

No. 779,620.

PATENTED JAN. 10, 1905.

J. M. OUGH & G. W. WALTENBAUGH.

POWER TRANSMITTER.

APPLICATION FILED MAY 26, 1900.

3 SHEETS—SHEET 1.

Fig. 2.

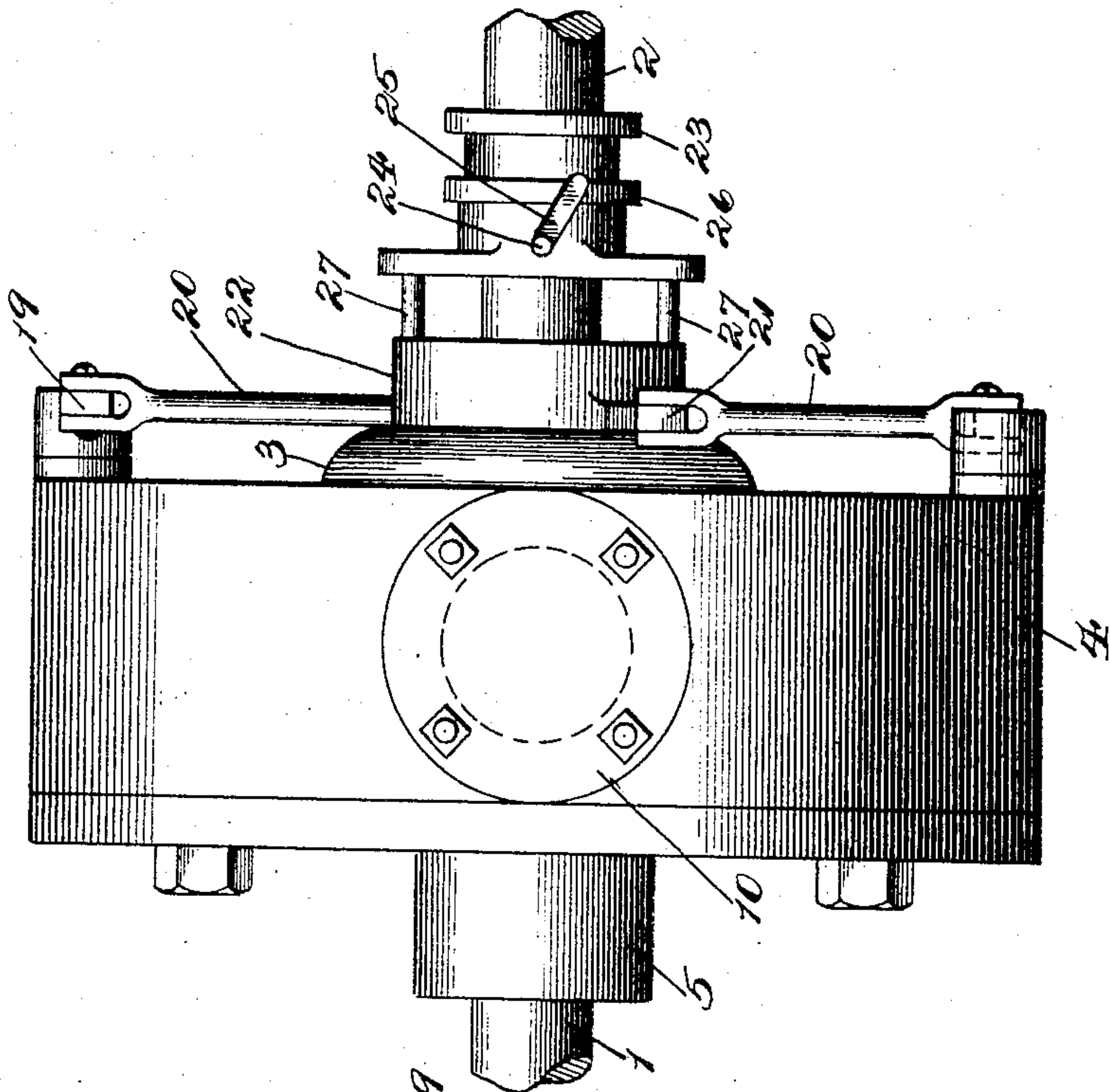
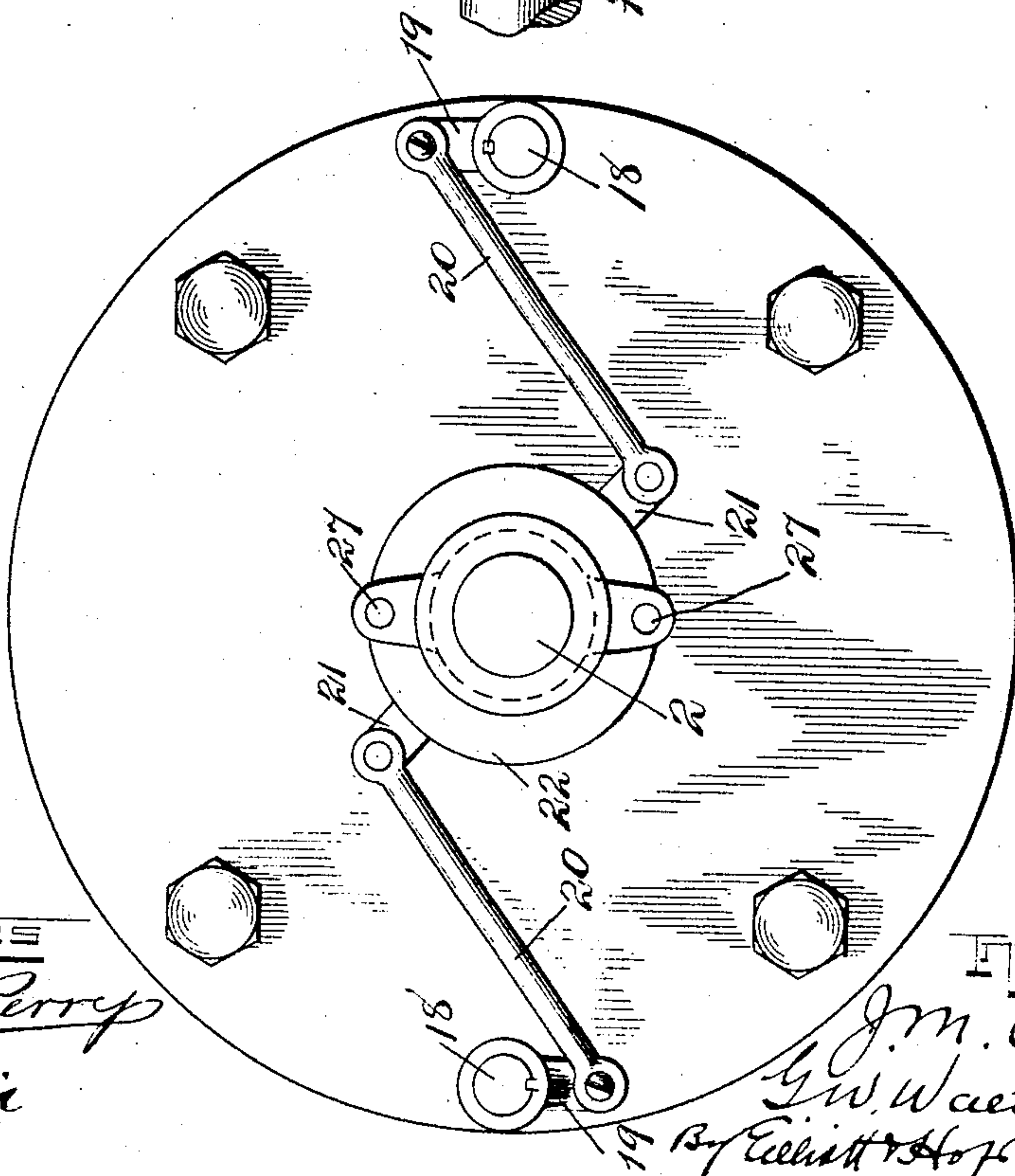


Fig. 1.



WITNESSES

Ira D. Perry  
J. B. Wein

INVENTORS

J. M. Ough  
G. W. Waltenbaugh  
By Ellis H. Smith Att'y

No. 779,620.

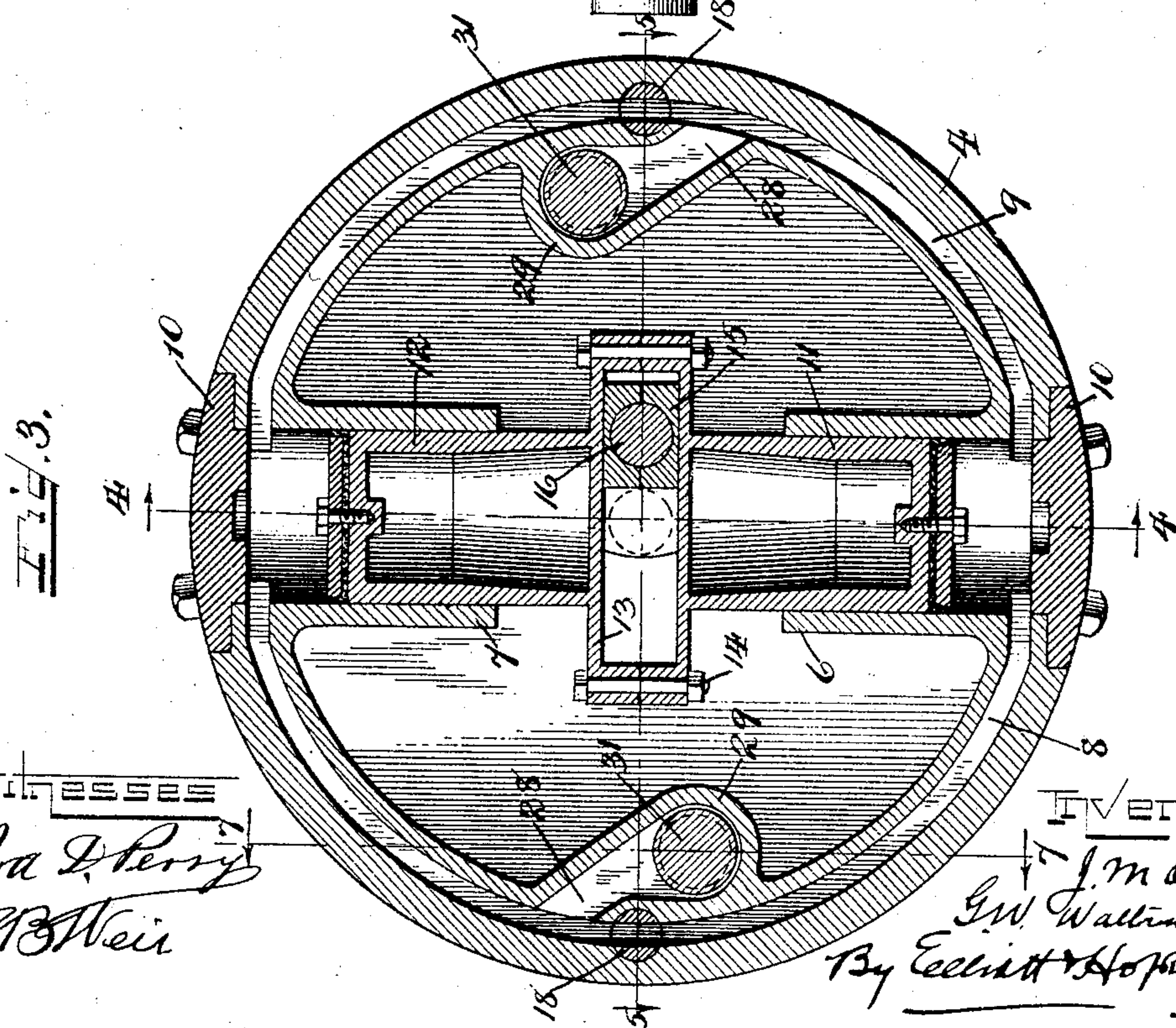
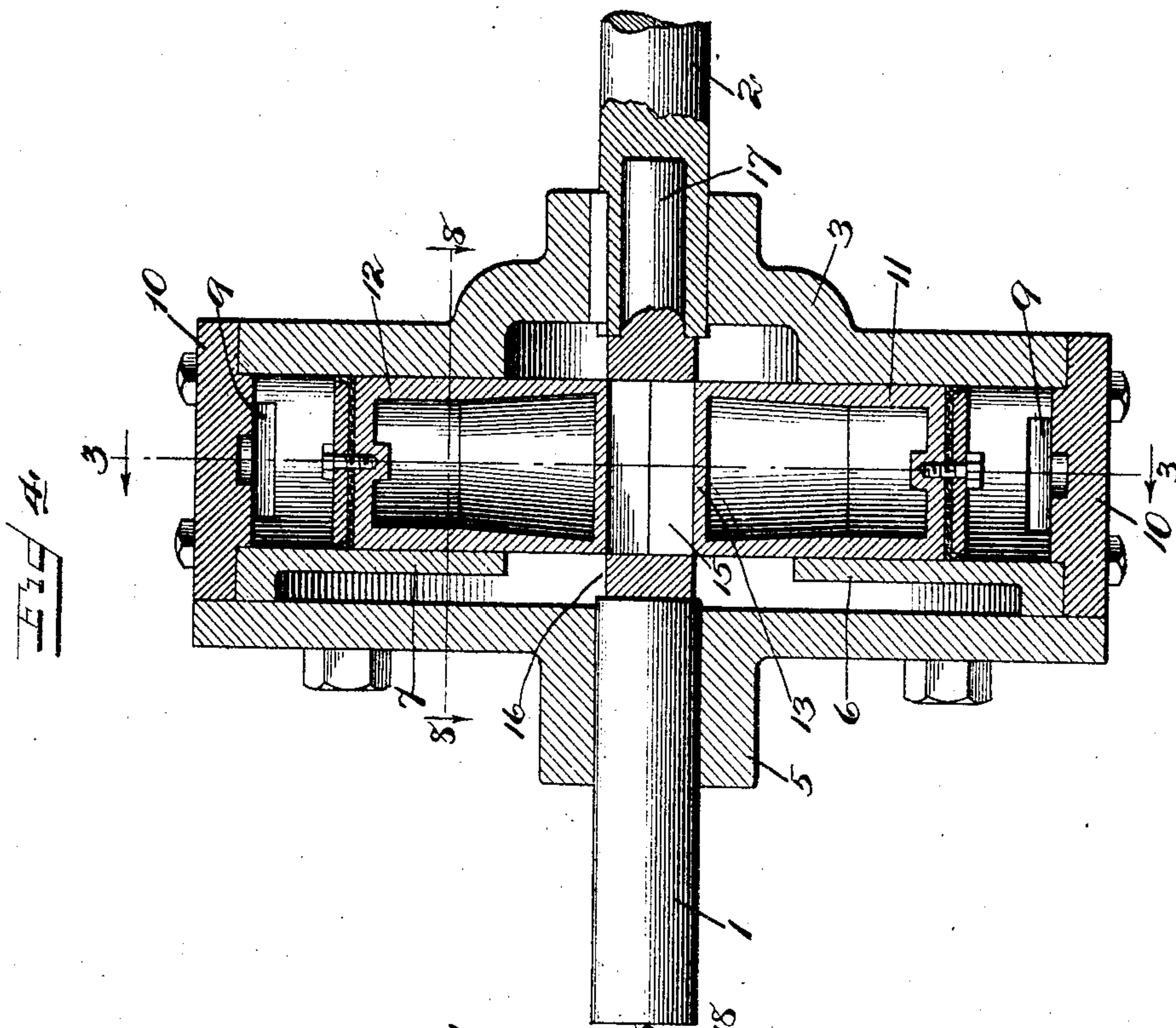
PATENTED JAN. 10, 1905.

J. M. OUGH & G. W. WALTENBAUGH.

POWER TRANSMITTER.

APPLICATION FILED MAY 26, 1900.

3 SHEETS--SHEET 2.



Witnesses

Ira D. Perry  
J B Wein

INVENTORS

J. M.ough  
 G. W. Wallinbaugh  
 By Ecclett & Hopkin  
 A-15



No. 779,620.

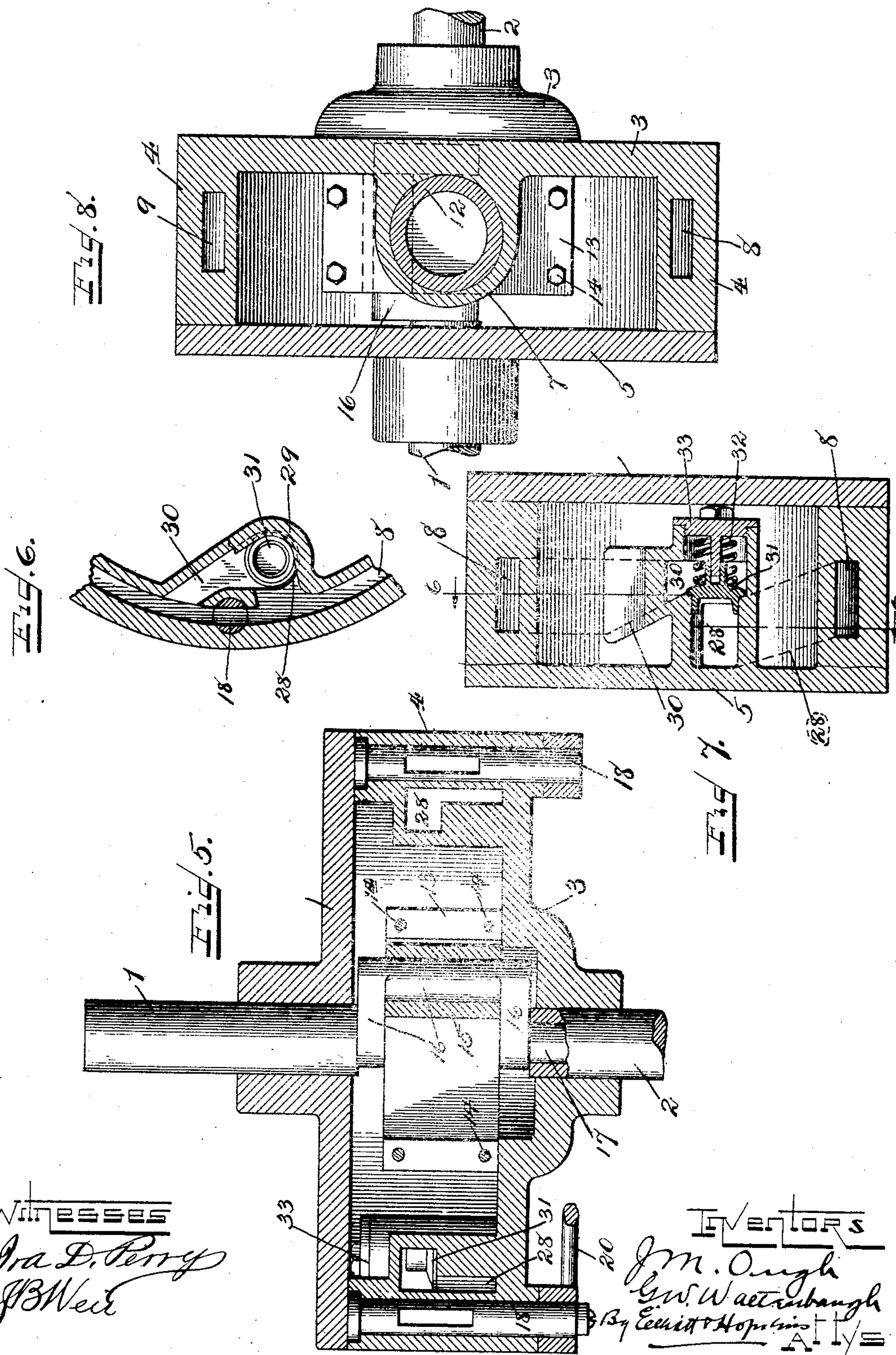
PATENTED JAN. 10, 1905.

J. M. OUGH & G. W. WALTENBAUGH.

POWER TRANSMITTER.

APPLICATION FILED MAY 26, 1900.

3 SHEETS—SHEET 3.



WITNESSES

Ara D. Perry  
J. B. Weir

INVENTORS

J. M. Ough  
G. W. Waltenbaugh  
By E. C. Hopkins  
ATTY



# UNITED STATES PATENT OFFICE.

JOSEPH M. OUGH AND GEORGE W. WALTENBAUGH, OF CHICAGO,  
ILLINOIS.

## POWER-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 779,620, dated January 10, 1905.

Application filed May 26, 1900. Serial No. 18,044.

*To all whom it may concern:*

Be it known that we, JOSEPH M. OUGH and GEORGE W. WALTENBAUGH, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Power-Transmitters, of which the following is a full, clear, and exact specification.

This invention relates to power-transmitters, and more particularly to a fluid-clutch or power-transmitter; and it has for its primary object to transmit rotary movement to a rotary member through the intermediary of a fluid medium, whereby such transmission may be effected gradually without objectionable jar or strain.

A further object of this invention is to provide a fluid-power-transmitting device which will automatically yield when the driven member encounters an obstruction greater than a predetermined strain, thus adapting the device for use in connection with continuously-operating motors without danger of injury to the machinery being driven thereby should the latter become clogged or otherwise abnormally obstructed or resisted.

With these ends in view the invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a front elevation of the improved power-transmitter. Fig. 2 is a side elevation thereof. Fig. 3 is a transverse section taken on the line 3 3, Fig. 4. Fig. 4 is a longitudinal section taken on the line 4 4, Fig. 3. Fig. 5 is a longitudinal section taken on the line 5 5, Fig. 3. Fig. 6 is a detail section taken on the line 6 6, Fig. 7. Fig. 7 is a detail section taken on the line 7 7, Fig. 3; and Fig. 8 is a plan section taken on the line 8 8, Fig. 4.

1 and 2 represent two alined shafts which are independent of each other and to one of which may be attached or connected the power, while to the other may be connected the mech-

anism to be driven. It is immaterial which is used for the power or for the driven mechanism; but for the sake of convenience the shaft 1 will be termed the "driving-shaft" and the shaft 2 the "driven" shaft. The driven shaft 2 is keyed or otherwise secured to one head 3, of a casing 4, in whose other head, 5, the end of the driving-shaft 1 may be suitably journaled. The casing 4 is cast or formed with one or more cylinders, preferably two, 6 7, which are arranged diametrically opposite each other within the casing, and the wall of the casing is formed on each side with surrounding passages 8 9, which connect the outer ends of the cylinders 6 7 together. The walls of the casing 4 opposite the ends of the cylinders 6 7 may, if desired, be provided with removable heads 10 to facilitate the formation of the cylinders and afford access thereto.

Arranged in the cylinders 6 7, respectively, are pistons 11 12, connected together by a cross-head 13, the latter being formed in halves, one-half on each of the pistons, and the halves secured together by bolts or rivets 14, and operatively connected to the cross-head 13, by means of a sliding block 15 or otherwise, is a crank 16, which is preferably double, as more clearly shown in Fig. 5, and has one of its axles 17 journaled concentrically in the end of the driven shaft 2, the crank on the opposite side being rigidly secured to or formed on the driving-shaft 1.

The cylinders 6 7 and the passages 8 9 being filled with any suitable fluid, preferably a non-compressible liquid, such as water or water and oil, but any other suitable fluid, it will be seen that when the driving-shaft 1 is rotated the crank 16 will cause the pistons 6 7 to reciprocate back and forth in their respective cylinders and alternately force the liquid in opposite directions through the passages 8 9, and so long as the liquid is afforded free passage into each cylinder at the inspiration-stroke of the piston and free egress from such cylinder along the passages 8 9 and into the other cylinder the driving-shaft 1 may continue to revolve, and thus reciprocate the pistons without rotating the casing 4 or revolving-



ing the driven shaft 2; but it is apparent that the instant the free passage of the liquid through the passages 8 9 becomes obstructed the driven shaft 2 will be rotated or a tendency to rotation set up therein with a degree of power in direct ratio to the force of the resistance to the current of the fluid in the passages 8 9, and if such passages be entirely obstructed it follows that the pistons 10 11 12 will be unable to move at all with reference to their respective cylinders, and as a consequence the entire casing, together with the driven shaft 2, will be rotated at the same rate of speed as the driving-shaft 1. In order that this current of the fluid to and from the cylinders may be thus resisted when it is desired to impart the rotation of the driving-shaft 1 to the driven shaft 2 with any desired degree of rapidity up to the maximum speed of rotation of the shaft 1, a valve-plug 18 is interposed in each of the passages 8 9, so as to close the latter entirely or partially close the same, accordingly as it is desired to have the driven shaft 2 revolve with greater or less rapidity. The outer ends of these plugs 18 are provided with crank-arms 19, to each of which is pivoted a link 20, and the inner ends of these links are connected to ears 21 on a revoluble collar 22, which when rotated opens or closes the valves 18 simultaneously. This rotation may be imparted to the collar 22 in any suitable way—such, for instance, as by means of a sliding sleeve 23 on the shaft 2—having suitable flanges for the engagement of the fork of an operating-lever (not shown) of any suitable or well-known construction, the collar 23 being provided with a lug 24, which engages in an inclined slot 25 in a second collar 26, which is connected by lugs 27 with the collar 22, so that when the collar 22 is pulled back and forth on the shaft 2 by means of the operating-lever aforesaid the collar 26, and consequently the collar 22, will be rotated by the action of the lug 24 in the slot 25.

In order to avoid the possibility of damage to the motor or to the machinery being driven in the event the machinery should become clogged or encounter an abnormal resistance of some kind, the passages 8 9 are provided with by-pass passages 28, which lead into one side of a valve-chamber 29, and by-pass passages 30, which lead from such chamber back to the passages 8 9; but at a point beyond the valve 18, the two passages 28 29, together with the valve-chamber, constitute a by-pass or channel around the valve 18, and in these by-pass passages is located a yielding obstruction. This preferably consists of a valve 31, interposed between the passages 28 30 and held to its seat by means of a spring or other suitable resistance 32, interposed between the valve 31 and a cap 33, which closes the valve-chamber, the latter being accessible by the

removal of the head 5. Thus it will be seen that under ordinary conditions the spring 32 may be of sufficient resistance to hold the valve 31 on its seat even while the valves 18 are closed, and thus compel the casing, and consequently the shaft 2, to revolve with the shaft 1; but should the shaft 2 meet an abnormal resistance the springs 32 will yield and permit the fluid to circulate past the valves 31, and consequently permit the pistons to reciprocate in their cylinders without revolving the casing. It will be observed from Fig. 3 that the by-pass passages on one side are open to the cylinder 6, so as to receive the fluid discharged from the outer end of the cylinder and permit it to pass to the other cylinder, while on the other side the arrangement of the by-pass passages is reversed. By this arrangement a relief for the pressure coming from either cylinder is provided.

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

1. In a power-transmitter the combination of a driving member, a driven member, a fluid-passage, means for obstructing said passage, means for forcing fluid through said passage connected partly to said driving member and partly to said driven member, a by-pass around said obstruction and a yielding obstruction in said by-pass, substantially as set forth.

2. In a power-transmitter the combination of a driving member, a driven member, a casing having two cylinders and a passage connecting the outer ends of said cylinders and said casing being operatively connected with one of said members, pistons in said cylinders operatively connected with the other of said members, a valve for closing said passage, a by-pass around said valve, and a yielding valve in said by-pass, substantially as set forth.

3. In a power-transmitter the combination of a driving member, a driven member, a casing operatively connected with one of said members and having diametrically opposed cylinders and passages connecting the outer ends of said cylinders together, pistons in said cylinders operatively connected with the other of said members, an adjustable obstruction in each of said passages, a by-pass extending around each of said obstructions and opening into said passages on opposite sides of said obstructions so that each of said by-pass passages will receive the pressure from but one of the cylinders, and a yielding obstruction in each of said by-pass passages, substantially as set forth.

J. M. OUGH.  
GEO. W. WALTEBAUGH.

Witnesses:

EDNA B. JOHNSON,  
F. A. HOPKINS.