

No. 749,279.

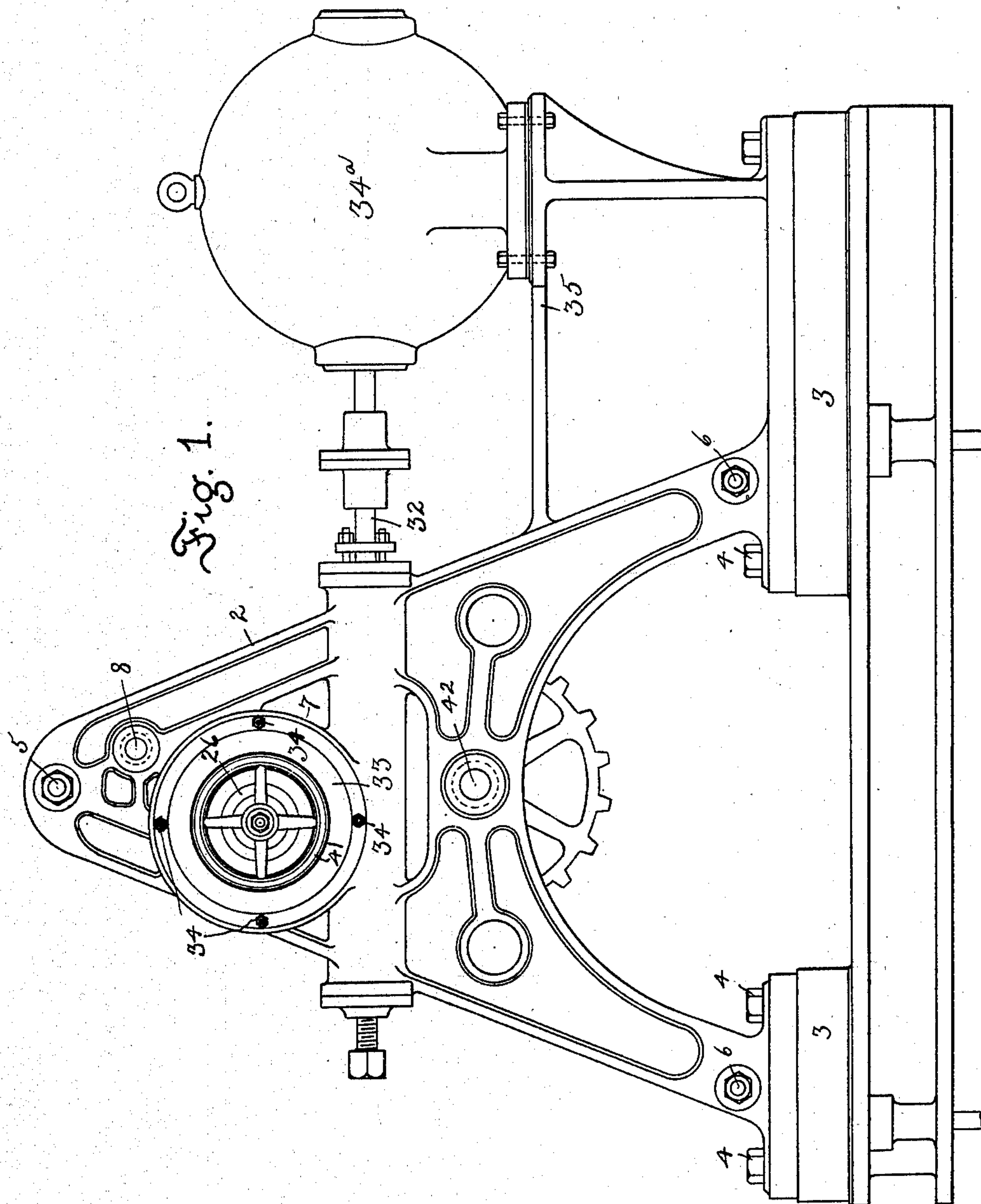
PATENTED JAN. 12, 1904.

C. E. ELLICOTT & J. B. NORRIS.
COMBINED HAND AND MOTIVE POWER WINCH.

APPLICATION FILED SEPT. 4, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:-
Henry Watson
Howard Habercam.

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Charles E. Ellicott
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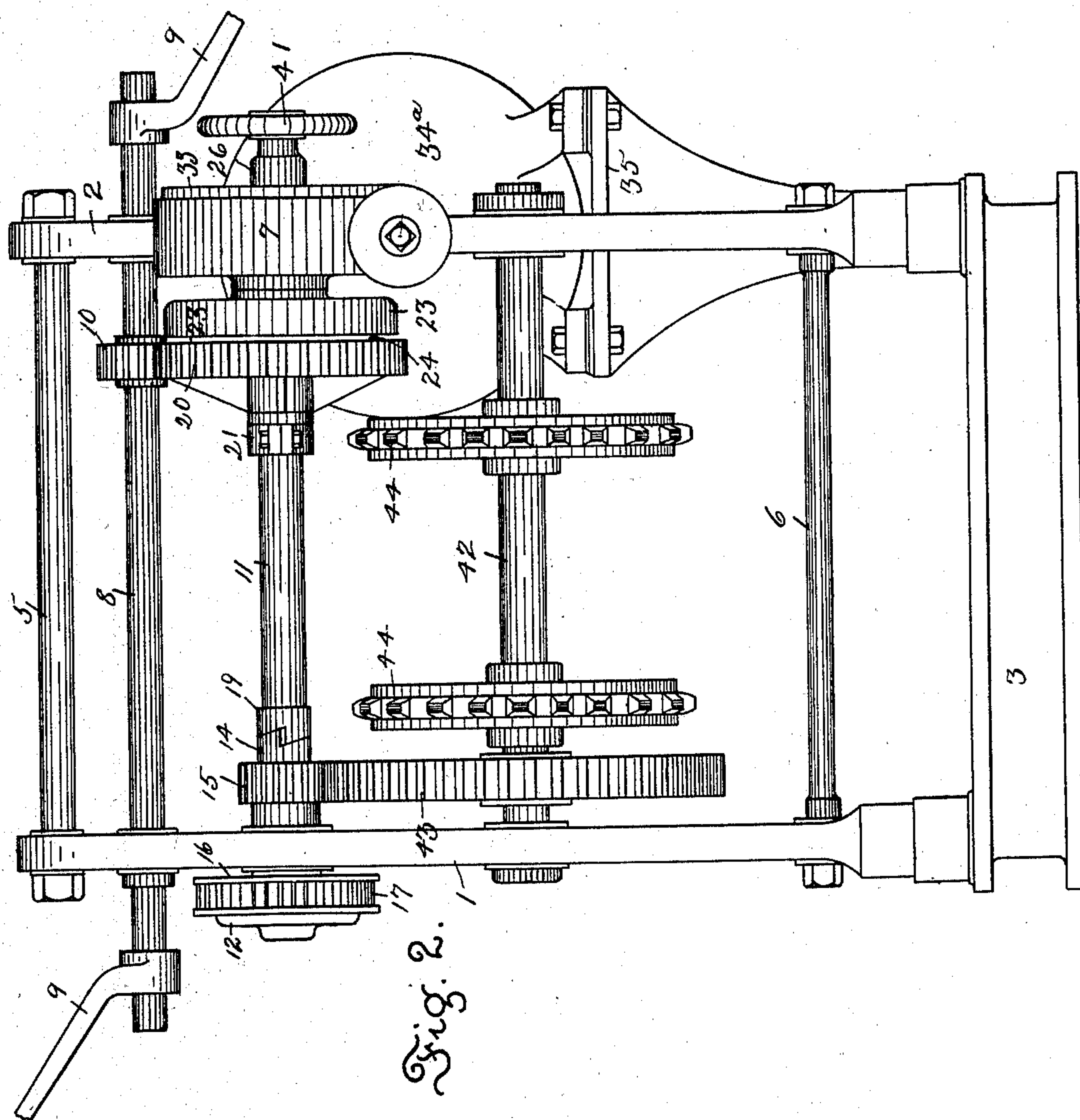
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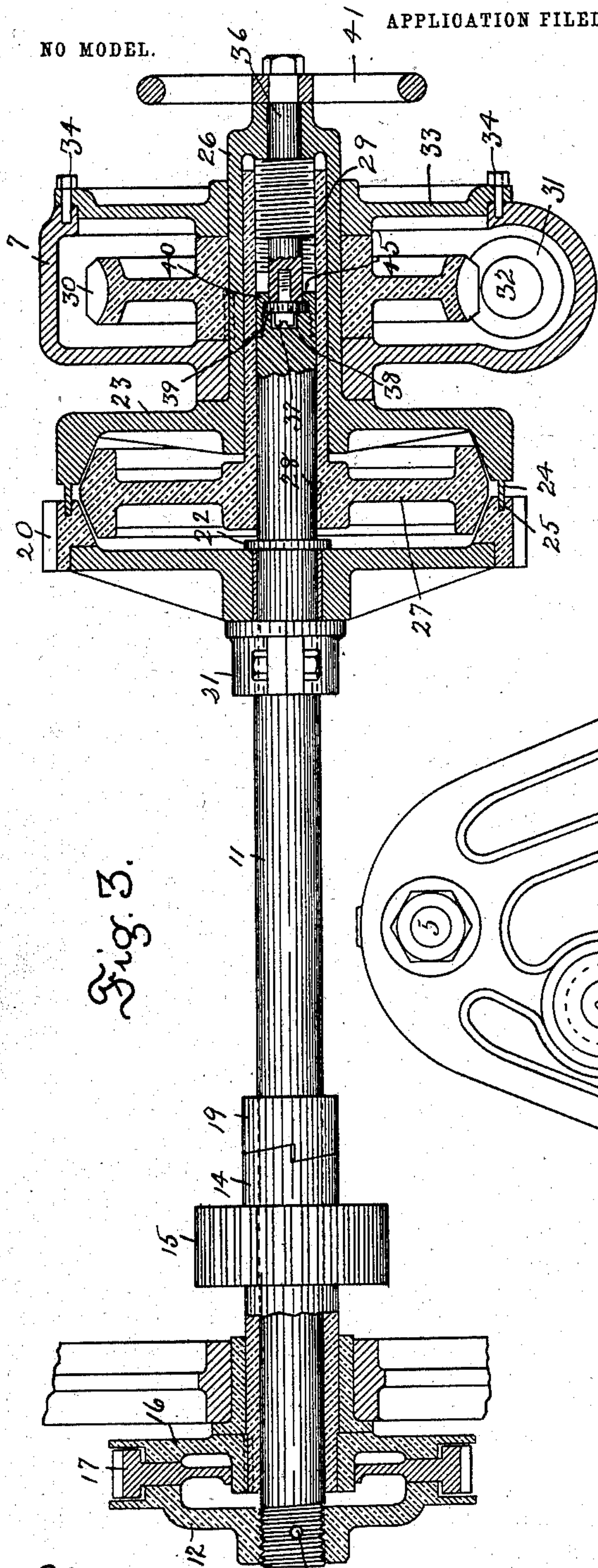


Fig. 3.

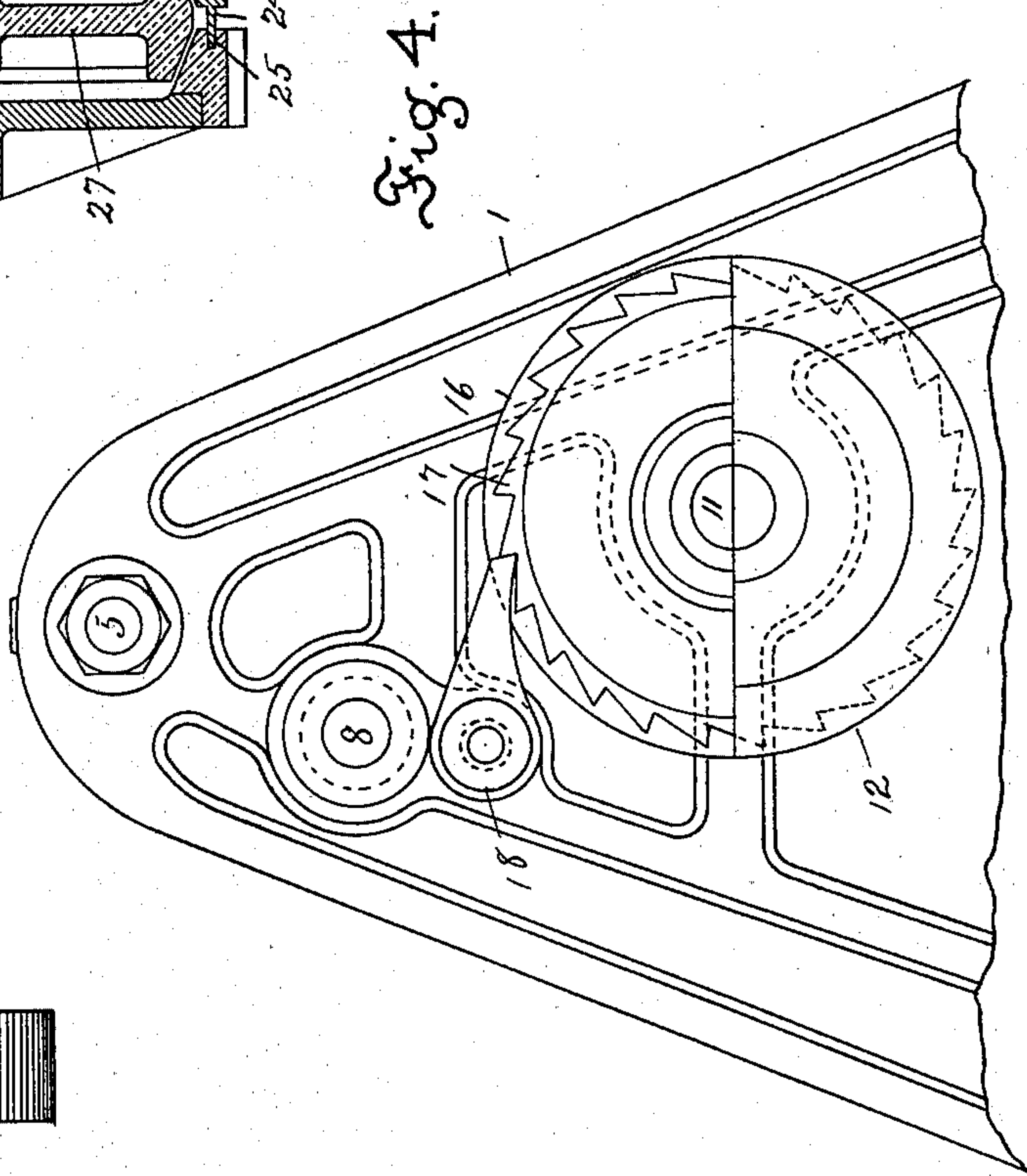


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES E. ELLICOTT AND JOHN B. NORRIS, OF BALTIMORE, MARYLAND.

COMBINED HAND AND MOTIVE POWER WINCH.

SPECIFICATION forming part of Letters Patent No. 749,279, dated January 12, 1904.

Application filed September 4, 1903. Serial No. 171,874. (No model.)

To all whom it may concern:

Be it known that we, CHARLES E. ELLICOTT and JOHN B. NORRIS, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in a Combined Hand and Motive Power Winch, of which the following is a specification.

This invention relates to improvements in combined hand and motive power winches.

The object of the invention is to provide a winch of such a construction as will permit of it being readily changed from hand to electric, steam, or other suitable power other than hand, or vice versa, for driving the main shaft from which power can be transmitted to any desirable point.

Other features of the invention will be fully set forth in the description of the accompanying drawings, in which—

Figure 1 is a side elevation of our improved device. Fig. 2 is a front elevation of same. Fig. 3 is a detailed sectional view, on an enlarged scale, of the main shaft and the parts mounted thereon; and Fig. 4 is a side elevation of the upper end of the frame, showing the pawl and ratchet.

Similar reference-numerals designate like parts throughout the several views of the drawings.

Referring to the accompanying drawings, forming part of this specification, 1 and 2 designate the sides of the metal frame, which are bolted to the base 3 by means of the bolts 4. The said sides 1 and 2 are held in their proper relative position by the rod 5 at the upper ends and by the rods 6 at the lower ends. The side 2 of the frame is provided with a housing 7, cast integral therewith.

The shaft 8 extends across the metal frame and is journaled in the sides 1 and 2. The ends of the shaft 8 project beyond the sides 1 and 2 of the frame and are provided with cranks 9, by means of which the said shaft is turned by hand-power. A small gear-wheel 10 is rigidly fixed to the shaft 8 and meshes with another gear-wheel on the main shaft 11.

The main shaft 11 extends across the metal frame and has one end journaled in the side 1 and the other end in the housing 7 of the side

2. On one end of the shaft 11 is a metal disk 12, screw-threaded upon said shaft and held securely in position by means of a pin 13, which extends through said disk and into the shaft 11. Loosely mounted upon the shaft 11 is a sleeve 14, which latter is provided with a gear-wheel 15, keyed thereto. One end of the sleeve 14 projects through the side 1 of the frame and is provided with a disk 16, keyed thereto. Loosely mounted upon the hub of the disk 16 and projecting between the disks 12 and 16 is a ratchet-wheel 17, which latter is provided with a pawl 18 to prevent the backward rotation thereof. When the sleeve 14 is forced to the left, the disk 16 will be carried with it and the ratchet-wheel 17 clamped between the disk 12 and disk 16 and carried with the shaft 11. The collar 19 is keyed to the shaft 11 and impinges against one end of the sleeve 14. The facing surfaces of the sleeve 14 and collar 19 are provided with a double incline, so that when the shaft 11 is revolved in one direction the sleeve 14 will be moved to the left along the said shaft, carrying with it the friction-disk 16 and ratchet-wheel 17 and clamping the latter tightly between the disks 12 and 16, which causes the friction between the collar 19 and sleeve 14 and between the ratchet-wheel 17 and friction-disk 16 to increase to such a degree that all the said parts will revolve with the shaft 11. When the shaft 11 is held stationary, the gear-wheel 15, and consequently the sleeve 14, will be prevented from revolving backward or in the direction opposite to that just described, as the slightest backward movement of the said gear-wheel would cause the sleeve 14 to move to the left, owing to the inclined facing surfaces of the said sleeve 14 and collar 19, and force the friction-disk 16 against the ratchet-wheel 17, which latter is held by the pawl 18.

A gear-wheel 20 is loosely mounted upon the shaft 11 and is prevented from moving longitudinally on said shaft by means of the collars 21 and 22. The gear-wheel 20 meshes with the gear-wheel 10 on the shaft 8. A disk 23 is also loosely mounted on the shaft 11 and has an integral flange 24, which projects into an annular groove 25 in the gear-wheel 20. The disk 23 is provided with an integral hol-

low hub 26, which projects through the housing 7 of the side 2 of the frame. The friction-clutch 27 is keyed to the shaft 11 at 28, but is free to move a limited distance longitudinally on said shaft. The outer surface of the said clutch 27 is inclined to correspond to the inclined faces of the gear-wheel 20 and disk 23. This clutch 27 is provided with a sleeve 29, integral therewith, which extends into the hollow hub 26 of the disk 23 and is screw-threaded on its inner surface to mesh with the screw-threads on the secondary shaft, as hereinafter described.

A gear-wheel 30 is keyed to the hub 26 of the disk 23 and is inclosed within the housing 7. This gear-wheel 30 meshes with a worm 31 on the shaft 32, also in the housing 7. The housing 7 is provided with a disk or plate 33, bolted at 34, which covers the aperture through which the wheel 30 can be withdrawn. The shaft 32 in the present instance is driven by a motor 34^a, which latter is secured to a base 35, cast integral with the side 2 of the frame; but it is obvious any other source of power may be employed.

A secondary shaft 36 projects through the end of the hollow hub 26 and extends into the sleeve 29 and has its inner end revolubly secured to the shaft 11. This shaft 36 is held to the shaft 11 by means of a bolt 37, having its head embedded in a recess 38 in the end of the said shaft 11 and the opposite end screwed into the end of the shaft 36. Between the head of the bolt 37 and the end of the shaft 36 is a collar 39. A nut 40 is screwed on the end of the shaft 11 and is provided with a shoulder 45, which impinges against the collar 39 and holds the latter tightly against the end of the shaft 11 and prevents the head of the bolt 37 from pulling out of the head of the recess 38. The recess 38 in the end of the shaft 11 is sufficiently deep to allow the head of the bolt 37 to revolve freely therein. On the outer end of the shaft 36 is keyed a hand-wheel 41, by means of which the shaft 36 is turned for the purpose of moving the friction-clutch longitudinally on the shaft 11 and changing the contact of the said clutch from the gear-wheel 20 to the disk 23, or vice versa, thereby changing the mode of operation of the shaft 11.

A shaft 42 is journaled in the sides 1 and 2 of the frame and is provided with a gear-wheel 43, which meshes with the gear-wheel 15 on the sleeve 14. This shaft 42 in the present instance is provided with two sprocket-wheels 44, from which power is transmitted to the desired point. It is obvious, however, that pulleys or gear-wheels may be substituted for the sprocket-wheels.

When it is desired to work the device as a hand-power machine, the wheel 41 is turned until the friction-clutch 27 is forced against the gear-wheel 20, to which motion is transmitted from the shaft 8 through the gear-

wheel 10. The shaft 10 is turned by means of the cranks 9 on the outer ends. As the gear-wheel 20 revolves it being in contact with the friction-clutch 27 will carry the said clutch with it, which latter being keyed to the shaft 11 causes the latter to revolve. As the shaft 11 revolves the collar 19, being keyed to the shaft 11, forces the sleeve 14 to the left on the shaft 11, causing the disk 16 to contact with the ratchet-wheel 17 and force the latter against the disk 12. At this point the friction of the parts is so great that the sleeve 14, and consequently the gear-wheel 15, is carried with the revolving shaft 11. The gear-wheel 15, being keyed to the sleeve 14, will revolve with the latter and transmit motion through the gear-wheel 43 to the shaft 42, from which latter it is transmitted to any desired point.

When it is desired to work the device by steam, electricity, or other motive power, the wheel 41 is turned in the opposite direction to that above described until the friction-clutch 27 contacts with the disk 23, to which motion is transmitted through the worm 31 on the shaft 32 and the gear-wheel 30, which latter is keyed to the hub 26 of the said disk 23. The result of driving the disk 23 by motive power when in contact with the clutch 27 will be identical with that described when the friction-clutch is in engagement with the gear-wheel 20.

When it is desired to reverse the gear-wheel 10—say for the purpose of lowering a load which has been raised—the travel of the shaft 11 is reversed, and as the collar 19 revolves the action of the inclined facing surfaces of the said collar 19 and sleeve 14 will allow the latter to move along the shaft 11 to the right sufficiently to release the disk 16 from contact with the ratchet-wheel 17 and permit the sleeve 14, and consequently the gear-wheel 10, to revolve with the shaft 11. Should the said gear-wheel 10 and sleeve 14 attempt to revolve faster than the shaft 11, this will be prevented by the action of the inclined faces of the said sleeve 14 and collar 19. The backward motion of the sleeve 14, if traveling faster than the shaft 11, would cause the inclined face of the sleeve to ride up on the highest part of the inclined face of the collar 19 and force the sleeve to the left and cause the friction-disk 16 to contact with the ratchet-wheel 17, and as the latter is held by the pawl 18 the said sleeve 14 and gear-wheel 10 would be held and prevented from traveling faster than the shaft 11.

While we have shown an electric motor for driving the shaft 32, it is obvious any other motive power may be employed.

Having thus described our invention, what we claim is—

1. The combination of a shaft having a gear-wheel loosely mounted thereon; a disk loosely mounted on said shaft and having a hub pro-

jecting at right angles thereto; a friction-clutch keyed to said shaft and projecting between the gear-wheel and disk; means to throw the said clutch in or out of engagement with either the said gear-wheel or disk; a gear-wheel keyed to the hub of the said disk; and a shaft having a worm thereon which meshes with the gear-wheel on the hub of the said disk.

2. The combination of a hand-power shaft having a gear-wheel keyed thereto; cranks for turning said shaft; a main shaft having a gear-wheel loosely mounted thereon which meshes with the gear-wheel on the hand-power shaft; a disk loosely mounted on the main shaft and having a gear-wheel keyed to the hub thereof; a friction-clutch keyed to the main shaft and projecting between the gear-wheel and disk, on said shaft; means for throwing the friction-clutch in or out of engagement with either the said wheel or disk; and a worm meshing with the gear-wheel on the hub of the said disk.

3. The combination of a shaft having a gear-wheel loosely mounted thereon; a disk loosely mounted on said shaft and having a hub projecting at right angles thereto; a friction-clutch keyed to said shaft and projecting between the gear-wheel and disk; means to throw the said clutch in or out of engagement with either the said gear-wheel or disk; a gear-wheel keyed to the hub of the said disk; a shaft having a worm thereon which meshes with the gear-wheel on the hub of the disk; a double-inclined-faced collar keyed to the main shaft; a sleeve loosely mounted on the main shaft having a double-inclined end impinging against the end of the said collar and carrying a gear-wheel; a disk keyed to the

opposite end of the said sleeve; a disk carried on the outer end of the main shaft; a ratchet-wheel loosely mounted between the two disks on the outer end of the main shaft; and means to prevent the backward rotation of the ratchet-wheel.

4. The combination of a shaft having a gear-wheel loosely mounted thereon; a disk loosely mounted on said shaft and having an integral hub; a friction-clutch keyed to said shaft and projecting between the gear-wheel and disk; means to throw the said clutch in or out of engagement with either the said gear-wheel or disk; a gear-wheel keyed to the hub of said disk; a shaft having a worm thereon which meshes with the gear-wheel on the hub of the disk; a double-inclined-face collar keyed to the main shaft; a sleeve loosely mounted on the main shaft having a double-inclined end impinging against the end of the said collar and carrying a gear-wheel; a disk carried on the outer end of the main shaft; a disk keyed to the outer end of the sleeve; a ratchet-wheel loosely mounted between the two disks on the outer end of the main shaft; means to prevent the backward rotation of the ratchet-wheel; a driven shaft within the frame from which power is transmitted to any desirable point; and a gear-wheel keyed to said driven shaft and meshing with the gear-wheel on the sleeve on the main shaft.

In testimony whereof we affix our signatures in the presence of two witnesses.

CHARLES E. ELLICOTT.

JOHN B. NORRIS.

Witnesses:

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