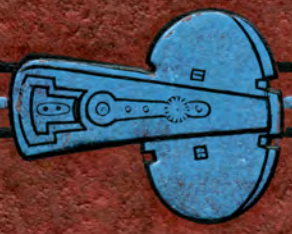
Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN
OIL FIELD
EQUIPMENT



Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Catalogue No. 31

LUFKIN UNITS

FOR

ECONOMICAL OIL PRODUCTION

PUMPING

Rotary or Cable Tool

DRILLING

OVER 1700 RIGS IN SERVICE

LUFKIN FOUNDRY & MACHINE CO.
LUFKIN TEXAS

Houston Tulsa Los Angeles New York City
Odessa, Tex. Eldorado, Ark. Seminole, Okla.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Telegraph and Cable Code

for all Lufkin equipment

Pages 82 and 83

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT

THE SUCCESS of this company is due, in a large measure, to the assistance of its many friends in the Oil Industry.

Constructive criticism, the cooperation and help towards the improvement of our product has been of real assistance to us and has in turn been a contribution towards the advancement of Modern Production Equipment.

We acknowledge the assistance of our many friends and to those who have had a part in this development we express our keenest appreciation.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

INDEX

Lufkin Oil Field Equipment

	Page
Introduction	8
Trout Counter-Balanced Crank	11-12
Comparison—Worm and Herringbone Units	13
Herringbone Unit Division	14 to 30
Worm Gear Unit Division	34 to 44
Central Power Division	48 to 54
Production Hoists	56 to 69
Samson Posts, Walking Beams, Pitmans and Auxiliary Equipment	70 to 79
Lufkin Line	84
A Pictorial History of Lufkin Equipment	Sepia Section

MISCELLANEOUS

Branch Office Directory	5
Foreword	7
Plant Birdseye	6
Unit Selection Guide	31 - 32
Electric Motors	33
Buda Powers	45 - 46
Crank Pins "Easy Change"	47
Rod Line Weight	68
Sprockets for Bull Wheels	68
"V" Belt Drives and Sheaves	80
Allpax Packing	81
Rex Chabelco Chain	81
Telegraph and Cable Code	82 - 83

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

THE LUFKIN FOUNDRY & MACHINE COMPANY

Executive Office and Factory

LUFKIN, TEXAS

Phones 36 and 37—Long Distance L. D. 5

Cable Address—"LUFFO"

BRANCHES

Gulf Coast Division

806 Second National Bank Bldg.
Phone Fairfax 5125
Houston, Texas.

Warehouses for Gulf Coast

Luling, Texas — Odessa, Texas

Mid-Continent Division

1901 Philtower Bldg. — Phone 30204
Tulsa, Oklahoma

Warehouses for Oklahoma Division

Tulsa, Oklahoma — Seminole, Oklahoma

Arkansas, Louisiana Division

El Dorado, Arkansas
Warehouse, Eldorado, Arkansas

California Division

801 Commercial Exchange Bldg.,
Phone WEstmor-2140
Los Angeles, Calif.
Warehouses—Bakersfield and Los Angeles

Export Department

149 Broadway, New York, N. Y.
Phone Barclay 7-4228
Cable address New York & Lufkin "LUFFO"
Lufkin's Private and A.B.C. 6th addition

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



Home of Lufkin Units

The plant of the Lufkin Foundry & Machine Company is modern, with every facility for manufacturing first-class products. Only the highest quality of materials are used in the manufacture of Lufkin equipment. Modern production tools are used throughout the plant and all parts are made strictly to gauge and template insuring absolute duplication.

The engineering staff, designers of Lufkin Equipment, are not only technically trained but have had actual experience in the fields where a practical working knowledge has been gained.

Interest in Lufkin Equipment does not cease with the manufacture of a first-class product. Experienced men, trained in the Lufkin plant, watch results in the field and are always ready to render assistance whenever and wherever necessary.

A most cordial invitation is extended interested oil men to visit the Lufkin plant.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Foreword

IN PREPARING this catalogue we have tried to make it as completely descriptive of Lufkin Oil Field Equipment as possible. Wherever tables, and dimensions, together with engineering data were thought advantageous to the purchaser they have been included. Our engineering department, consisting of technically trained and experienced men, will gladly assist with any problem.

Our policy is to be continually on the alert to improve our own products and to bring new equipment for improved production to the oil business.

With our increased facilities, production tools etc., we are well prepared to take care of our trade both in this country and abroad. A staff of well trained service men are maintained in the fields to watch the performance of Lufkin equipment, make adjustments whenever necessary and be of general assistance to the trade.

Terms

All quotations are F. O. B. our Lufkin factory unless otherwise specified. Our responsibility ceases upon delivery of goods to carrier.

All quotations are subject to change without notice.

All promises are estimated as closely as possible and our best efforts are used to ship within time specified but no responsibility is assumed for failure to ship when promised.

Special goods not subject to cancellation.

We guarantee workmanship and material when goods are used for purpose for which they were manufactured, but no claims for labor or damage will be allowed.

All agreements are subject to strikes, accidents and other causes beyond our control.

When purchasers have satisfactory rating, terms are thirty days net, unless otherwise provided for.

Export Business

Orders for export should be accompanied by explicit instructions regarding marks on packages, routing, port of shipment and entry, etc.

In describing equipment wanted catalogue page numbers should be used whenever possible and all possible information should be given.

Export shipments will be insured only when expressly stipulated, and only then at purchasers' expense.

Code

Our private Code is used for specifying our equipment whenever possible and reference to the Code in back of book will assist in describing types of drives, assembles, etc. For transmitting instructions regarding prices, terms of payment, method of shipment, routing, etc., use A. B. C. Code, 6th Edition.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

INTRODUCTION

Some General Pertinent Facts Concerning Lufkin Pumping and Drilling Equipment

UNIVERSAL ADAPTATION

Lufkin Units have had such a world wide distribution during the last seven years and have come into such general use in this country with many major companies standardizing on them, a comparison of their merits with the old Standard rig is no longer necessary.



Lufkin Herringbone Gear and Pinion

Lufkin Units in combination with Lufkin Hoists are doing any and all work that can be done with bull and calf wheels and in many instances doing better work and in less time. This is especially true in servicing a well with the loose drum type of hoists. Rod and tubing time is often cut in half. While "drilling in" is regularly accomplished with the Lufkin worm gear in equal time to a Standard rig, the Herringbone Gear is showing evidence in practical use of having a "better fall" and is making faster time drilling from the surface. See authoritative tests described on pages following.

COUNTER-BALANCING

The subject of correct counter-balancing has been very thoroughly discussed in the past few years so that through experience and tests, engineers are nearly of one accord; in that centrifugal counter-balancing in the crank, with simple adjustability is the settled and best practice. The greatest economy in well pumping is largely dependent on correct balancing of the well, elimination of rod trouble and undue strain on the entire mechanical apparatus; reducing the power required to the minimum and securing the lowest upkeep costs. The Trout Counter-balanced Crank, by test has been found to be the answer to this requirement. See detailed description on pages 11 and 12.

WORM AND HERRINGBONE GEARS

Seven years ago Lufkin pioneered the application of worm gearing to oil well pumping rigs. We were led to adopt the worm gear because of



Lufkin Worm Gear and Pinion

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

its dependability, its simplicity, its compactness, and its quietness due to its smoothness in action, all of which in turn insured absence of shocks and vibration. These characteristics likewise make for durability. The spiral or helical formation of the worm gear has the further advantage of inducing an oil film between the tooth surfaces, which makes for almost perfect lubrication and has a great influence in the relatively high load carrying capacity of the gear. The performance of more than sixteen hundred Lufkin worm geared units over an operating period of more than seven years has proved ample vindication of our judgment in its adoption.

Notwithstanding the success of our worm geared unit, we have been, and still are, alert to any possibility of improvement in our pumping units. Quite recently a new type of helical gear has become available, which has what are called herringbone teeth. These gears are actually worm gears, the teeth of the pinions being in all respects identical with worm threads of a relatively long lead. The essential difference, however, between the new herringbone gear which we have adopted and the worm gear is that the shafts of both wheel and pinion are parallel to each other instead of at right angles, as in the worm gear.

A further difference, which is possibly due to the shafts being parallel, is that the pinion, or worm, can be arranged with right and left hand threads, or teeth. This has the great advantage of eliminating all end thrust and therefore no thrust bearing is needed and, consequently, expense is saved. In addition, there are less number of parts and therefore less possibility of trouble and a tendency toward reducing maintenance expense.

An additional advantage is that the sliding action of the teeth in motion is less than in the worm gear, while at the same time, due to the relatively large helix angle which can be used, the smoothness of operation and the property of efficient lubrication is maintained. The mechanical efficiency, therefore, of the herringbone gear is slightly better than that of the worm gear, especially at loads much less than the normal load. It must be understood, however, that the herringbone gear does not afford much advantage in efficiency compared with the high grade worm gear which we have used. Nevertheless there is a slight advantage which is worth consideration.

Another advantage of the herringbone gear is that due to the reduced sliding motion it is possible to use a wheel made in steel instead of one having a phosphor bronze rim, as in the worm gear.

We have placed a great number of these herringbone geared units in service and they have proved very satisfactory and are preferred by many of our customers.

While it is customary to drill in wells with the worm gear units, and some wells have been completely drilled with cable tools in at least equal time as the standard rig, we believe the herringbone gear will give a better "fall" to cable tools than is possible with the worm gear due to its self locking nature, an especially valuable feature in pumping, another reason that led us to conclude to manufacture both types.

Before standardizing on these herringbone gears we made careful investigations to determine the best proportions of gears, both as regards diameters, face width and tooth proportions. We have adopted a specially strong tooth, which is desirable, not only on account of its strength, but also because it gives the best possible tooth action, the highest mechanical efficiency, and the utmost durability. We have also made careful investigations into the best materials to use, with a result that we have adopted a special alloy steel, heat treated to a definite hardness.

It will interest many of our friends to know that we have installed complete equipment at considerable cost for manufacturing these new herringbone gears in our own factory.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



Typical Gulf Coast installation of Lufkin Herringbone Unit, including Lufkin No. 52 Hoist with steel jack posts and Lufkin No. 1 Samson Post assembly. Unit is Lufkin Herringbone No. 6½—Well depth 4650 feet.

Lufkin Units Are Used on the Deepest Wells of the World

Lufkin Herringbone Gear Units are built in three sizes. Worm Gear Units are built in four sizes. Lufkin Central Powers are built in two sizes.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

The Trout Counter-Balanced Crank



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

The counter-balanced crank for oil well pumping has been accepted by oil producers and manufacturers of oil field equipment as the most desirable means of balancing wells, but only after exhaustive tests and comparisons with every other conceivable method of balancing a pumping well.

The Trout counter-balanced crank (see illustration) is the most effective and flexible counter-balance that has been placed at the disposal of 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 upstroke 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 upstroke 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 lift half of the stroke the force varies throughout and reaches a peak about the center of the stroke depending upon pumping conditions.

With more complete knowledge of what happens during the pumping cycle it is generally accepted that there is no advantage in leading or lagging the counterweights.

Counter-balanced 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.

The accompanying chart gives the various effective static weights for the different sizes and models of Lufkin Units.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Effective Static Weights of

Trout Counter-Balanced Cranks

FOR 6-1/2″ WORM OR HERRINGBONE GEAR UNITS:

Stroke—	32″ Pounds	42″ Pounds	52″ Pounds	62″ Pounds	72″ Pounds
Regular Crank No. 1158 W and Weights	14,400	11,000	8,900	7,400	6,400
With Auxiliary Weights (extra price)	17,800	13,500	10,900	9,200	7,900
With lead Weights 9″ thick (extra price)	23,800	18,150	14,700	12,300	10,600

FOR 5-1/2″ WORM OR HERRINGBONE GEAR UNITS:

Stroke—	32″	42″	52″	62″	72″
Regular Crank No. 1157 W and Weights	10,400	8,000	6,400	5,400	4,600
With Auxiliary Weights (extra price)	13,100	10,000	8,100	6,800	5,800
With lead Weights 8½″ thick (extra price)	18,400	14,000	11,300	9,500	8,200

FOR 4-1/2″ WORM OR JUNIOR HERRINGBONE GEAR UNITS:

Stroke—	21″	30″	39″	48″
Regular Crank No. 1001 W and Weights	10,800	7,550	5,800	4,720
With Auxiliary Wts. (extra price)	13,400	9,400	7,200	5,900

FOR BABY WORM GEAR UNIT:

Stroke—	16″	26″	36″
Regular Crank No. 1209 W and Weights	10,300	6,300	4,560

Note: Tabulated weights, as listed are equivalent to a much greater weight attached to the end of beam due to dynamic force. Weights as listed are effective only when crank is horizontal and counter weights are at end of long end of crank.

SUCKER ROD

Weight in Pounds Per 1000′

Type—	Section Length Feet	Size Rod 5/8″	3/4″	7/8″
Box and Pin	20	1140	1650	2320
Box and Pin	25	1120	1620	2200
Box and Pin	20	1110	1590	2200
DBL. Pin and coupling	25	1160	1670	2390
	30	1140	1630	2250

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

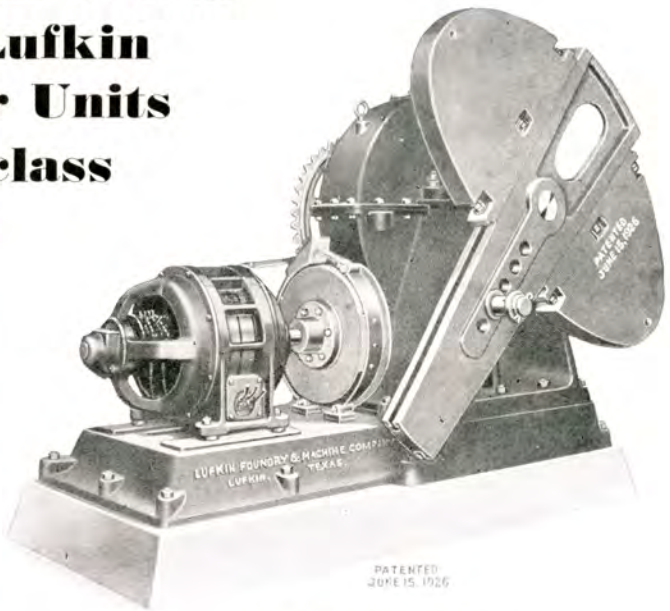
Comparison of Lufkin Worm Gear Units and Lufkin Herringbone Gear Units with respect to class of service

There are two classes of Lufkin Units, the Worm Gear and the Herringbone Gear types.

The Heavy Duty or 6-1/2" Worm Gear and the Heavy Duty or 6-1/2" Herringbone Gear Units are designed for the same class of service and each use the same Trout Counter-balanced Crank.

The Intermediate or 5-1/2" Worm Gear and the Standard or 5-1/2" Herringbone Gear Units are designed for the same class of service and each use the same Trout Counter-balanced Crank.

The Standard or 4-1/2" Worm Gear and the Junior or 5" Herringbone Gear Units are designed for the same class of service. The regular pattern 4-1/2" Worm Gear, however, has a shaft extension and outboard bearing to apply pulling sprocket 6'2" from center of well which can drive any of our hoists with or without line shaft.



Lufkin Worm Gear Unit

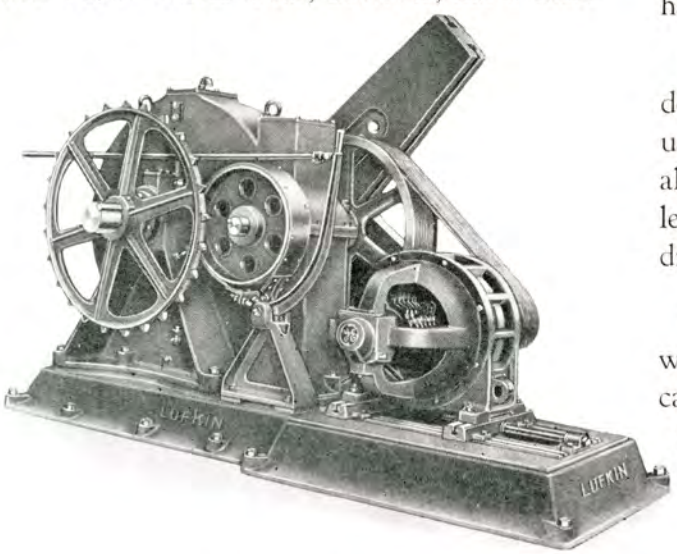
The Junior Herringbone Unit also has a sprocket 54 5/8" from well center line and a line shaft hoist would be necessary to use the sprocket drive.

The new Lufkin Baby Unit is designed for pumping only and is of the Worm Gear type having a 4 1/2" crank shaft.

This gear gives us a large reduction at one "step down" and, with the "V" Belt drive, allows the use of high speed plain induction motors, also allowing large motor drive pulley. The greatest leverage being in the gear, makes for an easy belt drive and a very compact efficient unit.

To accomplish this with the Herringbone Gear would require double gearing which is complicated and costly to keep up and with double gearing it is not as efficient as the worm gear.

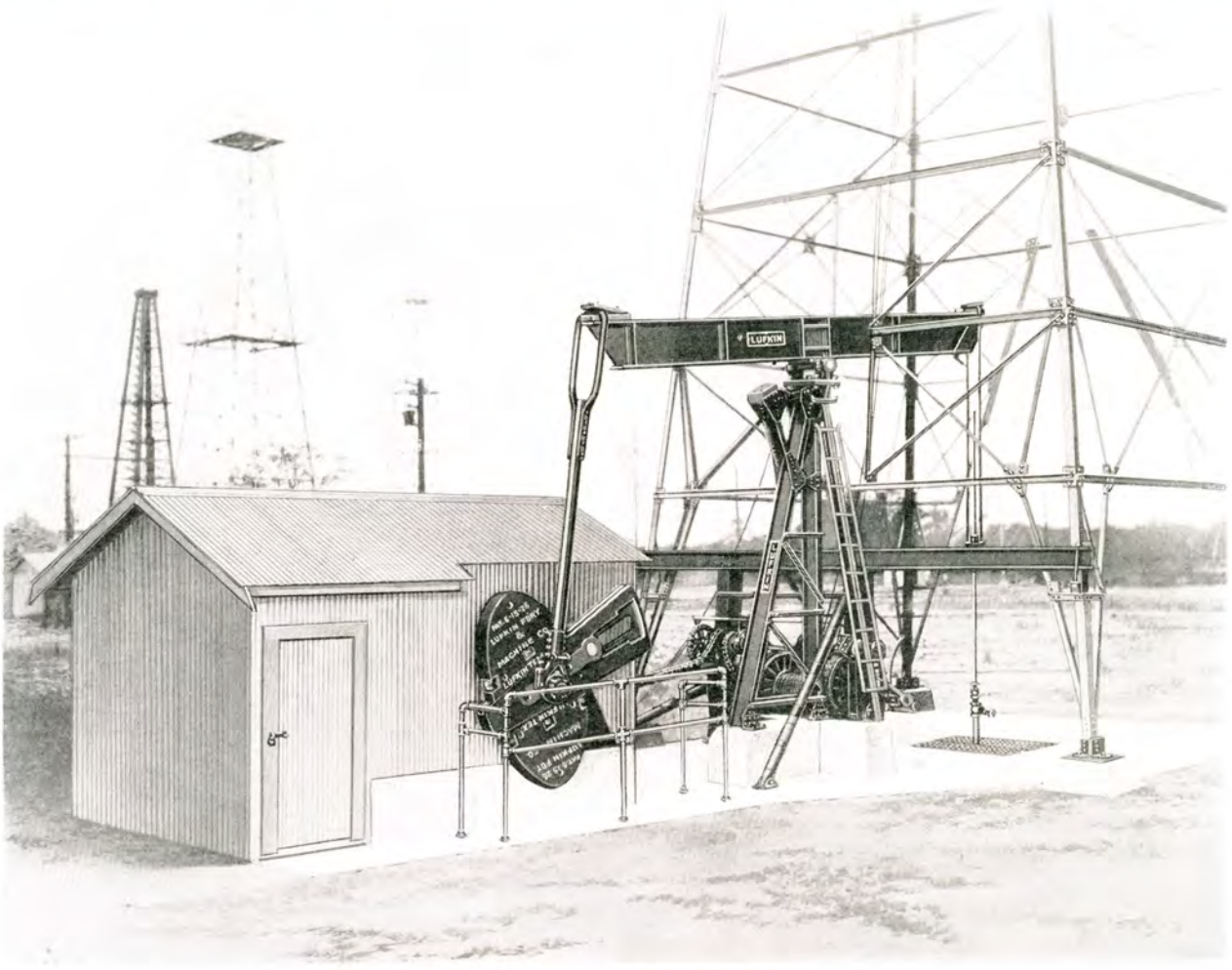
The compactness and adaptability of the Worm Gear is appreciated in this unit which we believe to be ideal for this service.



Lufkin Herringbone Unit

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT



Typical Herringbone Gear Installation

Lufkin Herringbone Units Mean Greater production—Lower power cost—Longer lasting service—Low upkeep cost—Elimination of fire hazard—High salvage value—Time servicing wells greatly reduced over any other type of unit or Standard Rig . . . Claims that are realized in actual practice.

GENERAL CONSTRUCTION

Lufkin Herringbone Units

Lufkin Herringbone Units are especially designed for oil field service, is strongly built, of heavy construction and of few parts with practically no adjustments to make. They are almost "fool proof." Outside of adjusting weights a roughneck would not know where to use a wrench on them, a good reason for their increasing popularity. The following points of mechanical construction will be of interest:

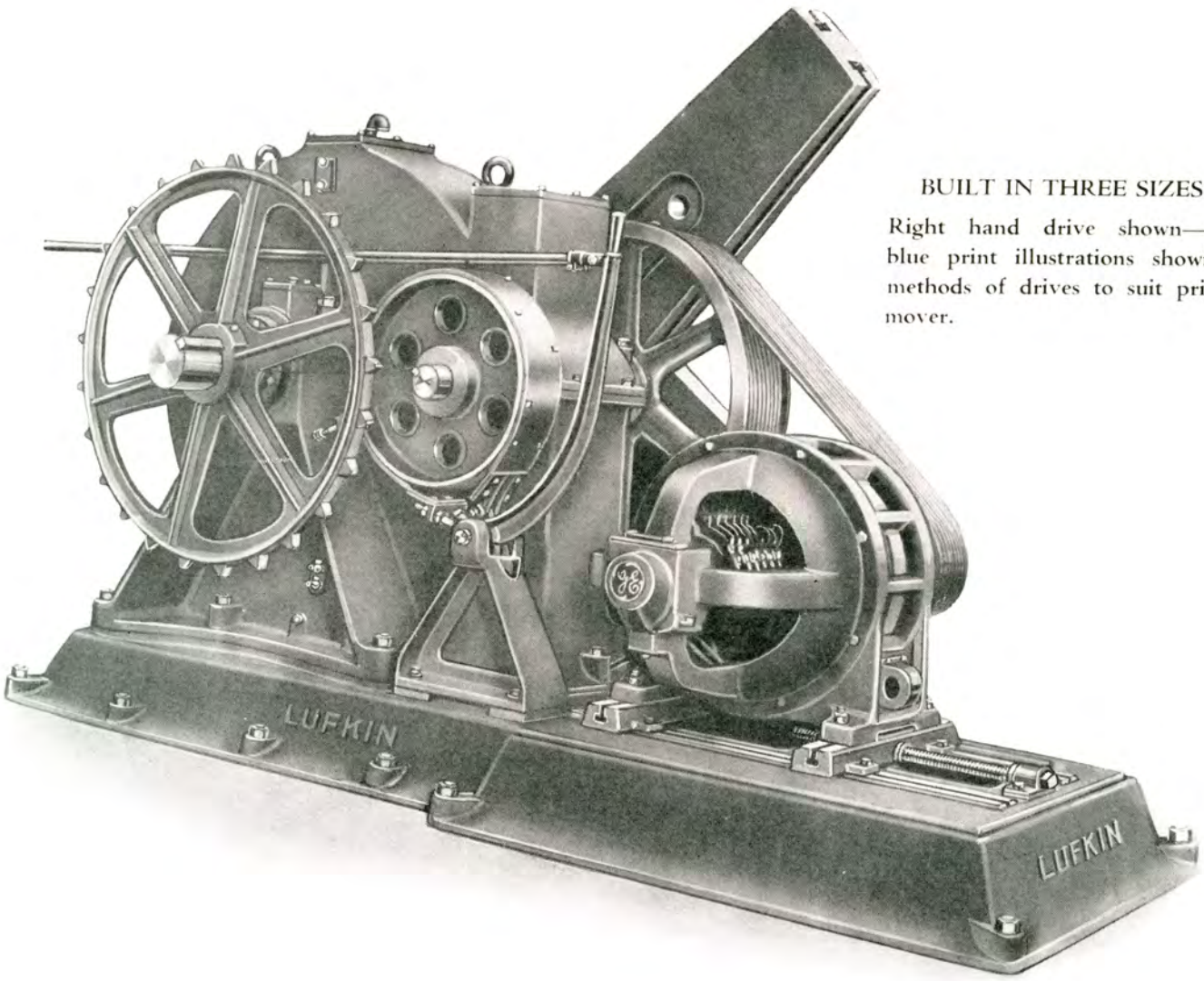
The base is of heavy ribbed construction box section with ample bolts to the gear housing and motor which are securely fastened to always insure proper alignment. While some of our smaller units set on concrete without a base, we do not recommend this practice especially with larger units.

The gear housing is rugged and well ribbed to

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT

Lufkin Sykes-Herringbone Gear Unit



BUILT IN THREE SIZES

Right hand drive shown—see blue print illustrations showing methods of drives to suit prime mover.

Regular Pattern—Built in 6½″ and 5½″ sizes—Both 72″ Stroke
(Cut Shows Right-Hand Drive)

hold the gears and stand the sudden strains of pumping or pulling and is securely bolted and doweled to base. Base plate and gear housings for both 5½″ and 6½″ Units are interchangeable.

The gear shaft is of alloy steel, forged, turned and ground, running in *Bronze Bearings* duplicate in size, as are our worm gears, where they have been so satisfactory.

The master gear is of high carbon Cast Steel while the *pinion* (generated integral with shaft) is forged alloy, heat treated, hardened steel, both generated on gear cutting machines in our own plant.

Lufkin Herringbone gears are amply large in diameter and width of face so that tooth pressures are reduced to a minimum, resulting in

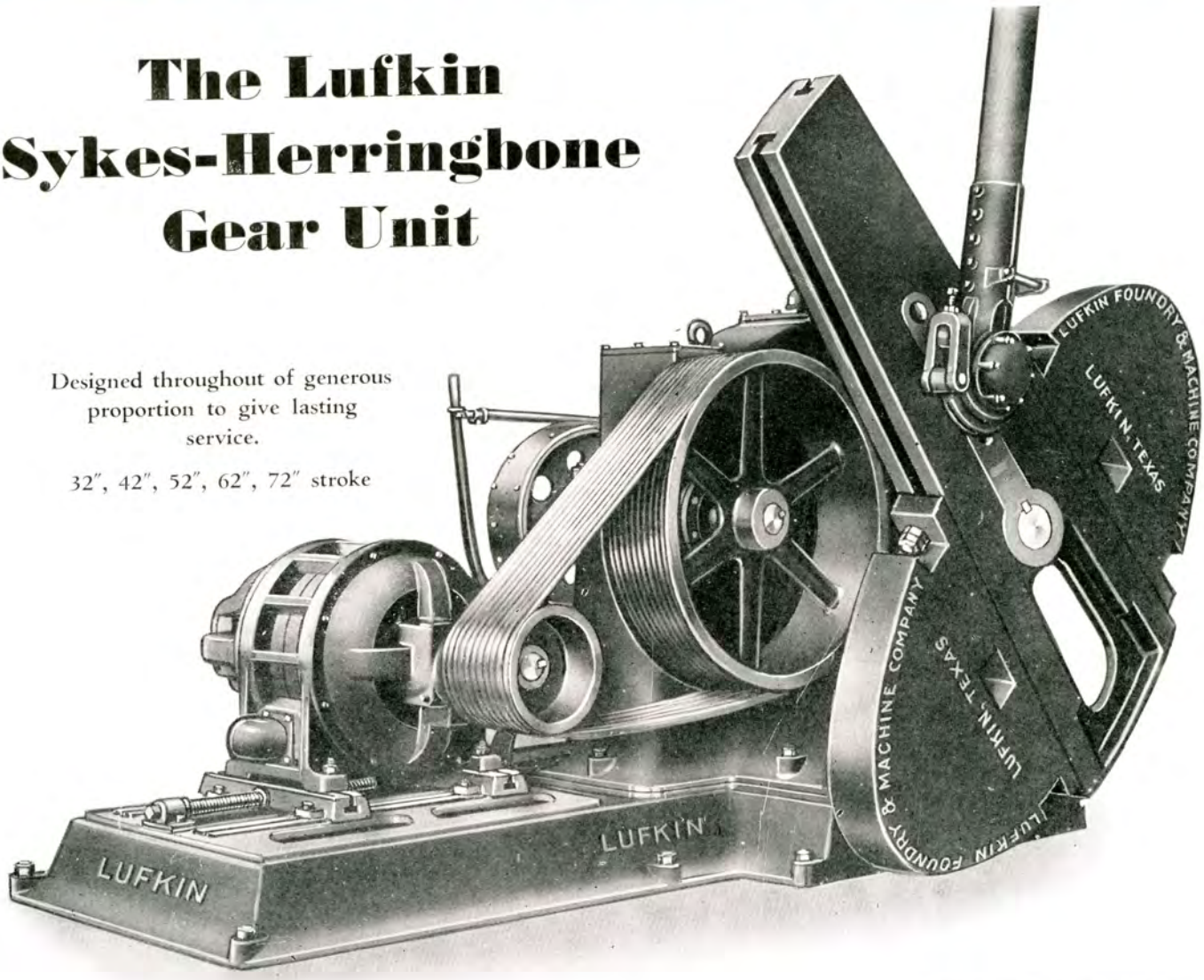
Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT

The Lufkin Sykes-Herringbone Gear Unit

Designed throughout of generous proportion to give lasting service.

32″, 42″, 52″, 62″, 72″ stroke



Standard type showing "V" Belt drive arrangement

SPECIFICATIONS:

6½″ Heavy Duty Herringbone Unit

SHAFT: Gear shaft 6-7/16″ in crank and bearings, 7-7/16″ in gear.
PINION SHAFT: 3-15/16″ in bearings, pinion 5.6″ P.D. (pinion generated integral with shaft).
GEAR: 54″ dia. 10″ face, 136-T.
PINION: 5.6″ P.D. 10″ face, 14-T.
RATIO: 9.7 to 1.
WEIGHT: 22,300 lbs.

5½″ Standard Herringbone Unit

SHAFT: Gear shaft 5-7/16″ in crank and bearings, 6-7/16″ in gear.
PINION SHAFT: 3-7/16″ in bearings, pinion 5″ P.D. (pinion generated integral with shaft).
GEAR: 47″ dia. 8″ face, 141-T.
PINION: 5″ P.D. 8″ face, 15-T.
RATIO: 9.4 to 1.
WEIGHT: 16,500 lbs.

long wear and lasting service. They are superior in strength, efficiency, and silent in operation.

The Trout counter-balanced crank is too well known for comment; its ease of adjustment in balancing the well; the speed with which the weights can be centralized on crank for pulling, has made it increasingly popular with the oil industry.

The unit has a suitable *brake* for not only holding crank for adjusting weights but the entire rig as well.

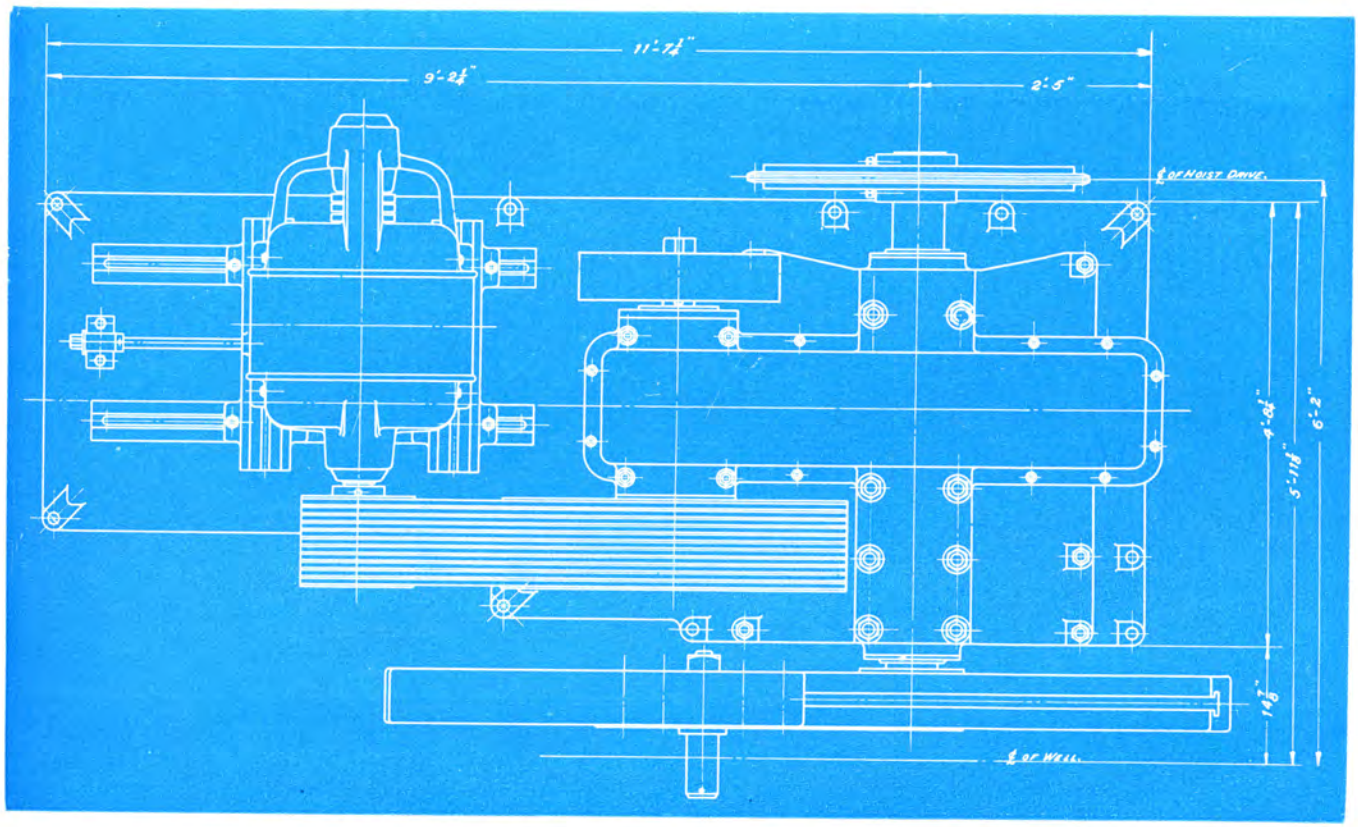
The "V" belt drives have been designed with a large factor of safety to easily handle an overload when necessary. Sheaves are amply large with suitable size belts to insure long service.

A solid sprocket is provided of suitable size to drive hoist, clutch sprockets can be provided at extra cost.

Blue print setting plans and necessary wrenches go with each unit. Foundation bolts are extra.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT

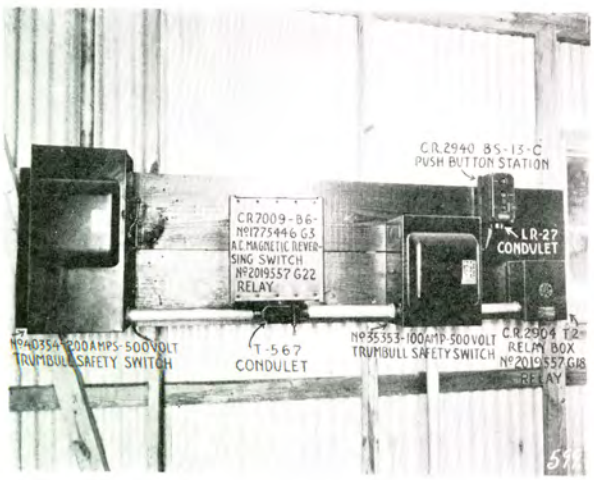


Regular layout for Lufkin 6½" and 5½" Herringbone Units. An ideal arrangement for motor with take-up slide rails.

Code for this arrangement: { 6½"—*FAADS* / 5½"—*FAAFT*

The base for these units, also Gulf Coast pattern units, are interchangeable—either size gear box will fit the base without drilling additional holes. This is found advantageous in the event well conditions change requiring a heavier unit or the replacement with a lighter unit when found economical.

FOR CABLE TOOL DRILLING SEE PAGE 28



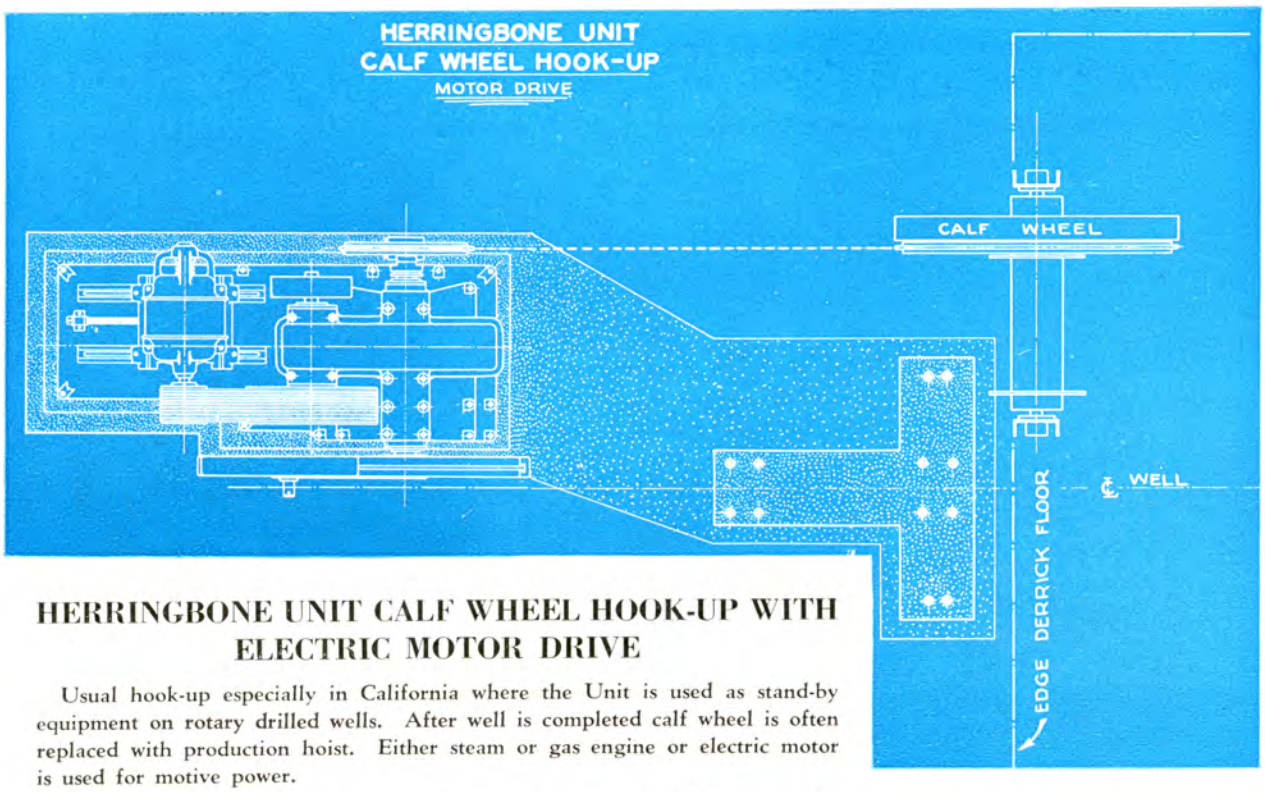
Layout of switch board panel used with equipment shown to right. Wiring diagram and full information furnished upon request.



Inside motor house. There is ample room to take off or put on belts on V drive not evident in picture.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

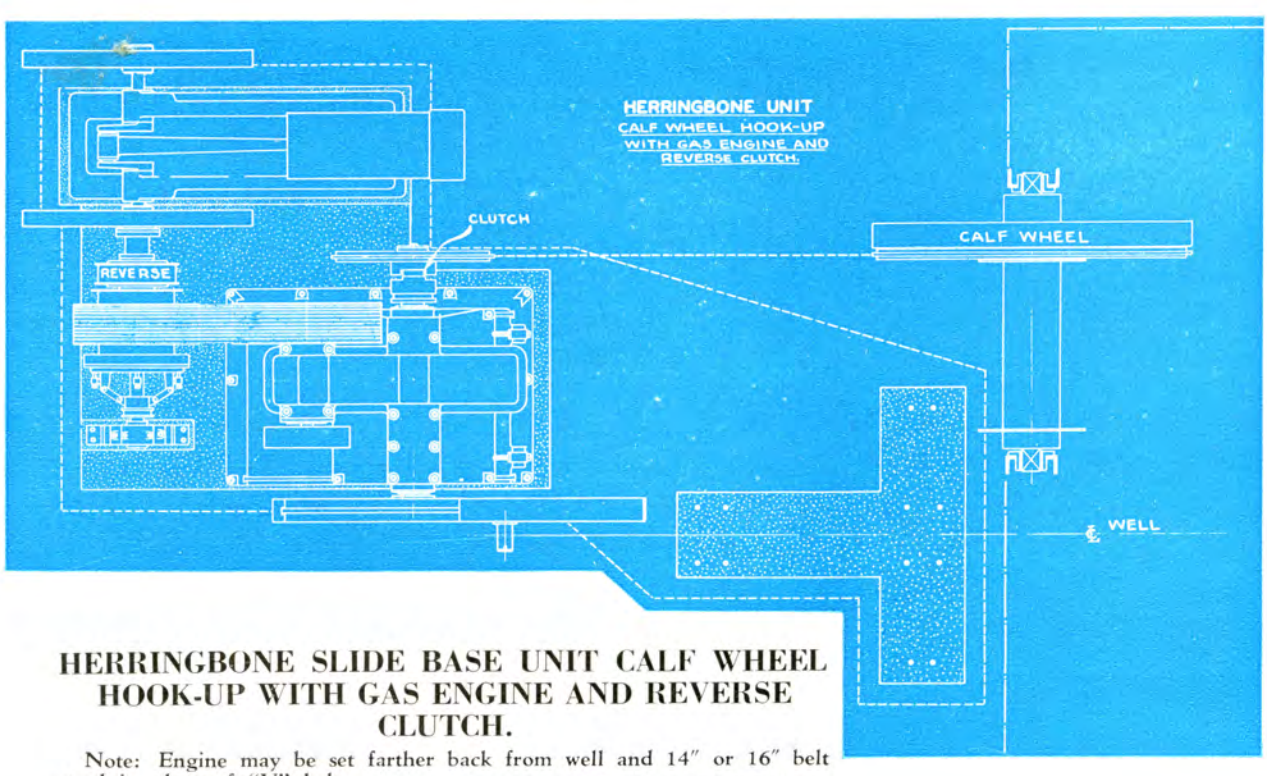
Calf Wheel Hook-Up to Lufkin Herringbone Units



HERRINGBONE UNIT CALF WHEEL HOOK-UP WITH ELECTRIC MOTOR DRIVE

Usual hook-up especially in California where the Unit is used as stand-by equipment on rotary drilled wells. After well is completed calf wheel is often replaced with production hoist. Either steam or gas engine or electric motor is used for motive power.

Code for this arrangement: { 6½"—*FAADS–FECUZ*
5½"—*FAAFT–FECUZ*



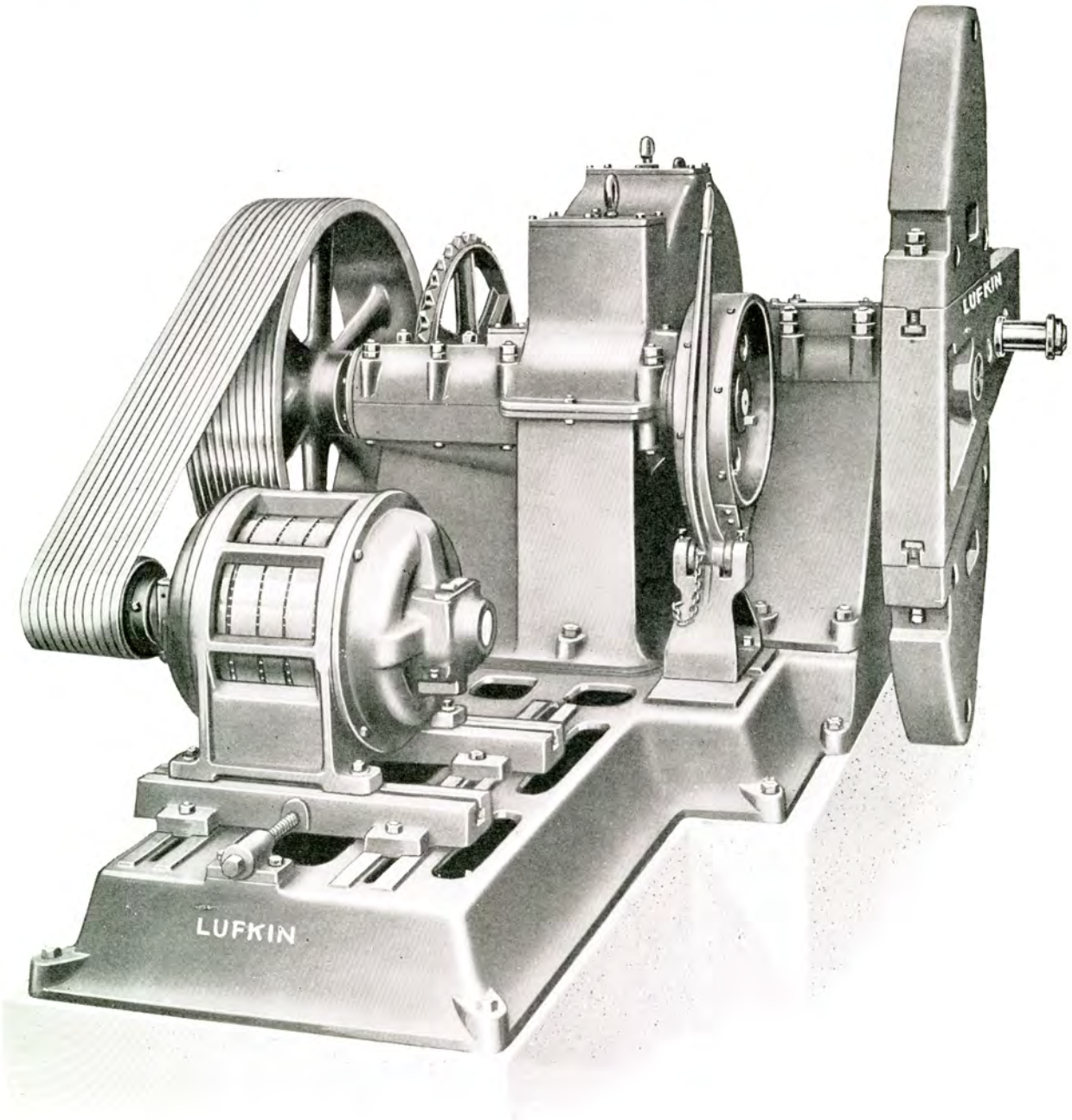
HERRINGBONE SLIDE BASE UNIT CALF WHEEL HOOK-UP WITH GAS ENGINE AND REVERSE CLUTCH.

Note: Engine may be set farther back from well and 14" or 16" belt used in place of "V" belts.

Code for this arrangement: { 6½"—*FAAMB–FECUZ*
5½"—*FAANC–FECUZ*

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT



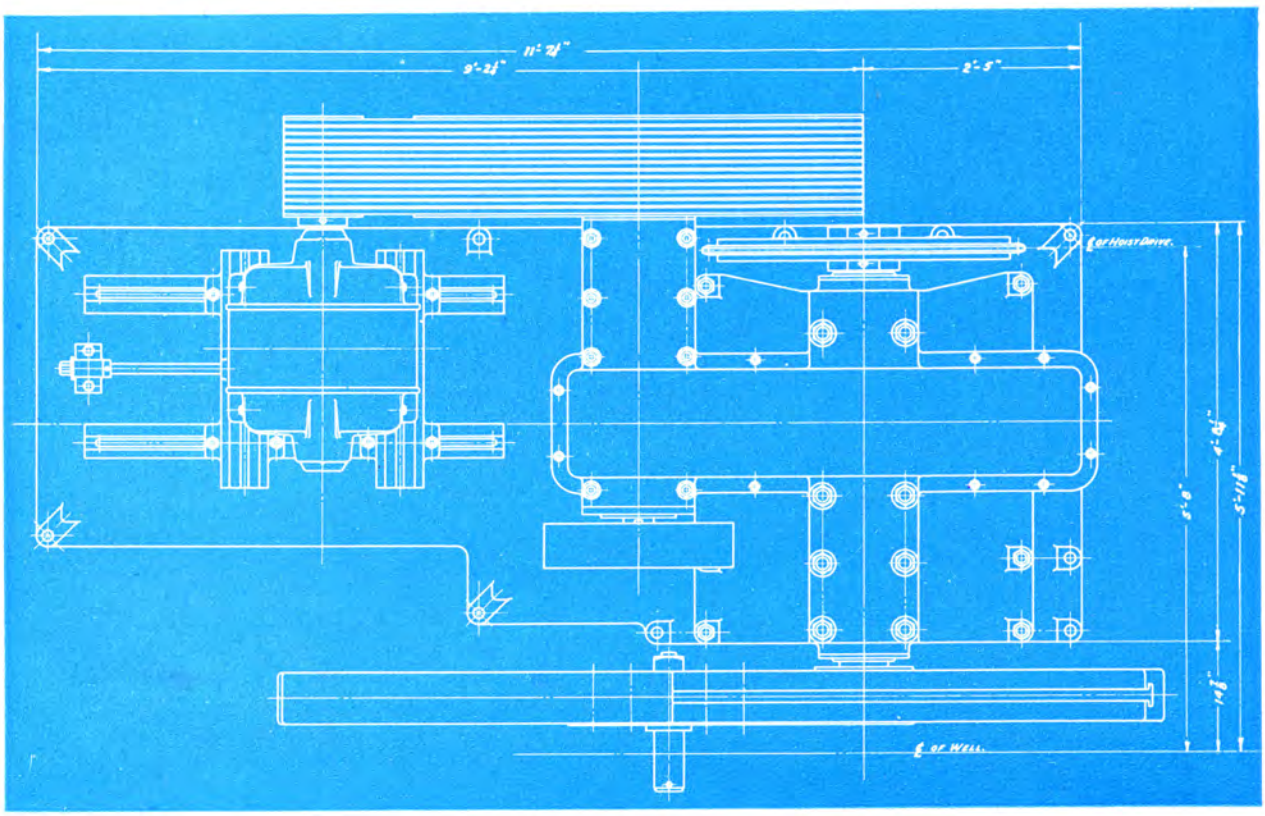
Gulf Coast Pattern
Lufkin Herringbone Unit

This Unit is especially designed for use with constant, high speed motors and where tractors are used for pulling. This design permits the use of larger sheaves than the regular unit shown on previous pages so that 1200 speed motors may be used.

While a sprocket is shown for pulling, its size is limited and it is not as large as is necessary for fast cleaning out work such as is obtained with the regular unit.

General specifications are the same as 5½" and 6½" units, also Universal Bed Plate is used same as regular units shown on page 15.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



Constant Speed Squirrel Cage Motor adaptation, Gulf Coast Pattern, left hand drive. This drive especially for constant speed motor where pulling is done by tractor. Left hand drive merely to permit use of larger sheaves

Code: { 6½" *FAARF* / 5½" *FAATH*

Information Usually Required in Ordering Units in This Catalog

FOR ELECTRIC MOTOR DRIVES:

Number of strokes per minute the well is to pump_____. Note: By changing small motor pulley number of strokes can be changed as desired.

Make of motor_____ Type_____ H. P._____ Speed_____

GAS ENGINE DRIVE:

Number of strokes per minute the well is to pump_____Make of engine_____
Type_____ Speed_____.

NOTE: Buda engines are recommended to operate at about 700 to 800 R. P. M. for economical pumping and long service.

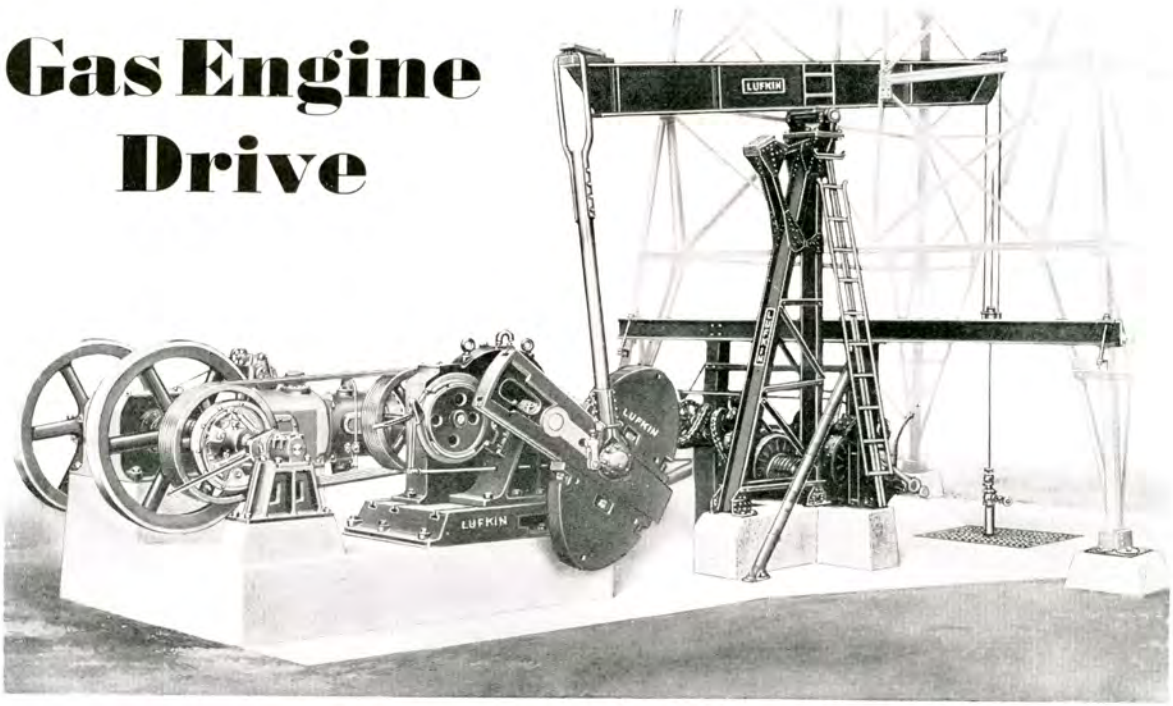
Single cylinder engines are recommended to operate at about 200 R. P. M. to 225 R. P. M. depending on conditions. It is desirable that the engine have good regulations, regular impulses (no coasting).

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Lufkin Herringbone Gear Unit

On Sliding Base for Single Cylinder

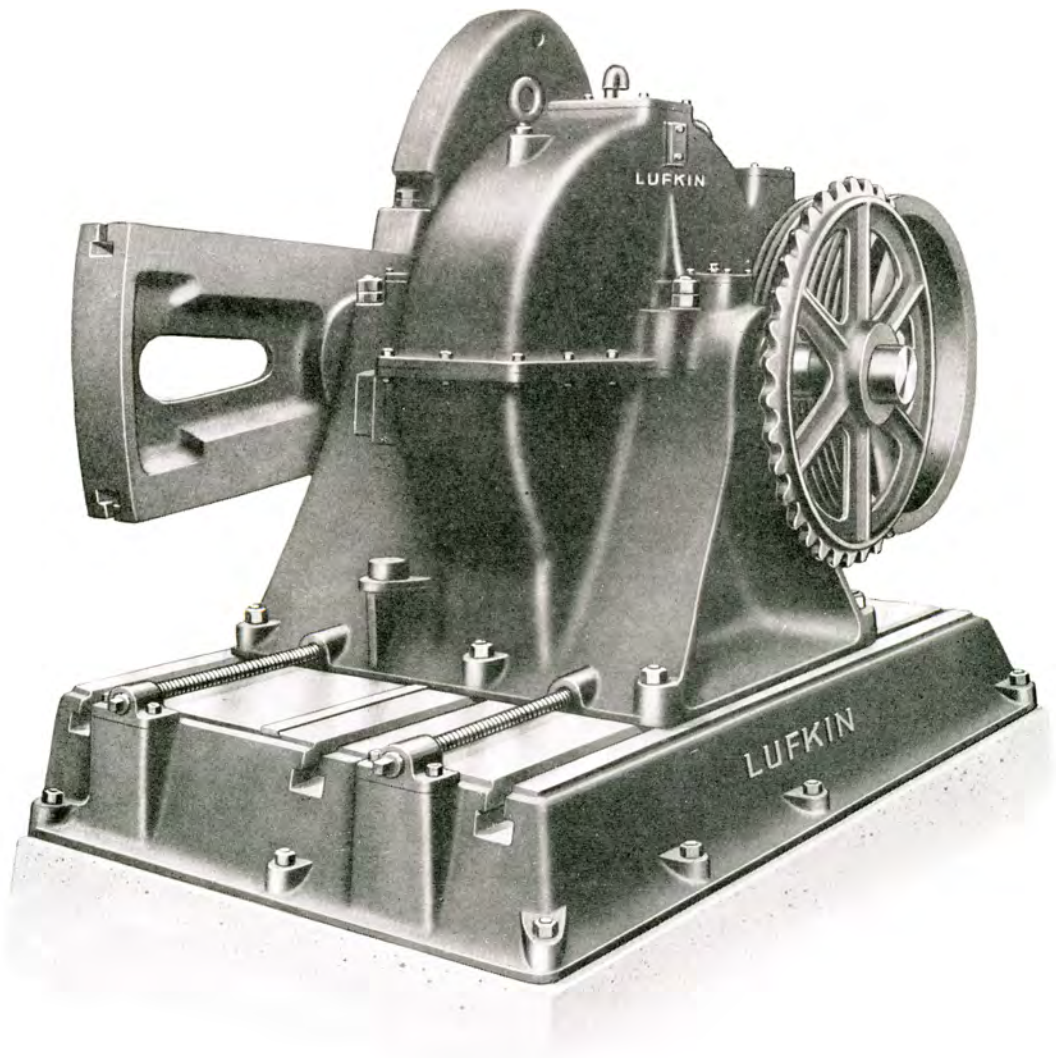
Gas Engine Drive



Lufkin Herringbone Gear Units are nicely adapted to the single cylinder engine drive. With the use of the "V" belt drive, shock and pulsation, commonly the source of trouble when direct connected, is entirely eliminated.

Note: Unit is on sliding base. On some original installations, (see page 29), a tightener on the inside of the belts was used very successfully. The slide base, however, is found more practical and is now furnished as standard equipment for this type of installation. (It has also been found that a slight advantage is gained by setting the Unit 10 to 16 inches back of the usual center in that a better operating angle is obtained between the walking beam and the Pitman, when lifting.) About the same advantage is obtained by pumping anti-clockwise, as many are pumping where electric power is used. All reverse clutches are eliminated on this type of drive. "V" pulley and belts with clutch and extension shaft are furnished to fit any size or make of gas engine.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



Lufkin Herringbone Unit, Left Hand Drive on Slide Base, Particularly for Gas or Steam Engine Drive

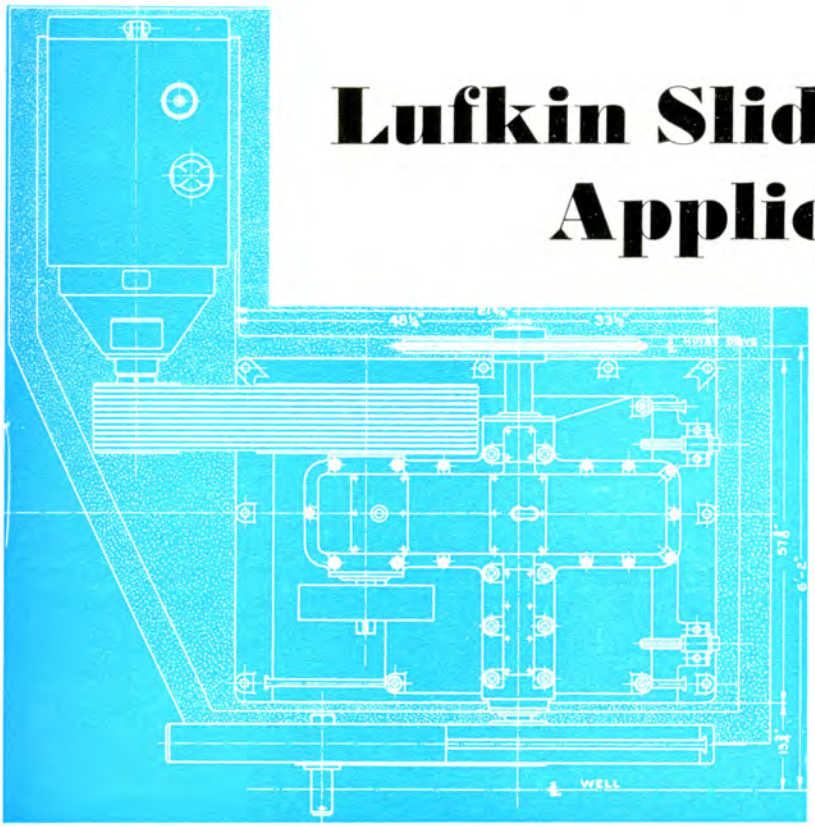
This is the regular Lufkin Herringbone Unit, specifications of which can be found on page 16 fitted to slide base for steam or gas engine drive.

Blue print installations showing types of this installation are found on page 23.

The gear box of this Unit is interchangeable with the regular unit and if found desirable to use electric power this may be done by setting the motor on concrete behind the Unit in the usual manner.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Lufkin Slide Base Unit Applications



Application Buda-Multi-Cylinder Engine to Herringbone Unit With Slide Base

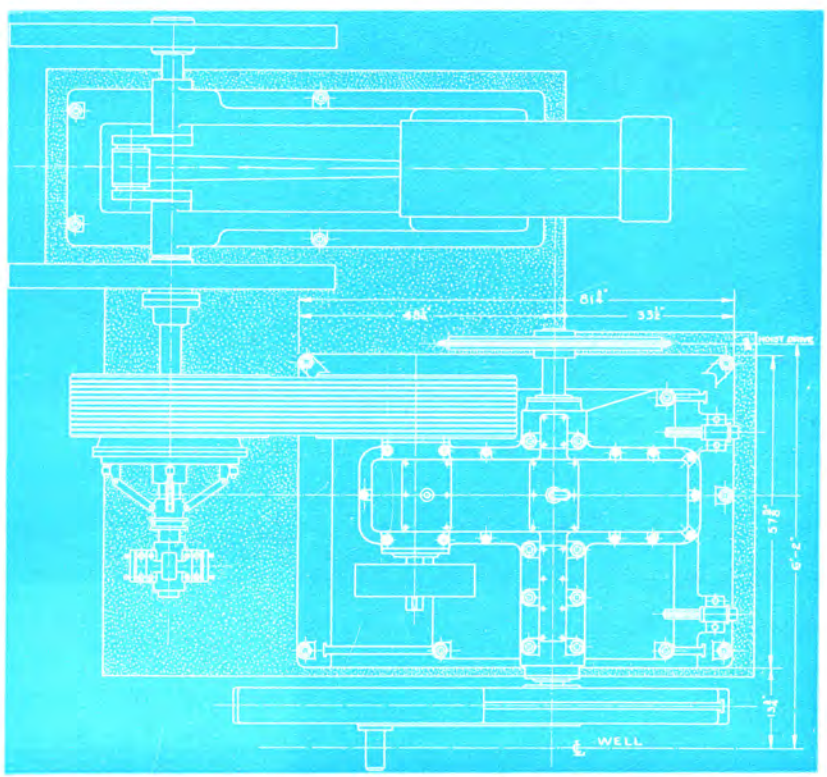
See descriptive matter pages 21 and 22

Code: { 6½" *FAAKY*
5½" *FAALZ*

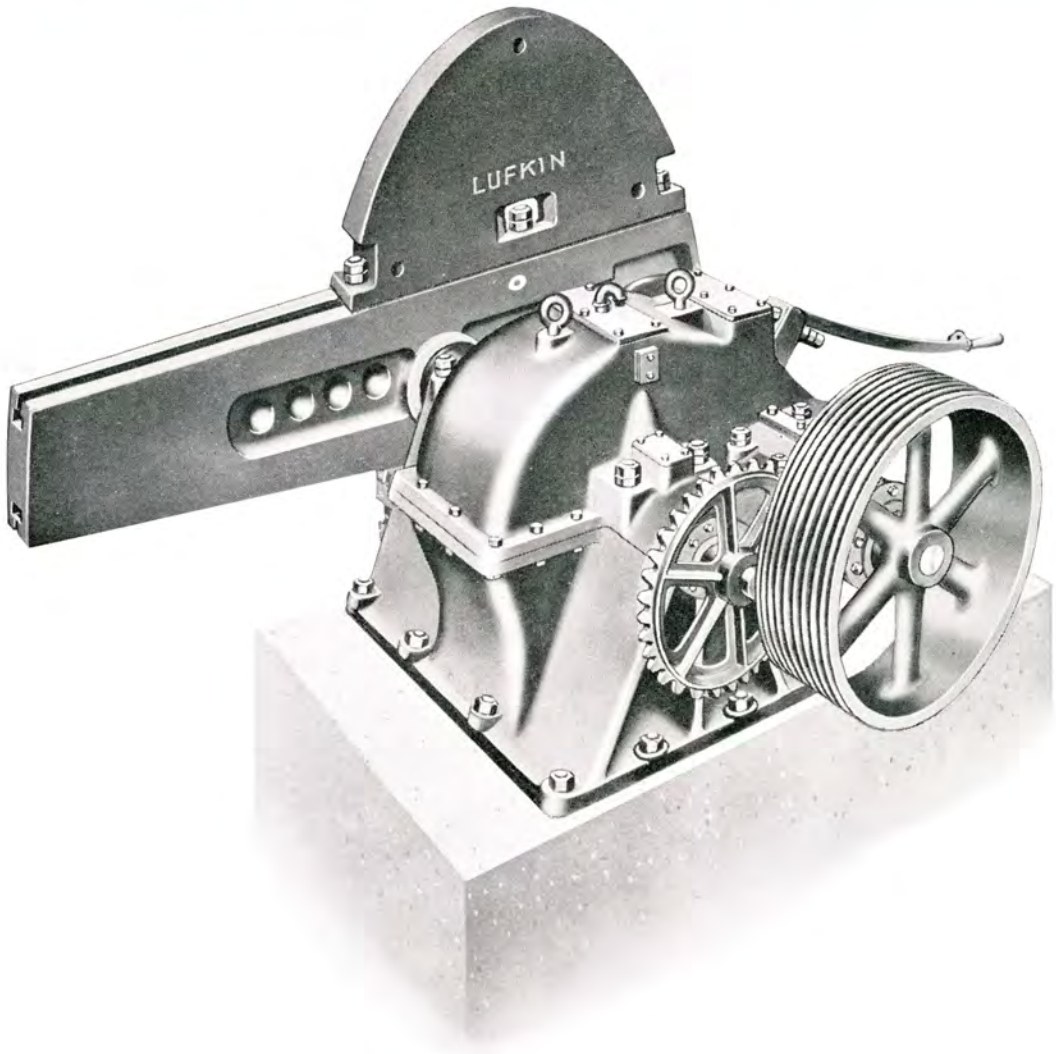
Application Single Cylinder Engine to Herringbone Unit with Slide Base Unit

See descriptive matter pages 21 and 22

Code: { 6½" *FAAMB*
5½" *FAANC*



Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



Lufkin Junior (5-in.) Herringbone Unit--- 48-in. Stroke

Made as illustrated, also with slide base for gas engine as on page 26

SPECIFICATIONS

Stroke—21″-30″-39″-48″.

Gear Shaft—5-15/16″ gear fit, 4-15/16″ in bearings.

Pinion—3-11/16″ in bearings, 2-15/16″ pulley fit.

Bronze bearings on gear shaft.

Hyatt Bearings on pinion shaft.

Master Gear 34″ P. D. 119-T 8″ face.

Pinion—4″ P. D. 14-T 8″ face.

Ratio—8.5 to 1.

"V" Belt Pulleys to suit motive power.

We recommend 15-H.P. plain induction motor 900 or 1200 speed, or a 15/40 Y-Delta motor if hoist is used.

GENERAL

This unit uses the same crank as our standard 4½″ worm gear unit especially to meet a demand for a medium herringbone gear unit for high speed electric motors, also 25-H. P. single cylinder gas engines to use in fields where wells are generally pulled with tractors.

While a hoist sprocket is furnished, it is only suitable to drive a line shaft hoist where driven sprocket is located in middle of line shaft.

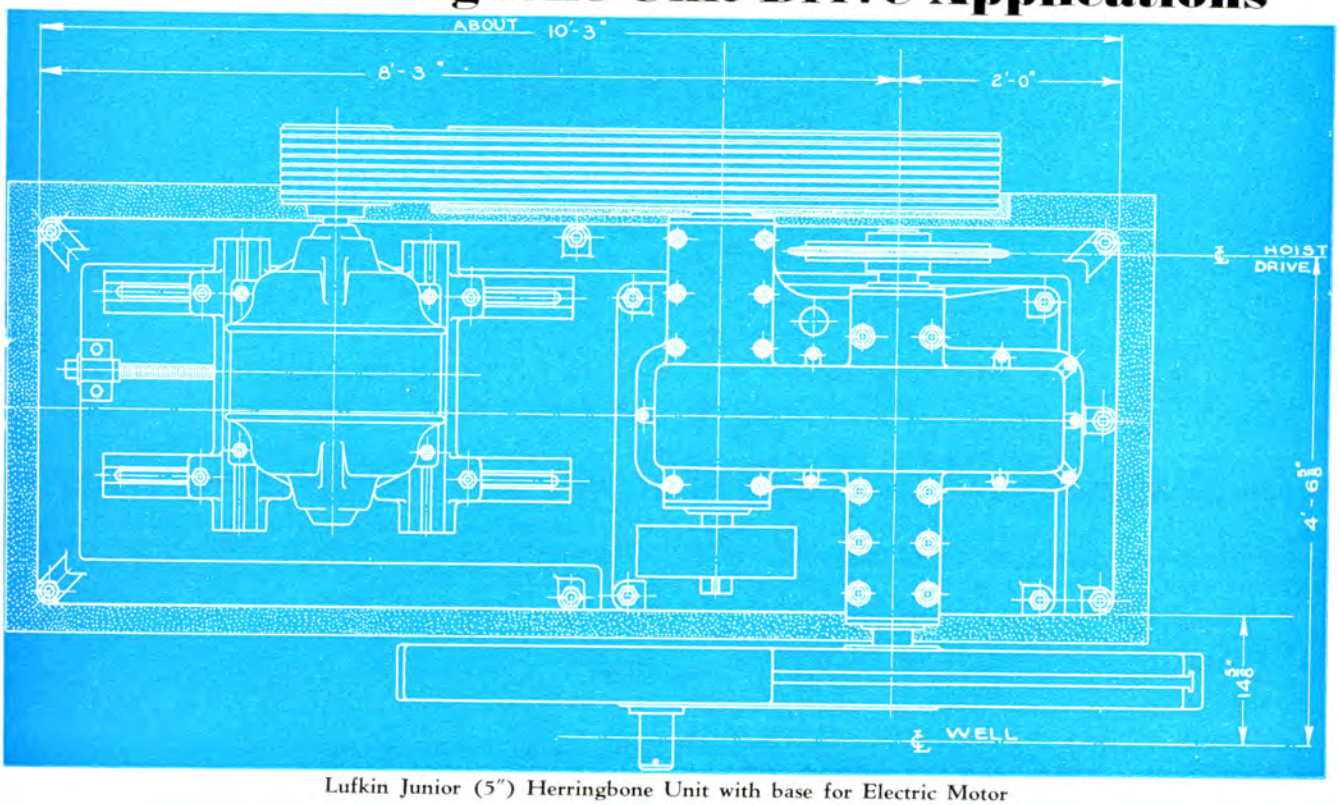
This unit is designed like our larger units in every way except smaller in size.

The gear box can be set directly on concrete for electric motor drive, or we will furnish a bed plate also, as shown on page 25.

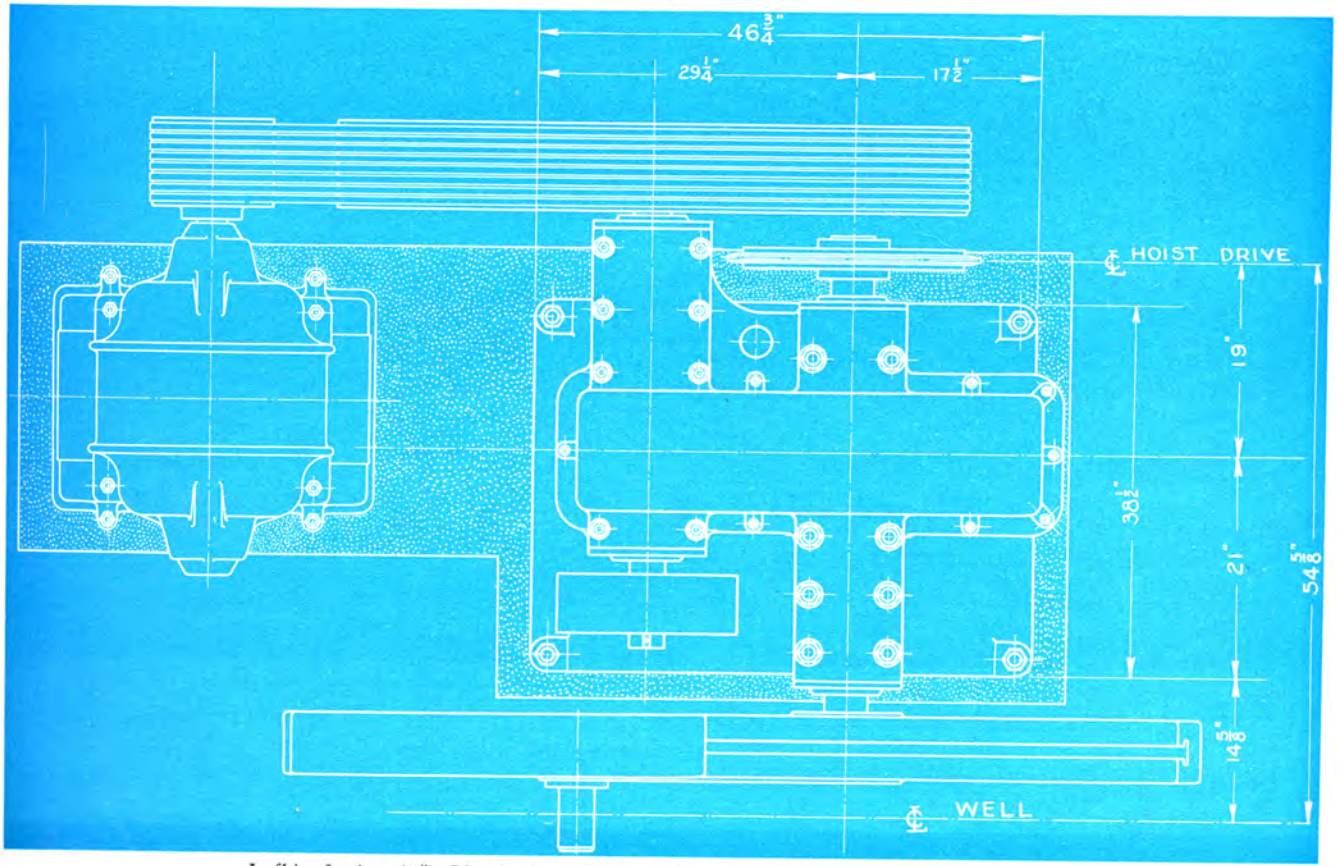
Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT

Lufkin Herringbone Unit Drive Applications

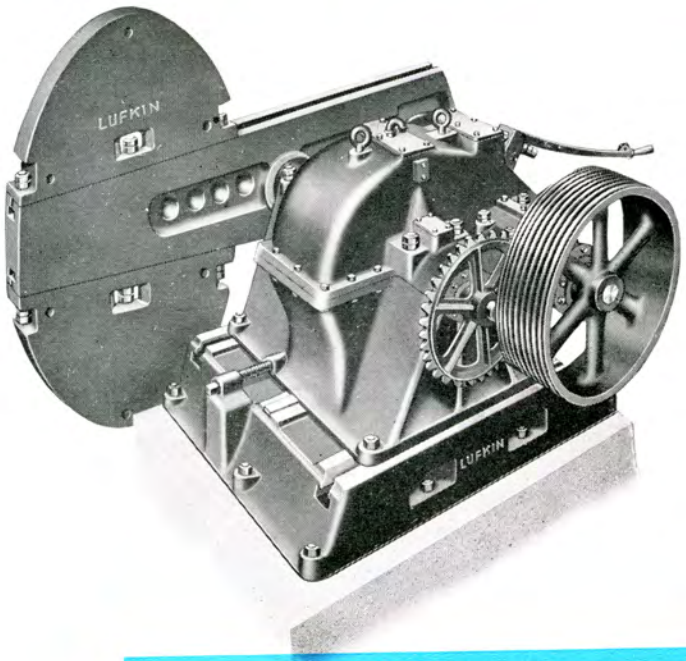


Lufkin Junior (5″) Herringbone Unit with base for Electric Motor
Code: FABAH



Lufkin Junior (5″) Herringbone Unit without base for use with Electric Motor
Code: FABUM

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

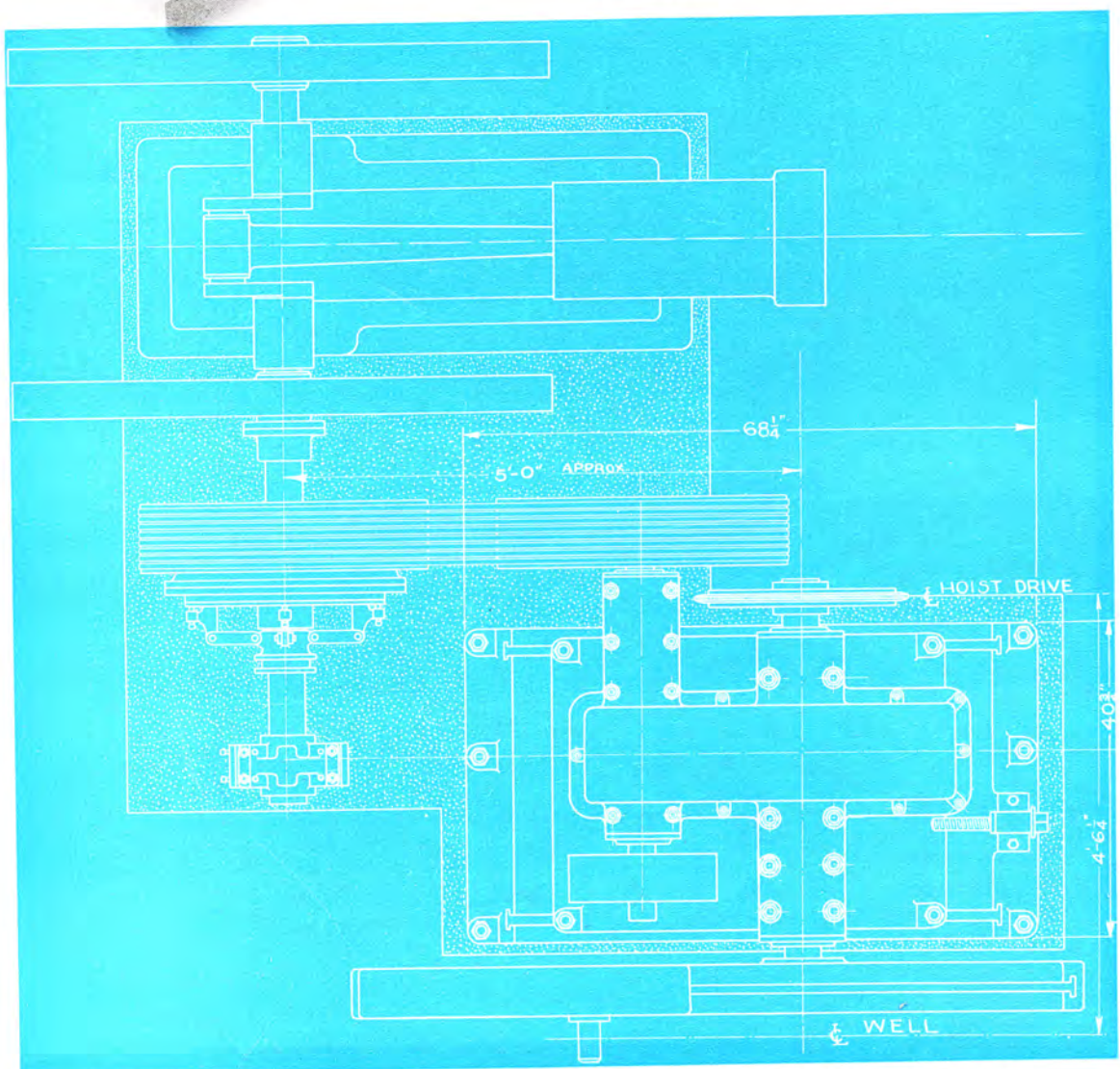


LUFKIN JUNIOR HERRINGBONE UNIT 5-in. Shaft 48-in. Stroke SLIDE BASE

LUFKIN JUNIOR HERRINGBONE UNIT WITH "SLIDE BASE" FOR GAS ENGINES

This is the same unit shown on the two preceding pages except provided with a slide base to use with single cylinder or Buda gas engines.

25 to 30 H.P. single cylinder engines are recommended running at 200 R. P. M. or a YR-4 Buda multi-cylinder engine, operating at 700 R. P. M.



Lufkin Junior (5″) Herringbone Unit with slide base for use with Multi-Cylinder or Single Cylinder Engine — *Code: FABOL*

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Drilling With Cable Tools *and* Lufkin Herringbone Units

Simms Oil Company, in August 1930, set new drilling record with Lufkin Herringbone Unit

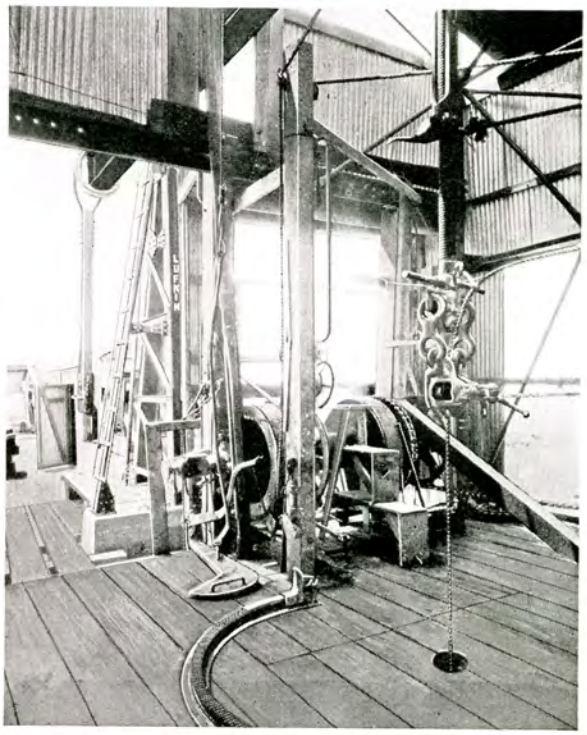
3650-foot Well Completed in 37 Days

What is believed to be a record in cable tool drilling is that established by the Simms Oil Company on their Simms-Phillips U. No. 3 in the Ector County pool in West Texas in August, 1930.

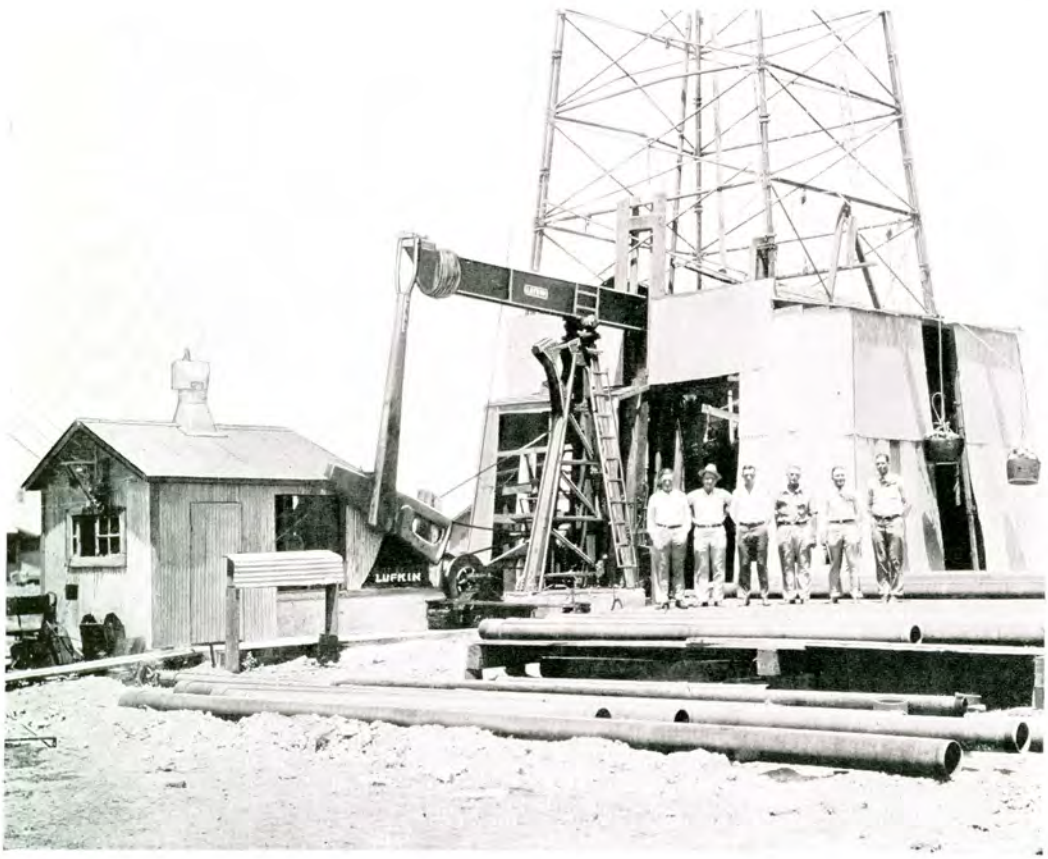
This well was equipped with a Lufkin 6½-inch Heavy Duty Herringbone Unit, which was driven by a 55/25 G. E. Motor. The casing was run off of a Lufkin No. 522 Hoist and the tools were handled by a chain driven bull wheel from the Unit.

This well was completed in thirty-seven days to a depth of 3650 feet, which is understood to be the fastest time in which this company has ever completed a well with cable tools from the top of the ground to this depth. From information we have a well on a nearby lease required forty-seven days to complete.

A complete report showing a detailed account of the expense of drilling this well, including labor, power consumed in spudding, drilling and setting pipe, together with a log of the Simms-Phillips U. No. 3 will be gladly sent to interested oil men upon request.

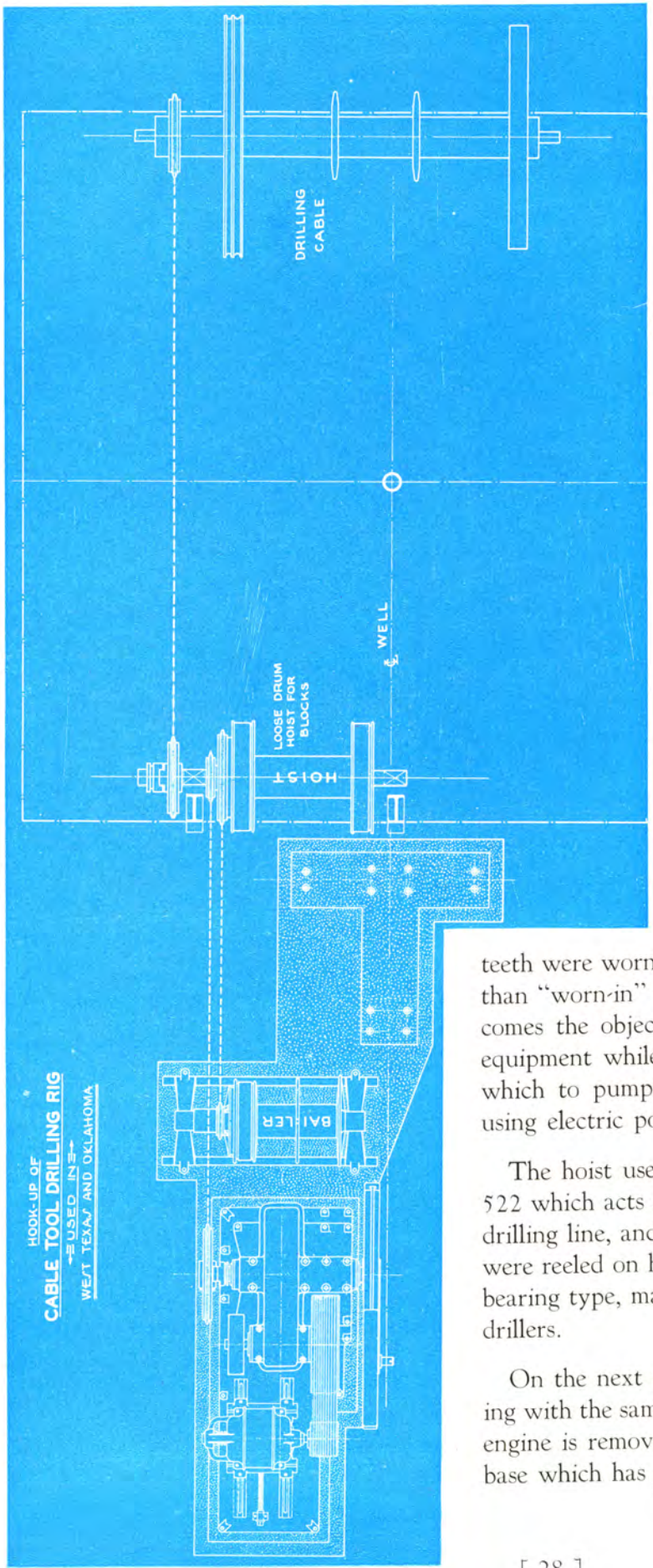


On the floor of Simms-Phillips U. No. 3 showing Lufkin equipment which set a new record for cable tool drilling.



Lufkin equipment and drilling crew that set a new record for cable tool drilling in Ector County, West Texas. Reading from left to right: T. J. Saugher, tool dresser; E. D. Ruse, driller; E. T. Barnes, tool dresser; A. T. Nuttall, driller; J. D. Best, Lufkin representative; S. P. Todd, tool pusher.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



Drilling With Lufkin Units

While operators have often "drilled in" with cable tools and Lufkin Worm Gear Units (two wells drilled from the surface) the Lufkin Herringbone Units have shown, in actual practice, to give a "complete fall" to the tools. As a result of this "complete fall," Lufkin Units are found to be ideal for cable tool drilling; are very economical in the use of power and wells are completed in less time than is possible with present day cable tool drilling methods.

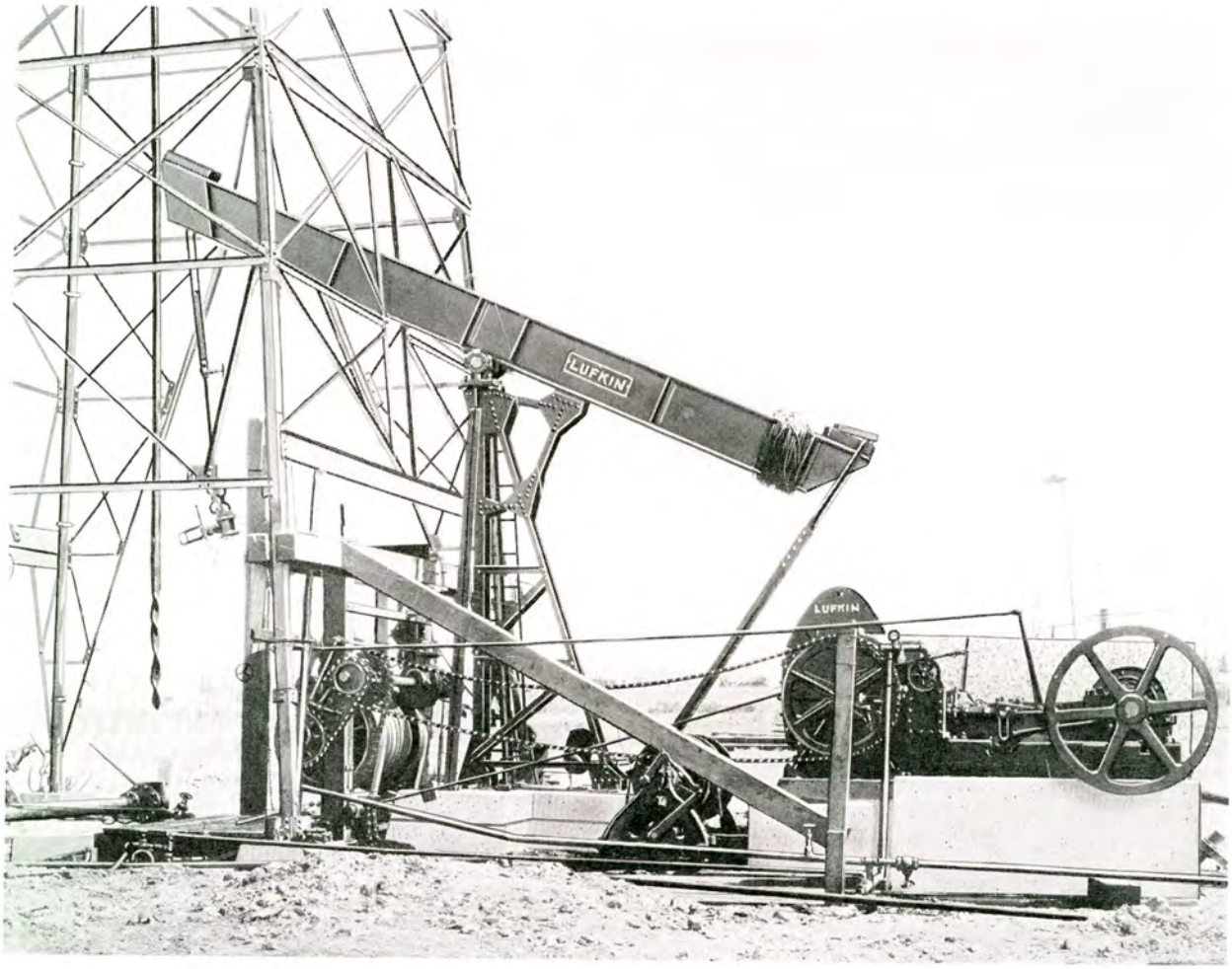
After drilling the well shown on the opposite page, a close inspection of the gear teeth was made and most of the tool or cutter marks were still in evidence. On the load side of the gear, measurements were taken with a vernier caliper and it was found that the teeth were worn .0095″ so that the gears were hardly more than "worn-in" when the well was completed. This overcomes the objection of some operators to "wearing out" equipment while drilling, leaving an inefficient unit with which to pump the well during its life, especially when using electric power.

The hoist used on this particular well was our number 522 which acts as a countershaft, driving bull wheels with drilling line, and bailer, (as shown). Traveling block lines were reeled on hoist proper, being of the loose drum roller bearing type, making a handy, speedy rig well liked by the drillers.

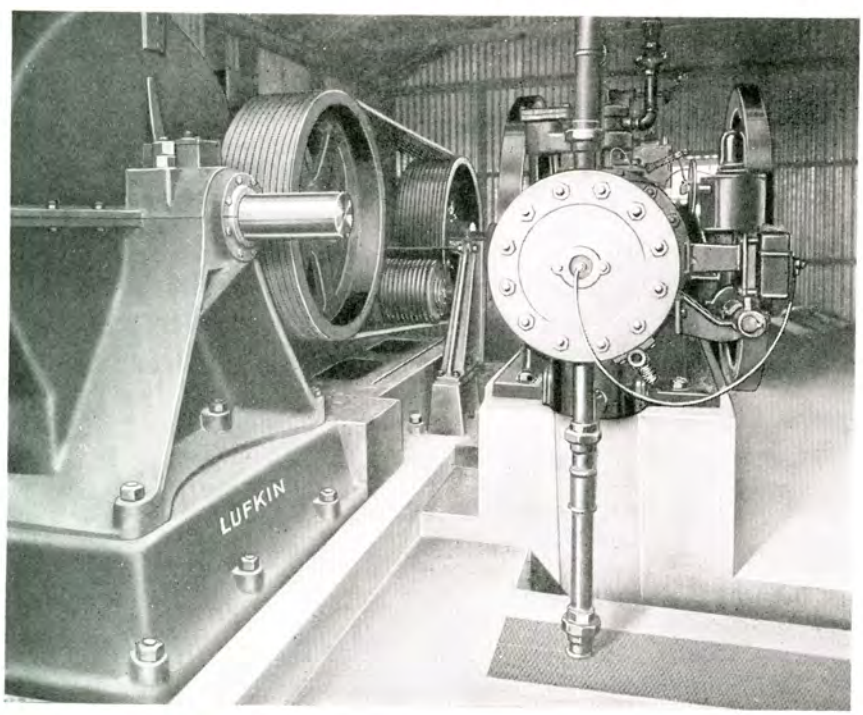
On the next page we illustrate a steam engine for drilling with the same hook-up. After well is completed, steam engine is removed and gas engine set directly on concrete base which has previously been prepared.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT



Drilling (Cable Tool) with steam engine. Later steam engine is replaced with gas engine on foundation prepared. This installation in Pampa district.

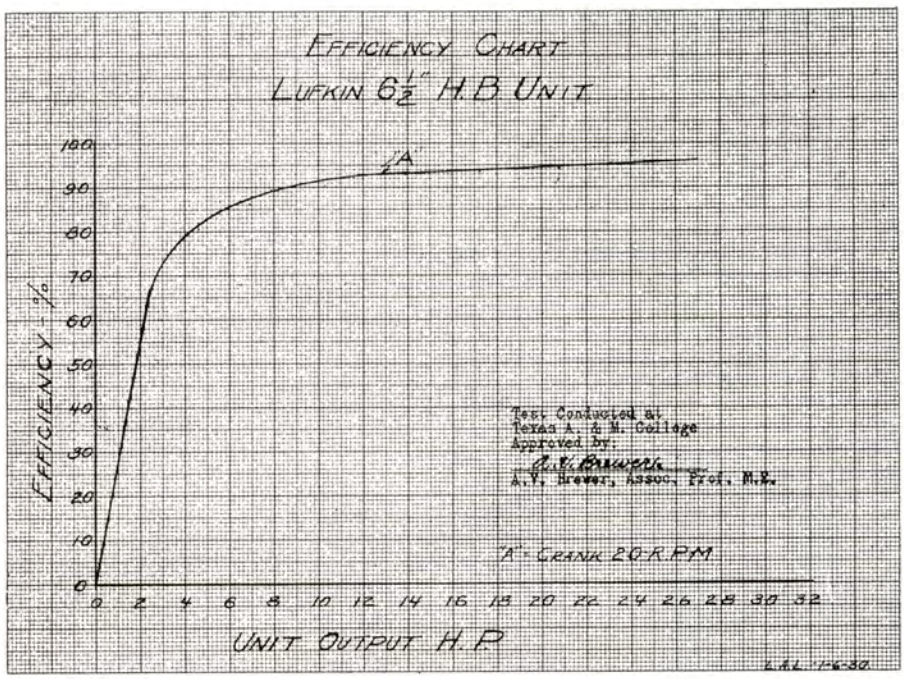


Typical Herringbone Unit Installation with Single Cylinder Engine Drive

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

University Test Shows Lufkin Sykes-Herringbone Unit High in Efficiency

Under the supervision of Mr. A. V. Brewer, Associate Professor of Mechanical Engineering, Agricultural and Mechanical College of Texas, College Station, Texas, and in co-operation with Lufkin Engineers in efficiency test of the new Lufkin Sykes-Herringbone gear was conducted, using the 6½" Heavy Duty size.

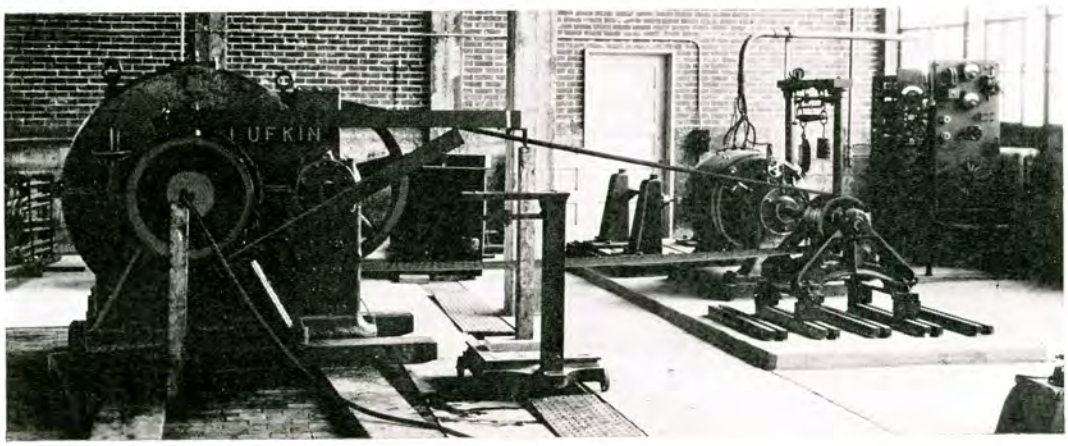


Efficiency chart Lufkin 6½" Herringbone Unit, result of test conducted at A. & M. College of Texas, under supervision of A. V. Brewer, Associate Professor of Engineering

The chart, approved by Professor Brewer, is submitted with this brief mention and tells the whole story. The input load to the Unit was measured by means of a General Electric dynamometer and the output load by means of a Prony Brake on the crank shaft of the Unit. The photograph below shows the details of the testing set-up.

Curve "A" is the characteristic efficiency curve obtained from this test with the crank shaft running approximately 20 R.P.M. and the dynamometer motoring at approximately 610 R.P.M.

One will readily recognize, by analyzing the chart, the high efficiency of the new Lufkin Unit.



Lufkin Sykes-Herringbone Unit on the test block at A. & M. College

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Guide for Selecting Lufkin Units

We are especially anxious to have our equipment give satisfaction and lasting service over a period of years as this class of machinery should.

Our units are all designed with large factors of safety. They will stand tremendous overloads, yet, being designed for their main job of pumping and to secure long service and retain high efficiency it is very essential they be selected on a horse power input basis with ample leeway or reserve strength, that the wearing surface may have long life.

Most important also is having a unit with counter-weight heavy enough to balance the well. An unbalanced well results in a tremendous loss of power, and an unnecessary strain and wear on the pumping equipment.

If there are any Lufkin Units in service that are not satisfactory, 98% of the complaints are where too small a unit has been purchased. This we are well aware of, and are almost powerless to overcome, for in spite of our protests, the customer too often takes a chance to keep down initial costs, and specifies the unit he believes he can "get by" with.

The selection of the correct size unit to pump a particular well, or of a group of units for the pumping of a number of wells, is a very difficult problem. First of all, the operating conditions should be diagnosed from a standpoint of what the well may develop into; mainly as to pumping depth, fluid to be handled and horse power required.

From a standardization standpoint, the pumping unit should be purchased large enough to efficiently, and economically handle the heaviest pumping that it is possible to estimate, for the particular problem in hand, or for the heaviest pumping to which it may be necessary to move the unit due to later developments.

In order to assist in selecting a unit, we have devised a chart (shown on next page) which gives the size of unit which will operate satisfactorily under average well conditions, at various pumping depths, and varying production in barrels per 24-hours. This chart has been arrived at on a theoretical basis and the assumption that we are pumping fluid equivalent to the weight of water; as the average United States Crude Oil has a gravity of about 32 degrees A. P. I. and is about 13% lighter than water. This is a conservative figure. Well friction due to moving parts and internal friction of the oil and friction of the oil against the tubing is a difficult item to compute and makes the chart only an approximation at best. Viscosity varies with temperatures and different viscosity oils have widely different friction head losses. For this reason the unit selection chart should be used as a guide and, before the size of the unit is decided upon, all of the well conditions should be considered.

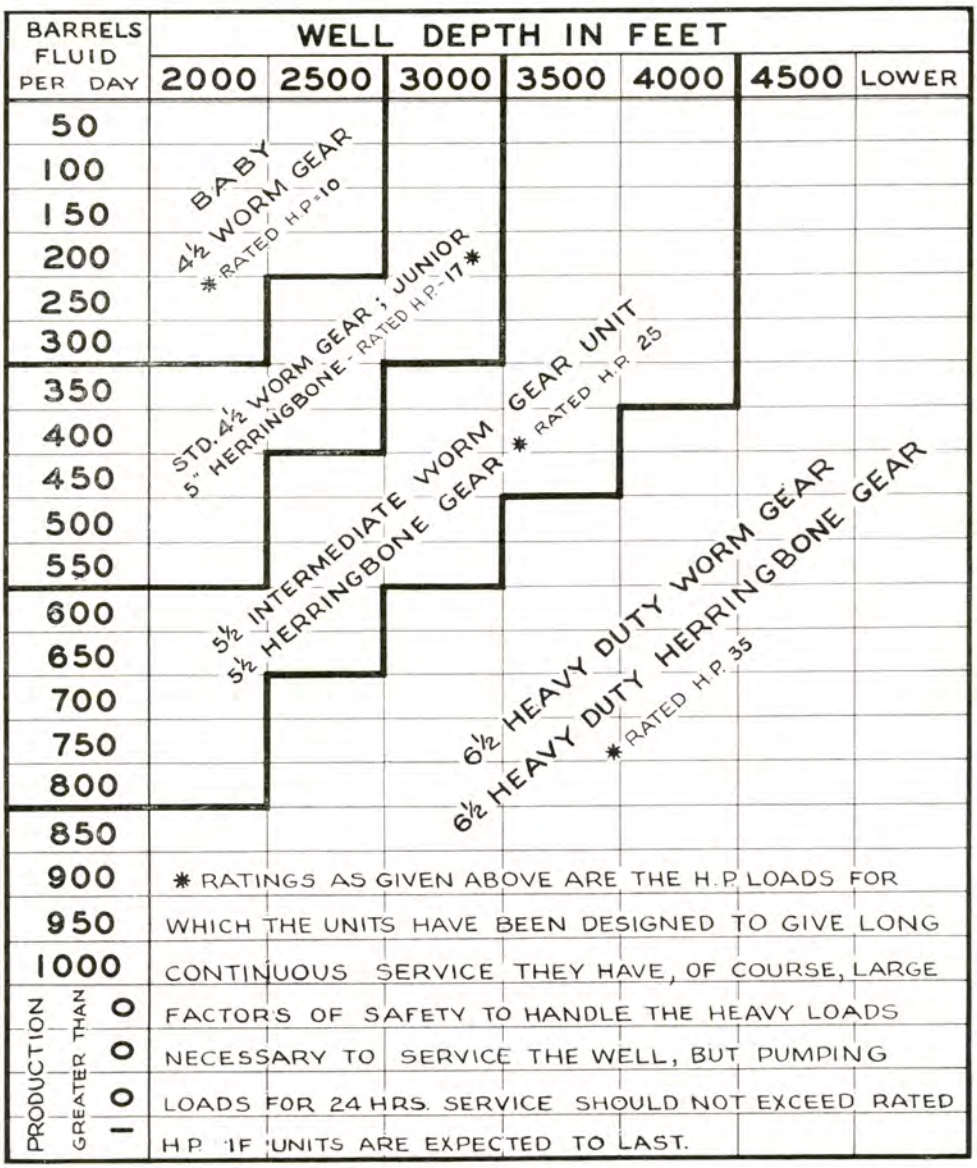
In using this chart, consideration should be given to the possibility of deepening the well to lower producing sands, also the practicability of moving the unit to other locations. In considering the fluid to be lifted, always consider the volume of water that may encroach and create the necessity for handling larger volumes of fluid as the well gets older.

Lufkin maintains an engineering department, trained and experienced in this particular work, and will gladly co-operate with you in the selection of suitable equipment for your individual requirements.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Unit Selection Guide

See text matter on page 31



In using this chart, consideration should be given to the possibility of deepening the well to lower producing sands, also the practicability of moving the unit to other locations. In considering the fluid to be lifted, always consider the volume of water that may encroach and create the necessity for handling larger volumes of fluid as the well gets older.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Selecting Type of Electric Motor for Use With Lufkin Units

Lufkin Units were originally designed to be driven by oil field type (G. E. type OMT) motors. At the present three distinct classes of motors are used, dependent upon the class of service to be performed by the pumping unit and the motors as follows:

First Class—The oil field type motor (G. E. type OMT) a slip ring induction motor should be used for pumping, pulling and the performance



Type OMT-536, 35/15-hp., Two-speed Oil Well Motor, with Both Speeds Variable, for Pumping, Pulling, and Cleaning

of all of the operations necessary in maintaining a producing well. This motor offers the greatest flexibility for oil field use and is designed for the rough usage accorded a motor in the oil fields.

All of the oil field type motors are 3-phase, 440-volt machines for operation on either 60 or 50 cycles, and all are 6/12 pole motors with synchronous or no load speeds of 1200/600 R.P.M. on 60-cycles and 1000/500 R.P.M. on 50-cycles. The standard ratings on either frequency are 35/15 H.P. 55/25 H.P. and 75/35 H.P. The low side of motor is used for pumping and the high side is used for pulling and servicing. The speed is variable on both high and low side.

Second Class—Y-Delta motors (G. E. type



Type K Single Speed Y-Delta Motor



Assembled and Wired Control Unit for 35/15-hp. Two-speed Oil Well Motor

K) are used for pumping and a certain class of pulling.

The Y-Delta motor is usually a standard delta connected motor with the Y-connections brought out. It is constant speed with two horsepower ratings. High torque motors may also be used as Y-Delta motors.

Third Class—Standard constant speed motors started directly across the line may be used for pumping only. This type of motors are usually used with the Lufkin Baby Units. Either G. E. type K or type FTR motors are used for this class of service. The type K has a better running torque but lower starting torque than the FTR motor.

MOTOR SIZES AVAILABLE FROM STOCK

Type—Speed—	Sizes—H. P.
OMT—(Oilfield two speed) 1200/600	35/15—55/25—75/35
K—(Y-Delta) 900	40/15—50/20
FTR—(General Purpose) 1200/900	5—7½—10—15—25

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Lufkin Worm Gear Units



TYPICAL WORM GEAR INSTALLATION

This installation on the lease of one of the larger operators includes Lufkin 6½" Worm Gear Unit driven by 15/40 Y-Delta Motor with "V" Belt Drive. Lufkin equipment includes Lufkin No. 522 Hoist with steel Jack Posts, Lufkin Self-Supporting Samson Post, Lufkin "I" Beam type beam and Lufkin-Trout Oil-Bath Self-aligning Pitman.

This equipment is installed while drilling the well and is ready when well stops flowing.

Users find total installation cost of Lufkin Equipment is no more than Standard Rig Equipment and the saving in operating and maintenance cost is a well known and established fact.

DESCRIPTION LUFKIN WORM GEAR UNIT

Lufkin worm geared units are now in use in all fields of the world and are so generally known that an extensive description is unnecessary.

They are built in four sizes and listed on the following pages as 6½" Heavy Duty, 5½" Intermediate, 4½" Standard and 4½" Baby Unit.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT

Also two sizes of worm driven central powers that are recognized as very efficient, practical and having many advantages over old style band wheel powers. Ultimate installation costs are lower.

While, as stated in our introduction, worm gears, especially in the larger sizes, are not quite as efficient as the herringbone gears, it is somewhat of a question if not in the long run it is the more economical gear of the two. It has many advantages and for pumping service only cannot be equaled.

The longer it runs the more efficient it becomes, and after years of service the ring gear and worm are easily replaced.

Being naturally a self-locking gear it handles the uneven, unbalanced load of the heaviest oil wells in absolute steady motion with seeming ease and quietness.

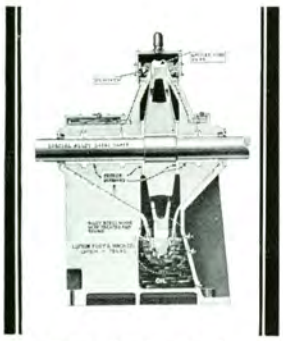
After nearly seven years experience we can safely state that our claims for long wear and service have been fully justified where proper size units have been purchased, and we believe they will be giving real daily service for many, many years to come.

Originally made for the two speed double powered oil field type motors direct connected as shown, we have hundreds of Y-Delta motors in use direct connected, also with "V" belt drives as shown on page 44.

The smaller Units—known as "Standard" and "Baby" are usually driven with plain induction motors.

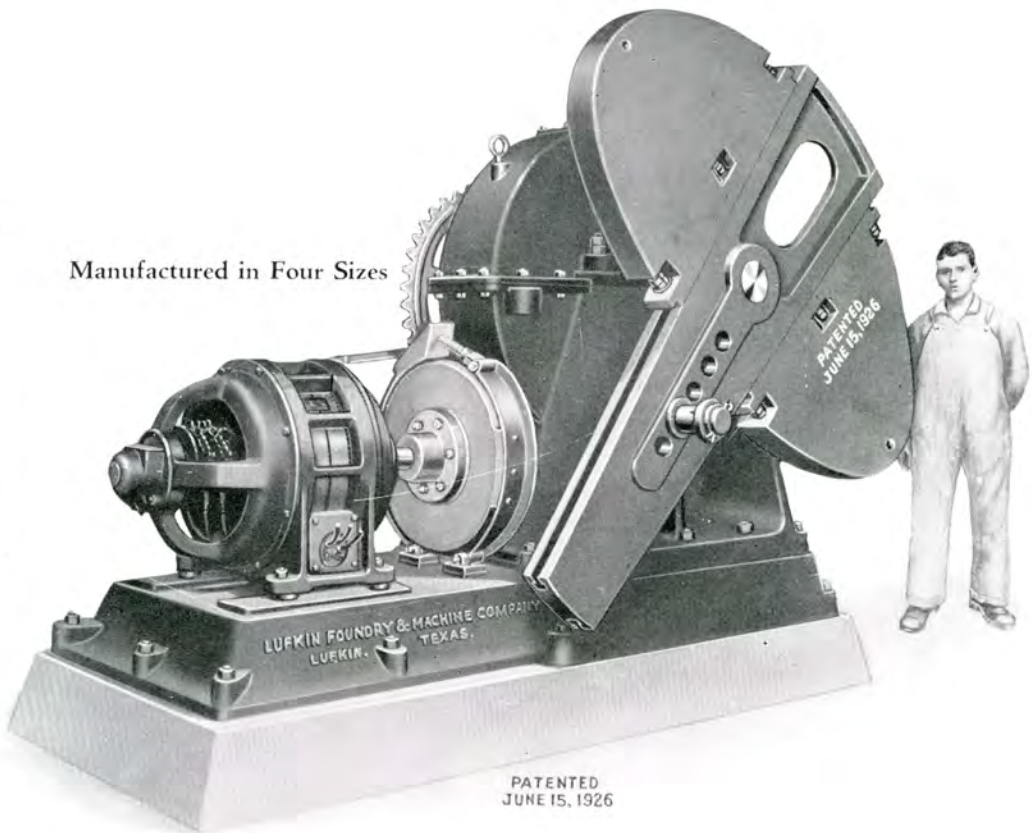
As stated on page 13, these units pair up size for size with the herringbone gears—except the Baby Unit is not duplicated in the herringbone line, due to the fact that to secure the reduction double gears would be necessary which would not be as efficient as our worm gear with its step-down (20 to 1 and 30 to 1 ratios) making it a most practical unit with few parts to wear, all of these easily renewable.

The following pages show detailed construction sizes and applications of any Power Unit.



Cross Section Lufkin Worm Gear Unit. Note generous size of bearings, Alloy Steel shaft and efficient lubrication.

Manufactured in Four Sizes



Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Mechanical Construction

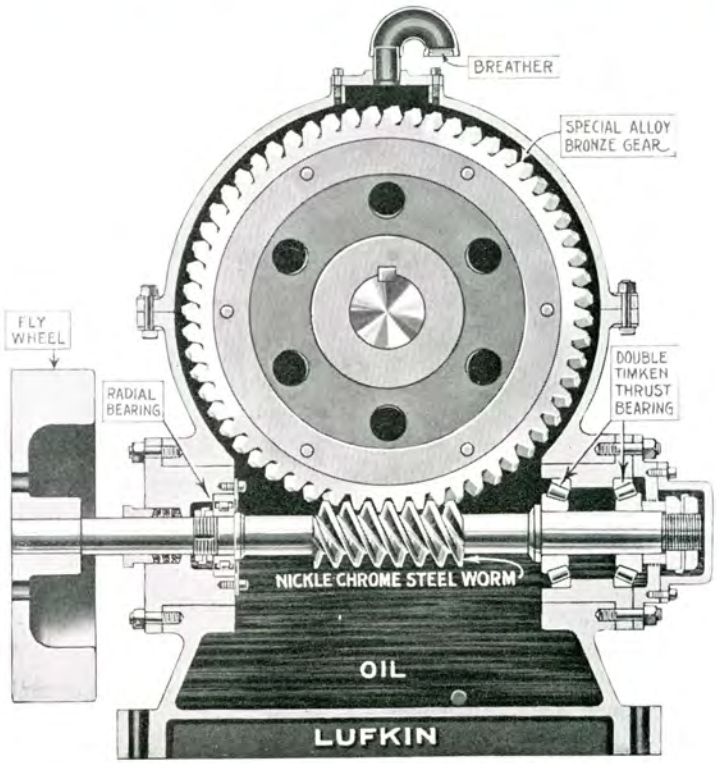
Lufkin Worm Gear Units are substantially built in a modern plant with up-to-date tools, of the best materials, and good workmanship.

All parts subject to wear are easily renewable.

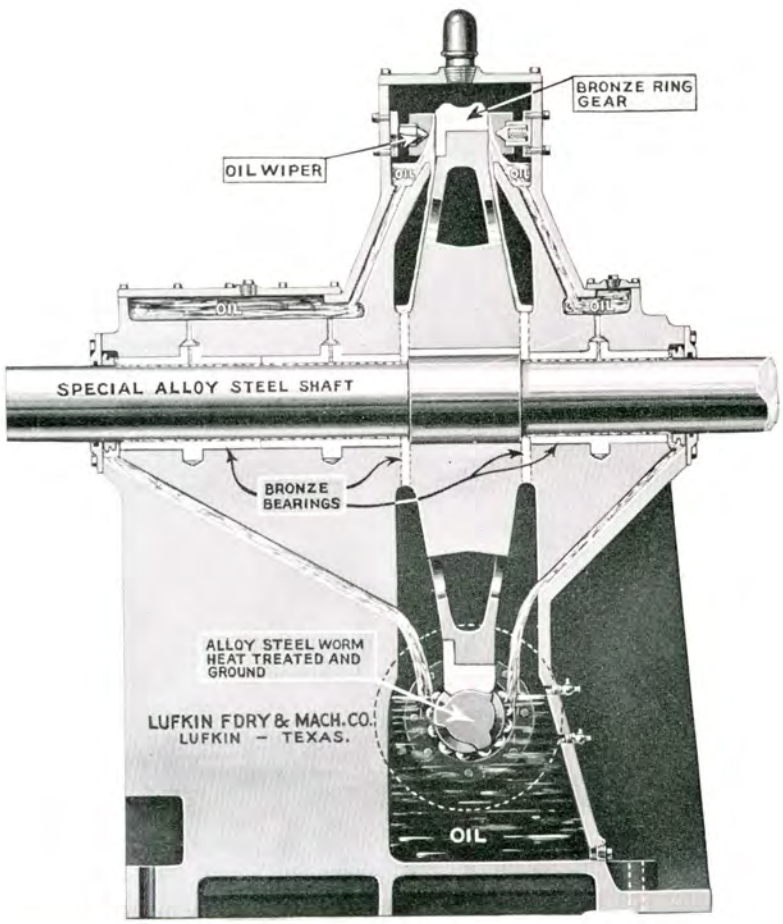
Absolutely automatic lubrication.

Crank Gear Shaft has interchangeable bronze bearings.

Worm Shaft has Timken Thrust and Roller Radial bearings.



Cross Section Lufkin Worm Gear



Across Shaft Section

Thrust Bearing is adjustable without changing the oil.

A. P. I. sizes as far as possible.

Tobin Bronze Gear Ring with alloy steel worm shaft, insures long life and real service.

Units are "run in" and thoroughly tested and adjusted before shipping.

Made strictly to gauges and templates.

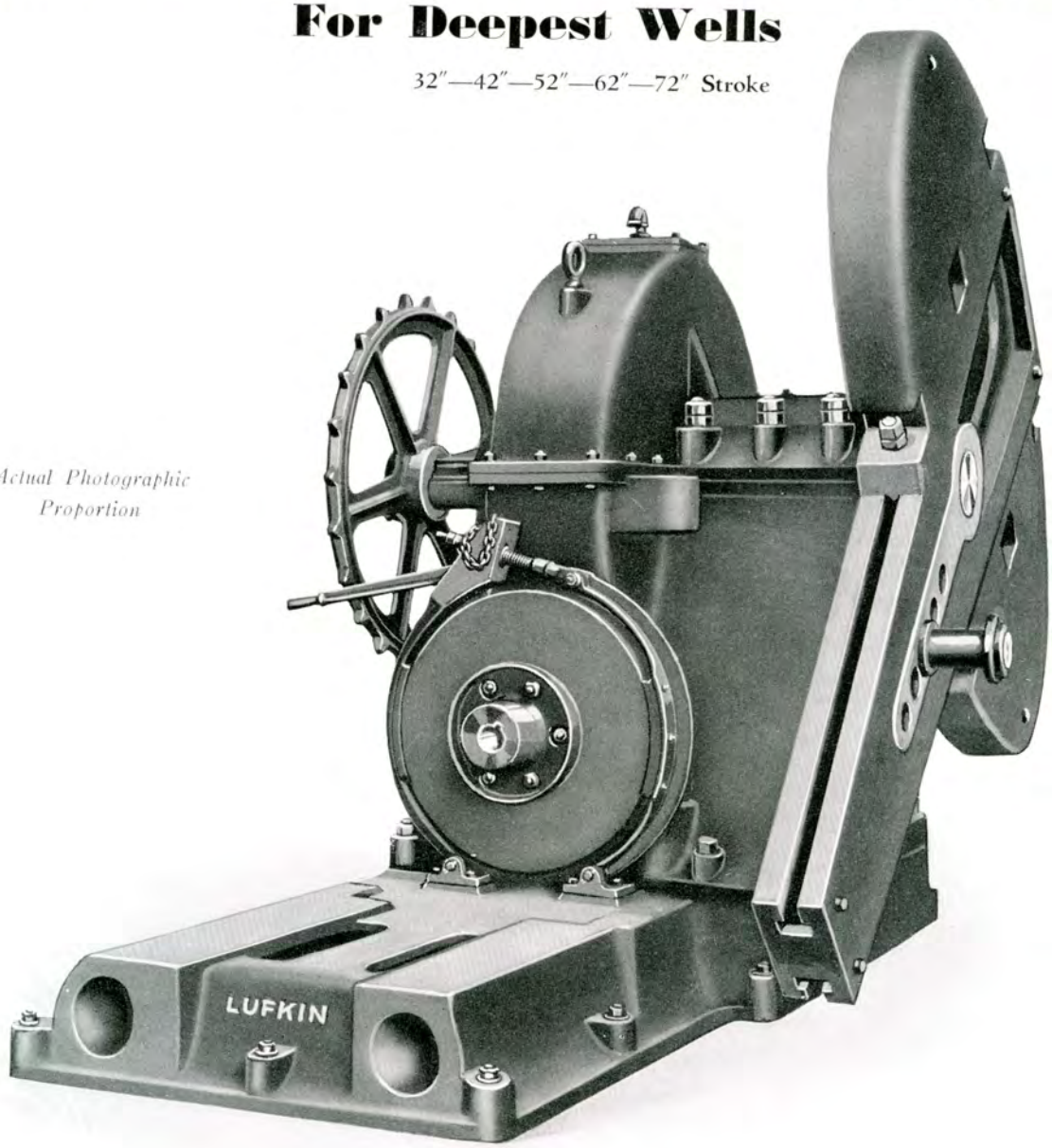
Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT

Heavy Duty Lufkin Worm Gear Pumping Unit For Deepest Wells

32″—42″—52″—62″—72″ Stroke

Actual Photographic Proportion



SPECIFICATIONS

Shaft: 6-7/16″ diameter in bearings and crank; 7-7/16″ diameter in gear.

Bearing: Crank side, 24″ long, sprocket side, 12″ long.

Crank Pin: 4″ diameter, 6″ pitman bearing length.

Gear: 49½″ pitch diameter, 4½″ face, 1¾″ circular pitch.

Ratios: 29-2/3 to 1 triple thread, 22¼ to 1 quadruple thread.

Worm: 5-7/16″ pitch diameter.

Flywheel: 30″ diameter, 6″ face, 3-7/16″ bore.

Center of worm shaft to motor base, 17″.

Center of crank shaft to top of foundation, 4′ 7¾″.

Center of well to center of hoist sprocket, 6′ 2″.

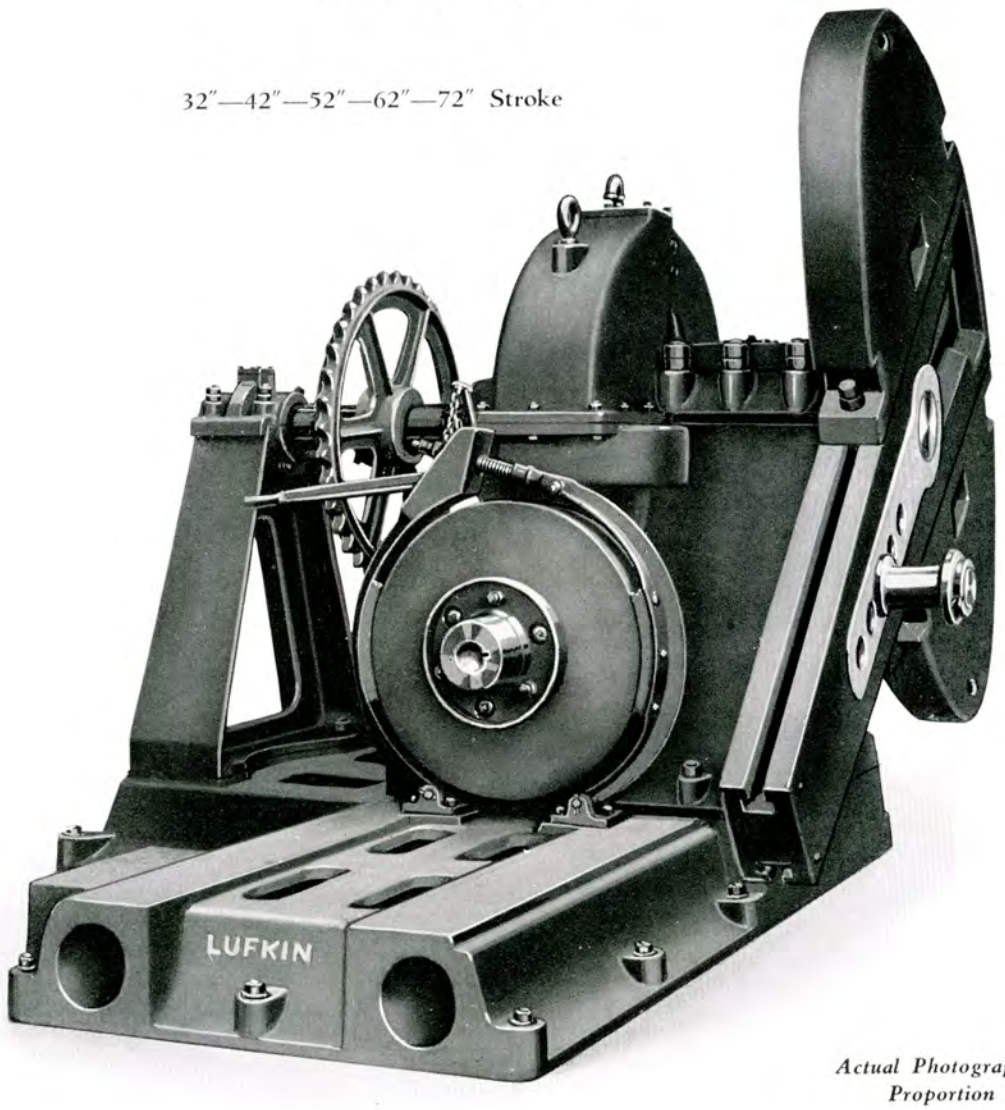
Power recommended: 55/25 or 75/35 horsepower electric motor, or No. 85 Buda gas engine.

Note: **Calf wheel clutch sprocket applied, if desired, at extra cost. Center of well to sprocket 6′-8″**

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Intermediate Lufkin Worm Gear Pumping Unit

32″—42″—52″—62″—72″ Stroke



Actual Photographic Proportion

SPECIFICATIONS:

Shaft: 5-7/16″ diameter in bearings and crank; 6-7/16″ diameter in gear.

Bearings: Crank side 20″ long, sprocket side 10″ long with Hyatt outboard bearing.

Crank Pin: 4″ diameter, 6″ pitman bearing length.

Gear: 40-7/8″ pitch diameter, 3¾″ face, 1⅝″ circular pitch.

Ratios: 26-1/3″ to 1 triple thread, 19¾″ to 1 quadruple thread.

Worm: 4-7/8″ pitch diameter.

Flywheel: 30″ diameter, 6″ face, 3-7/16″ bore.

Center of worm shaft to motor base 17″.

Center of crank shaft to top of foundation 4′ 2-3/8″.

Center of well to center of hoist sprocket 6′ 2″.

Power recommended: (To suit conditions), 35/15, 55/25 horsepower electric motors, or No. 85 Buda gas engines.

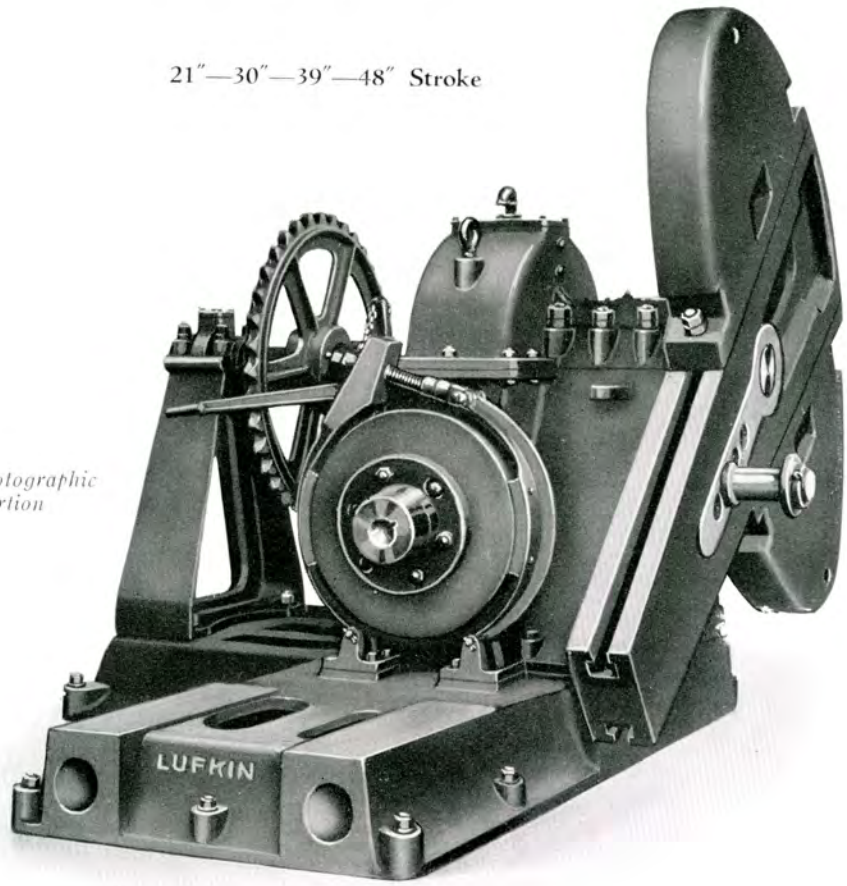
NOTE: This unit was originally designed for a limit stroke of 62″ and later to meet a demand for longer stroke on light production the additional hole (72″) was added—really out of proportion to gear diameters.

The Heavy Duty Unit should be used when 72″ stroke is desired on heavy wells.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Standard Lufkin Worm Gear Pumping Unit

21″—30″—39″—48″ Stroke



Actual Photographic Proportion

SPECIFICATIONS:

Shaft: 4 7-16″ diameter in crank and bearings; 5 7-16″ diameter in gear.

Bearings: Crank side, 16″ long, sprocket side, 8″ long, with Hyatt outboard bearing.

Crank Pin: 3¼″ diameter, 6″ pitman bearing length.

Gear: 28-3/16″ pitch diameter, 3½″ face, 1½″ circular pitch.

Ratios: 19-2/3 to 1 triple thread; 29½ to 1 double thread.

Worm: 3-15/16″ Pitch diameter.

Flywheel: 24″ diameter, 6″ face, 2-7/16″ bore.

Center of worm shaft to motor base 16″.

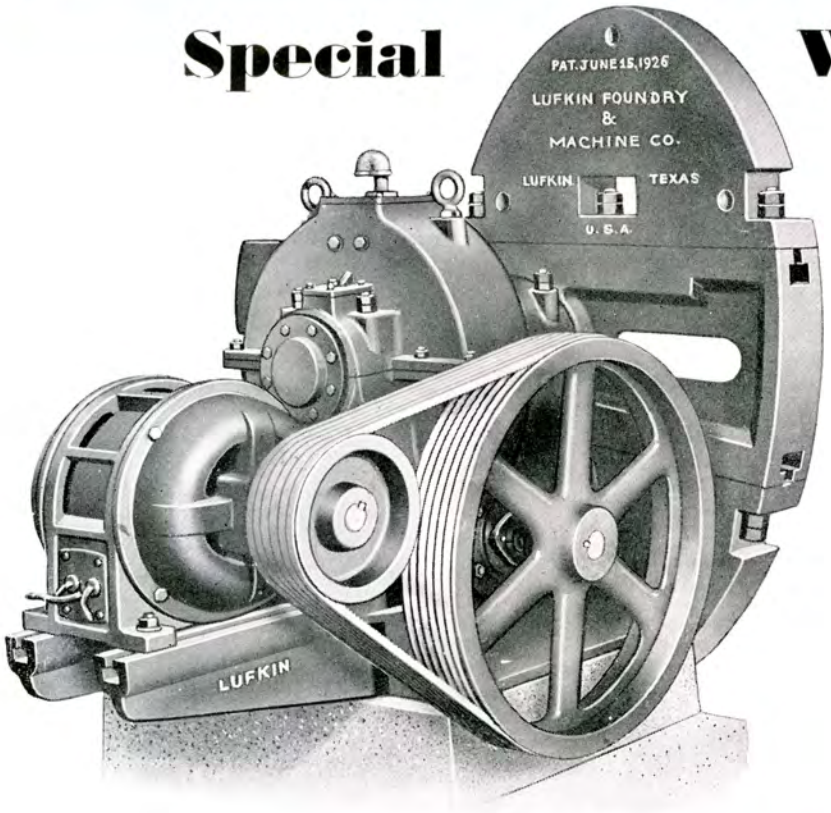
Center of crank shaft to top of foundation 41-9/16″.

Center of well to center of hoist sprocket, 6′ 2″.

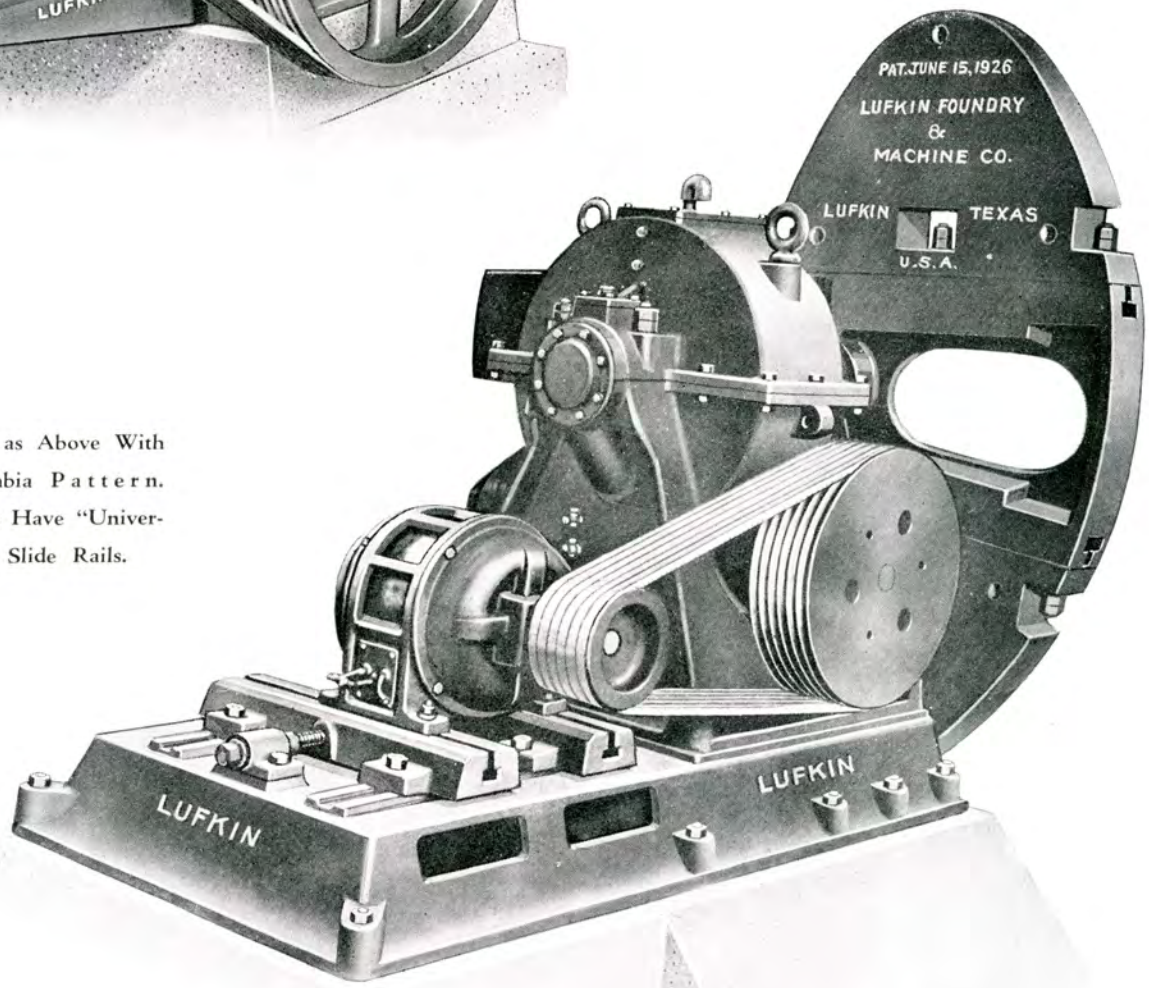
Power recommended: 35/15 horsepower electric motor or No. 60 Buda gas engine.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Special Worm Gear Applications



Stripped Standard (4½) Unit — With "V" Type Drive Used with Plain Induction Motors where Tractors do the Pulling.



Same Unit as Above With Base Columbia Pattern. These Units Have "Universal" Motor Slide Rails.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



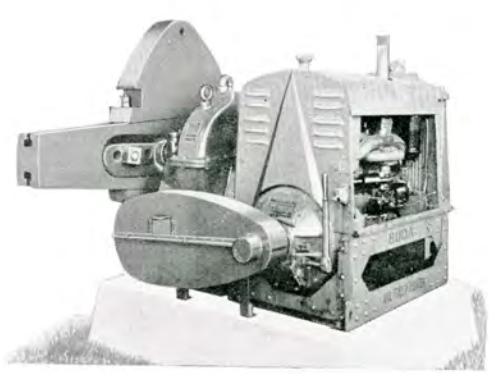
Lufkin Baby Unit Complete Assembly

◆ ◆

Lufkin Worm Gear Baby Units are extensively used for light wells 2500′ and under where not over 10 H. P. is required to pump. They are very efficient in the use of power, run noiselessly and require very little attention. This unit was designed to serve individual wells in place of powers especially in rough country, making a great saving in power over pull rods, etc., that a central power requires.

NOTE: The Buda drive Unit at right shows arrangement for a small high speed engine WTU. We rather prefer to furnish a larger engine YR4 with direct connection as shown on page 46.

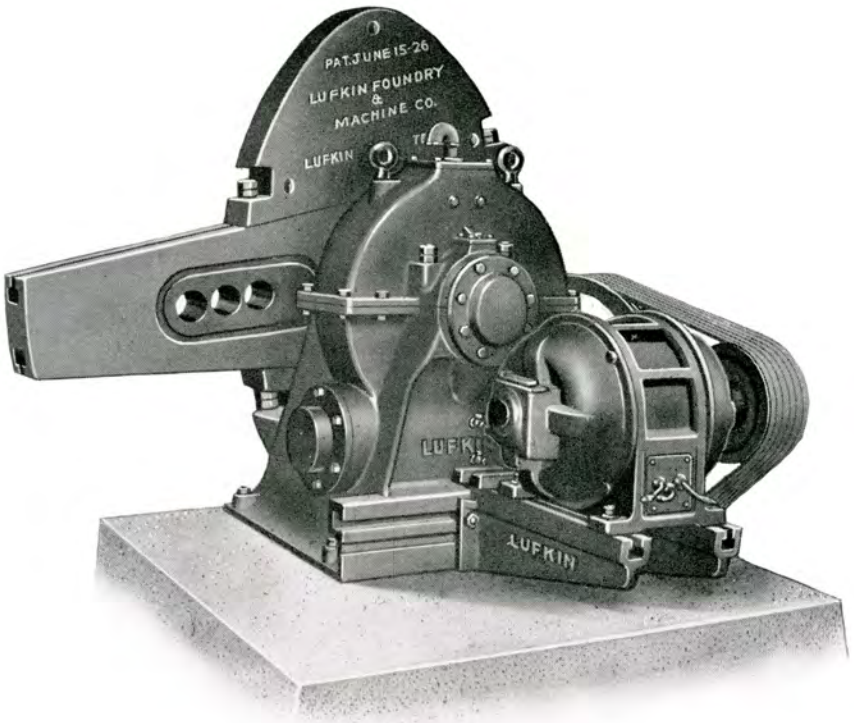
Buda Installation
Lufkin Baby Unit



Buda engines with silent chain or "V" belt drive, see note at left.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Lufkin Baby Units



Lufkin Baby Unit, with Motor and Drive Cover Removed

SPECIFICATIONS

Strokes 16", 26", 36", 3-hole Crank.

Crank Shaft 4-1/2" dia.

Worm Shaft 2-15/16" dia.

Gears are 23½" P. D. 3" face.

Regular ratio 20 to 1.

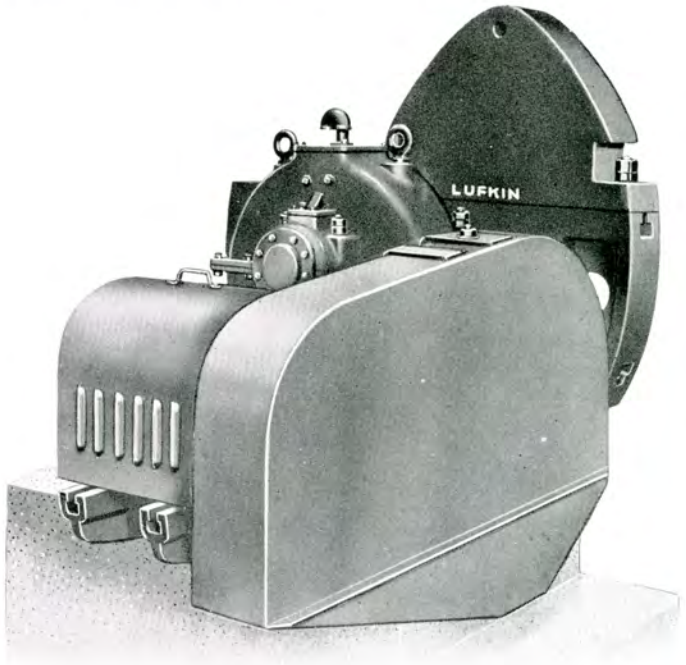
Special ratio 30 to 1, on order.

When ordering state make and size of motor and number strokes desired.

Universal motor brackets provided.

Samson Post base to center of saddle trunnion 8'-2½".

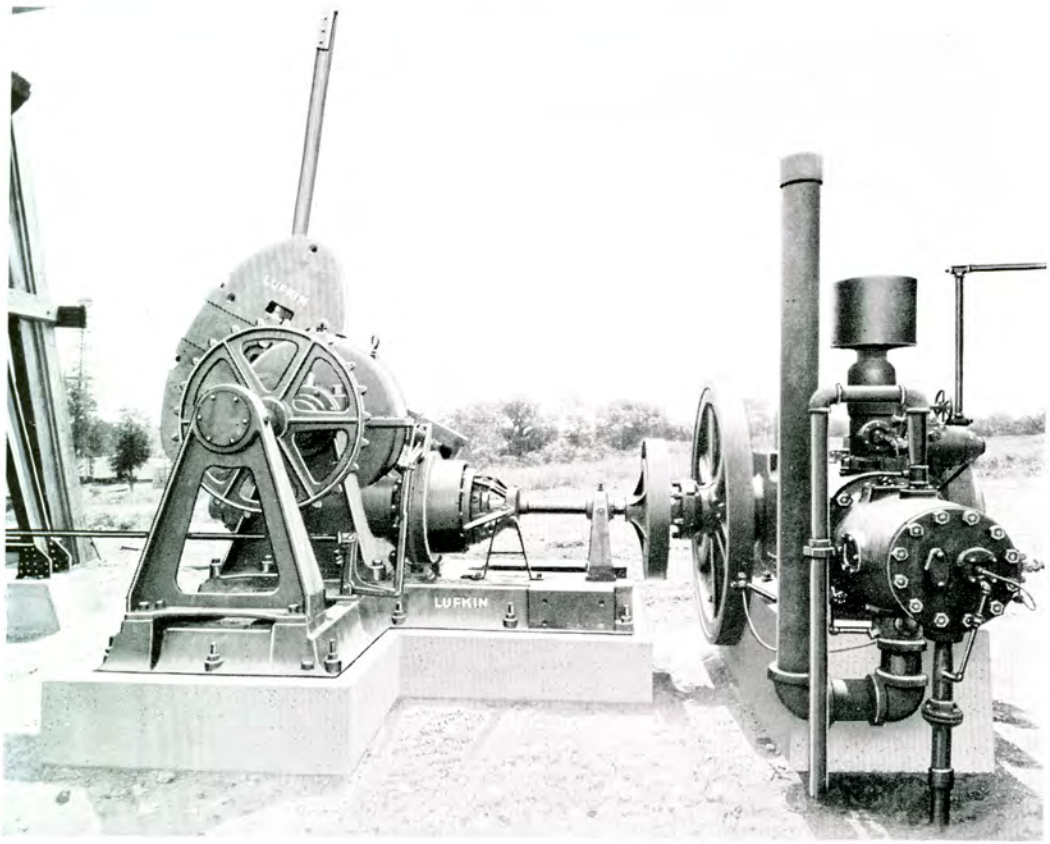
Walking Beam 7' working points.



Rear view of Lufkin Baby Unit, showing cover over drive

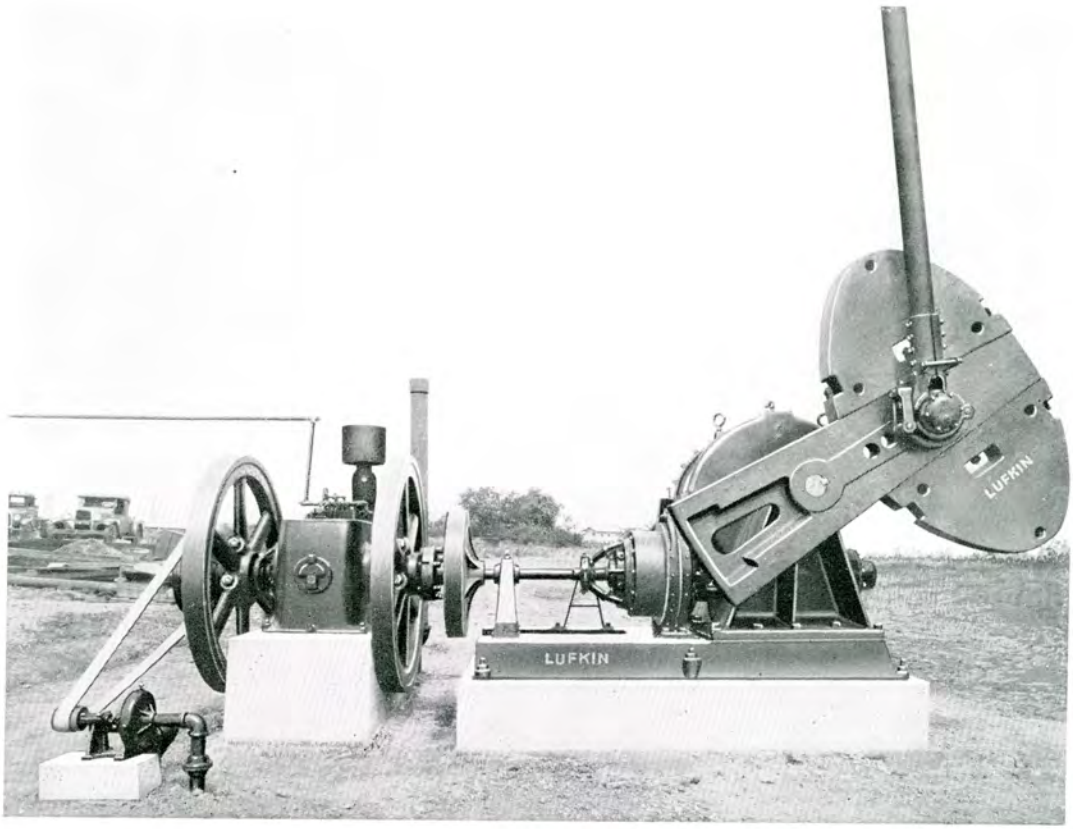
Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT



Direct Connected Worm Gears

Lufkin Worm Gear in stallation with single cylinder engine direct connected drive using twin-disc clutch attached to unit. A convenient and efficient arrangement with single cylinder engine drive.



Same installation as above showing shock absorbing coupling.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

Lufkin Worm Gear Direct Drive

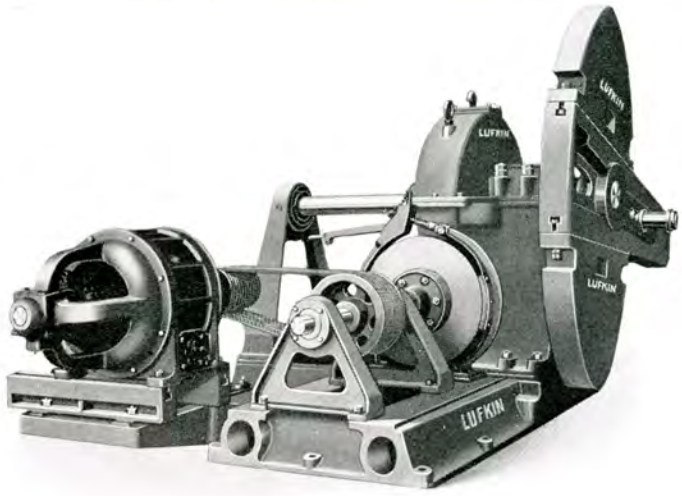
Opposite Page

For a number of years we have been trying to adapt the Single Cylinder engine direct connected to the Worm Gear. The difficulty largely laid in the coupling connection transmitting every impulse of the engine through the gear and to the well rods that caused frequent breakage.

Recently with the help of one of the industries leading production engineers a shock absorbing coupling has been designed, tested and is giving very satisfactory service.

This shock absorbing coupling together with a well governed engine having good heavy fly wheels and a good friction clutch on a very husky well, has solved our problem. After months of trial then through tests with the most approved recording instruments, absolute steady motion is realized with no pulsations transmitted to the rods.

We consider the installation a most successful one, that has many advantages.

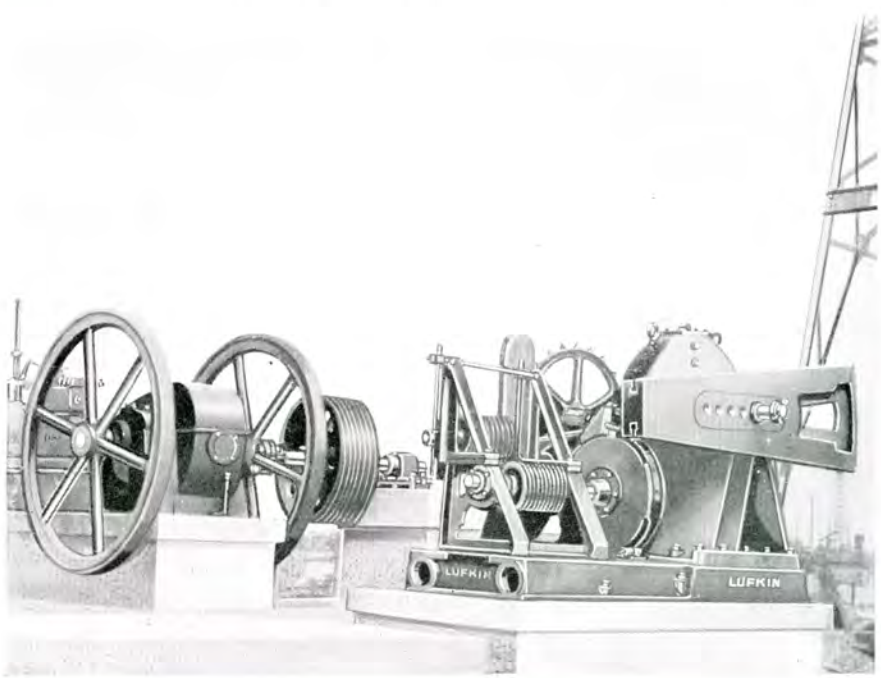


Constant Speed Motor and "V" Belt Drive As Extensively Applied to Lufkin Worm Gears

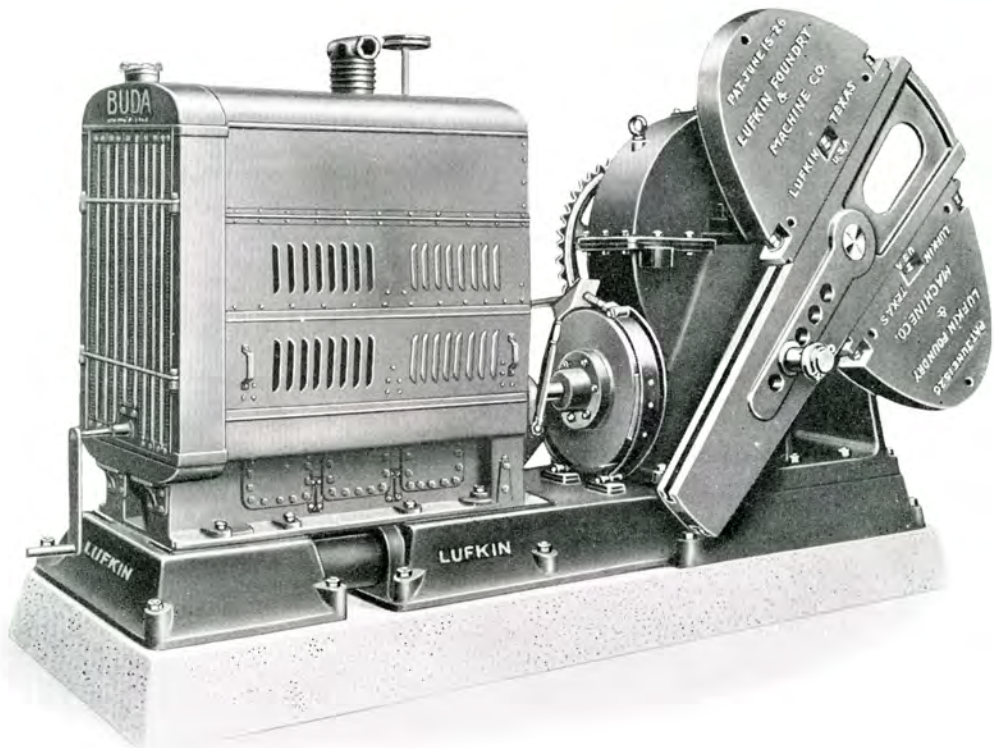
Where units are used for pumping only, the Y-Delta double power constant speed motor is used extensively and using the "V" Belt Drive as shown allows the use of a higher speed motor (lower cost) and has the advantage of changing speed of the Unit by changing small motor pulley at slight expense.

Single Cylinder Engine Drive With "V" Belts To Worm Gear

The installation shows method of driving our worm gears with a single cylinder gas engine ("V" belts are not shown). It will be seen that engine and unit being stationary, a tightener is necessary which is placed on the inside of the drive and is a most satisfactory arrangement. We have over sixty of these installations in operation. The drive can be applied to any of our Worm Gears as desired.



Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



Heavy Duty BUDA Engines

Dependable, Economical, Power

A number of features added to the new Buda power units assure ruggedness and give ideal power for oil field service. The engine crankcase and upper half of bell housing bolts directly on to a ledge of the cast iron base. This gives support for the engine throughout its entire length and makes weaving or vibration between the engine and base an impossibilty. The cast iron base serves as an oil pan and is fitted with large hand hole plates on each side providing accessibility for inspection or adjustment of the main and connecting rod bearings.

The heavy-duty Twin Disc clutch is a new development brought out to meet the severe conditions encountered in oil field service. It has an extra large friction surface for the transmission of power. Contact between the friction plates and the drive plate bolted to the flywheel is through gear teeth. This gives more contact thus reducing wear and eliminating the use of drive pins. The shaft is of large diameter and is carried on heavy bearings in the outer clutch housing and the flywheel. The clutch housing is of large diameter giving ample support. The clutch is so mounted that the upper half is bolted to the engine bell housing which is a part of the crankcase and the lower half directly on to the cast iron frame. This ties the rear end of the unit together so that weaving is impossible.

The radiator is supported on a cast bracket attached to the engine base and is provided with heavy bars at the front to prevent damage to the cores. Another feature of importance is the fact that the radiator core is made in sections. In case of damage to a section, it can be removed and replaced. The radiator has sufficient water capacity and frontal area to cool the engine under the most adverse conditions met in oil field work.

A large diameter fan is driven from the engine crankshaft by two "V" belts. The fan is braced solidly to the engine crankcase and is provided with an adjustment for tightening the belt.

The engines operate on either natural gas or gasoline fuel—the carburetor being arranged so that by a simple adjustment either fuel can be burned efficiently. The combustion chambers in the cylinder heads are designed especially for burning natural gas and because of these features smooth and flexible operation can be obtained on natural gas fuel.

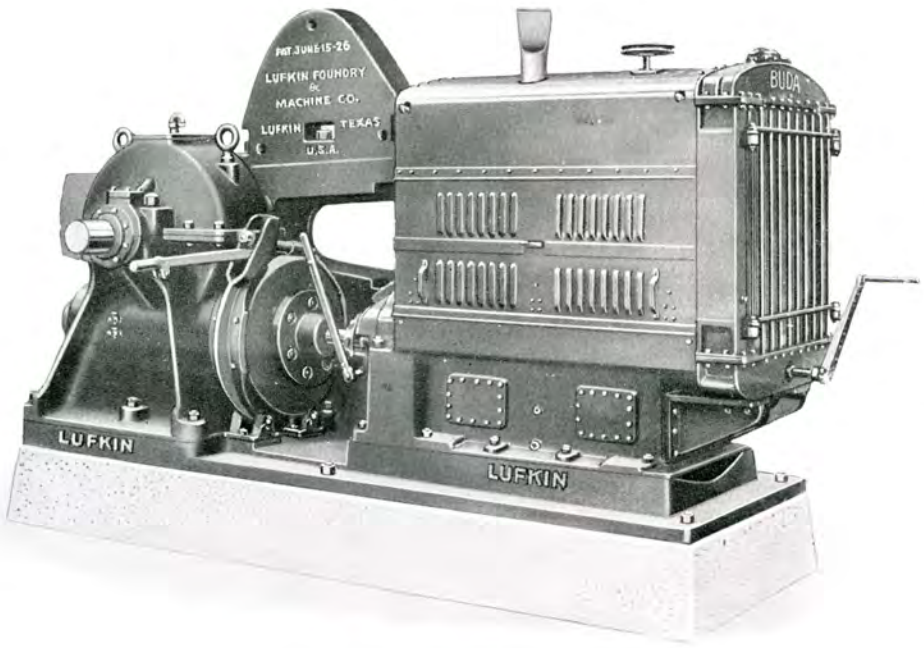
The oiling system is kept clean by an efficient oil filter mounted on the engine crankcase. This gives the oil longer usability and protects the engine.

The fully enclosed built-in governor is provided with an adjustment for two ranges in speed—one for pumping and the other for pulling when a higher speed is required.

The housing over the unit is of heavy-gauge material, braced so that vibration is eliminated. The side doors are of the hinged type which open upward and are provided with a fastener. When closed, they can be locked. The engine is fitted with special balanced pistons. The crankshaft, flywheel and connecting rods are carefully balanced. These operations insure smooth running of the engine and minimize vibration.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT



Buda Power

Special low base for 4½" Stripped Standard Unit

SPECIFICATIONS

The adaptation of a Buda engine to our worm gear units is shown on opposite page by adding an extension base rigidly to our regular units 6½", 5½" and 4½".

When applied to a Stripped Standard (See page 40), where no well pulling is required we can apply the base above at some saving in price.

The table herewith gives sizes, weights and horse powers. If desired they can be furnished less radiators and housing when tank circulation is used.

DISCUSSION OF CHART

The brake horse powers a slisted to the right were the maximum obtainable by constant loading with a dynamometer and with the engine operating under ideal conditions and adjustment. In order to take care of the peak loads and for economical, continuous pumping service the ENGINE HORSE POWER OUTPUT SHOULD NOT EXCEED 50% OF CHART RATING.

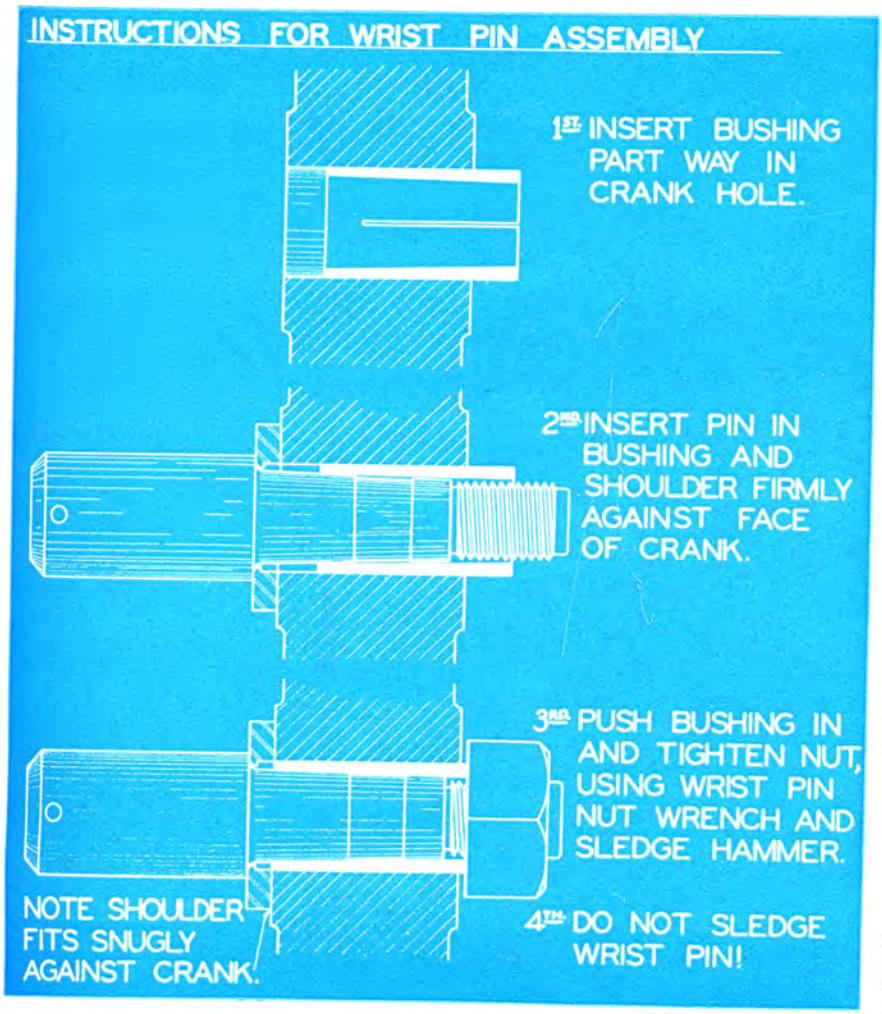
Maximum Brake Horse Power of Buda Gas Engines at Various Speeds

TYPE	BORE	STROKE	FUEL	SPEED IN R.P.M.						
				500	600	†700	†800	900	1000	1200
YR-4	4¾"	6"	GASOLINE	23	29	34	39	43	46	50
WT.- 2300 LBS.			NAT.* GAS	19	24	28	32	35	37	40
FR-4	5½"	6½"	GASOLINE	33	44	50	56	62	67	70
WT.-2950 LBS.			NAT.* GAS	29	36	42	47	51	54	56
JH-4	6"	7⅛"	GASOLINE	45	56	66	75	81	86	90
WT.-4000 LBS			NAT.* GAS	38	47	55	61	66	69	72
JH-6	6"	7¼"	GASOLINE	74	87	100	112	124	136	155
WT-5500 LBS.			NAT.* GAS	63	73	83	92	101	110	124

* NATURAL GAS B.T.U. CONTENT= 1000 PER CU. FT.
† RECOMMENDED PUMPING SPEED. PULLING SPEED MAY BE AS HIGH AS 1200 R.P.M.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT



"Easy Change" Crank Pins *for* LUFKIN UNITS

The Lufkin "easy change" taper bushing crank pin has many outstanding advantages.

First: It is loosened by one blow of the sledge and easily removed by hand.

Second: It is pulled tight by the wrist pin nut and does not have to be driven in. This permits an oil bath bearing to remain intact on the crank pin when changing crank holes.

Third: The crank hole cannot wear or wallow out, if the bushing wears it is readily and cheaply replaceable.

Fourth: Crank pin and Crank weight wrenches are furnished with Lufkin units.





LUBRICATION OF LUFKIN UNITS

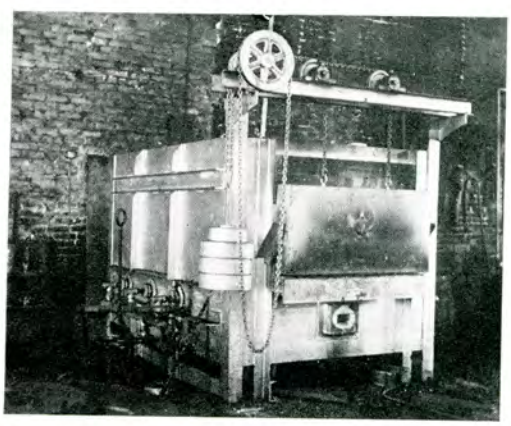
Lufkin Pumping Units operate in a bath of oil and are wholly self oiling with the exception of the outboard bearing of the 4½" and 5½" worm gear units which are lubricated by Alemites.

For worm gear units use a good grade of steam cylinder oil; in cold weather it may be necessary to dilute this oil with motor oil. Fill the unit even with the top oil pet cock; the plate fastened to the pet cock gives quantity of oil required.

For herringbone gear units use S. A. E. 50 in the Summer and S. A. E. 40 in the winter. Fill the unit even with top oil pet cock; quantity of oil required is given on plate fastened to oil level pet cock.

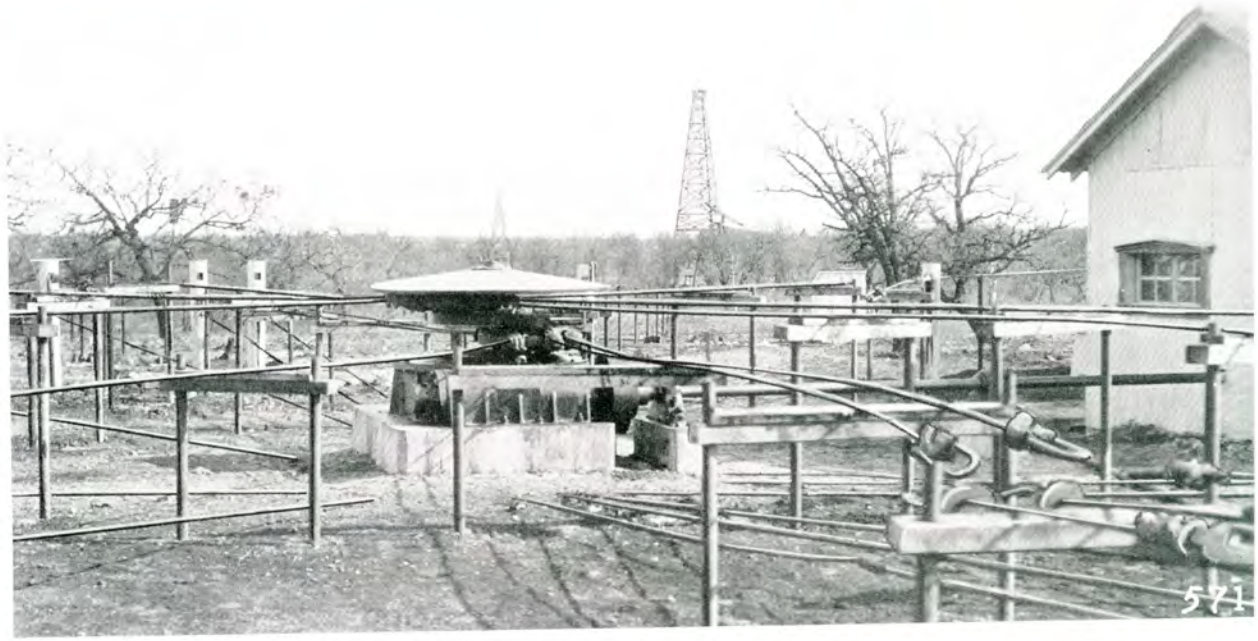
Too much creates heating, foaming and leakage as well as undue waste.

Crank Pins, Pinions, Shafts Are All Heat Treated



Heat Treating Furnace

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2



General View Lufkin Standard Power. Typical Installation

Lufkin Central Powers

BUILT IN TWO SIZES

It is the opinion of many successful operators as well as ourselves that, generally speaking, central Powers are not economical in use of power, are expensive to keep up and resulting production in oil does not approach what may be secured by efficient individual Units. They are generally considered more economical in first costs, installation, etc., which is true in many cases, yet we have seen a number of recent power installations that cost upward of twenty thousand dollars where individual Units would have cost no more, especially is this true where electric power is used.

However, due to the success of our Worm Geared Units some of our customers suggested the design of our Worm Geared Power to replace the large band wheels so commonly known; to eliminate the long costly quarter twist belts (a most abnormally inefficient drive) with high speed tighteners, heavy friction load eccentrics, necessarily large buildings with the subsequent fire hazard, all of which are done away with in the use of the Geared Power.

As this catalogue goes to press we have over fourteen of these Powers in successful operation, some of the large companies purchasing their fourth and fifth machines realizing their many advantages, experienced in one installation after another.

Users Find by Experience That Lufkin Powers:

Run without noise.

Are automatically lubricated.

Require practically no attention.

Are oil and dust tight.

Are highly efficient in use of power.

Installation costs are less than band wheels.

Easily adapted to any type of motive power.

Users after three years experience say they will outlast two to three band wheel powers, with practically no repairs.

Any user will verify these statements.

Copied from an original at The History Center, Diboll, Texas. www.TheHistoryCenterOnline.com 2013:023
Oil Field Equipment Catalog 31 Part 1 of 2

LUFKIN PERMANENT EQUIPMENT

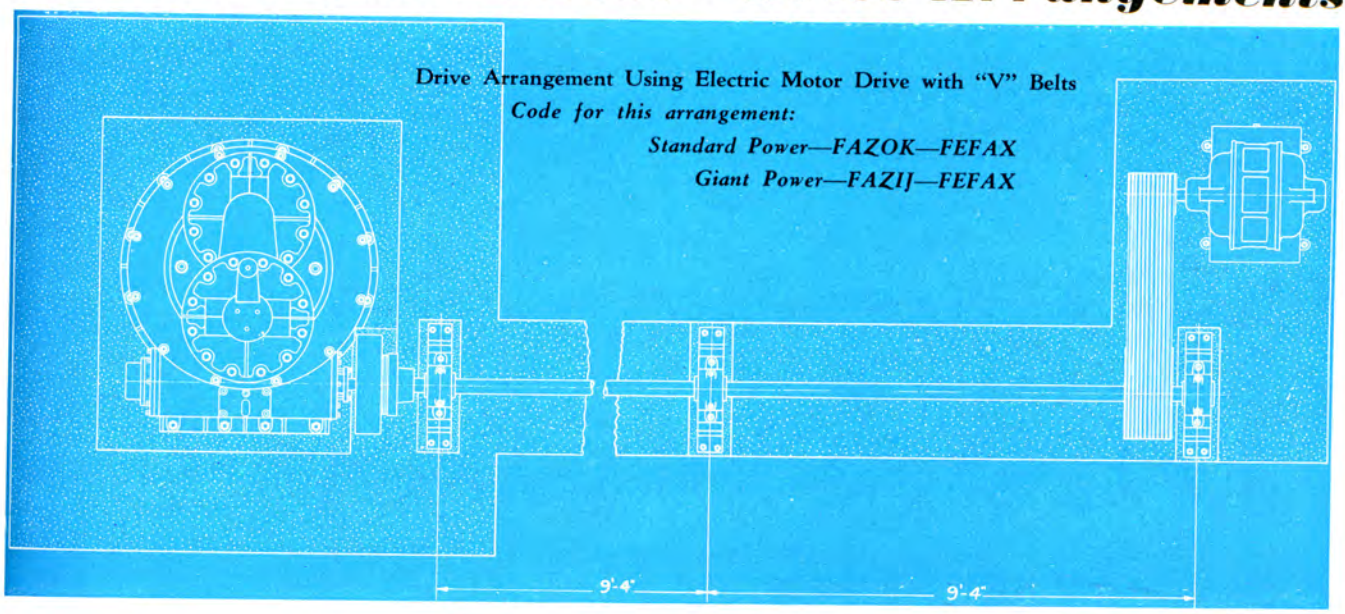
Lufkin Central Powers--*Drive Arrangements*

Drive Arrangement Using Electric Motor Drive with "V" Belts

Code for this arrangement:

Standard Power—FAZOK—FEFAX

Giant Power—FAZIJ—FEFAX

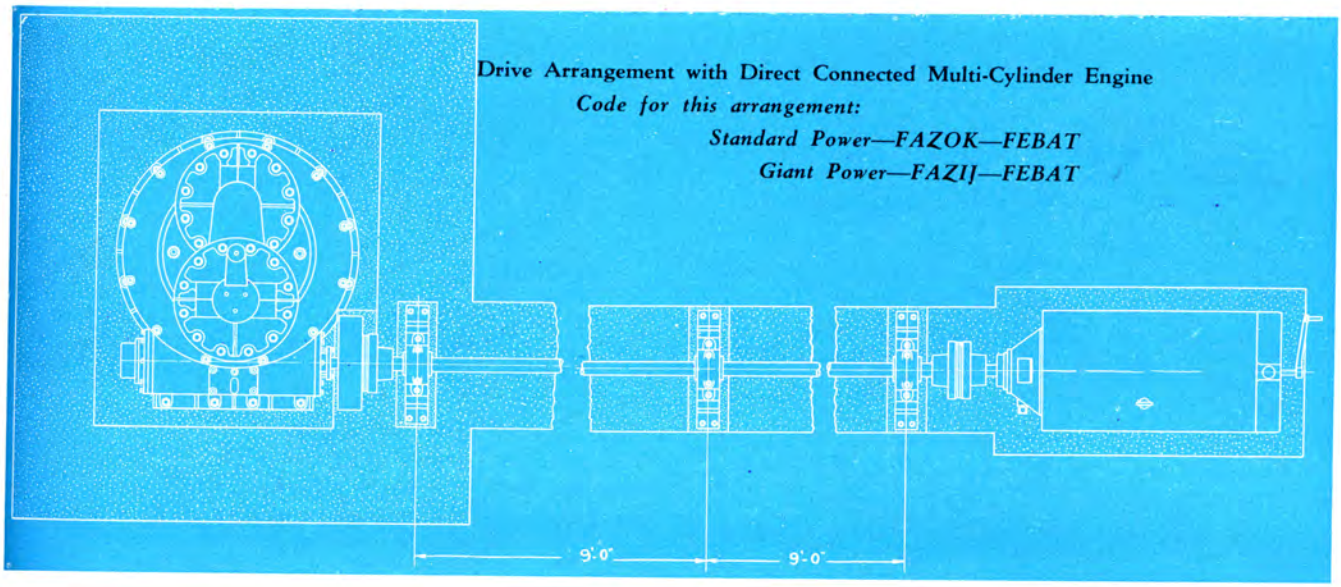


Drive Arrangement with Direct Connected Multi-Cylinder Engine

Code for this arrangement:

Standard Power—FAZOK—FEBAT

Giant Power—FAZIJ—FEBAT



Drive Arrangement with Single Cylinder Engine with Clutch and "V" Belts

Code for this arrangement:

Standard Power—FAZOK—FEBEV

Giant Power—FAZIJ—FEBEV

