

No. 811,905.

PATENTED FEB. 6, 1906.

A. CRAIG & E. DOUBLE.  
WELL DRILLING APPARATUS.  
APPLICATION FILED MAY 31, 1904.

2 SHEETS—SHEET 1.

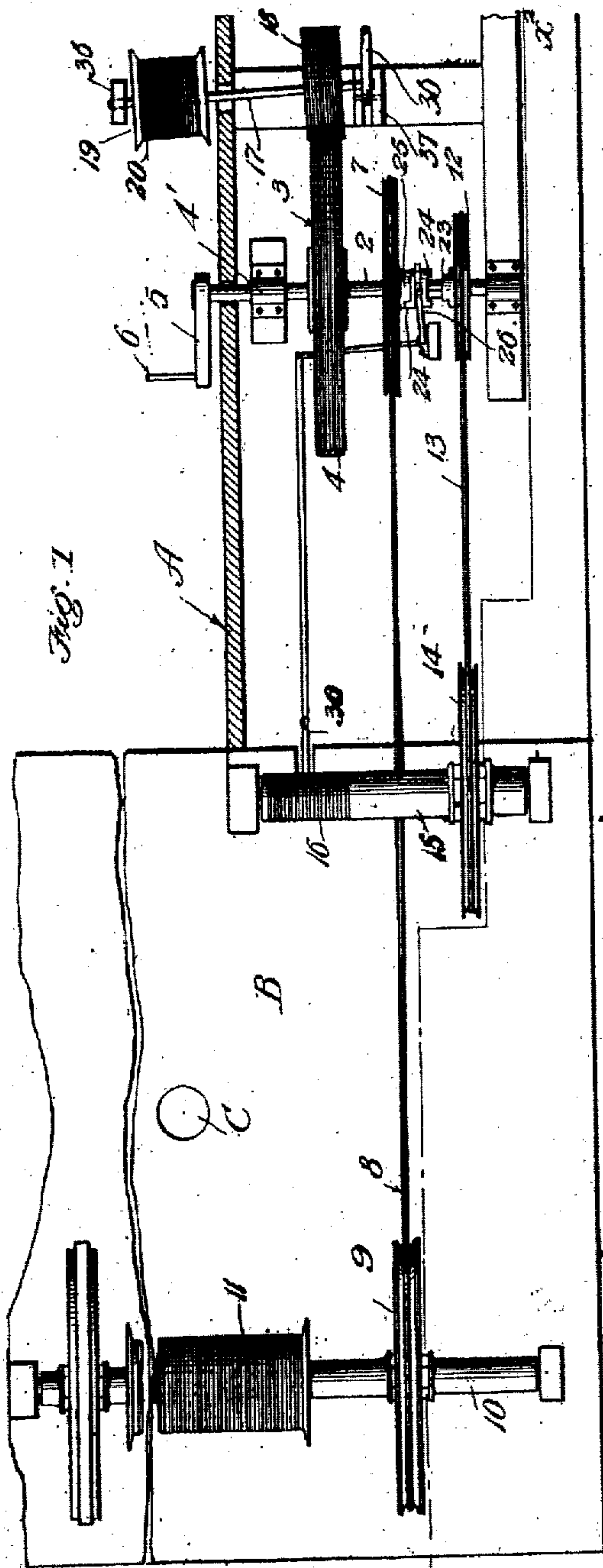


Fig. 1

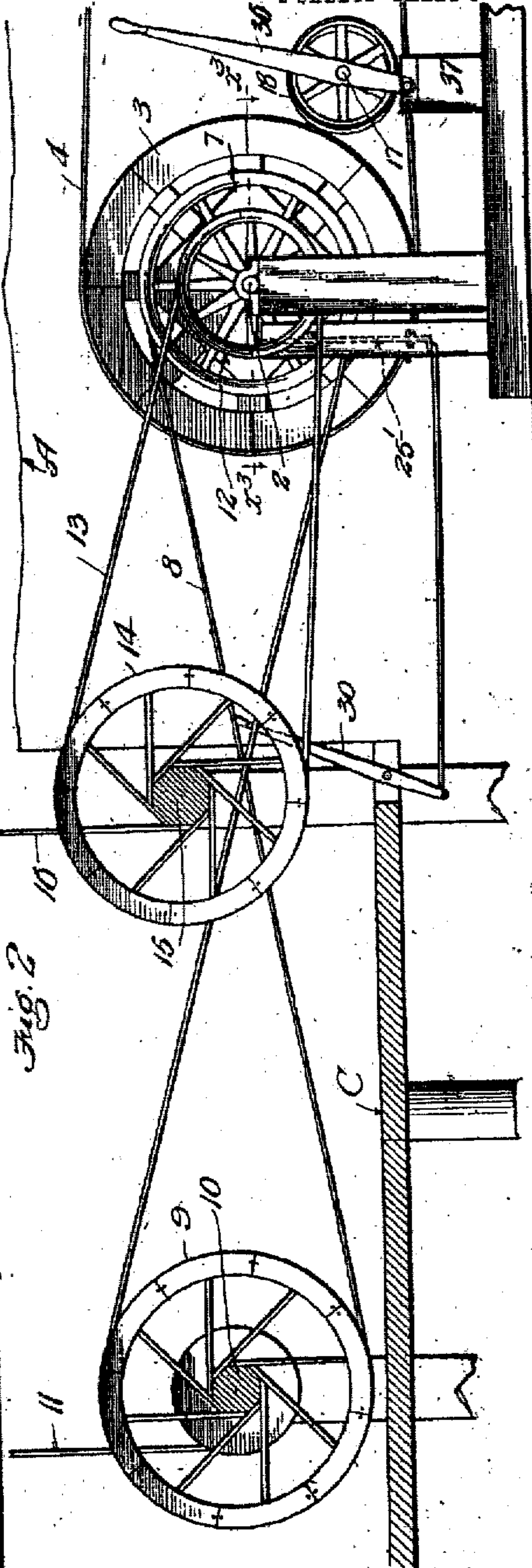


Fig. 2

Witnesses  
James G. Brown  
Frederick B. Lyon

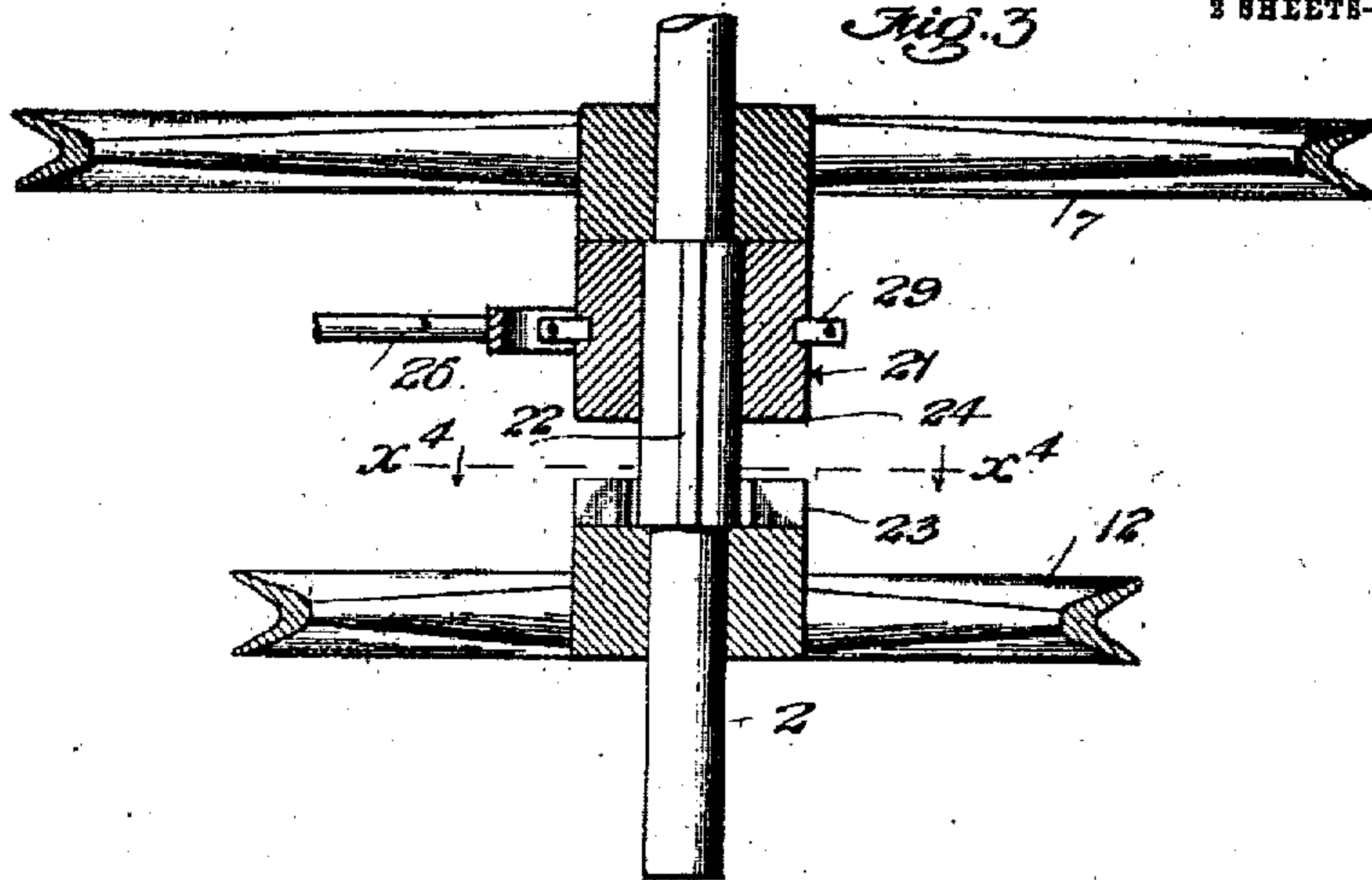
Inventors  
Allen Craig  
Edward Double  
By Townsend & Sons atty

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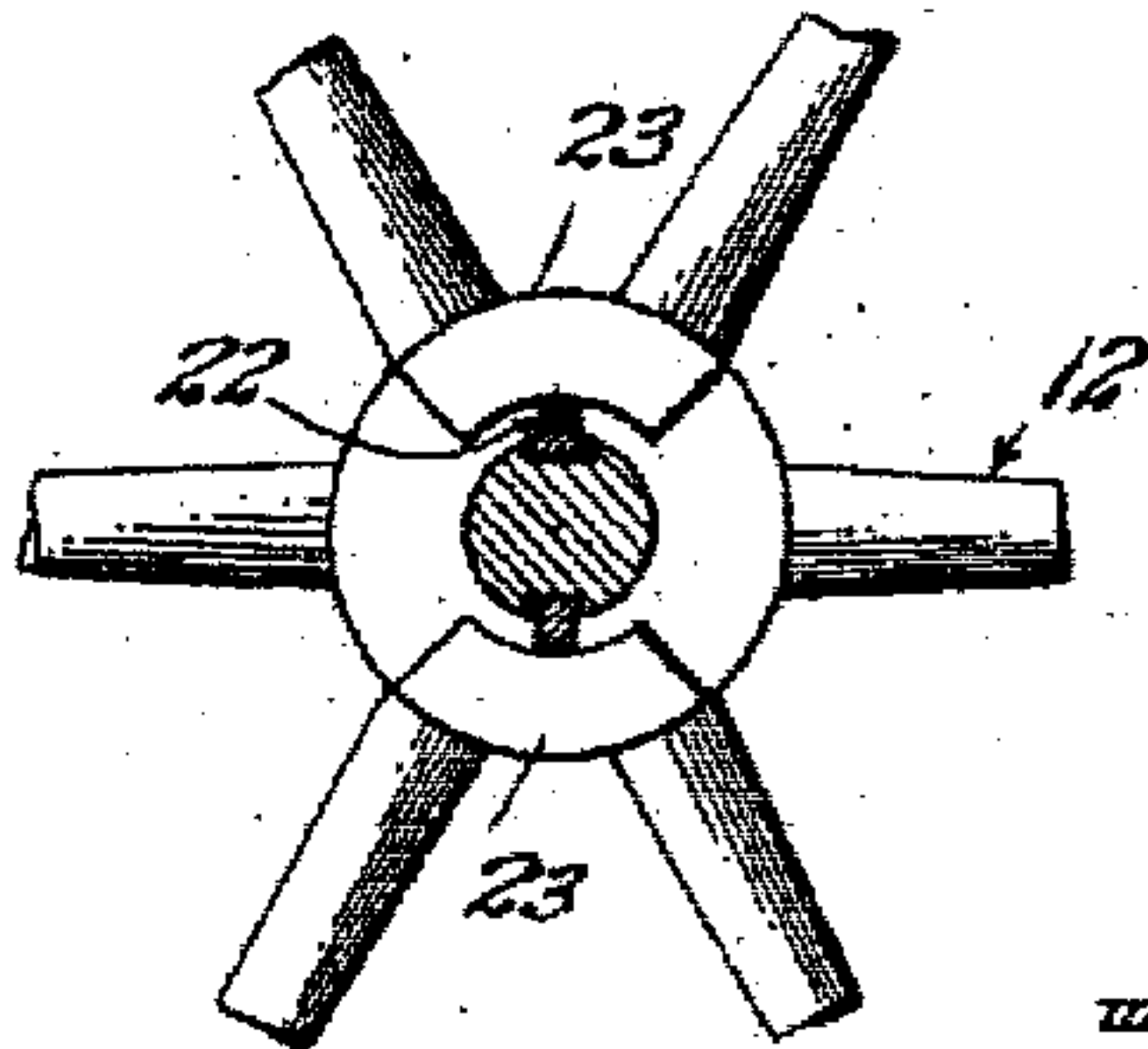
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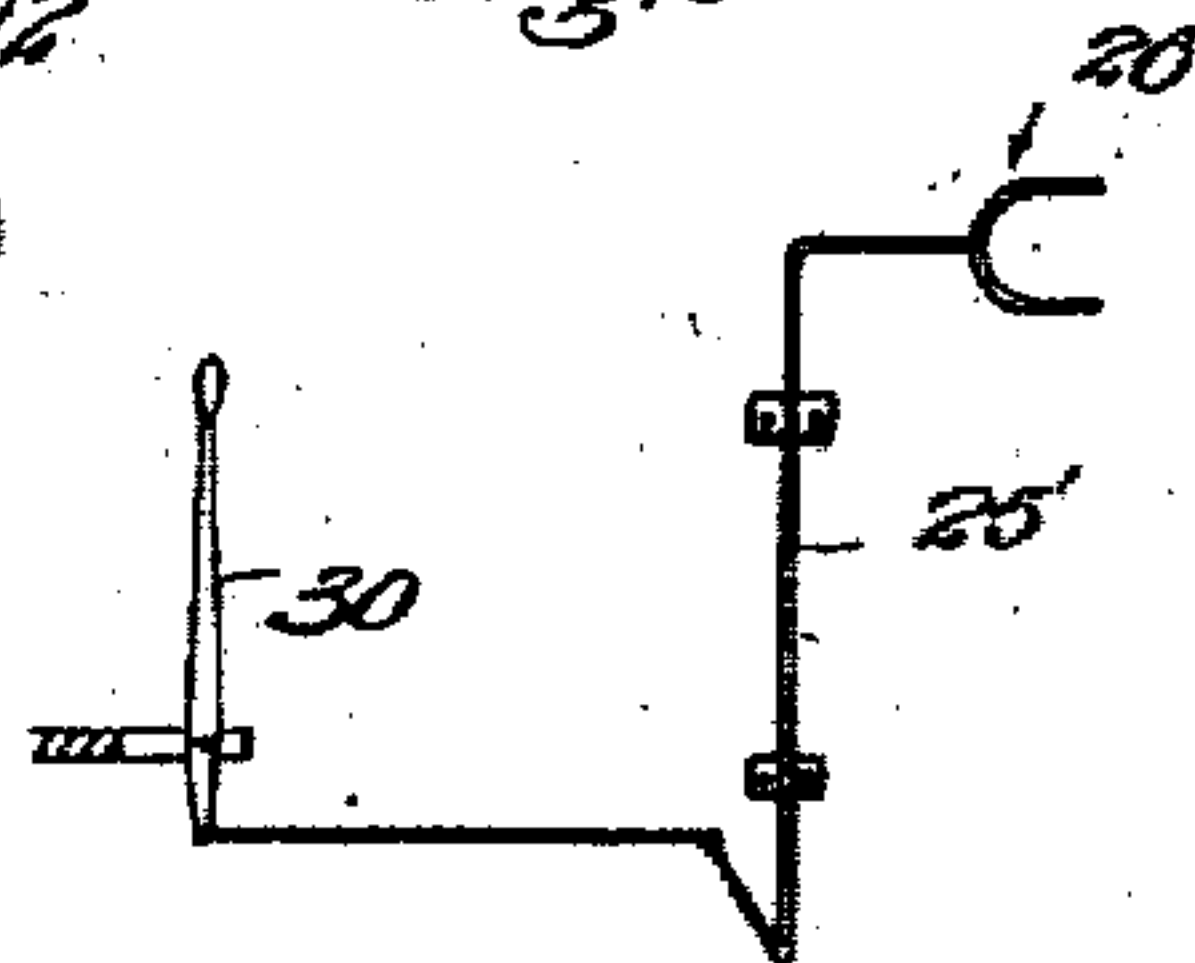
3 SHEETS—SHEET 2.



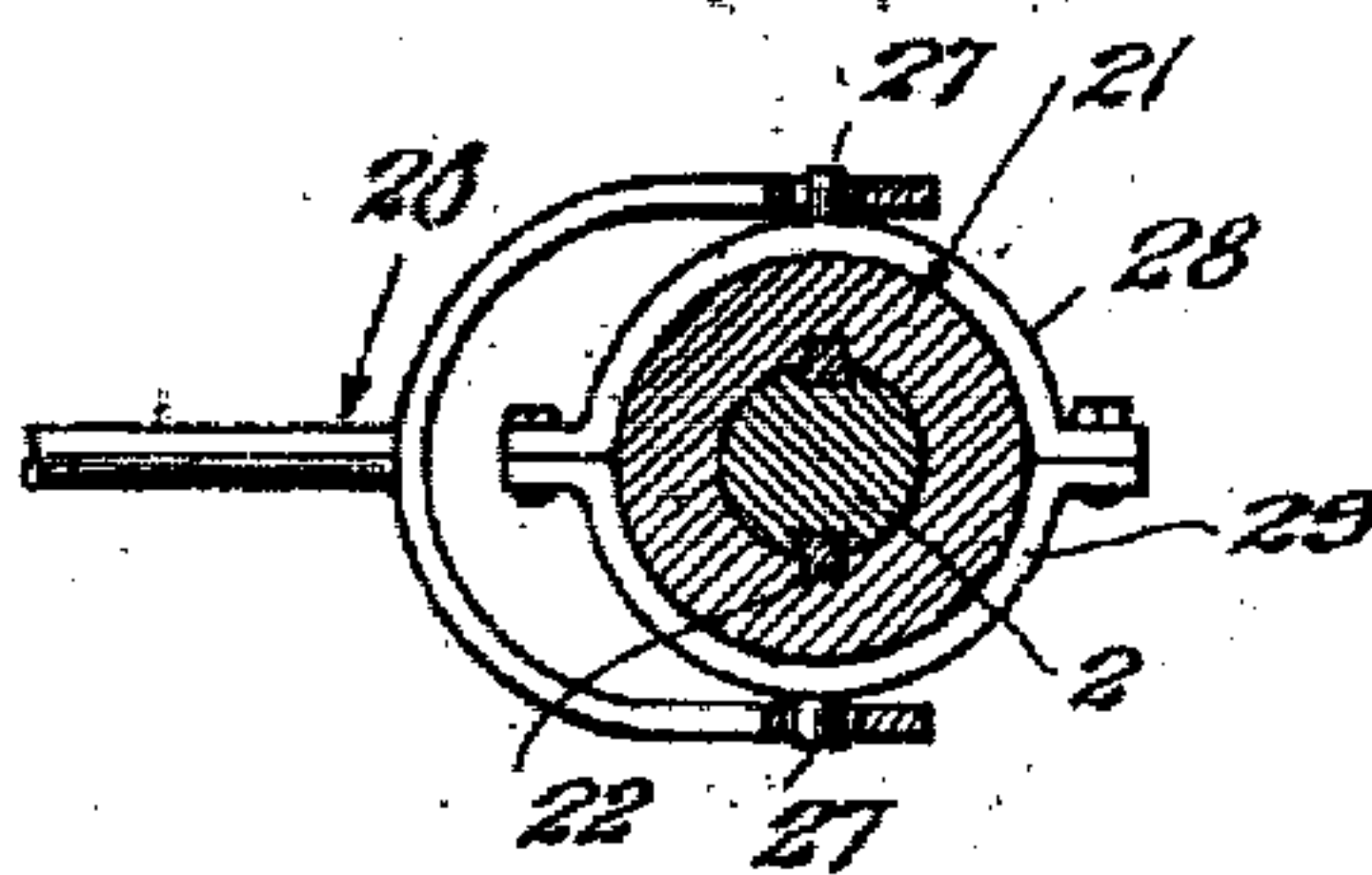
*Fig. 4*



*Fig. 6*



*Fig. 5*



Witnesses

*Edmund A. Strauss*

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# UNITED STATES PATENT OFFICE.

ALLEN CRAIG AND EDWARD DOUBLE, OF LOS ANGELES, CALIFORNIA.

## WELL-DRILLING APPARATUS.

No. 811,905.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed May 8, 1904. Serial No. 210,329.

*To all whom it may concern:*

Be it known that we, ALLEN CRAIG and EDWARD DOUBLE, citizens of the United States of America, residing in the city of Los Angeles, county of Los Angeles, State of California, have invented certain Improvements in Well-Drilling Apparatus, of which the following is a specification.

This invention relates to well-drilling apparatus, and particularly to improvements in the means for handling the tools and casing during the drilling of a well.

The primary object of the invention is to provide an apparatus by the use of which the loss of time incurred during the operation of drilling a well consequent upon a change of tools in the well-hole or a change in the operation of drilling may be reduced to a minimum.

The object of this invention is to so construct and arrange the apparatus as to avoid the necessity of at any time throwing off the bull-rope or the calf-rope, and thus economize materially the time consumed in these operations.

To these ends the invention consists in the provision in a well-drilling apparatus of a hand-wheel shaft carrying a hand-wheel, a bull-wheel-rope sheave and a calf or casing wheel-rope sheave, a bull-wheel, a calf or casing wheel, a crank-arm on the hand-wheel shaft for connection with the walking-beam, and a sand-pump and bailer-reel adapted to be driven from the hand-wheel, means being provided whereby the bull-rope sheave and the calf or casing rope sheave may be permitted to remain stationary during the revolution of the hand-wheel shaft or either the bull-rope sheave or the casing-rope sheave operated as desired.

The invention consists, further, in various constructions and in combinations of parts, all as hereinafter described, and particularly pointed out in the claims, and will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of a well-drilling apparatus embodying our invention. Fig. 2 is a longitudinal sectional view on the line X-X of Fig. 1. Fig. 3 is a sectional plan view on the line X-X of Fig. 2. Fig. 4 is a transverse sectional view through one of the sheaves on the hand-wheel shaft, showing the method of splining the clutch on the shaft. Fig. 5 is a transverse sectional view through

the shipping-lever, clutch, and shaft. Fig. 6 is a diagrammatic view of the shipping-lever.

In the drawings, 2 represents a shaft mounted in suitable bearings within the derrick A. Mounted upon and fixed to this shaft 2 is a hand-wheel 3, which may be of the ordinary or any preferred construction, and from this hand-wheel a belt 4 extends to a drive-pulley on the engine's shaft. One end of the shaft 2 extends out beyond the bearing 4' and is provided with a crank-arm 5 and wrist-pin 6, to which the walking-beam of the well-rig is adapted to be detachably connected in the ordinary manner. 7 represents the bull-rope sheave or pulley. This sheave is loosely mounted on the shaft 2 and is connected by a cross belt or rope 8 with a sheave 9 on the shaft 10 of the bull-wheel or winding drum, upon which is carried the main cable or rope 11 for handling the drilling-tools. 12 represents the calf or casing wheel sheave. This sheave 12 is also loosely mounted on the shaft 2 and is connected by a rope or belt 13 with the sheave 14 of the calf or casing wheel or reel 15, which carries the cable 16, used in raising and lowering the casing for the well-hole.

17 represents a short shaft having suitable bearings. This shaft, as shown, is mounted parallel with the shaft 2 and carries a friction-pulley 18, which connects with or bears against the periphery of the hand-wheel 3. The outer end of this shaft 17 extends outside the shed of the derrick A and is provided with a sand-reel 19, adapted to carry and operate the sand line or cable 20 in the ordinary or any preferred manner.

As shown best in Fig. 3, a clutch member 21 is slidably mounted on the shaft 2, being connected with said shaft by splines. The portion of the shaft 2 provided with the splines 22 is preferably of greater diameter than the remaining portions of the shaft, and, as shown in Fig. 3, the splines preferably extend in between the flanges 23 on the pulley or sheave 12, these flanges 23 forming on the hub of the pulley 12 members cooperating with the clutch member 21, which clutch member 21 being provided with shoulders or flanges 24, oppositely disposed with relation to the flanges 23 and adapted when the member 21 is thrown into engagement with the pulley 12 to bear upon the flanges 23 and cause the pulley 12 to be rotated with the clutch 21 and shaft 2. At the other end of the clutch member 21 similar projections 25 are provided, adapted



to engage the flanges or projections on the hub of the pulley or shaft 7 similar to the flanges 23 on the pulley 12. An operating-arm 25 is provided with a yoke 27 adapted to be connected with the pins 27 upon the ring-sections 28 29, bolted about the clutch 21. These ring-sections 28 29 are preferably set in a groove provided in the circumference of the clutch member 21, as shown best in Fig. 3. The operating-arm 25 is connected with a shipping-lever 30, preferably arranged in front of the calf-wheel 16 and extending above the floor and within the main derrick B.

It is thus seen that when it is desired to lower the string of tools into the well-hole C, the string of tools having been connected with the bull-rope, the lever 30 is thrown back into the position of Fig. 2 to throw the clutch into connection with the pulley 7. The band-wheel being rotated, motion is imparted through the pulley 7 and rope belt 8 to the bull-wheel and the string of tools raised or lowered, as desired. When the string of tools has been lowered to the requisite depth for drilling, the lever 30 is thrown to the intermediate position, so that the clutch 21 is out of engagement with both the pulley 7 and the pulley 12. The walking-beam is then connected to the wrist-pin 6 in the ordinary manner and the string of tools connected with the walking-beam. The drilling-tools may then be operated, and when it is desired to raise the same from the well and use the sand-pump or bailer all that is necessary is to disconnect the walking-beam, throw the lever 30 to the position of Fig. 2, and raise the tools out of the well, then throw the lever 30 into the intermediate position and operate the sand-pump line or reel in the ordinary manner. It is thus seen that all necessity for throwing either the belt 13 or 8 off the pulleys at any time is obviated, and, as in drilling oil-wells frequent change of tools is necessary, a very large saving of time and labor is thus secured.

The bearing for the outer end of the shaft 17 is in a standard 35, while the inner end of the shaft 17 has its bearing in an arm 36, pivoted in a standard 37, so that the pulley 18 may be thrown into or out of frictional contact with the periphery of the band-wheel. If desired, any suitable means may be employed in connection with the arm or lever 36 and extended up into the main room B of the derrick.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A well-drilling rig comprising a band-wheel, a shaft therefor, pulleys or sheaves loose thereon, a clutch on the shaft adapted to revolve with said shaft, means for operatively connecting said clutch with either of said pulleys, a bull-wheel, a rope connecting

the same with one of said pulleys, a calf or casing wheel, a rope connecting the same with the other pulley, and means for driving the band-wheel.

2. A well-drilling rig comprising a band-wheel, a shaft therefor, loose pulleys thereon, means operatively connected with said shaft for operatively connecting either of said pulleys with said shaft, a bull-wheel, a calf or casing wheel, belts connecting said bull and casing wheels with their respective pulleys on said shaft, and means for driving said band-wheel.

3. A well-drilling rig comprising a band-wheel, a shaft whereon the same is fixed, pulleys loose on said shaft, means for operatively connecting said pulleys to said shaft as desired, means for connecting a walking-beam to said shaft, a bull-wheel, a calf or casing wheel, means operatively connecting said bull and calf wheels with their respective loose pulleys, and means for driving said band-wheel.

4. A well-drilling rig comprising a band-wheel, a shaft whereon the same is fixed, pulleys loose on said shaft, means for operatively connecting said pulleys to said shaft as desired, means for connecting a walking-beam to said shaft, a bull-wheel, a calf or casing wheel, means operatively connecting said bull and calf wheels with their respective loose pulleys, a sand-reel driven from said band-wheel, and means for driving the band-wheel.

5. A well-drilling rig comprising a shaft, loose pulleys on said shaft, means for rotating said shaft, a bull-wheel, a calf-wheel, ropes connecting said bull-wheel and calf-wheel respectively with their respective loose pulleys, and means carried by said shaft whereby either of said loose pulleys may be operatively connected with said shaft to rotate therewith.

6. A well-drilling rig comprising a shaft, loose pulleys on said shaft, a clutch carried by said shaft, a shipping-lever for operating said clutch to engage either of said pulleys, a calf-wheel, a bull-wheel, means operatively connecting said calf and said bull wheels with their respective loose pulleys, and means for driving said shaft.

7. A well-drilling rig comprising a band-wheel, a shaft therefor, a loose pulley thereon, a clutch carried by said shaft for engaging said loose pulley, a calf-wheel, a rope or belt connecting said calf-wheel and loose pulley, a bull-wheel, means for driving said bull-wheel from said shaft, and means for operating said clutch.

In testimony whereof we have hereunto set our hands, at Los Angeles, California, this 21st day of May, 1904.

ALLEN CRAIG.  
EDWARD DOUBLE.

In presence of—

FREDERICK O. LYON,  
RILLA ROBERTS.