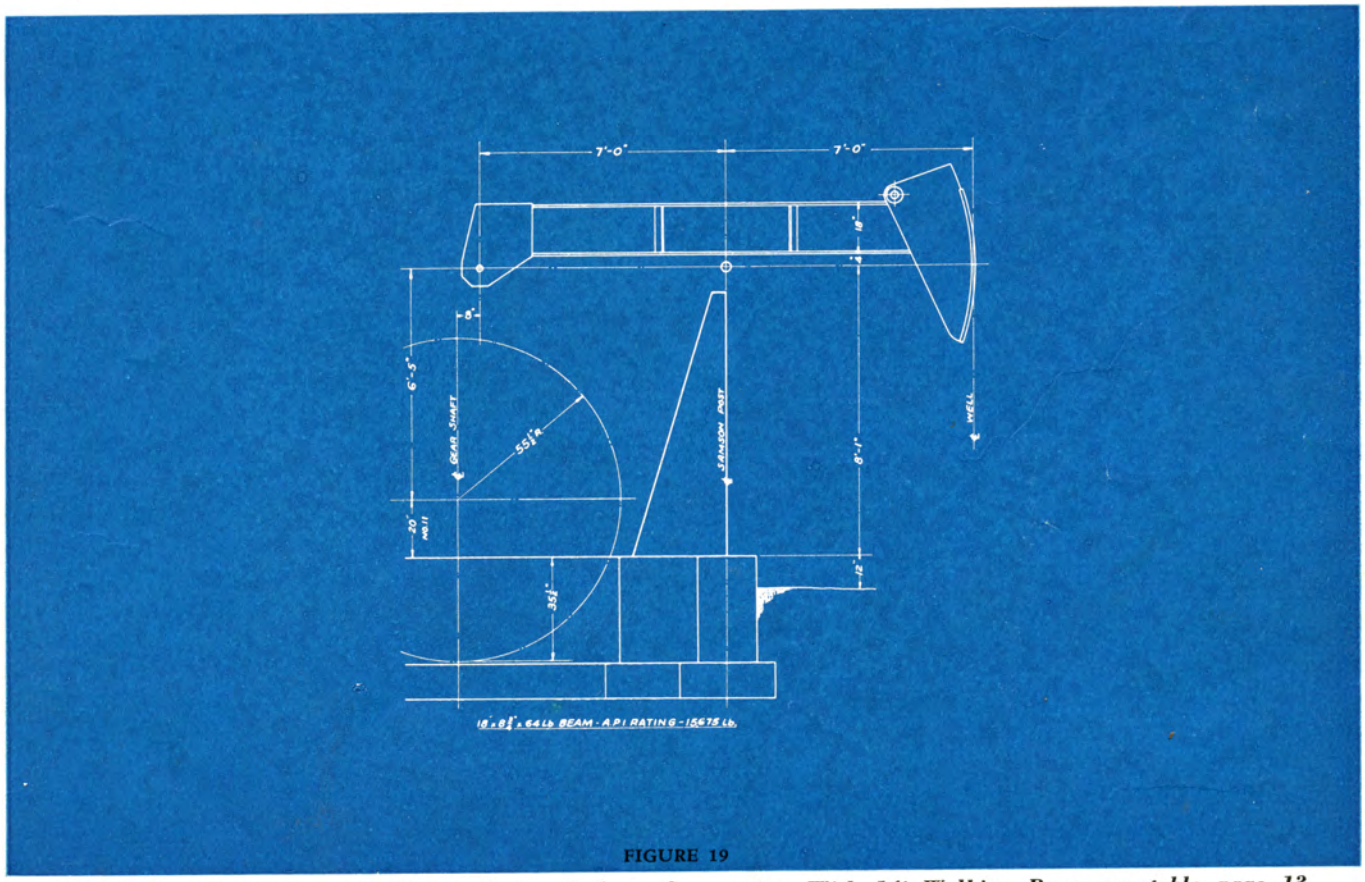
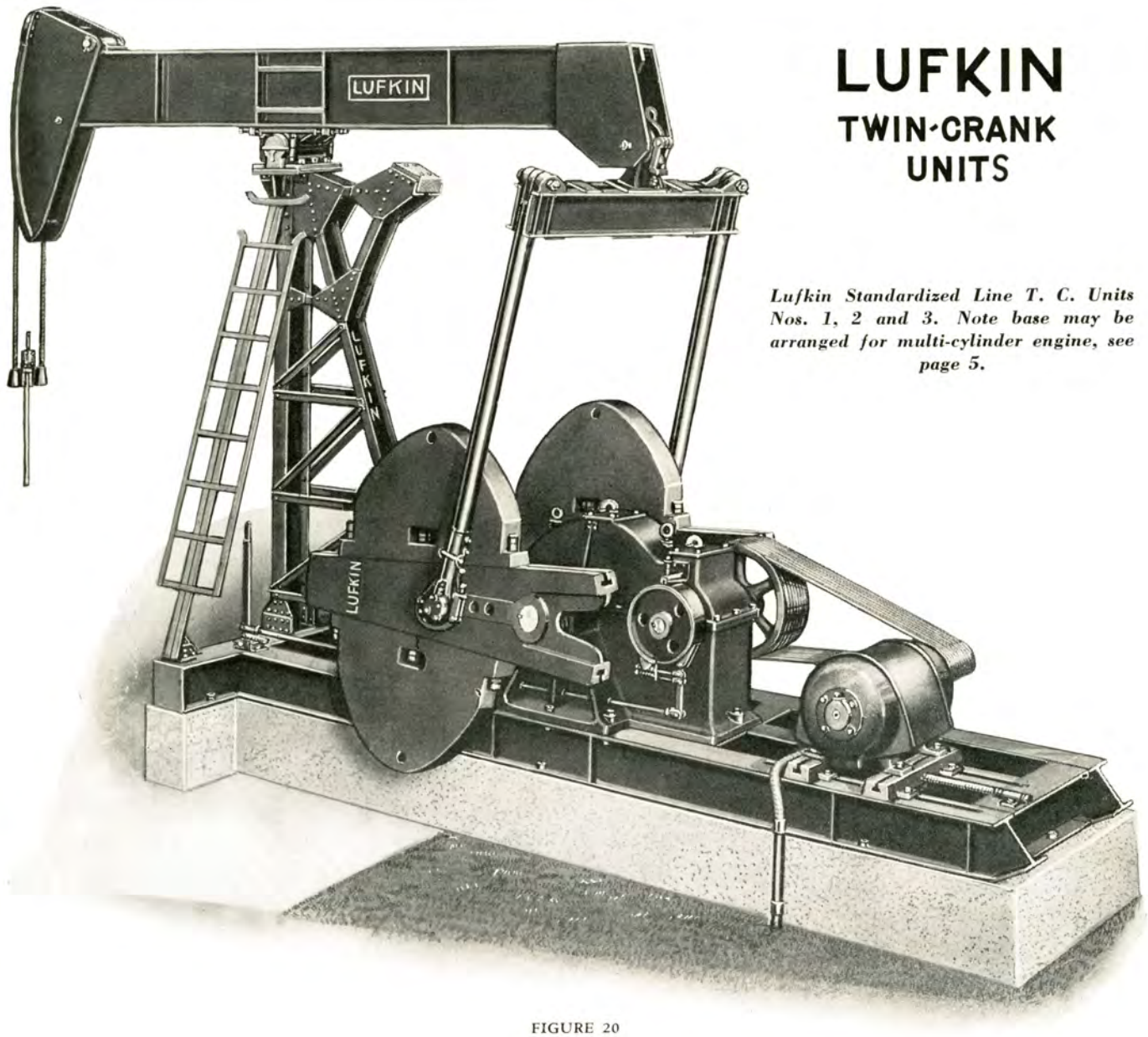


FIGURE 19

Lufkin No. SC-3 Series of Single Crank Herringbone Gear units—With 14′ Walking Beam see table page 13.



LUFKIN
TWIN-CRANK UNITS

Lufkin Standardized Line T. C. Units Nos. 1, 2 and 3. Note base may be arranged for multi-cylinder engine, see page 5.

FIGURE 20

LUFKIN TWIN-CRANK HERRINGBONE UNITS

For some time we have been manufacturing TWIN CRANK UNITS up to 72" stroke and in horsepower capacities as high as 60.

An increased demand has now justified a standardization of four sizes of assemblies (base, post, beam, and pitmans), to which can be applied either single or double reduction units as shown in the table on the opposite page, and in the accompanying blue print drawings.

TWIN CRANK UNITS have proven very successful in the field from an operating standpoint. Being self contained, they are always in perfect alignment, easily portable, and while they cost more than Single Crank Units, they can be installed at a minimum cost.

There is no "over hang" in the TWIN CRANK UNIT since the whole structure sets on an oblong base centrally on the foundation. Torque strains in the main shaft are evenly divided between the cranks; bearing pressures are equal on each bearing, and with two pitmans, the crank pin bearing surfaces are doubled. This, with a pitman equalizer and full universal connection to beam gives a well balanced unit that insures very satisfactory operation.

The gears used in the Lufkin Twin Crank Unit are the same as used in the Single Crank Units—of the Herringbone type described elsewhere in this catalogue. This type of gearing is so familiar to the Oil Industry that further description is unnecessary.

The walking beams and center bearings are the same on all types of TWIN CRANK UNITS, except

FIGURE 21

Lufkin T. C. 4-11 Unit with motor mounted behind unit.

the shorter beams have a hinged horsehead (see page 29) which can be turned up over the beam to clear the well when servicing. The center bearing also allows the beam to swing around if necessary to further clear the well.

The table on page 19 and the accompanying line drawings shows various sizes of twin crank units. The TC No. 3 Unit is the size most generally used, being heretofore known as our 4½ Twin Crank, of which we have sold several hundred units. In this standardization, however, some improvements have been made as will be noted from the table. The samson post in the new standardization will be 10-ft. high, in place of 8-ft. The beam is provided with a hinged horse head, and also a larger center bearing with ample bearing surface. The style of pitman has been changed to the cross bar double channel equalizer type, and the same style connection to the tail end of beam is used that has proven so popular with our center line beam assembly.

The pitman connections are of 3″ hydraulic tubing, and crank pins are our No. 2 pitman type, size 3½″ x 5″ in place of 2½″ x 4″ (as formerly), making this a very much stronger and improved unit.

LUFKIN TC NO. 4-11 UNIT ASSEMBLY

The TC No. 4-11 Unit Assembly (base, post beam and pitman), is practically the same structure, as we have been building regularly and known as our 4½″ Twin Crank Unit, except the beam and the cranks are lighter, and the unit is now limited to 42″ stroke at 12,000 pounds polish load. Our double reduction unit No. 11 is used on this assembly, and the solid horse head is regularly furnished on this unit.

All of these units and their counterbalance capacities, are in the very best proportion for stroke and horse power loads. See table page 19.

FLOOR UNITS—WHERE CRANK MUST NOT SWING BELOW BASE OF UNIT

Most of our customers set our units on concrete high enough to clear sweep of cranks above floor which is obviously better, however, where units go on derrick floors or to be especially portable, we can furnish them so cranks will clear. This is done on Units TC No. 3 and No. 4 by using deeper bases but on the larger units it is necessary to supply a sub-base under unit all of which can be provided at an extra price.

FIGURE 22

LUFKIN TC NO. 4-11 UNIT ASSEMBLY

View shows motor mounted under samson post. Hanger shown is special. The solid horse head type, shown on page 17, will be furnished regularly as standard equipment unless otherwise specified.

A hinged horse head can be furnished at a small extra cost, however, the beam is arranged to swivel on the post to clear well when servicing and hinged head is not considered necessary.

Lufkin T. C. 4-11 Unit with motor mounted under Samson post. Hanger shown is special. Solid Horse Head is furnished unless otherwise specified.

TWIN CRANK UNITS WITH LONG CENTER-LINE BEAMS AND UNIVERSAL ROD HANGER

By lengthening base between unit and samson post, long center beams of the hanger type may be applied to the TC units No. 1 and No. 2—see page 5 and 22 where long beam and universal hanger is illustrated. To properly distinguish these units they are numbered TC No. 1-A and TC No. 2-A.

TC No. 1-A may be furnished with 25′ or 28′ center beams—see page 22.

TC No. 2-A may be furnished with 20′ or 25′ center beams—see page 22.

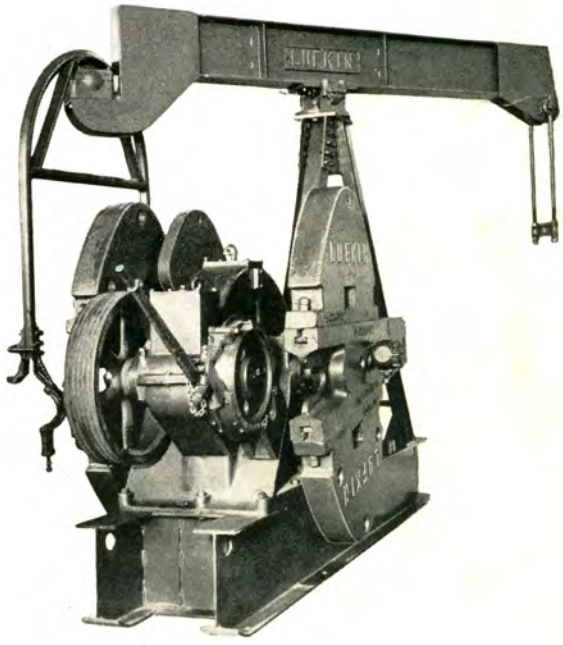


FIGURE 23

T. C. No. 4-11 Unit Assembly with deep base so cranks will swing clear of floor. This also illustrates how beam swivels on all T. C. Units to clear when servicing the well.

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

Lufkin Gear Ratings Are Based on Wear.

LUFKIN TWIN CRANK UNITS
Table of Specifications

Lufkin Gear Ratings Are Based on Wear Insuring 5 to 10 Years Service Without Appreciable Loss in Efficiency.

TC-1—NO. 1 TWIN CRANK ASSEMBLY—(See Page 20, Fig. 27)
Designed for 25,000 lbs. Polish Rod Load and 72″ Maximum Stroke

General Specifications: Depth Base, 16″; No. 16—Samson Post 16′ 3″ high; No. 1B Center Bearing, 5″x24″ Trunnion; Walking Beam, 24″x12″x100 lb.; Working Centers, 9′ 3″ and 10′ 9″; Pitman][Crosshead Type 4″ Heavy Pipe Connection; 4″x6″ Trout Crank Pins; 6266 Cranks 65½″ Radius.

Unit Number	Type Gears	H.P. @ 24 S.P.M. Luf-Sykes Formula	H.P. @ 24 S.P.M. Lewis Formula	Ratio	Crank Shaft	Drive Sheave Bore	Sheave Dia. & No. Grooves	Dia. and Face Main Gear	Center Crank to Base Unit	Polish Rod Stroke	Effective Counterbalance, Lbs. Reg. Wts.	C.I. Aux. Wts.	Lead Aux. Wts.
56	Single Reduction	45	190	9.4	6 7/16″	3 7/16″	35″-11-C 35″ Max.	48″x10″	30″	37.2″	23,800	28,750	31,600
51	Double Reduction	52	205	28.8	6 7/16″	2 15/16″	25″-11-C 52″ Max.	36″x12″	30″	48.8″	18,150	21,900	24,100
48	Single Reduction	36	154	9.4	5 7/16″	3 7/16″	37″-11-C 37″ Max.	48″x8″	30″	60.4″	14,650	17,700	19,480
41	Double Reduction	40.6	162	30.15	6 7/16″	2 15/16″	25″-8-C 48″ Max.	34″x10″	28″	72″	12,280	14,850	16,330
31 31-A	Double Reduction	24 29 Spe.	115	29.3 23.25	6″	2 7/16″	25″-6-C 40″ Max.	28″x10″	24″				

EXAMPLE: The No. 48 Unit, when used with the above assembly, will be designated thus:—TC-1-48.

NOTE: We can furnish regular 25′ to 28′ Walking Beams with Universal Rod Hanger in place of the Horse Head which necessitates the use of a longer base. These Units would have the same specifications as above except the Beam and the length of the Base, and will then be known as TC-1A-48-1025C; 48 being the number of the Unit and 1025C meaning a Centerline Beam weighing 100 lbs. per foot with 25′ Working Centers.

TABLE 24

TC-2—NO. 2 TWIN CRANK ASSEMBLY—(See Page 20, Fig. 28)
Designed for 20,000 lbs. Polish Rod Load and 56″ Maximum Stroke

General Specifications: Depth Base, 16″; Samson Post, No. 12, 12′ 0″ high; No. 2B Center Bearing 5″ x 18″ Trunnion; Walking Beam, 21″ x 9″x82 lb.; Working Centers, 7′ 8″ and 8′ 4″; Pitman][Crosshead Type 3″ Pipe Connection; 3½″ x 5″ Trout Crank Pins; 5256 Cranks 55½″ Radius.

Unit Number	Type Gears	H.P. @ 24 S.P.M. Luf-Sykes Formula	H.P. @ 24 S.P.M. Lewis Formula	Ratio	Crank Shaft	Drive Sheave Bore	Sheave Dia. & No. Grooves	Dia. and Face Main Gear	Center Crank to Base Unit	Polish Rod Stroke	Effective Counterbalance, Lbs Reg. Wts.	C.I. Aux. Wts.	Lead Aux. Wts.
48	Single Reduction	36	154	9.4	5 7/16″	3 7/16″	37″-11-C 37″ Max.	48″x8″	30″	23.8″	25,000	31,300	35,100
41	Double Reduction	40.6	162	30.15	6 7/16″	2 15/16″	25″-8-C 48″ Max.	34″x10″	28″	34.7″	17,200	21,600	24,000
26-A 26	Single Reduction	32 Spe. 26	127	8.0 10.5	5 7/16″	3 7/16″ 2 15/16″	32″-8-C 32″ Max.	42″x8″	27″	45.6″	13,100	16,400	18,300
31 31-A	Double Reduction	24 29 Spec.	115	29.3 23.25	6″	2 7/16″	25″-6-C 40″ Max.	28″x10″	24″	56.5″	10,600	13,250	14,800

NOTE: We can furnish regular 20′ Centerline Walking Beams with Universal Rod Hanger in place of Horse Head, and a longer Base to accommodate same. These Units will be designated TC-2A-48-8220C.

TABLE 25

TC-3—NO. 3 TWIN CRANK ASSEMBLY—(See Page 21, Fig. 29)
Designed for 17,000 lbs. Polish Rod Load and 48.8″ Maximum Stroke.

General Specifications: Depth Base, 10″; Samson post—Tripod 10′ 0″ high; No. 3B Center Bearing, 4″ x 18″; Walking Beam, 18″ x 8¾″ x 64 lb.; Working Centers, 5′ 3¼″ x 7′ 0″; Pitman][Crosshead Type 3″ Pipe Connection; 3½″ x 5″ Trout Crank Pins; 3645 Cranks 45½″R.

Unit Number	Type Gears	H.P. @ 24 S.P.M. Luf-Sykes Formula	H.P. @ 24 S.P.M. Lewis Formula	Ratio	Crank Shaft	Drive Sheave Bore	Sheave Dia. & No. Grooves	Dia. & Face Main Gear	Center Crank to Base Unit	Polish Rod Stroke	Effective Counterbalance, lbs. Regular Wts.	Kidney Wts.
26-A 26	Single Reduction	32 Spe. 26	127	8.0 10.5	5 7/16″	3 7/16″ 2 15/16″	32″-8-C 32″ Max.	42″x8″	27″	21.7″	15,400	22,500
22	Double Reduction	17	71	30.6	4 7/16″	2 7/16″	25″-4-C 40″ Max.	25″x7″	27″	35.2″	9,950	13,900
18	Single Reduction	19	93	10.5	4 7/16″	2 15/16″	34″x6-C 34″ Max.	42″x6″	27″	48.8″	6,860	10,000

TABLE 26

TC-4-11 TWIN CRANK ASSEMBLY—(See Page 21, Fig. 30)
Designed for 12,000 lbs. Polish Rod Load and 42″ Maximum Stroke.

General Specifications: Depth Base, 10″; Samson Post—Tripod 8′ 2″ high; No. 3 Center Bearings 3″ x 15″ Trunnion; Walking Beam, 16″ x 8½″ x 58 lb.; Working Centers, 5′ 3¼″ x 6′ 0″; Pitman—Wishbone Type, 2½″ Pipe Connection; 2½″ x 4″ Trout Crank Pins, 3636 Cranks 35½″ Radius.

Unit Number	Type Gears	H.P. @ 24 S.P.M. Luf-Sykes Formula	H.P. @ 24 S.P.M. Lewis Formula	Ratio	Crank Shaft	Drive Sheave Bore	Sheave Dia. & No. Grooves	Dia. & Face Main Gear	Center Crank to Base Unit	Stroke	Regular Wts.	Kidney Wts.
11	Double Reduction	10	55	30.25	4 7/16″	1 15/16″	25″-4-C 32″ Max.	22″x6″	20″	18.6″	9,230	13,200
										30.5″	6,620	8,050
										42″	4,100	5,850

TABLE 26A

All crank shafts are 1″ diameter larger in gear.

PROPORTIONATE SIZES LUFKIN TWIN CRANK UNITS

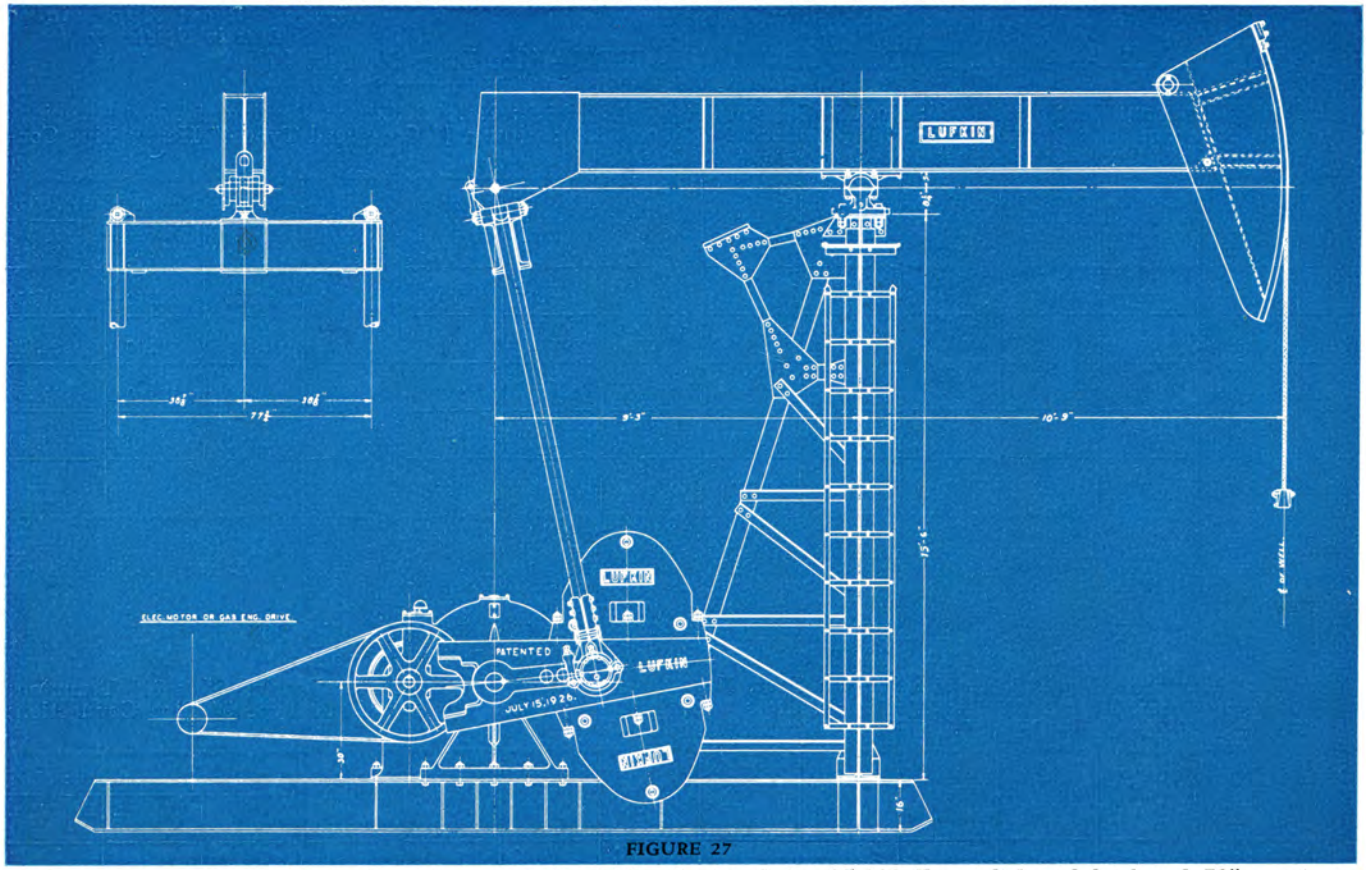


FIGURE 27

Lufkin TC-1 Twin Crank Herringbone Gear Unit Assembly—Designed for 25,000 lbs. polish rod load and 72" maximum stroke. For general specifications see table page 19.

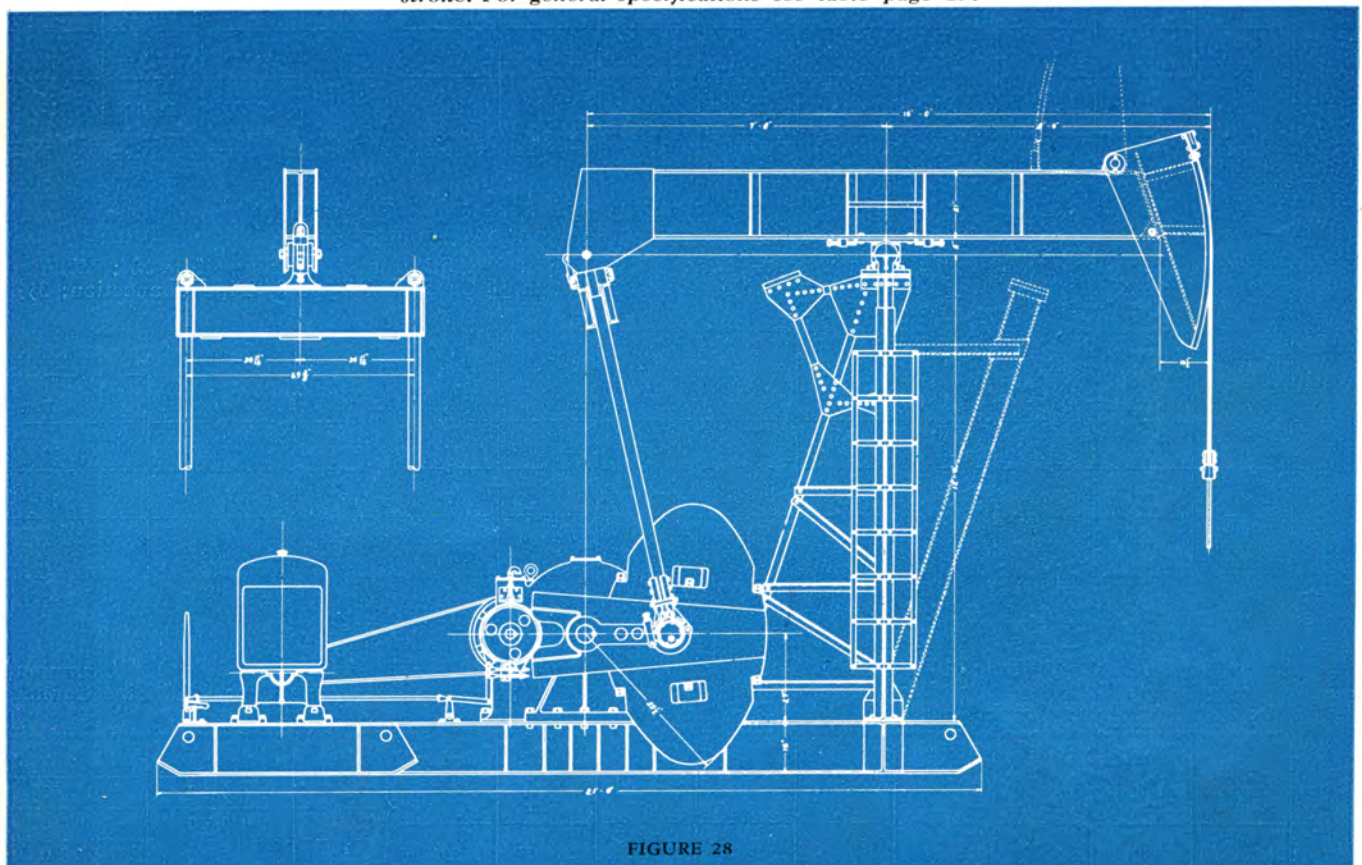


FIGURE 28

Lufkin TC-2 Twin Crank Herringbone Gear Unit Assembly—Designed for 20,000 lbs. polish rod load and 56" maximum stroke. For general specifications see table page 19.

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

PROPORTIONATE SIZES LUFKIN TWIN CRANK UNIT

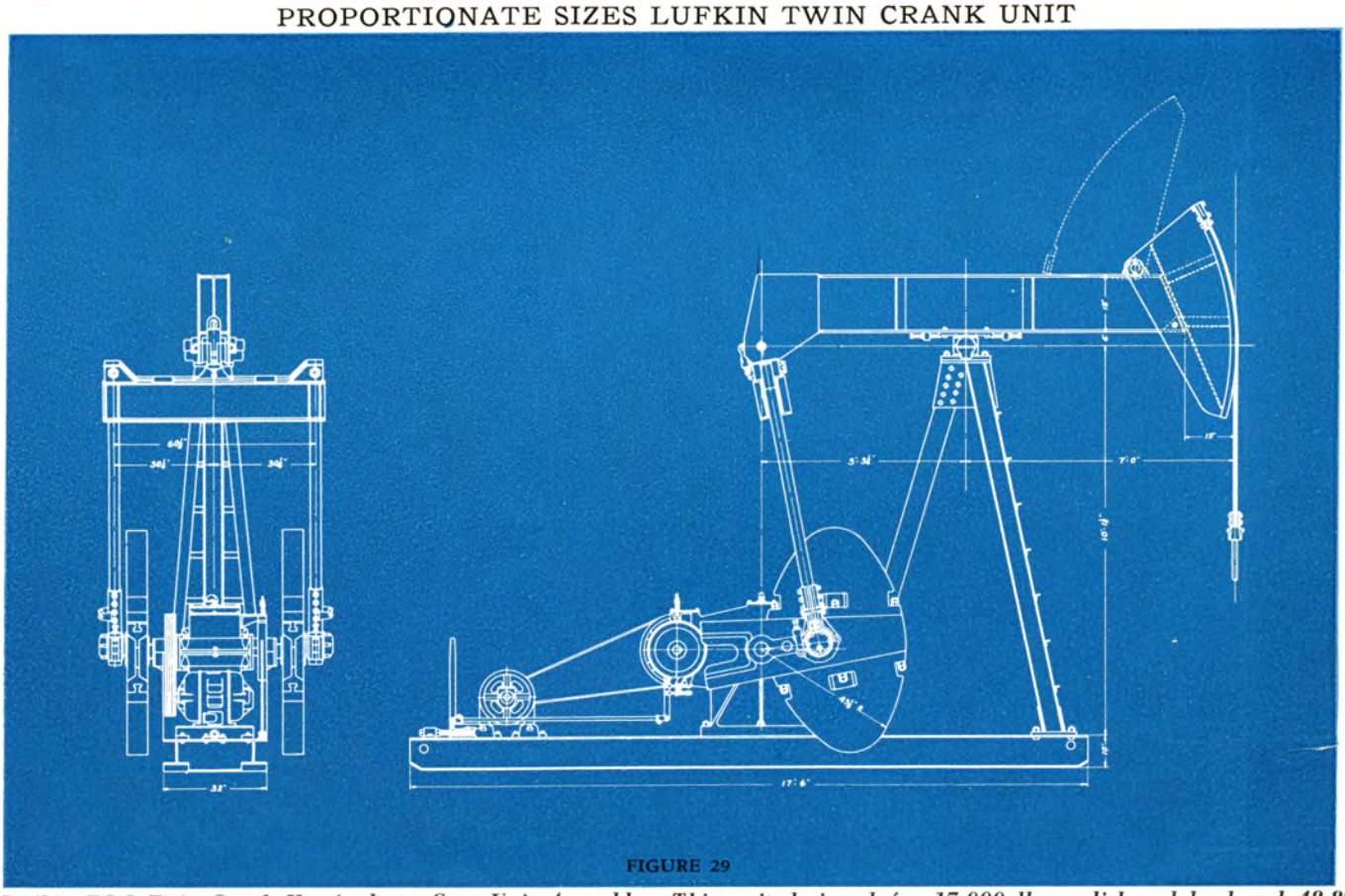


FIGURE 29

Lufkin TC-3 Twin Crank Herringbone Gear Unit Assembly—This unit designed for 17,000 lbs. polish rod load and 48.8" maximum stroke. For general specifications see table page 19.

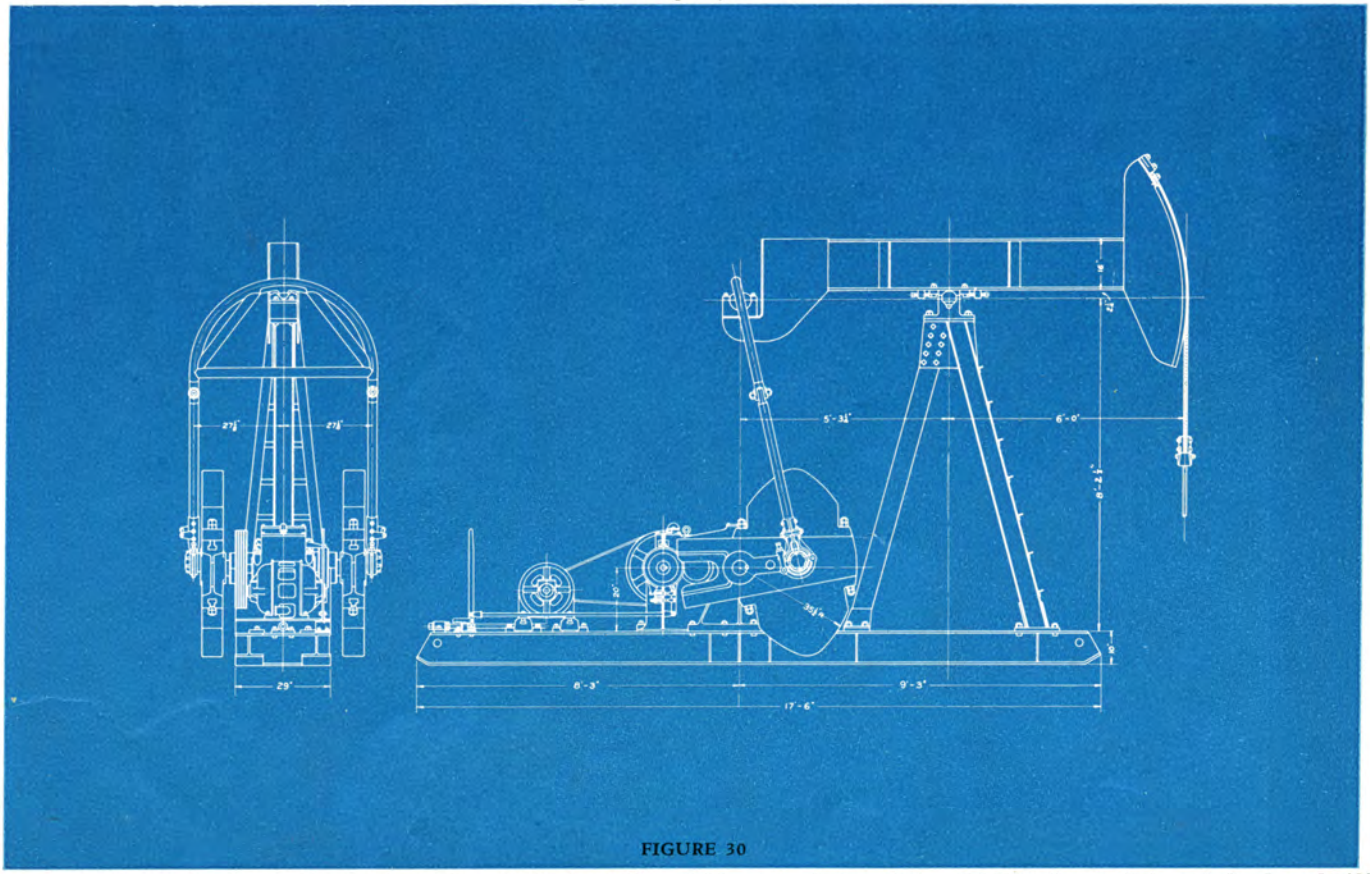


FIGURE 30

Lufkin TC-4 Twin Crank Herringbone Gear Unit Assembly—This unit designed for 12,000 lbs. polish rod load and 42" maximum stroke. For general specifications see table page 19.

PROPORTIONATE SIZES LUFKIN TWIN CRANK UNITS

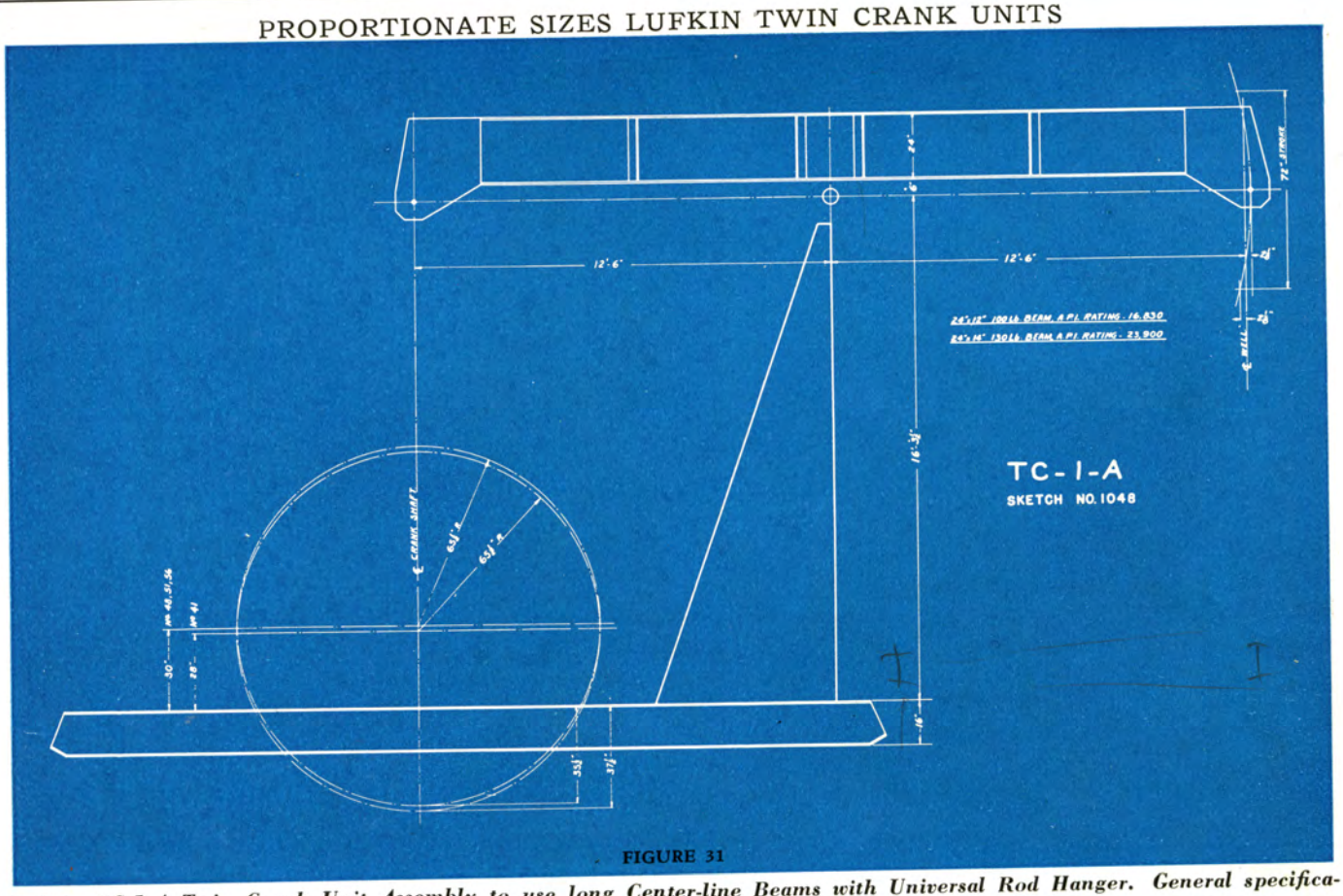


FIGURE 31

Lufkin TC-1-A Twin Crank Unit Assembly to use long Center-line Beams with Universal Rod Hanger. General specifications of units are the same as TC-1—see table page 19.

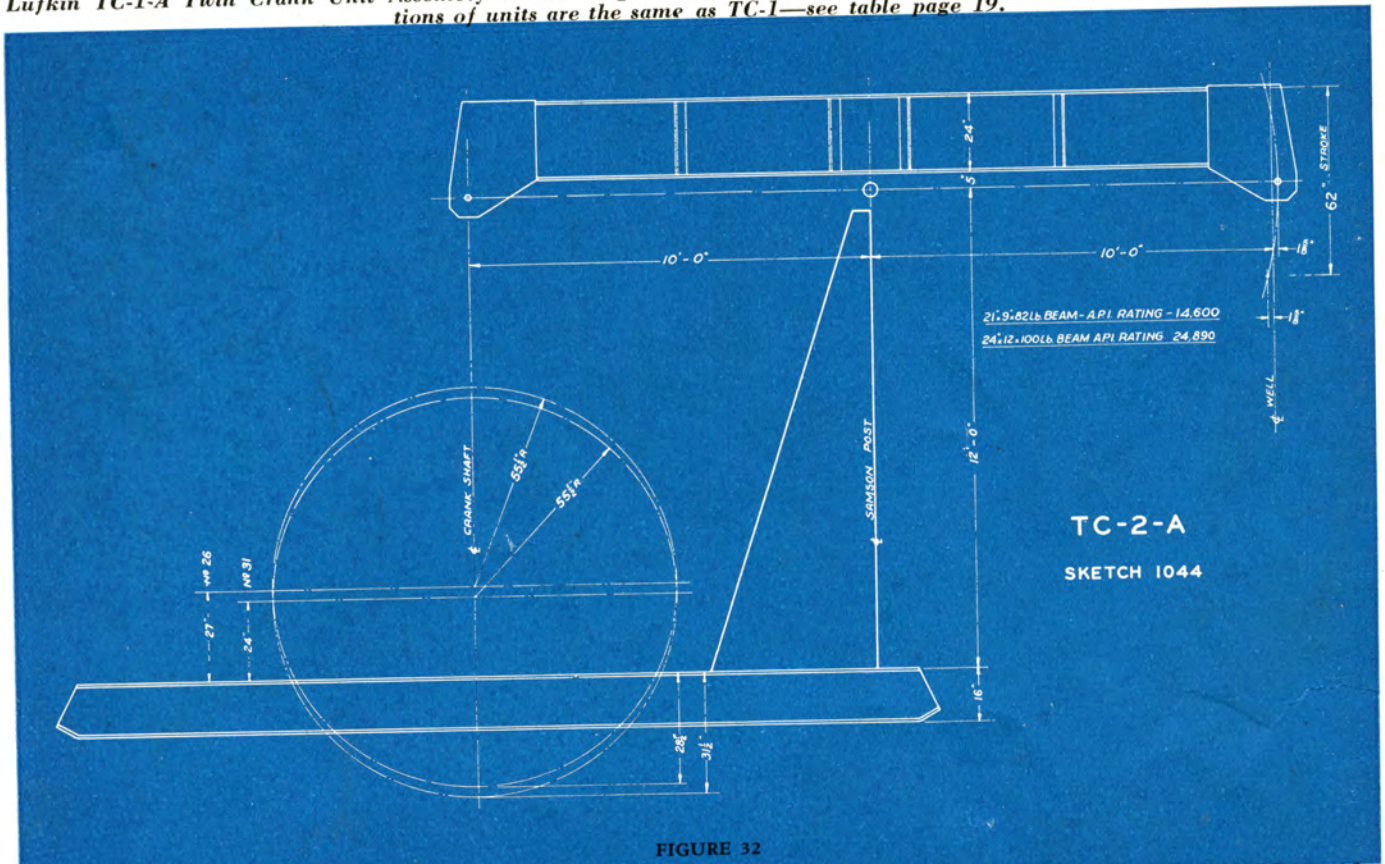


FIGURE 32

Lufkin TC-2-A Twin Crank Unit Assembly to use long Center-Line Beams with Universal Rod Hanger. General specifications of units are the same as the TC-2—see table page 19.

FIGURE 33

THE LUFKIN "BABY" WORM GEAR PUMPING UNIT

The Lufkin Worm Gear Units, preferred by a large number of producers, are no longer regularly stocked but can be furnished in all sizes upon order. Lufkin worm gear units have, to a very large degree, been replaced by the Sykes-Herringbone type of Lufkin Units.

The Lufkin Baby Worm Gear Unit, however, is still in demand for light production not to exceed 15 horsepower loads. Its rugged, simple construction makes it a highly favored unit, especially where compactness and portability are determining factors.

The Lufkin Baby Worm Gear Unit is similar in design and constructed of the same high quality materials as the larger worm gear units and is equipped with a special No. 3 Samson Post, Beam and Trout Universal Pitman.

One large export customer who has used nearly two hundred of this type unit, reports a lifting cost of only 2½ cents per barrel—the lowest known cost for pumping wells 2000 to 3000 feet in depth. Practically no upkeep expense and low power costs are the contributing causes for this low cost production.

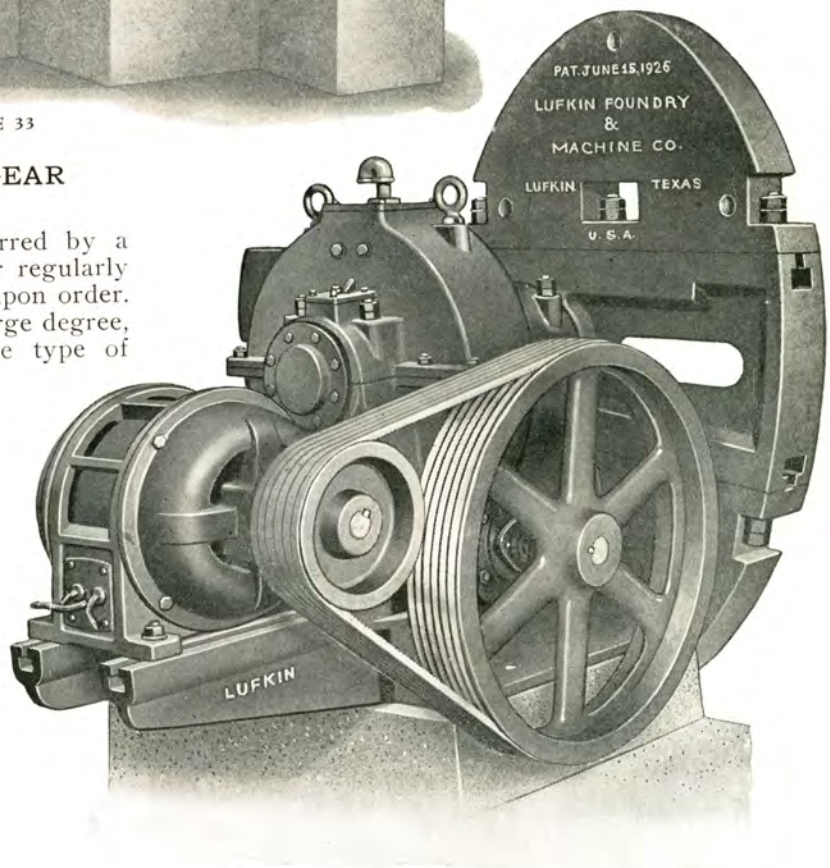


FIGURE 34

Lufkin "Stripped Standard" Worm Gear Unit with especially adapted bracket for electric motor operation. This unit also furnished with cast iron base and Universal Motor Slide Rails

THE TROUT COUNTER-BALANCE CRANK

After exhaustive tests and comparisons with every conceivable method of balancing a pumping well, the Trout counter-balance crank has been accepted by oil producers as the most desirable and effective means of well balancing.

The Trout counter-balance crank (see illustration) is the most effective and flexible counter-balance that has been offered the oil industry. It is compact and made up of a few simple parts which are "fool proof." The counter weights can be moved along the ways of the crank, so that any desired effective counter-balance can be easily obtained.

Studying the pump cycle of a well we find that all of the useful work is done during half the cycle, or in other words, on the upstroke of the rods. At the start and finish of the stroke the power required is theoretically zero as the rods are stationary. During the center portion of the up-stroke of the rods, the velocity in feet per minute at which the rods travel is a maximum. Power required is the product of force times velocity. Therefore, from a power input standpoint the counter-balance should be most effective during the center portion of the up-stroke which is the case with the Trout-Crank.

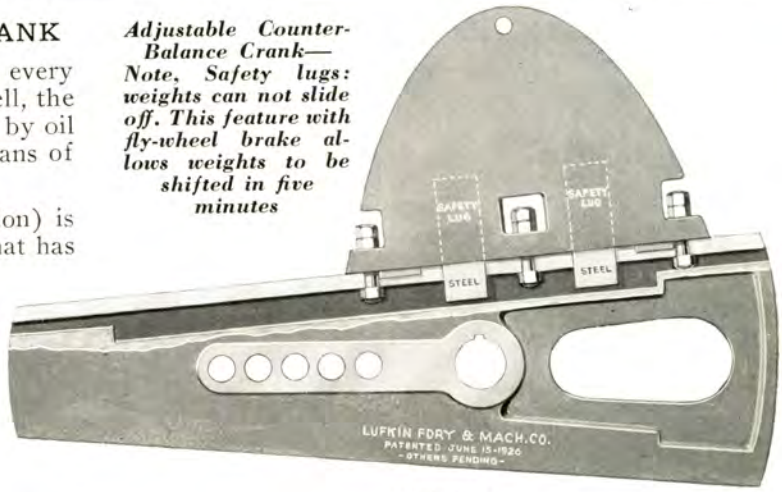
Whether the center of gravity of a rotary counter-balance should lead or lag the crank pin has been a much mooted question. But it has been definitely determined by experiment that the counter-balance cannot economically lead or lag over five degrees. It has never been shown that either a leading or lagging counter-balance has any advantage over a counter-balance with its center of mass in line with crank shaft and crank pin.

Theoretically the greatest force should be found at the point of maximum acceleration since

Force = Mass X Acceleration

The point of maximum acceleration is at the start of the upstroke, but dynamometer cards indicate that during the upstroke the force varies throughout and reaches a peak about the center of the upstroke, depending upon pumping conditions.

Counter-balance cranks aided by high speed fly wheels cut down the strain on pumping equipment, aid economical operation by permitting the use of smaller electrical equipment and lets the driving power operate at a higher efficiency.



Adjustable Counter-Balance Crank— Note, Safety lugs: weights can not slide off. This feature with fly-wheel brake allows weights to be shifted in five minutes

FIGURE 35

LUFKIN "EASY CHANGE" CRANK PIN

As every operator knows the crank pin is of vital importance in a pumping rig, usually giving the most trouble, and frequently the cause of accidents.

Due to better steels and heat treatment they now seldom break but still give trouble unless they are securely fastened in the pin hole.

Ten years experience with our "easy change" pin has given general satisfaction regardless of which direction the unit is operated.

Recently a key has been provided to prevent pin from turning, also a castellated nut with a large cotter pin, that makes them DOUBLY SAFE. If pin and bushing is put in as directed and nut tightened up they **cannot come loose.**

Before adopting this pin years ago, many tests were made on straight and taper pins (without bushing) and we found that by the use of the wedge bushing the pin could be tightened where it was equal to a 25-ton press fit and yet it could be released with a few blows of a hammer. The straight fit pin can only be put in with a sledge and not over a one ton press fit, which is about all one man can do, and is the main reason they wallow out. Taper holes in crank were found impractical for the same reason and the fact that in case of a "wallowed out hole" it is impractical to rebore the cranks in the field.

With the "Easy Change" Pin, any damage to the hole usually comes in the bushing which is easily replaced.

Crank pin wrench, also counterbalance weight wrench are furnished with each Unit.

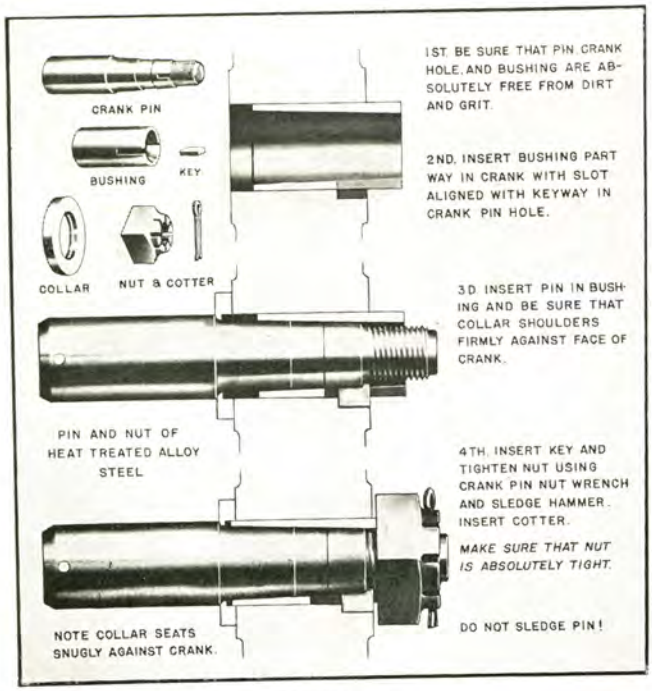


FIGURE 36

Instructions for assembling.

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

LUFKIN PRODUCTION HOISTS

Lufkin Engineers feel that they have reached the ultimate in operating efficiency in Production Hoists. Operation under the most severe conditions in the field over a period of years, has definitely proven the many advantages of the Lufkin "Loose-drum" roller bearing Hoists. The loose drum feature permits the Hoist to reverse without use of Power when going into the hole. This is found particularly desirable when using multi-cylinder or single cylinder engines. All Lufkin Hoists are equipped with Trout Expansion Brake Drums, which are unaffected by heat; Hyatt drum bearings; asbestos clutch blocks and asbestos brake bands of superior quality. Lufkin Hoists are ruggedly constructed and are fast and powerful in action. Time pulling rods and tubing is greatly reduced. Lufkin Hoists are furnished with either steel or wooden posts.

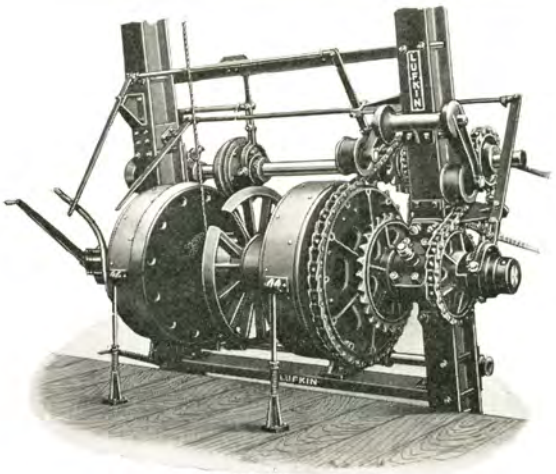


FIGURE 40
No. 52 Lufkin Production Hoist
(Same as No. 522 with line shaft added)

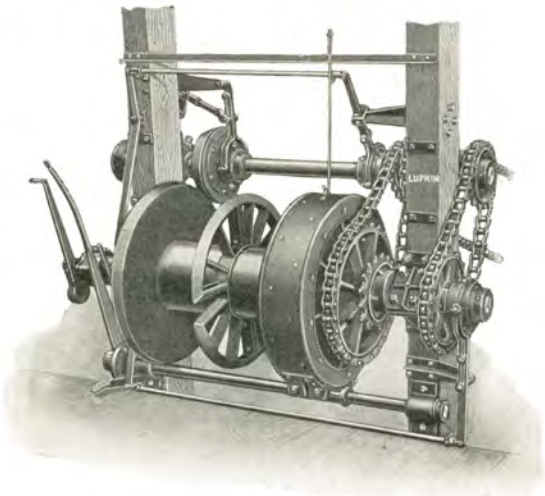


FIGURE 37
No. 2 Lufkin Production Hoist

FIGURE 39
Lufkin Combination Ball Bearing Rod Line Weight and "Sister Hooks"

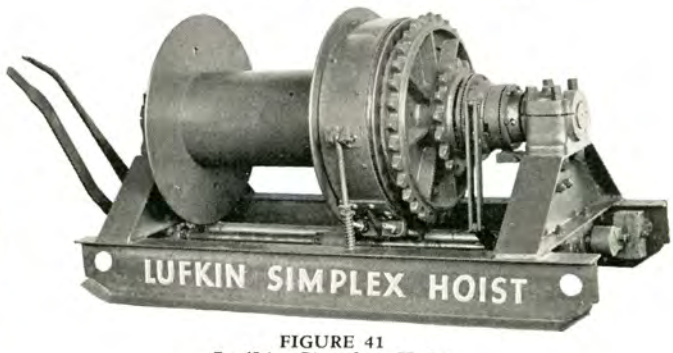


FIGURE 41
Lufkin Simplex Hoist

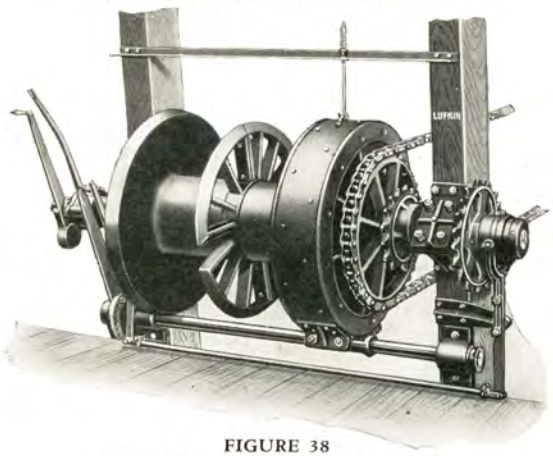


FIGURE 38
No. 6 Lufkin Production Hoist
(Same as No. 2 without line shaft)

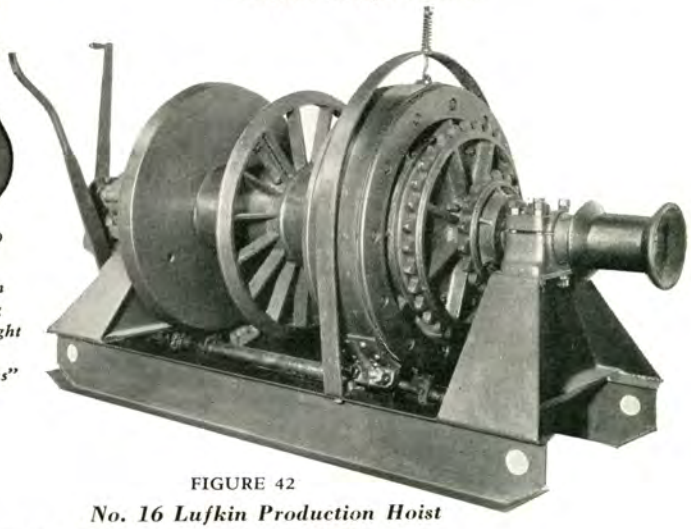
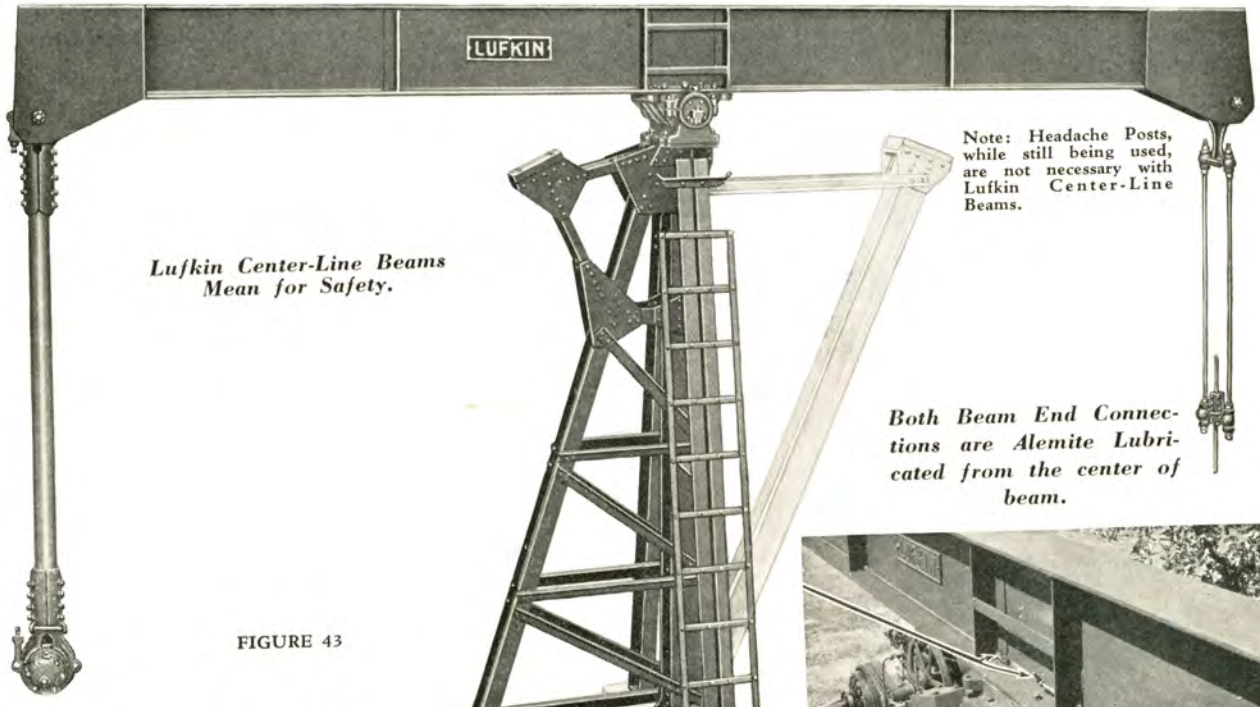


FIGURE 42
No. 16 Lufkin Production Hoist

SPECIFICATIONS OF LUFKIN PRODUCTION HOISTS

DIMENSIONS		No. 2	No. 6 & 16	No. 52	No. 522	Simplex
Line Capacity	3/16" Line	10,000	10,000	11,000	11,000	6,400
	5/16" Line	8,500	8,500	9,000	9,000	5,200
	1/4" Line	6,000	6,000	6,400	6,400	3,600
	7/8" Line	4,400	4,400	4,600	4,600	2,600
	1" Line	3,500	3,500	3,600	3,600	2,000
Diameter Drum Shaft		4	4	5	5	4
Diameter Drum		16	16	16	16	16
Length of Drum		35	35	36	36	30
Diameter Drum Flanges		42	42	42	42	36
Diameter Line Shaft		4	None	4	None	None
Line and Drum Shaft Bearings		Babbitt	Babbitt	Babbitt	Babbitt	Babbitt
Drum or Clutch Sprocket Bearings*		Hyatt	Hyatt	Hyatt	Hyatt	Hyatt
Area Braking Surface		880 Sq. In.	880 Sq. In.	1760 Sq. In.	1760 Sq. In.	690 Sq. In.
Area Friction Clutch		443 Sq. In.	443 Sq. In.	706 Sq. In.	706 Sq. In.	443 Sq. In.
Low Speed Sprocket		32T.	32T.	44T.	44T.	32T.
High Speed Sprocket		22T.	17T.	22T.	28T.	17T.
Bull Wheel Drive Sprocket		17T.	22T.	28T.	22T.	None
Weight in Pounds		7400#	6200#	12,000#	11,000#	3500#

*Clutch Sprocket Bearing on Simplex Only.



Lufkin Center-Line Beams Mean for Safety.

Note: Headache Posts, while still being used, are not necessary with Lufkin Center-Line Beams.

Both Beam End Connections are Alemite Lubricated from the center of beam.

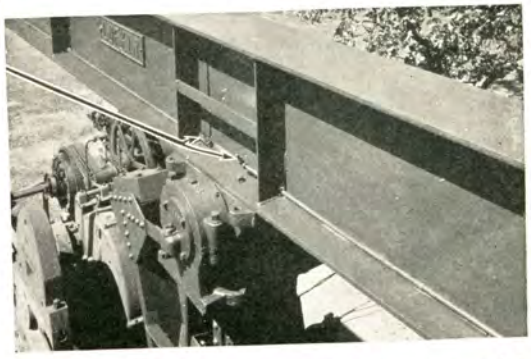


FIGURE 43

LUFKIN CENTER LINE WALKING BEAM, PITMAN, CENTER BEARING AND FULL UNIVERSAL ROD HANGER

Numerous attempts have been made to design a **Center Line Beam,** but most have met with little success. We believe this was due to the retention of the old style conventional type of friction producing stirrups and regular head connections. Engineers familiar wtih this inefficient type of design have demanded improvements.

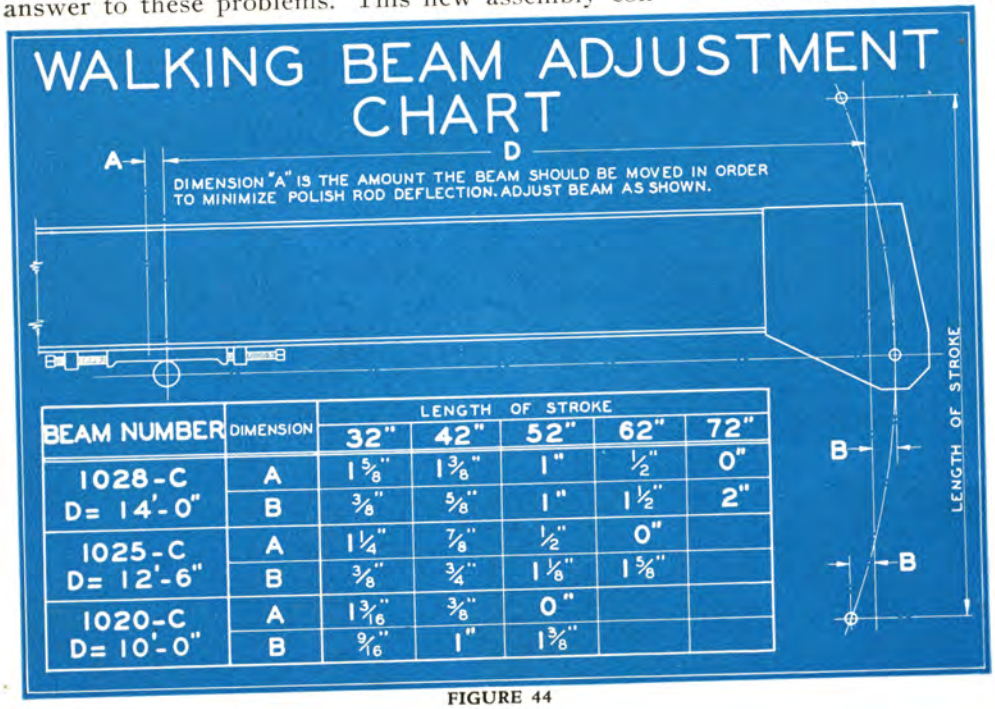
The Lufkin Center Line Beam assembly is the answer to these problems. This new assembly consists of the regular I-beam type walking beam with all bearings **in line** and with improved pitman and rod hanger bearings.

The beam is equipped with heavy welded-on plates, arranged with steel pins and bronze bearings. Alemite lubrication to these bearings is facilitated by means of pipe connections from the center of the beam (see illustration).

The center iron is of special Lufkin (patented) design with a bronze bearing 5"x24"—is self-oiling and oil and dust tight.

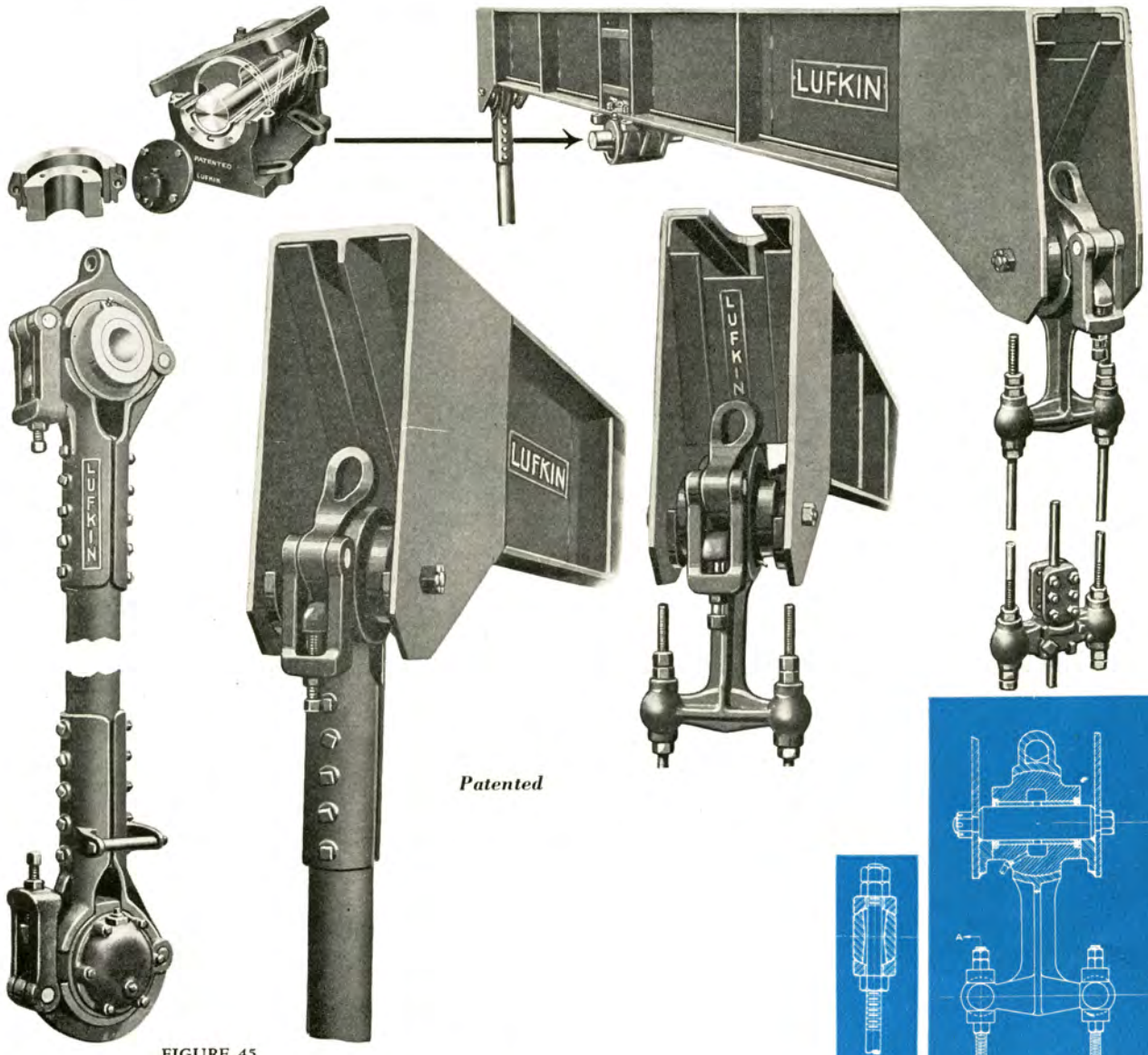
The Pitman bearings and rod hanger bearings (size 3 7/16" x 9") are bronze bushed — oil tight and dust proof — and like the Trout Crank Pin bearing, stays on the pin. Connections to the pitman and rod hanger are by means of steel strap shackles which are very readily disconnected for well servicing and are also designed to accommodate any mis-alignment.

The new Babbitted Bearing Center Iron may be substituted for the Bronze Bearing Center Iron at a slightly lower price. See Page 28 for details of Center Irons.



BEAM NUMBER	DIMENSION	LENGTH OF STROKE 32"	42"	52"	62"	72"
1028-C D= 14'-0"	A	1 5/8"	1 3/8"	1"	1/2"	0"
	B	3/8"	5/8"	1"	1 1/2"	2"
1025-C D= 12'-6"	A	1 1/4"	7/8"	1/2"	0"	
	B	3/8"	3/4"	1 1/8"	1 5/8"	
1020-C D= 10'-0"	A	1 3/16"	3/8"	0"		
	B	9/16"	1"	1 3/8"		

FIGURE 44



Patented

FIGURE 45

LUFKIN UNIVERSAL, PITMAN AND ROD HANGER BEARINGS FOR CENTER-LINE BEAM ASSEMBLIES

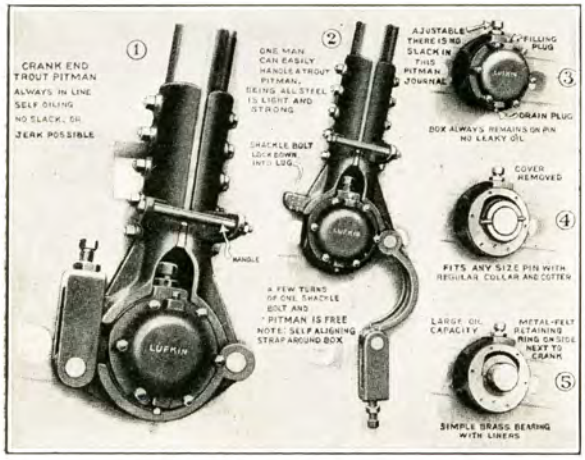
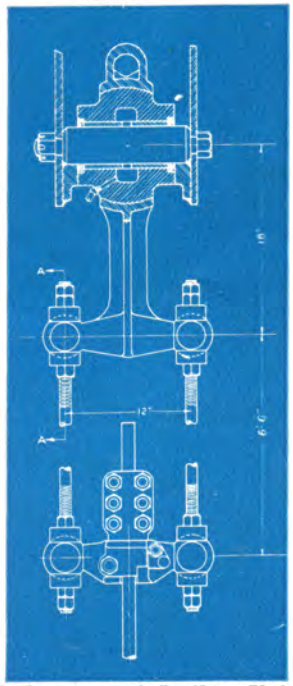


FIGURE 46

Trout Universal, Oil-Bath, Pitman (Patented)

Section "A-A"



Sectional drawing of Lufkin Universal Pitman and Rod hanger bearing connections.

See descriptive matter, page 26.

TROUT, OIL-BATH, DUST-PROOF PITMAN

The Lufkin-Trout Universal, self-aligning Pitman met with immediate acceptance by the oil industry. The Trout Pitman is oil-tight and dust-proof. The box remains on the pin as shown in the illustration. It is only necessary to loosen shackle bolts to unstrap Pitman from box to make any necessary adjustments. Made in sizes to fit any A.P.I. Pin.

NOTE—We have furnished a number of anti-friction type roller bearings with our regular pitmans, especially on twin crank jobs, all of which have proved exceptionally satisfactory. We are therefore prepared to furnish roller bearings in place of bronze bearings at a slight additional cost if desired.

LUFKIN NO. 1-O.B.—OIL-BATH CENTER IRON

Dust Proof—Bronze Bushed

The Lufkin self-oiling, dust proof center iron provides strength where most needed and owing to its construction (rugged and bronze bushed) is designed for life-time service under the most exacting circumstances. Little care is needed during the life of the Lufkin Oil-Bath Center Iron for, as the name implies, the bearing operates in an oil bath and is also dust-proof. The bearing of high quality bronze is 5″ diameter, 24″ in length and easily renewable.

Operators using the Lufkin Oil-Bath Center Iron soon find it advantageous to standardize on this type of bearing.

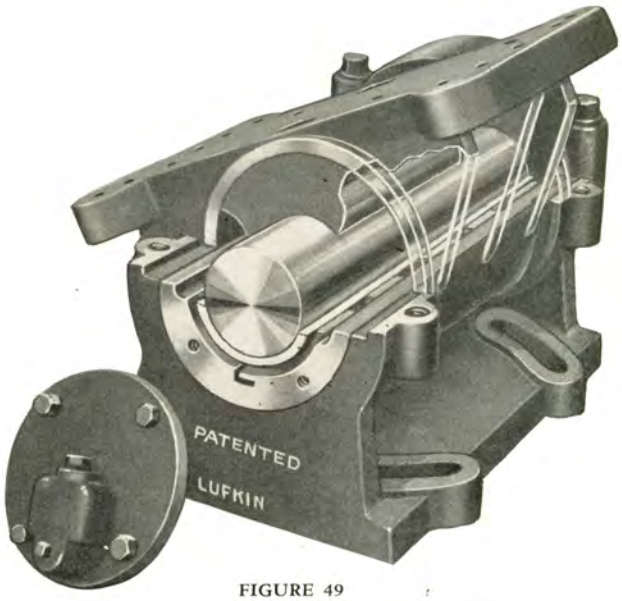


FIGURE 49

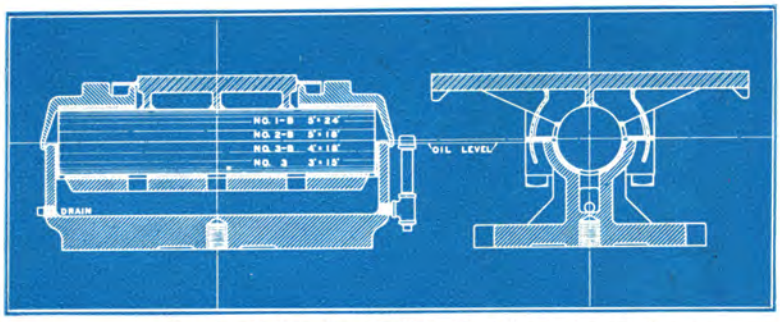
FIGURE 47

LUFKIN BABBITTED CENTER IRON

This new type center iron, while having a babbitted bearing instead of bronze bushings in the better type illustrated above, has an increased bearing surface over the old style A.P.I. standard—has an oil-bath arrangement and is reasonably dust-proof. This babbitted center iron is lined with a special high grade tin base metal to withstand very heavy load strains.

The new bearing is made in the following sizes:

No. 1-B	5″ x 24″	—120 sq. inches
No. 2-B	5″ x 18″	— 90 sq. inches
No. 3	3″ x 15″	— 45 sq. inches.
No. 3-B	4″ x 18″	— 72 sq. inches



Sectional drawing Lufkin Babbitted Center Iron

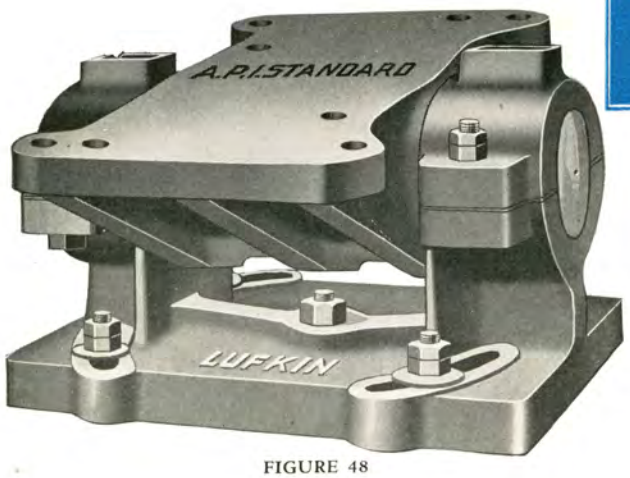


FIGURE 48

A.P.I. STANDARD CAST IRON CENTER IRON

This is the old style cast iron center iron and saddle that is still regularly furnished but not recommended, for heavy service.

This is a plain bearing and due to inadequate oiling provision is "short-lived." The Lufkin plain center iron has a swivel base to allow beam to clear when servicing well.

FIGURE 50
Hinged Horse Head showing Equalizer

LUFKIN HINGED HORSE HEAD WITH WIRE LINE HANGER

The Lufkin Hinged Horse Head type of hanger is designed to tilt back over the beam, clearing the beam when the well is being serviced.

Hinged Horse Heads are regularly furnished on Twin Crank Units Nos. 1, 2 and 3. They are also furnished on Single Crank SC No. 3-11 Units. A Solid Horse Head is furnished on TC No. 4 only as operators prefer to unshackle pitmans and swing beam to clean well.

NOTE: Should a Solid Horse Head be preferred (See Page 15) on any unit in place of the hinged type we can supply them at no extra charge.

LUFKIN STANDARD TYPE, BEAM, POST, PITMAN ASSEMBLY WITH PLAIN CENTER IRONS AND STIRRUP TYPE PITMANS

This is the old style type of plain beam assembly for which there still exists a small demand. This type of Post assembly is made in standard A.P.I. sizes and only plain cast iron center irons are used as well as the conventional type of stirrup pitman. Any ordinary type of rod hanger may be applied to the well end of the beam. The chief advantage of this type of assembly is in first cost, but against this is the constant danger of accident and maintenance expense, necessary care and attention which is almost wholly eliminated in the Center-Line Beam assembly described in this catalogue on pages 26 and 27.

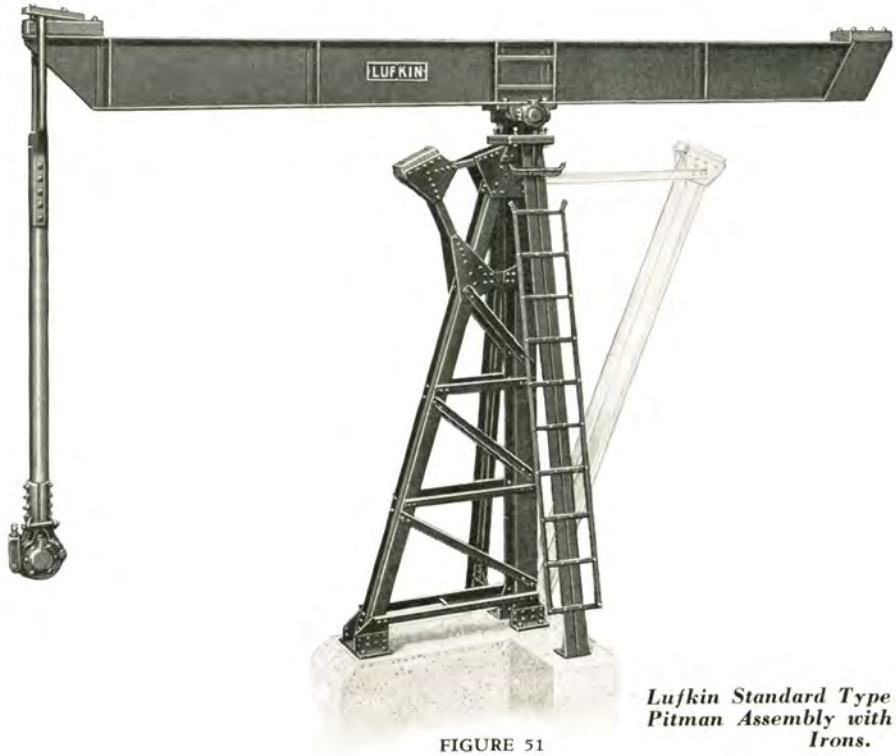
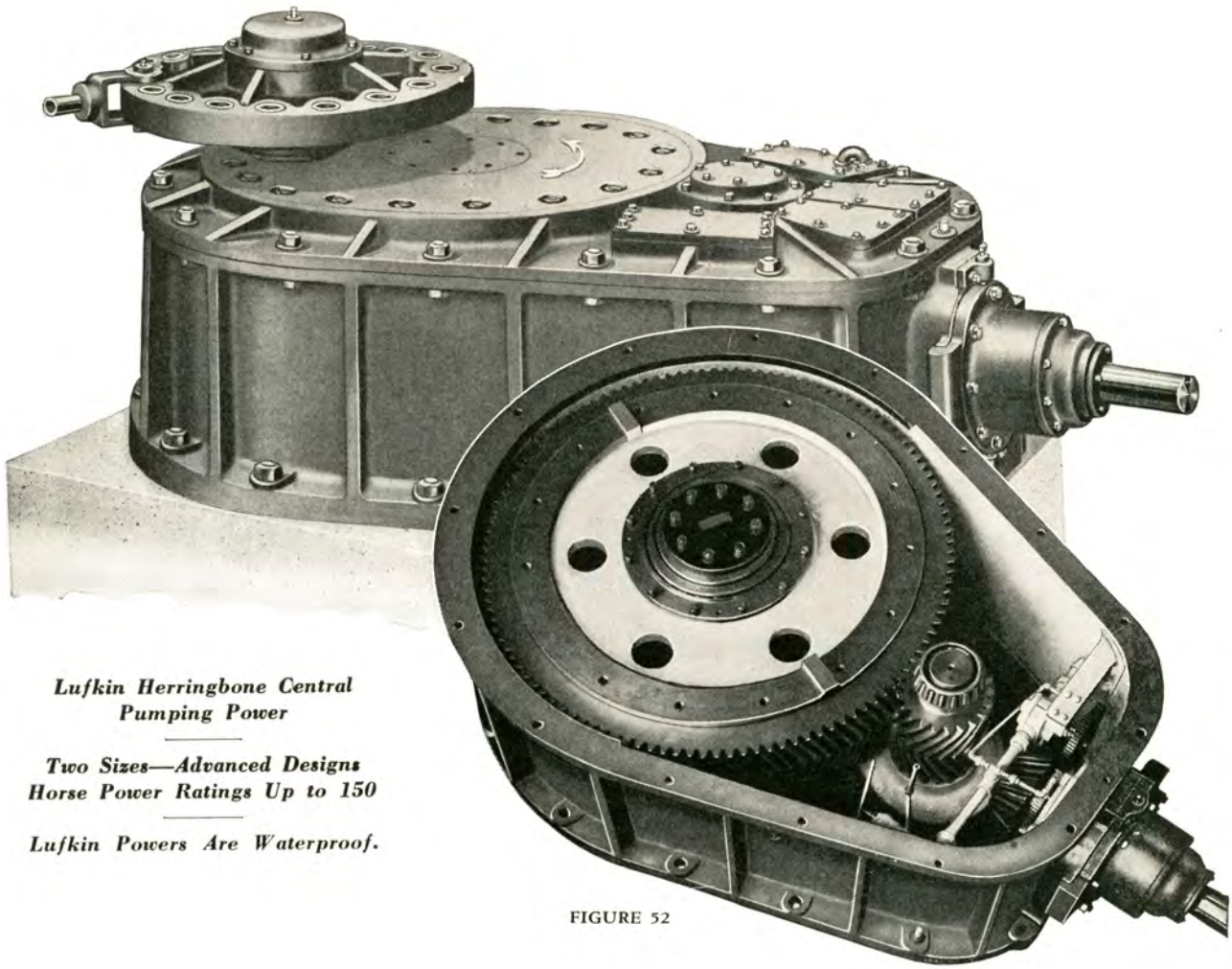


FIGURE 51

Lufkin Standard Type Post, Beam, Pitman Assembly with plain A.P.I. Irons.

LUFKIN CENTRAL PUMPING POWERS



Lufkin Herringbone Central Pumping Power

Two Sizes—Advanced Designs
Horse Power Ratings Up to 150

Lufkin Powers Are Waterproof.

FIGURE 52

LUFKIN HERRINGBONE GEAR CENTRAL PUMPING POWERS

Mechanical Characteristics

LUFKIN CENTER TRUNNION

Note: Cross section drawing — the shocks of unbalanced well conditions are transmitted through this massive Alloy Steel Trunnion directly to the solid concrete foundation in which it is mounted. This design insures absolute stability and rigidity at the most vital operating point and makes impossible any misalignment in the central Timken bearing regardless of load distribution. No strain is carried by the cover plate—no shearing effect on the gear box base—deficiencies common in most geared Powers. The center trunnion is a distinct Lufkin patented feature found only in the design of Lufkin Central Powers.

LOW CENTER OF GRAVITY

Crank Pin Cast Integral With Crank

Lufkin Powers are of compact design with low centers of gravity for the transmission of power to pull rods meaning minimum lever for transfer of load from crank to trunnion bearing—pull rod take-off is only 34″ above base of power. The crank is keyed and cap screwed directly to the main gear—eliminating torsion load transmitted to a shaft. Crank pin is cast integral with crank thereby eliminating loose crank pins—crank is of a special nickel Alloy Steel.

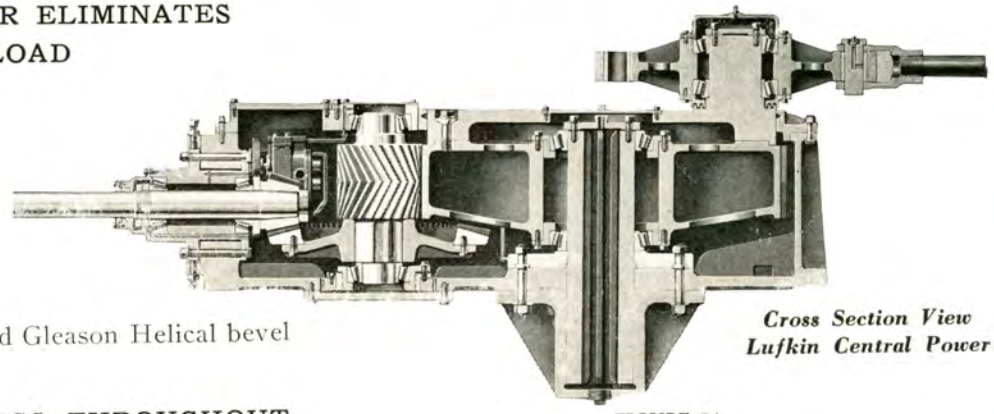
LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

LUFKIN CENTRAL PUMPING POWERS

HERRINGBONE GEAR ELIMINATES THRUST LOAD

Easy Adjustability

The Herringbone main gear equalizes all gear thrust load insuring longer bearing life. A Lufkin patented feature permits easy adjustability, in the field, of both Herringbone and Gleason Helical bevel gears.



Cross Section View Lufkin Central Power

FIGURE 54

ANTI-FRICTION BEARINGS THROUGHOUT

All bearings are Timken Roller Bearings of generous size with high load carrying capacities.

GENERAL SPECIFICATIONS

Herringbone Units

1. Lufkin-Sykes Herringbone Main Gears.
2. Gleason Helical Bevel Gears.
3. Nickel-Alloy Massive Steel Trunnion.
4. Low Center of Gravity—compact.
5. Pressure Pump Lubrication—Positive.
6. Timken equipped throughout.
7. Crank Pin cast integral with crank.
8. No housing expense except for prime mover.
9. Designed throughout with conservative wear formulas—rugged—strong—for long lasting service.

Ask for special bulletin.

Distinct Features

A distinct feature characteristic of both the Lufkin Worm Gear and Herringbone Gear Powers is the design of the **center trunnion**. This massive center trunnion is an exclusive patented Lufkin feature found in no other type of geared central powers. All the shocks and strains due to unbalanced well conditions are transmitted through this center trunnion, directly to the solid concrete base. The Lufkin center trunnion is the result of ten years operating experience with various designs of geared central powers.

Lufkin Powers may be adapted to any type of prime mover.

LUFKIN WORM GEAR CENTRAL POWERS

Mechanical Characteristics

The first Lufkin Geared Powers were of the Worm Gear type. The earliest installations are today operating as efficiently as when first installed—an operating characteristic of Worm Gears, namely, sustained efficiency throughout the life of the gears.

Lufkin Worm Gear and Herringbone Gear Powers are comparable in many operating characteristics. Lufkin Worm Gear Powers, it may be said, exceed Herringbone Powers in simplicity of design—with fewer wearing parts—other mechanical features may be summed up in the following:

1. **Center Trunnion of Nickel Alloy Steel.**
2. **Center and Crank pin bearings; Timken.**
3. **Worm Bearings: double Timken Thrust, Hyatt Radial.**
4. **Gear is of alloy bronze.**
5. **Worm of alloy steel heat treated.**

Lufkin worm gear powers are of heavy rugged construction designed for life-time service.

Write for special bulletin!

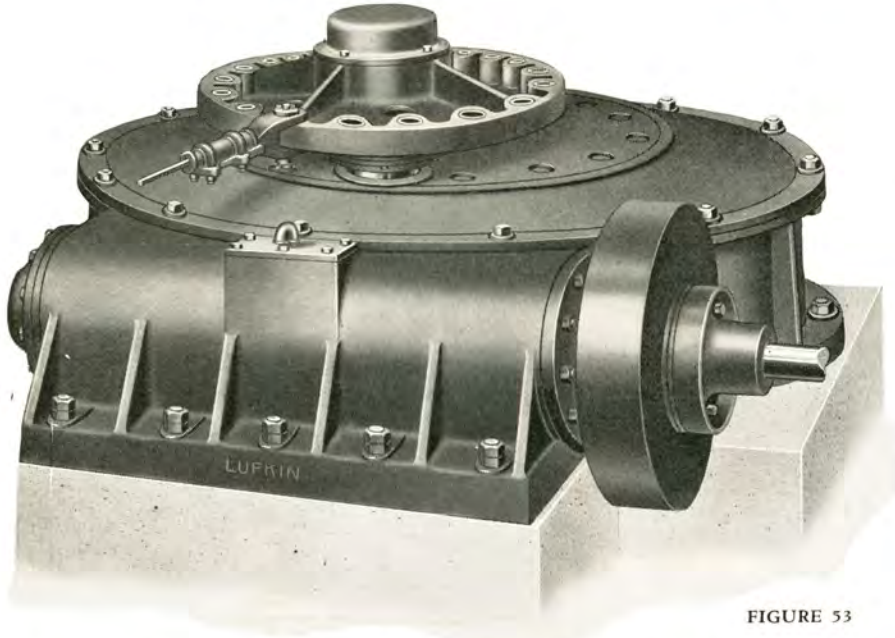
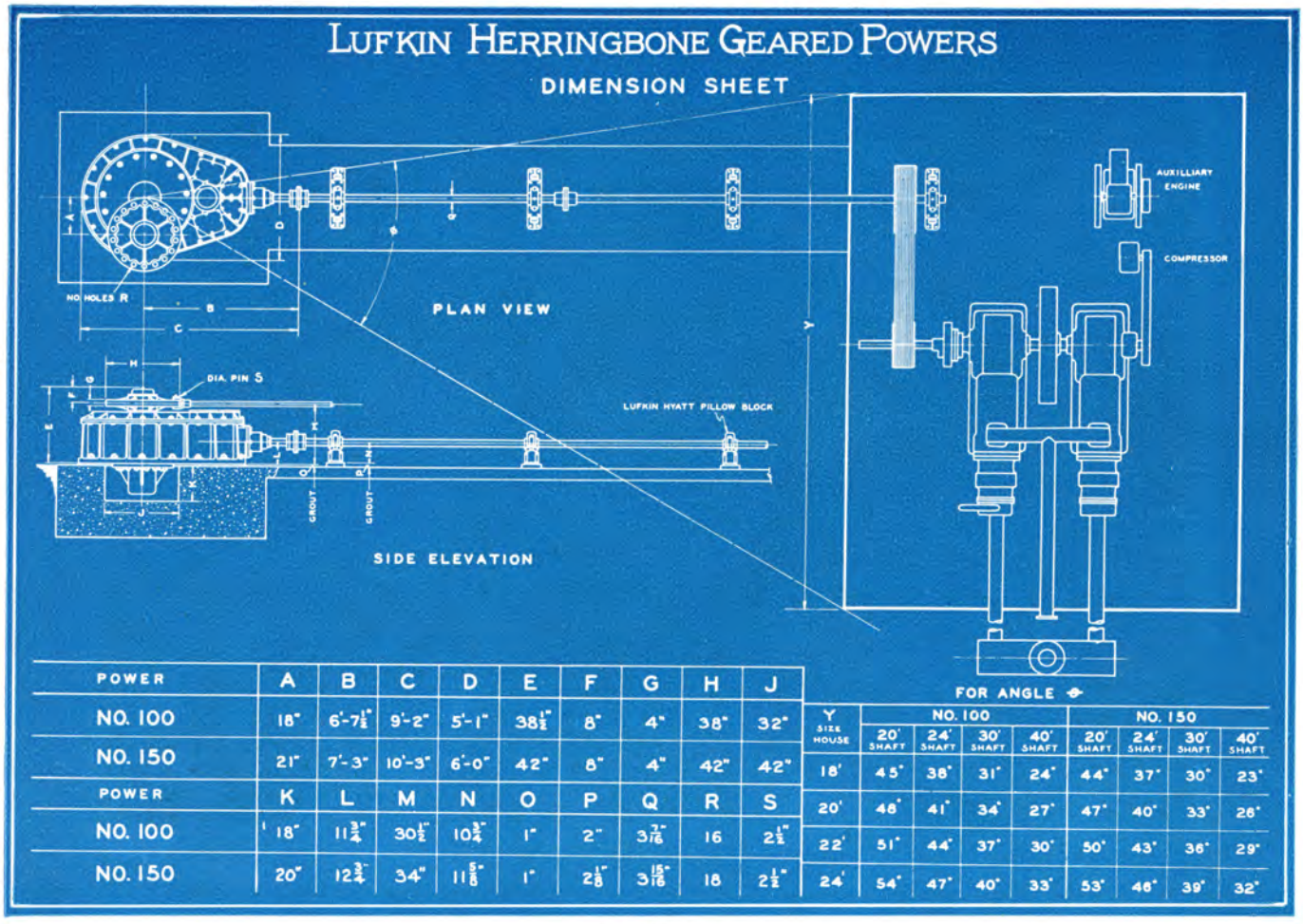


FIGURE 53

The Lufkin Giant Worm Gear Central Power—Two sizes, 50 and 125 H.P.



POWER	A	B	C	D	E	F	G	H	J
NO. 100	18"	6'-7½"	9'-2"	5'-1"	38½"	8"	4"	38"	32"
NO. 150	21"	7'-3"	10'-3"	6'-0"	42"	8"	4"	42"	42"
POWER	K	L	M	N	O	P	Q	R	S
NO. 100	18"	11¾"	30½"	10¾"	1"	2"	3 7/16"	16	2½"
NO. 150	20"	12¾"	34"	11⅝"	1"	2⅛"	3 15/16"	18	2½"

FOR ANGLE

Y SIZE HOUSE	NO. 100				NO. 150			
	20' SHAFT	24' SHAFT	30' SHAFT	40' SHAFT	20' SHAFT	24' SHAFT	30' SHAFT	40' SHAFT
18'	45°	38°	31°	24°	44°	37°	30°	23°
20'	48°	41°	34°	27°	47°	40°	33°	26°
22'	51°	44°	37°	30°	50°	43°	36°	29°
24'	54°	47°	40°	33°	53°	46°	39°	32°

FIGURE 55

GENERAL CHARACTERISTICS LUFKIN HERRINGBONE CENTRAL PUMPING POWERS

In general design this Power has ten years of successful operation and experience behind it. We adopted the design of the center stationary post in our worm gears and LUFKIN POWERS are now carrying pumping loads that were hardly believed possible.

While pumping units are subject to high "peaks" and overloads, in **Central Powers** this is accentuated almost in proportion to the number of wells, and this, with the "unbalanced load" so often disregarded by operators as impractical to overcome, challenges the manufacturer of Central Powers to meet these unusual conditions. Through experience LUFKIN designs have been developed and are successfully meeting these generally unlooked-for variable loads, inherent in their operation.

Experience teaches us also that the "power required" on most installations is underestimated, especially under proration, then too often, more wells are hooked on—not only overloading the power itself, but using the motive power to its limit.

Economic conditions are largely responsible for this policy, to which there is a limit of course, but we believe LUFKIN POWERS have the "background and the backbone" to withstand the greatest loads of any Power offered for this service.

Size for size, we believe any engineer who investigates these Powers will conclude that being of the Herringbone Type there is no end thrust, (bearing down pressure as when helical gears are used)—that the gears, bearings, and rugged design of the power itself, are 50% to 100% stronger and are very conservatively rated.

While every possible adjustment for gears and bearings are provided to take up wear, experience proves factory adjustments are seldom altered, once set, they require no further attention. All parts are immediately accessible for inspection and cleaning when cover is removed.

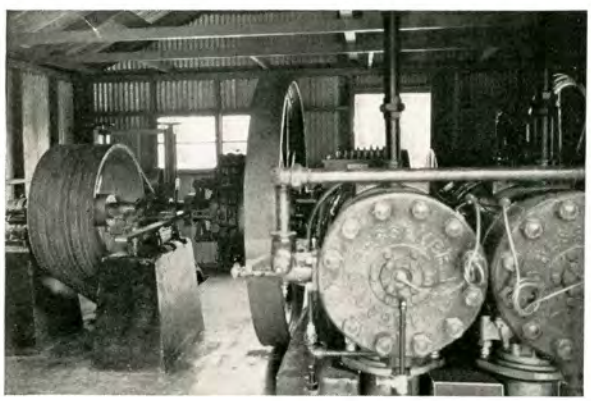


FIGURE 56

Typical Gas Engine Drive for Lufkin Herringbone Central Power Installation

LUFKIN CENTRAL PUMPING POWERS

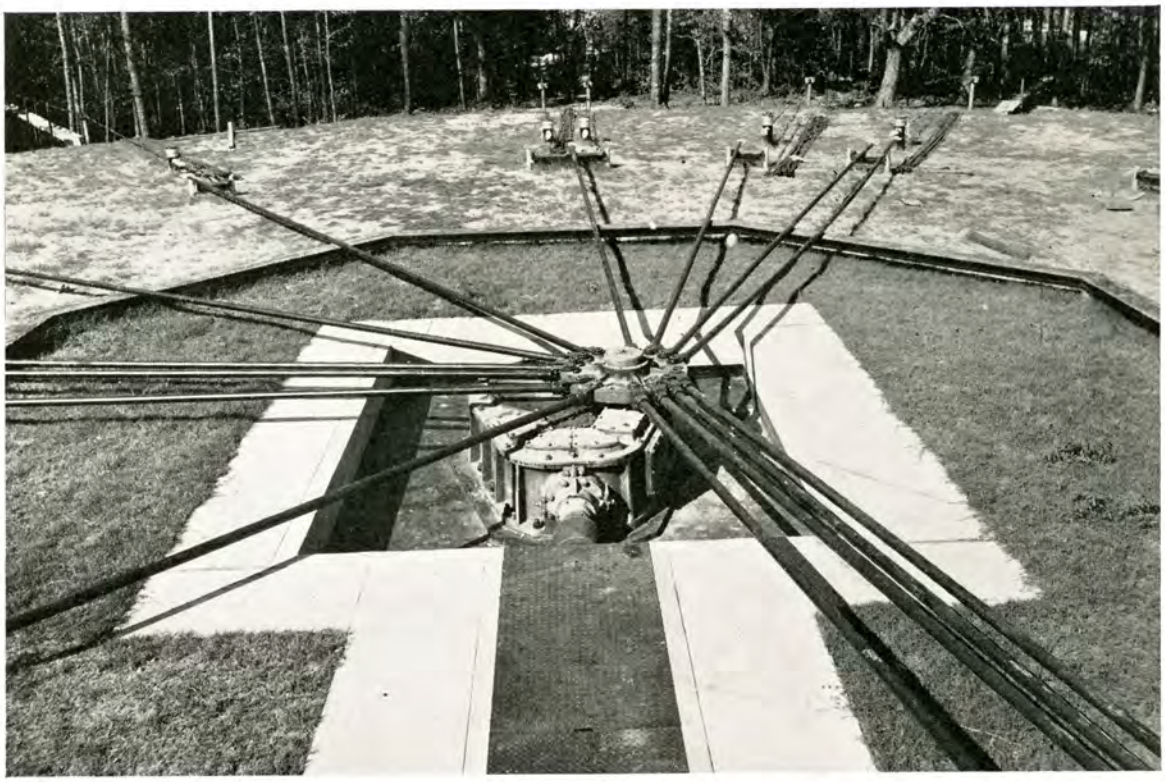


FIGURE 57

Lufkin Herringbone Geared Central Power installation in East Texas pulling 14 wells

NOTES ON SELECTING LUFKIN POWERS

In replacing a Band Wheel Power the total load can be easily determined by past experience. It would be advisable however, to check the friction load which is often excessive in poorly constructed Power installations.

This may be reduced by supporting the rod lines on proper carriers and by properly lubricating the jacks, swings, road crossings and other auxiliaries.

To determine beforehand the horsepower required to pump a number of either new or old wells is another problem. There are so many factors, that it is difficult to arrive at any exact horsepower figure and at best this can only be an estimate.

Individual well loads vary with depth of hole; depth to fluid level; speed and length of pumping stroke; size of working barrel; size of rods; friction of cups; gravity; temperature, and viscosity of oil; length of pull rod lines; and friction in surface equipment. Large quantities of salt water will increase the load. A flow of gas may assist or hinder the pump, depending upon conditions.

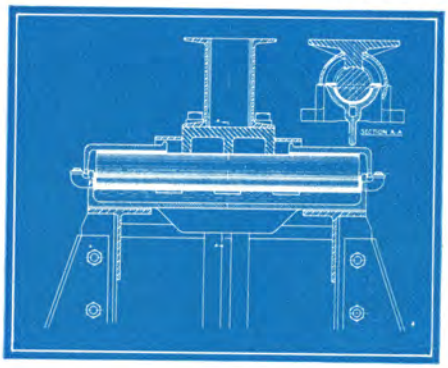
Counterweighting the sucker rods at the well and off-setting unbalanced pull rod lines at the Power with counter weight boxes greatly affects the ability of the Power to handle the load and the power necessary for its operation. The most important consideration for Power capacity is the proper balancing or distribution of the well loads around the Power. If the load is correctly balanced the only power required is that necessary to raise the oil in the well and to overcome friction. A few wells improperly attached may subject the Power to greater strains than several times the number skillfully handled.

Most engineers are familiar with these problems and can arrive at a close approximation of horsepower required for a number of wells, however, if you wish our help or suggestion in determining size of Power, engine or motor, please mail us thefollowing information:

Make a diagram of the wells to be pumped, preferably to scale, locating your idea of where Power should set—marking from there length pull rods to each well. Then letter or number each well giving depth pumped; size of tubing; size of rods; gravity of oil; production if known; water if any; any general information as to ground conditions, etc., or better, have our engineer call and make up an estimate.

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

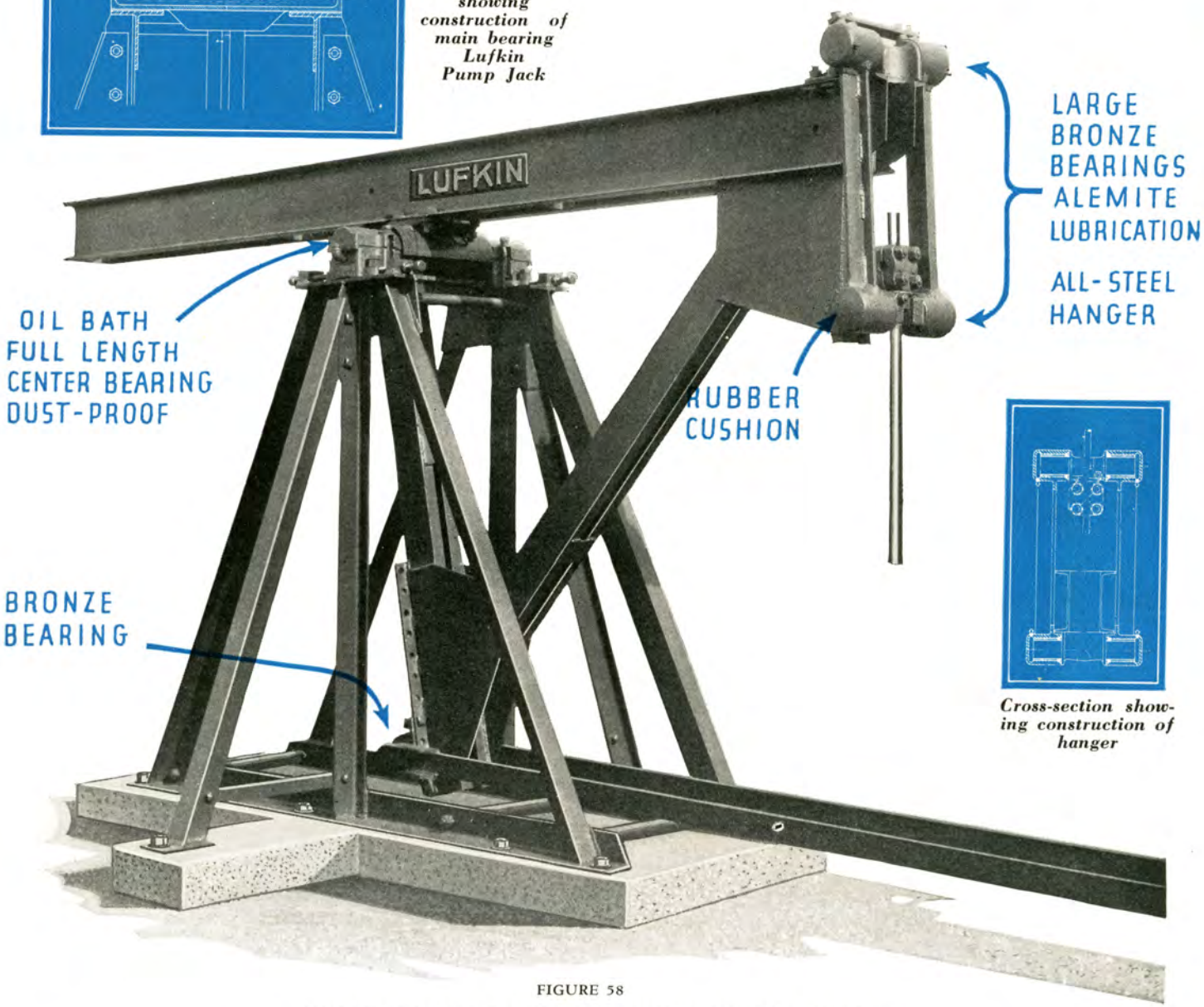
LUFKIN ARC-WELDED IMPROVED PUMP JACKS



Cross-section showing construction of main bearing Lufkin Pump Jack

TWO SIZES

No. 17 . . . . . 17,000 lb. Capacity
No. 10 . . . . . 10,000 lb. Capacity



Cross-section showing construction of hanger

FIGURE 58

LUFKIN IMPROVED ARC-WELDED PUMP JACK

After many years experience in the manufacture of Pump Jacks, and a thorough study of their operation from an engineering standpoint, we have now confined our line to two sizes, in which very definite improvements have been made.

Concentration of the best engineering practice in the design of these Jacks has made possible increased strength and rigidity where most needed. Larger bearing surfaces are provided in the main saddle and hanger bearings. Improved oiling facilities found most desirable for heavy duty service are incorporated in their design.

The frame and walking beam are of structural steel—arc-welded throughout and an unusual spread is obtained in the side braces both lengthwise and crosswise of the beam. The foundation or bolt layout corresponds with the foundation layout of the Lufkin T. C.-4-11 Unit which permits of individual well pumping without additional foundation expense should this method of pumping be found desirable at any time.

The saddle bearing is of new and novel design. (See cross-section). The saddle bearing cast in one piece ties the two side frames rigidly together. The saddle is entirely of steel with a large turned shaft provided its entire length. This bearing is babbitted with a strictly tin base metal of highest quality—is dust proof—oil-tight and has by far, the largest bearing surface of any Jack that we know of.

The Hanger is entirely of steel and is of the link hanger type, providing an ideal straight lift or motion to the polish rod. (See diagram.) The Hanger bearings are extra large and are equipped with bronze bushings, Alemite lubricated, which are easily and inexpensively replaced when worn.

The pull bars are flat steel with an equalizing bar to fasten to rod lines. The pull bar Jack bearing is adjustable, bronze bushed and Alemite lubricated.

LUFKIN JACKS will convince and satisfy the most "exacting" individual looking for practical and substantial equipment with lowest maintenance cost.

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

LUFKIN ARC-WELDED IMPROVED PUMP JACKS

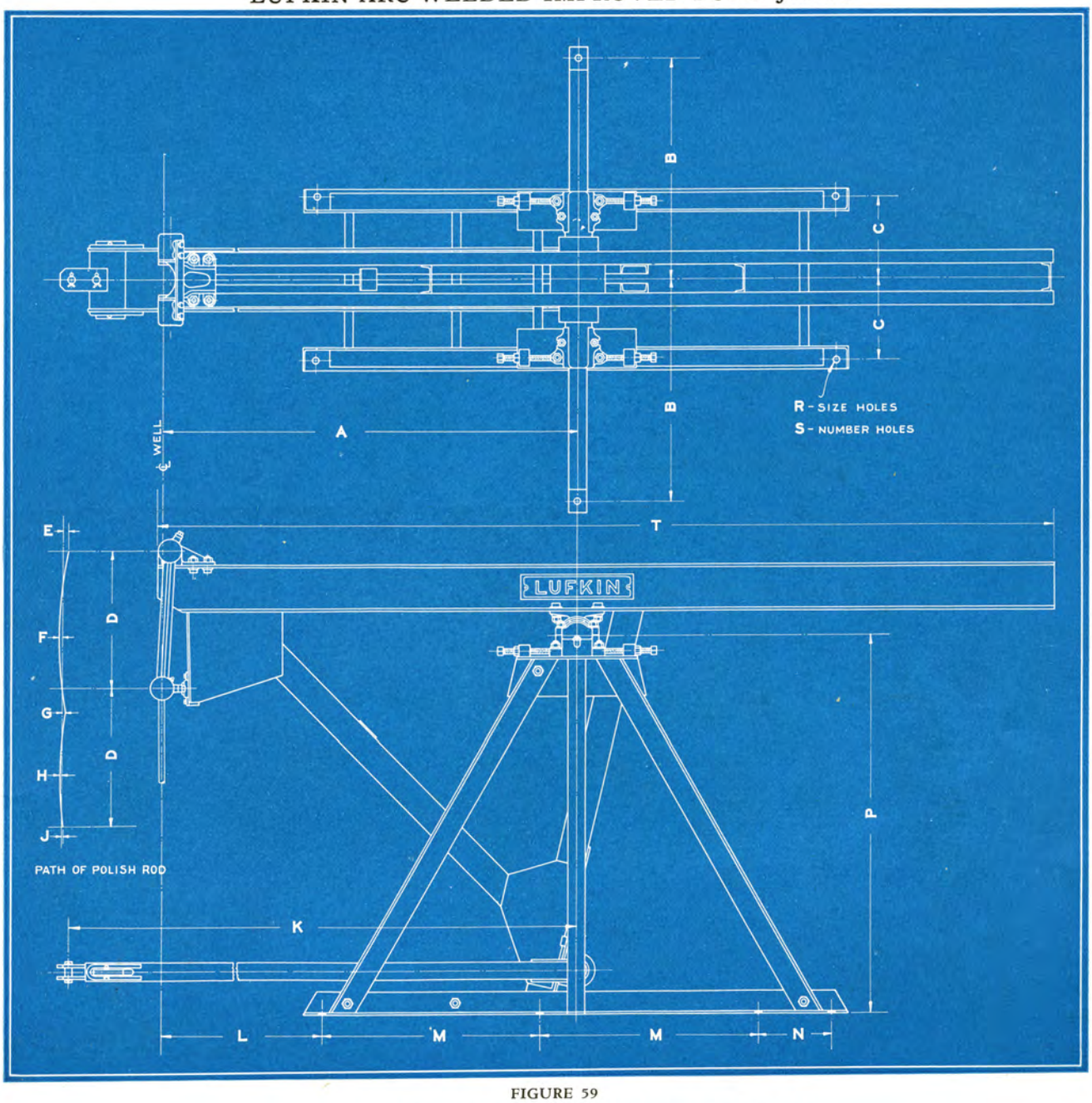


FIGURE 59

DIMENSION SHEET—LUFKIN PUMP JACKS

SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
No. 10	6′–0″	3′–3″	14⅜″	2′–0″	1 1/16″	9/16″	5/16″	5/16″	¼″	10′–2½″	2′–9″	3′–6″	*	5′–6″	1½″	8	13′–0″
No. 17	7′–0″	3′–6″	14⅜″	2′–6″	1 1/16″	⅞″	⅝″	⅜″	7/16″	12′–3¾″	2′–9″	3′–6″	18″	6′–6″	1½″	10	15′–0″

*Only 8 holes for Foundation Bolts on No. 10 Jack.

GENERAL SPECIFICATIONS

	No. 10	No. 17
Rated Polish Rod Load	10,000 lbs.	17,000 lbs.
Stroke	48″	60″
Maximum Ratio Polish Rod to Pull Rod Stroke	1.68 to 1	1.70 to 1
Minimum Ratio Polish Rod to Pull Rod Stroke	1.17 to 1	1.15 to 1
Depth Walking Beam Double Channels	8″	10″
Diameter and Length Saddle Bearing	2 1/16 x29⅜	3 1/16 x29⅜
Bearing Surface Saddle Bearing (High Grade Babbitt)	87 Sq. In.	116 Sq. In.
Bearing Surface on Hanger (Bronze)	15 Sq. In.	24 Sq. In.
Base to Bottom of Hanger at Mid-stroke	4′—8⅞″	5′—5⅛″
Stirrup Bearing Size	2 1/16 x8″	3 1/16 x8″
Number and Size Foundation Bolts	8—1¼x24″	10—1¼x24″

LUFKIN SURFACE EQUIPMENT

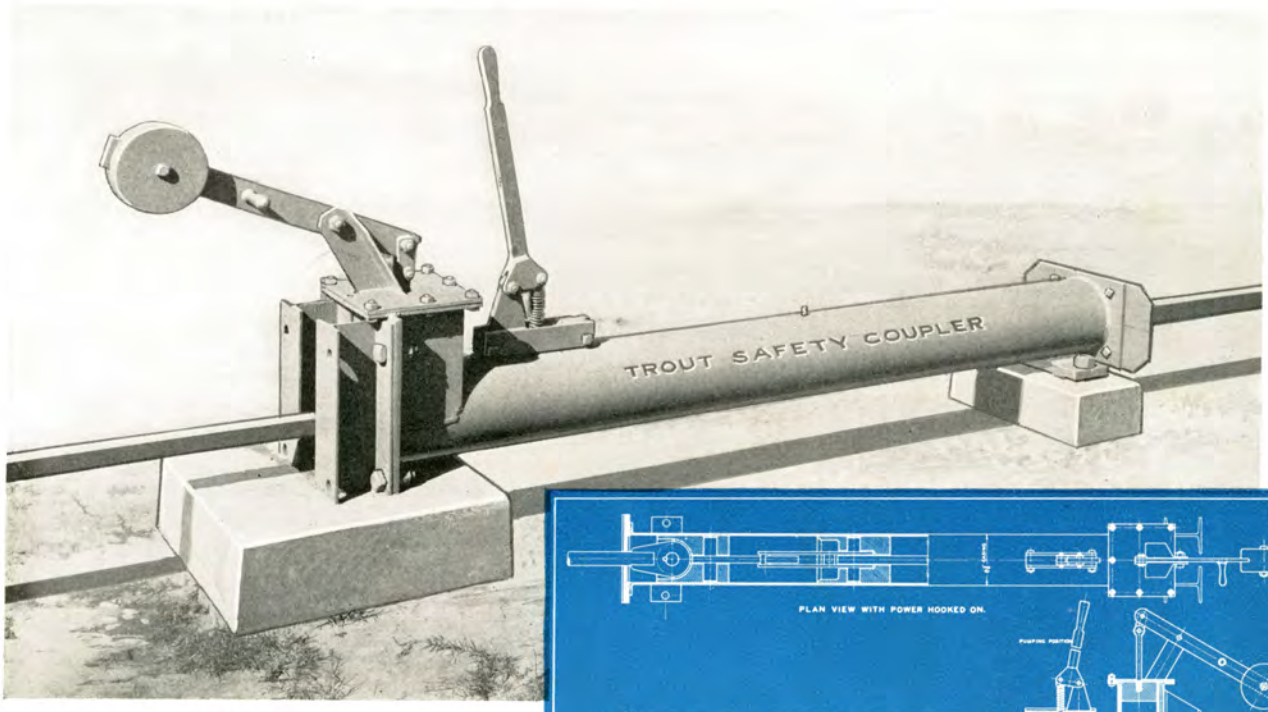
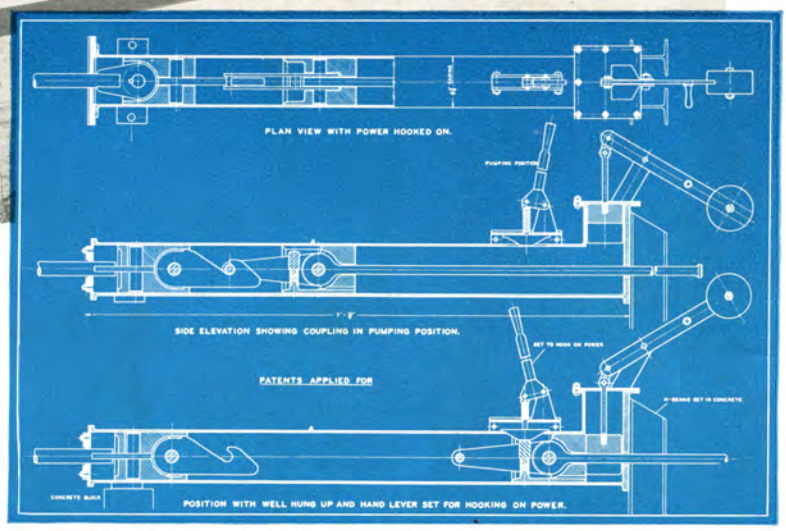


FIGURE 60



Cross-section print showing entire working mechanism. Patented

TROUT SAFETY COUPLER OR KNOCK-OUT

The Trout Safety Coupler or knock-out is designed to eliminate accidents in throwing a well off and on production. In throwing off a well, a weighted lever is raised. In putting the well on production a small upright lever is thrown forward. As will be noted in cross-section blue print the pipe cylinder is bored and a piston fastened to the power connection, which has an automatic hook for picking up or releasing the well. The cylinder is dust and water proof and contains sufficient oil for splash lubrication. The entire mechanism is ruggedly built for long, lasting service.

LUFKIN SLIDE-BAR TYPE KNOCK-OUT POST

The Lufkin slide-bar type knock-out post is a simple, yet very effective type of knock-out consisting of an iron pipe stand filled with an oak filler block, with a positive "hook-on"-"hook-off" arrangement of a "slide-bar" with yoke connections.

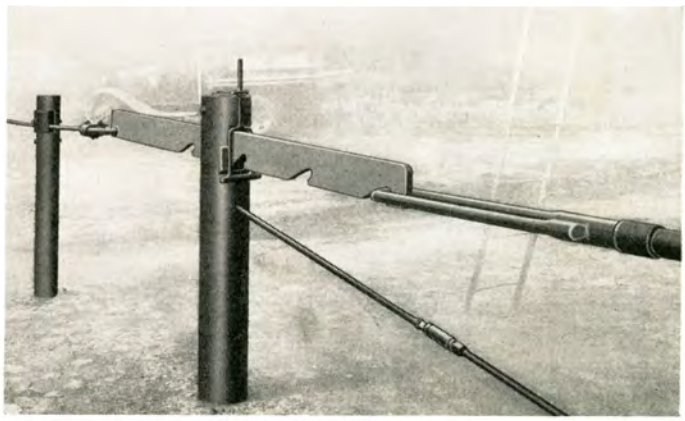


FIGURE 61

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

LUFKIN SURFACE EQUIPMENT

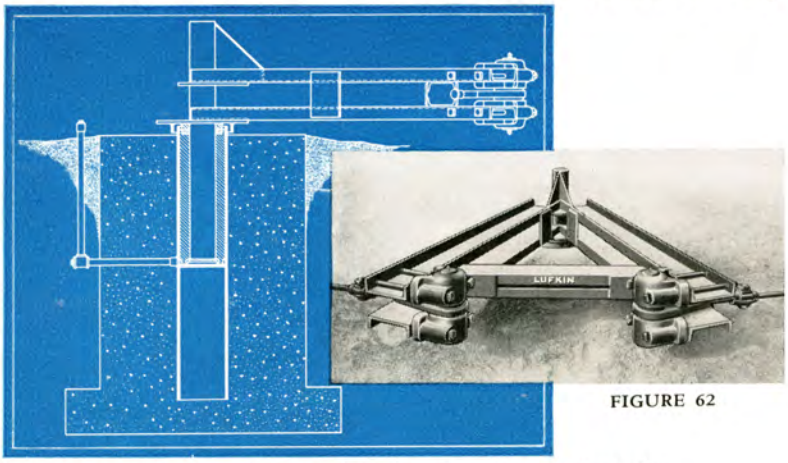
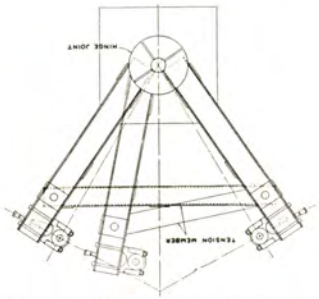


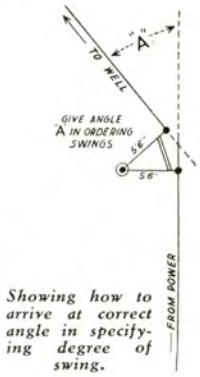
FIGURE 62

Cross-Section Lufkin Improved Swing showing particularly bearing arrangement

LUFKIN IMPROVED SWING



Showing how adjustment in arc or angle may be accomplished.



Showing how to arrive at correct angle in specifying degree of swing.

The Lufkin improved swing is designed with the central shaft mounted in an oil-tight, dust-proof bearing—set in concrete, which eliminates the use of braces and particularly minimizes wear due to the operation of the shaft in a continuous oil bath. The rod line bearings are Alemite lubricated and all wearing parts are inexpensively renewed. Adjustment to desired arc or angle is accomplished as illustrated by sketch figure.

FIGURE 63 FIGURE 64

Lufkin hold-up and hold-down. All bearings interchangeable and Alemite lubricated.

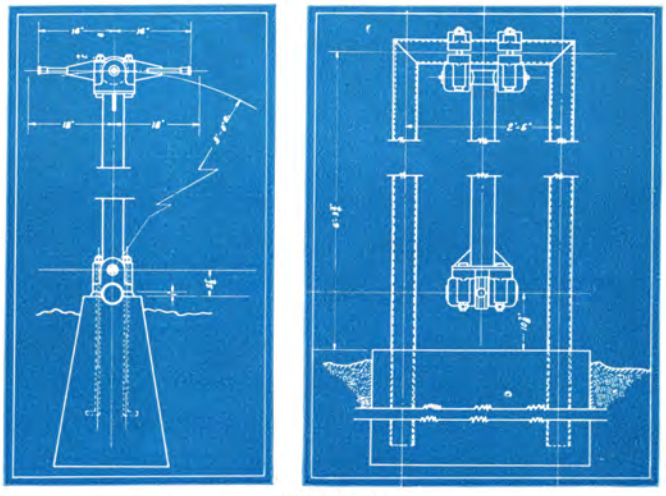


FIGURE 66

Blue print showing construction of Lufkin Hold-up and Hold-Down.

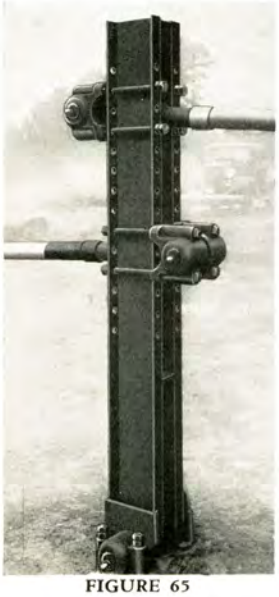


FIGURE 65

LUFKIN STROKE OR MULTIPLIER POST

This type post is commonly used when change is desired near unit. The bearings on this post, both rod connections and ground bearings are interchangeable with Lufkin hold-up and hold-down.

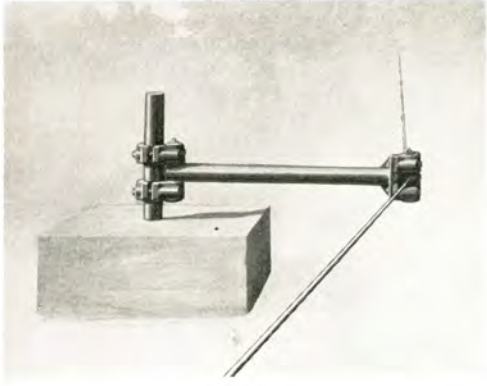


FIGURE 67

Hold-Up used for Swing where small angles are encountered

LUFKIN "BACK-SIDE" CRANK EQUIPMENT

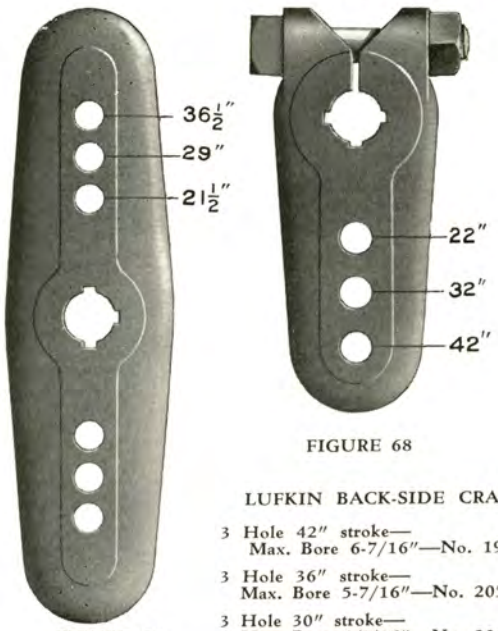


FIGURE 68

FIGURE 70

LUFKIN BACK-SIDE CRANKS

3 Hole 42" stroke—
Max. Bore 6-7/16"—No. 1910-W

3 Hole 36" stroke—
Max. Bore 5-7/16"—No. 2059-W

3 Hole 30" stroke—
Max. Bore 4-7/16"—No. 2060-W

These cranks use 4" x 6" taper pins.

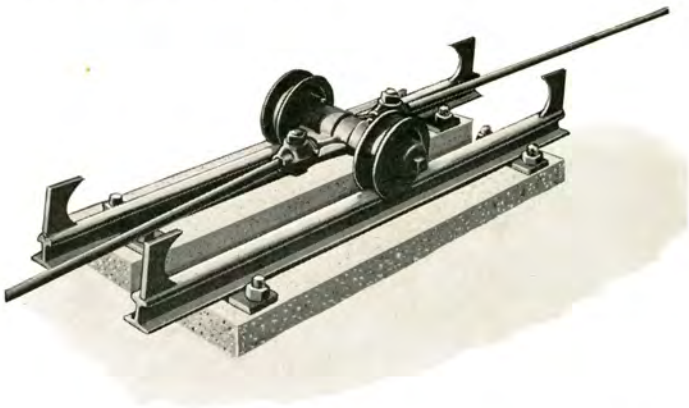


FIGURE 69

LUFKIN ROLLER HOLD-DOWN—This hold-down arrangement made of 35-lbs. rail has bronze bushed, oil bath, wheels with bolted end guards. This may also be made up as a Hold-Up by inverting the structure.

FIGURE 73
Lufkin tapered shank crank pin with 4" x 6" bearing for use with crank as shown in Fig. 68.

FIGURE 71
Single Take-off Connector.

FIGURE 72
Double Take-off Connector.

LUFKIN ROD LINE EQUIPMENT

FIGURE 75
Lufkin Pull Rod Carrier; split malleable iron housing, 5" diameter gray iron sheave, paraffin maple bearings.

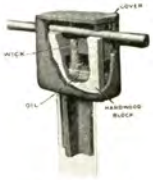


FIGURE 76
Lufkin Pull Rod Carrier, gray iron housing furnishing oil bath lubrication to wood carrier block either wick oiling or capillary feed.

FIGURE 77
Merrick Rod Line Carrier—A very good and inexpensive sheave type rod line carrier.

FIGURE 78
Lufkin roller bearing rod line carrier.

FIGURE 79
Lufkin C-Link

FIGURE 80
Reducer pull rod coupling to fit any pullrod combination.

FIGURE 81
Plain Safety CC Clamp, also furnished with rod ends countersunk.

FIGURE 82
Lufkin Improved Bull Ring bronze bushed. Alemite lubricated connections.

FIGURE 83
Lufkin knock-out block, heavy construction. Electric welded.

FIGURE 84
Pull Rods and Pull Rod Coupling—any standard size.

LUFKIN VERTICAL TYPE TAKE-OFF
For Back Crank Pumping

The Lufkin Vertical type Take-Off, fitted with Alemite lubricated bearings, is the most efficient of all types of take-offs. The underslung feature is very desirable, keeping the rods nearer the ground. For diagram installation see page 39.

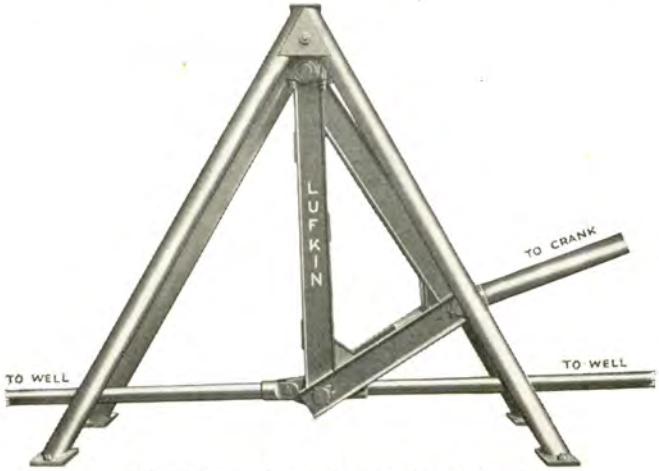
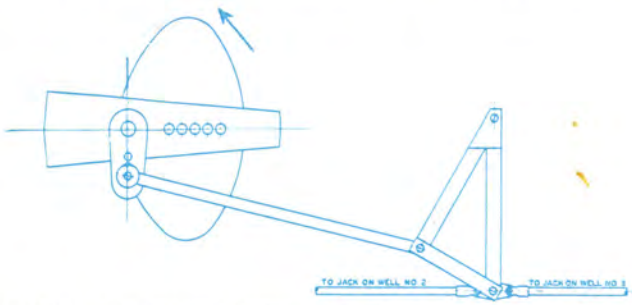
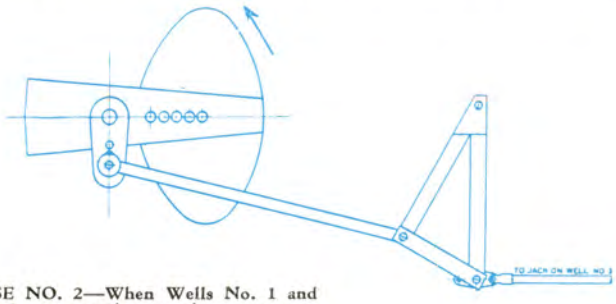


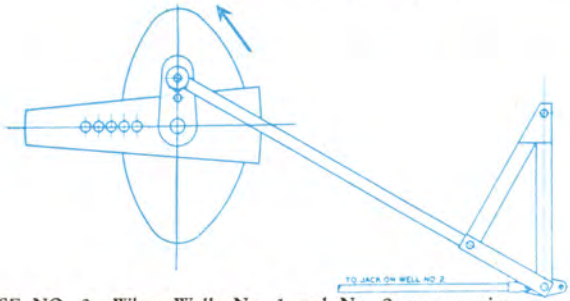
FIGURE 74—Lufkin Vertical Type Take-off.



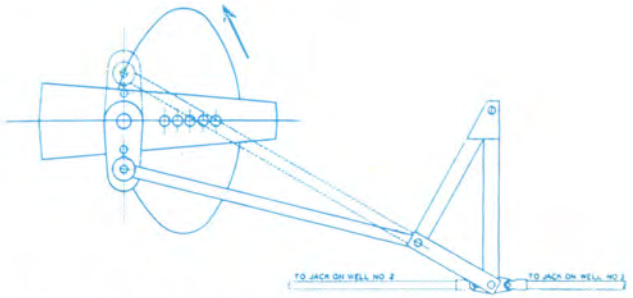
CASE NO. 1—In three-well hookup when all wells are pumping, Jacks will balance each other and Trout Crank will largely affect balance on beam well only.



CASE NO. 2—When Wells No. 1 and No. 3 are pumping, maximum counter-balance is required.



CASE NO. 3—When Wells No. 1 and No. 2 are pumping, no counter-balance is required, that is, crank weights are to be centered.



CASE NO. 4—When only Well No. 3 is pumping, counter-balance will be as for Case 1 and back crank will lag main crank by 90°, however, when only Well No. 2 is pumping, crank pin must be moved to the opposite end of our 180" back crank, (as shown above by dotted lines) counter-balance to remain in same.

FIGURE 85

"BACK-SIDE CRANK" PUMPING

The use of "back-side or back cranks" for pumping two or more wells has become quite prevalent since the advent of the East Texas field. For this type of production Lufkin has provided especially designed equipment which has met with instant favor. Back-crank pumping is more readily adapted to Lufkin Units because of the ease with which the Trout Counterbalance crank weights are adjusted to secure the correct effective counterweight, or balance, regardless of the number of wells pumping as will be noted by referring to the diagram above.

The purpose of this diagram is to show the ease with which part-time wells may be balanced with the Lufkin Counterbalance Crank. To obtain the correct effective counterbalance one man can do this in a few minutes whereas with many types of competitive cranks it is necessary to send to the tool house for additional weights and requiring at least two men to add these weights. This operation requires so much more time that it is almost impractical to change the counterbalance as one or the other of the three wells are hooked on or hooked off. This means that the pumping unit is out of balance a good portion of the time throughout the pumping day.

With the Lufkin crank there is no excuse for the pumper not keeping the unit in balance at all time, thereby eliminating surface equipment trouble.

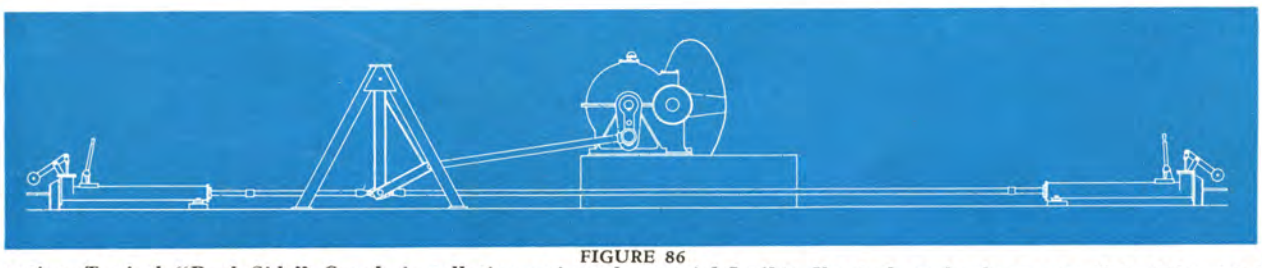


FIGURE 86

Illustrating Typical "Back-Side" Crank installation using the special Lufkin Vertical, underslung type Take-Off with Trout Cylinder type Safety Knock-Out. *See also page 6.*

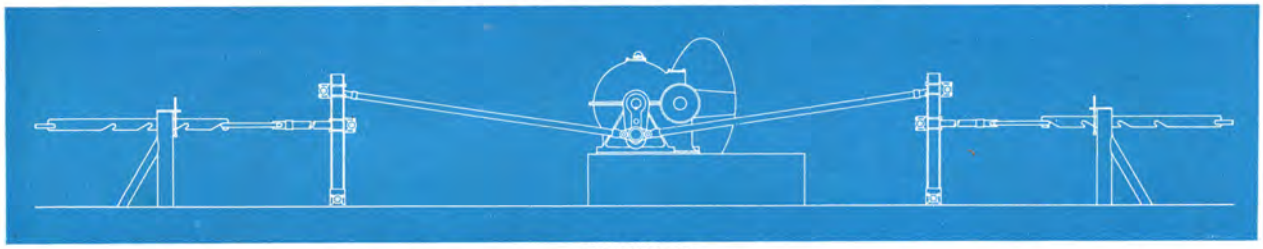


FIGURE 87

Illustrating Typical Lufkin "Back-Side" Crank installation using regular Lufkin Slide-Bar Type Knock-Outs and Multiplier Posts.

VOLUMETRIC DISPLACEMENT—BARRELS PER DAY

Based on 100% Efficiency

Length of Stroke	Strokes per Minute	Size of Plunger				
		1 1/8"	1 3/4"	2 1/4"	2 3/4"	3 3/4"
1"	1	.132	.357	590	.882	1.64
	10	1.32	3.57	5.90	8.82	16.40
	20	2.64	7.14	11.80	17.64	32.80
	25	3.30	8.92	14.75	22.05	41.00
22"	1	2.90	7.85	12.98	19.40	36.10
	10	29.0	78.5	129.8	194.0	361.0
	20	58.0	157.0	259.6	388.0	722.0
	25	72.5	196.3	324.5	485.0	902.5
32"	1	4.22	11.42	18.88	28.22	52.48
	10	42.2	114.2	188.8	282.2	524.8
	20	84.4	228.4	377.6	564.4	1049.6
	25	105.5	285.5	472.0	705.5	1312.0
42"	1	5.54	14.99	24.78	37.04	68.88
	10	55.4	149.9	247.8	370.4	688.8
	20	110.8	299.8	495.6	740.8	1377.6
	25	138.5	374.8	619.5	926.0	1722.0
52"	1	6.86	18.56	30.68	45.86	85.28
	10	68.6	185.6	306.8	458.6	852.8
	20	137.2	371.2	613.6	917.2	1705.6
	25	171.5	464.0	767.0	1146.5	2132.0
62"	1	8.18	22.13	36.58	54.68	101.68
	10	81.8	221.3	365.8	546.8	1016.8
	20	163.6	442.6	731.6	1093.6	2033.6
	25	204.5	553.2	914.5	1367.0	.....
72"	1	9.50	25.70	42.48	63.50	118.08
	10	95.0	257.0	424.8	635.0	1180.8
	20	190.0	514.0	849.6	1270.0	2361.6
	25	237.5	642.5	1062.0	1587.5	.....

FIGURE 88

LUFKIN GEAR RATINGS ARE BASED ON WEAR INSURING 5 TO 10 YEARS OPERATION WITHOUT APPRECIABLE LOSS IN EFFICIENCY

MOTORS—ENGINES—"V"-BELTS

ELECTRIC MOTORS AND CONTROLS—We are the general agents for General Electric Motors and can furnish from stocks at various points, any type of motors and controls ordinarily used in oil field practice.

ENGINES—We can furnish all standard makes of Multi-Cylinder Gas Engines. Lufkin Units are adaptable to any type of Single or Multi-Cylinder Engines. We use and have selling arrangements with all of the better known engine manufacturers.

"V"-BELTS AND DRIVES—We can furnish, by virtue of selling arrangements with the manufacturers, all types and brands of "V"-Belts and have license to manufacture all sizes of "V"-Belt sheaves under Geist patent No. 1,662,511.

We manufacture all types of Couplings, Gears, Pulleys, Sheaves, Clutches, Tighteners, and General Power Transmission Machinery.

ENGINEERING DATA FOR THE PRACTICAL ENGINEER

WELL LOADS

Weights as listed are based on a specific gravity of 1. To correct for individual condition multiply the figures in the following columns by the specific gravity of the fluid produced.

Size Plunger	Size Rods	Weight To Be Lifted Per 1000 Feet				
		½ Fluid	All Fluid	Rods	½Fluid Plus Rods*	All Fluid Plus Rods
1 1/16"	5/8"	125	250	1150	1275	1400
1¾"	5/8"	442	884	1150	1592	2034
1¾"	¾"	429	858	1690	2119	2548
2¼"	5/8"	793	1586	1150	1943	2736
2¼"	¾"	780	1560	1690	2470	3250
2¼"	7/8"	730	1460	2270	3000	3730
2¾"	¾"	1195	2390	1690	2885	4080
2¾"	7/8"	1170	2340	2270	3440	5610
3¾"	7/8"	2290	4580	2270	4560	6850

* Weight of one-half the fluid plus the rods equals the required counterbalance.
Weight of rods per 1000 Feet—5/8" = 1150 lbs.; ¾" = 1690 lbs.; 7/8" = 2270 lbs.

FIGURE 89

HORSEPOWER REQUIRED FOR VARIOUS VOLUMES OF FLUID FROM VARIOUS DEPTHS

Specific Gravity Fluid = 1

Bbls. Fluid Per Day	Horsepower at Tabulated Well Depths									
	1000′	2000′	2500′	3000′	3500′	4000′	4500′	5000′	6000′	7000′
50	.74	1.47	1.84	2.21	2.58	2.94	3.31	3.68	4.42	5.16
100	1.47	2.94	3.68	4.42	5.16	5.88	6.62	7.36	8.84	10.32
150	2.21	4.41	5.52	6.63	7.74	8.82	9.93	11.04	13.26	15.48
200	2.94	5.88	7.36	8.84	10.32	11.76	13.24	14.72	17.68	20.64
250	3.68	7.35	9.20	11.05	12.90	14.70	16.55	18.40	22.10	25.80
300	4.42	8.82	11.04	13.26	15.48	17.64	19.86	22.08	26.52	30.96
350	5.15	10.29	12.88	15.47	18.06	20.58	23.17	25.76	30.94	36.12
400	5.88	11.76	14.72	17.68	20.64	23.52	26.48	29.44	35.36	41.28
450	6.62	13.23	16.56	19.89	23.22	26.46	29.79	33.12	39.78	46.44
500	7.36	14.70	18.40	22.10	25.80	29.40	33.10	36.80	44.20	51.60
600	8.84	17.64	22.08	26.52	30.96	35.28	39.72	44.16	53.04	61.92
700	10.30	20.58	25.76	30.94	36.12	41.16	46.34	51.52	61.88	72.24
800	11.76	23.52	29.44	35.36	41.28	47.04	52.96	58.88	70.72	.....
900	13.24	26.46	33.12	39.78	46.44	52.92	59.58	66.24	79.56	.....
1000	14.72	29.40	36.80	44.20	51.60	58.80	66.20	73.60	.....	.....
1200	17.68	35.28	44.16	53.04	61.92	70.56	79.44	.....	.....	.....
1400	20.60	41.16	51.52	61.88	72.24	.....	.....	.....	.....	.....
1600	23.52	47.04	58.88	70.72	.....	.....	.....	.....	.....	.....

NOTE: Although the above table is not theoretically exact it is sufficiently accurate for most practical purposes. It is based conservatively on an overall efficiency of 50%

FIGURE 90

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

Below is a partial list of users of Lufkin equipment in the domestic and foreign fields. A careful check of the list will reveal that practically every major oil company is a user of Lufkin Equipment.

Such an imposing list of users, we feel, is pretty fine evidence of the acceptance and use of Lufkin Equipment. We gladly refer you to any user.

LUFKIN EQUIPMENT USERS IN UNITED STATES

Allison & George
Amerada Petroleum Corp.
American Liberty Oil Co.
Jack Appel
Arkansas Fuel Oil Corp.
Atlantic Oil Producing Corp.

Bankline Oil Co.
Barnsdall Oil Co.
Berry Asphalt Co.
Bill and Dave Oil Co.
Bradley, W. W.
Burton Drilling Co.
Burwyn Oil Corp.

California Company
Capitol Oil Producing Co.
Capps, L. W.
Carter Oil Co.
Columbia Oil & Gas Co.
Continental Oil Co.
Cook Drilling Co.
Cosden & Company
Cox & Hamon
Crail Bros.
Cranfill & Reynolds
Crude Oil Purchasing Co.
Culp, H. C.
Cunningham Production Co.

Dalport Oil Corp.
Darby Petroleum Co.
Dearing, R. H. & Son
Deep Rock Oil Corp.

East Santa Fe Oil Co.
Empire Gas & Fuel Co.
Exchange Oil Company

Falcon Oil Co.
F. H. & E. Oil Co.
Fifty Five Oil Co.
Florence Oil Co.
Fort Bend Oil Co.

General Petroleum Corp.
Golden Bear Oil Co.
Gordon Folwell & Dickson
Gulf Production Co.
Gypsy Oil Co.

Hampton, Lewis
Harcher Oil Co.
Honolulu Oil Co.
Houston Oil Co.
Howard County Oil Co.
Humble Oil & Refg. Co.
Humphreys Oil Co.
Hunt, H. L. Production Co.
Hyland Oil Co.

Imperial Petroleum Co.
Indian Territory Illuminating Oil Co.

Jergins Company, A. T.
Johnson, T. A.
Johnston & Owens

Kathleen Oil Co.
Knox, Chas. E.
Knox, Powell & Stockton

Laurel Oil Company
Lechner & Hubbard
Lee & Burnett
Leidecker & Vaughn
Lide-Rowe Oil Co.
Lion Oil & Refg. Co.
Lonnie Glasscock
Loring Oil Co.
Louisiana Oil & Refg. Co.
Luling Oil & Gas Co.

Magna Production Co.
Magnolia Petroleum Corp.
Manziel, Bob
Marcus Oil Co.
Mar-La-Fay Oil Corp.
Marland Oil Company
Martin, L. B.
McCutcheon, Alex
McVicar & Rood
Mecon Oil Company
Menke, John G.
Merco Oil Co.
Merrick, J. F.
Mid-Continent Production Co.
Mid-Kansas Petroleum Corp.
Mid-Kansas Oil & Gas Co.
Miller-Lacy Oil Co.
Mills Bennett Production Co.
Miramar Corporation
Mortex Petroleum Co.
Moss, H. S.
Mul-Berry Oil Co.
Murdock, C. E., Inc.
Murray & Goode
Murray, T. W.

Navarro Oil Co.
Naylor, H. M.
Nelms, H. G.
Nicholson-Terrell Oil Corp.
Nile Oil Co.

Ohio Oil Co.
Omega Oil Co.
Orchard, Chas.
Owen & Sloan Oil Co.

Pace, Geo. L.
Pan American Petroleum
Pansy Oil Co.
Petroleum Securities
Phillips Petroleum Co.
Pilot Oil Co.
Powell, L. W.
Prairie Lea Production Co.
Pure Oil Co.

Reese, J. T.
Reeves, G. I.
Rex Oil Co.
Richfield Oil Co.
Rio Bravo Oil Co.
J. I. Roberts Drilling Co.
Roeser & Pendleton, Inc.
Rosemar Oil Co.
Rovenger Oil Co.
Ryan Oil Co.

Seward Oil Co.
Shaffer Oil & Refining Co.
Shaw, T. G.
Shell Petroleum Co.
Simms Oil Co.
Sinclair-Prairie Oil Co.
Skelly Oil Co.
J. R. Smith Oil Properties
Smith, R. E.
Smith, Victor C.
Smith, Walter R.
Smitherman & McDonald
Sonron Oil Corp.
South Texas Oil Co.
Southern Development & Prod. Co.
Spear, H. K.
Standard Oil Co. of La.
Standard of California
Standard of Kansas
Stanolind Oil & Gas Co.
Sterling Oil & Refining Co.
Stroube & Stroube, Inc.
Sun Oil Company

Tarver, A. H.
Terminal Oil Co.
Texas Trading Co.
The Texas Company
  Texas Division
  California Division
The Tidal Osage Companies
Thompson, W. L. & Will
Tide Petroleum Co.
Tide-Water Companies
Top Oil Co.
Turman, L. C.

United North & South Co.
United Oil Well Supply Co.
Unity Oil Co.

Vacuum Oil Co.

Weaver-Crim Oil Co.
Western Gulf Oil Co.
Wil-Day Oil Co.
Wilshire Oil Co.
Winfree Oil Co.
Witherspoon Oil Co.
Woodley Petroleum Corp.

FOREIGN

Anglo Mexican Petroleum Corp.
Argentine Government Oil Fields
Asiatic Petroleum Co.
Burmah Oil Co.
Cia Mexicana de Petroleo
  "El Aguila"
International Petroleum Co., Ltd.
Lago Petroleum Corp.
Mitsubishi Shoji Kaisha, Ptd.
North Saghalien Petroleum Co.
Oil Well Engineering Co.
Romano Americana
Steaua Romana
Standard Oil Co. of New Jersey
Standard Oil Co. of Argentine
Standard Oil Co. of Venezuela
Tropical Oil Co.
Venezuela Gulf Oil Co.

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