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C. E. ELLICOTT & J. B. NORRIS.

INTERCHANGEABLE HAND AND MOTIVE POWER MECHANISM.

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NO MODEL.

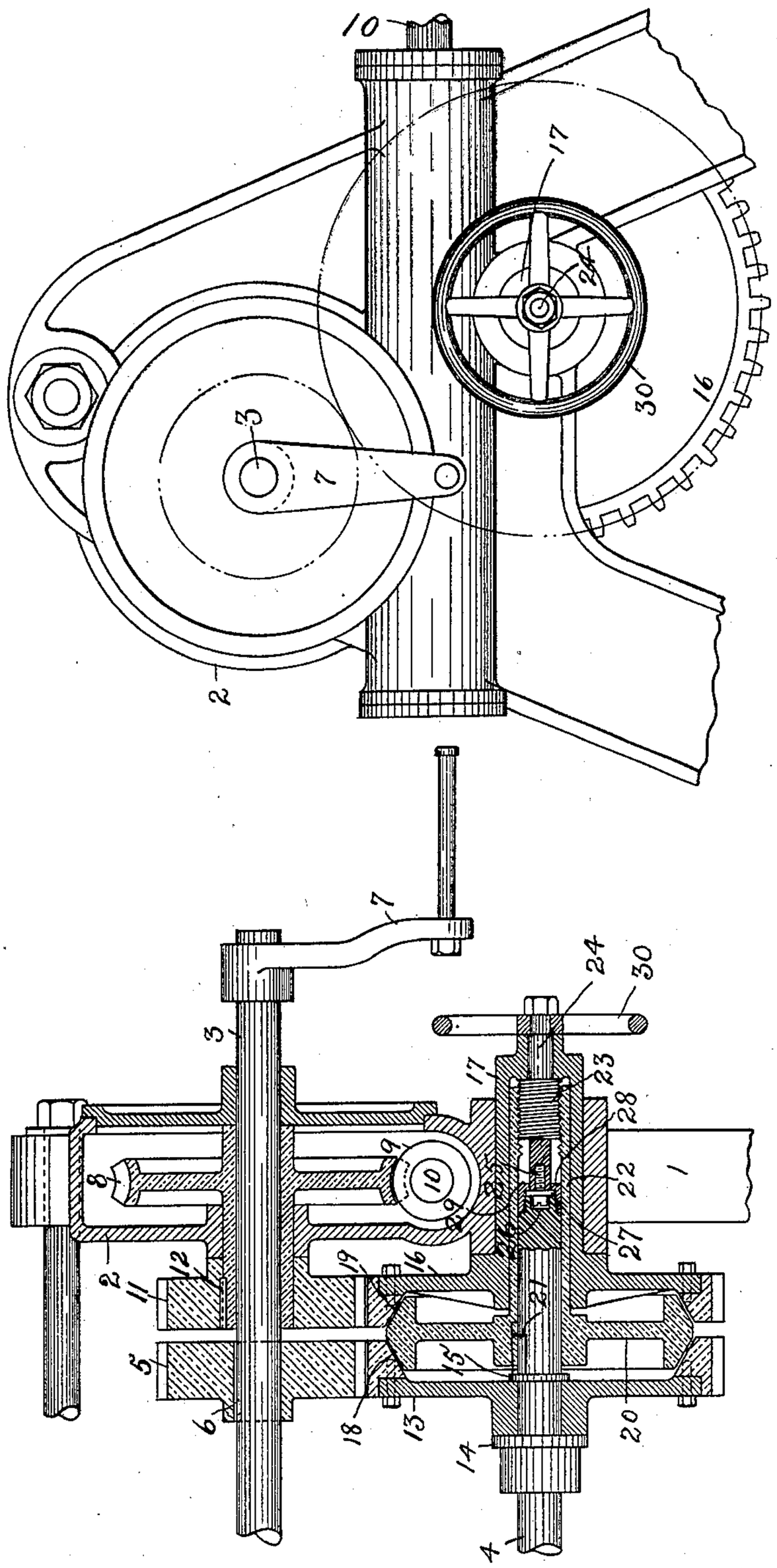

Fig. 2.

Fig. 1.

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UNITED STATES PATENT OFFICE.

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

INTERCHANGEABLE HAND AND MOTIVE POWER MECHANISM.

SPECIFICATION forming part of Letters Patent No. 754,757, dated March 15, 1904.

Application filed September 1, 1903. Serial No. 171,532. (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 Interchangeable Hand and Motive Power Mechanism, of which the following is a specification.

This invention relates to improvements in interchangeable hand and motive power mechanism.

The object of the invention is to provide a device that can be readily changed from hand to electric, steam, or other motive power, or vice versa, for driving a shaft from which power is 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 vertical longitudinal section of the crank-shaft and main shaft and the operative parts mounted thereon; and Fig. 2 is an end view of same, showing part of the frame in which the crank-shaft and main shaft are journaled.

Referring to the accompanying drawings, forming part of this application, 1 designates a frame having a housing 2 integral therewith, 3 the crank-shaft, and 4 the main shaft. The crank-shaft 3 is journaled in the housing 2 and is provided with a gear-wheel 5, keyed thereto at 6, and a crank 7 on the outer end for revolving the said shaft. Loosely mounted upon the shaft 3 within the housing 2 is a worm-wheel 8, which meshes with the worm 9 on the shaft 10, which latter is driven by steam, electricity, or other motive power. One end of the hub of the worm-wheel 8 projects through the housing 2 and is provided with a gear-wheel 11, keyed thereto at 12.

A gear-wheel 13 is loosely mounted upon the main shaft 4 and is prevented from moving longitudinally on the said shaft by means of the collars 14 and 15. This gear-wheel 13 meshes with the gear-wheel 5 on the crank-shaft 3 and is driven by hand-power from said shaft 3 by means of the crank 7. The gear-wheel 16 is loosely mounted upon the shaft 4 and meshes with the gear-wheel 11, keyed to the hub of the worm-wheel 8, and is driven by electricity, steam, or other suitable power other than hand. The gear-wheel 16 is provided with a hollow hub 17, which extends through the side of the frame 1 below the housing 2. The gear-wheels 13 and 16 are each provided with inclined faces 18 and 19, against which the friction-clutch 20 is forced when it is desired to drive either one or the other of said gear-wheels. The friction-clutch 20 is keyed to the shaft 4 at 21, but is free to move a limited distance longitudinally on the said shaft. The outer surface of the said clutch 20 is inclined to correspond to the inclined faces 18 and 19 of the gear-wheels 13 and 16. This clutch 20 is provided with a sleeve 22, integral therewith, which extends into the hollow hub 17 of the gear-wheel 16 and is screw-threaded on the inside to mesh with the screw-threads 23 on the secondary shaft 24. A secondary shaft 24 projects through the end of the hollow hub 17 and extends into the sleeve 22 and has its inner end revolubly secured to the shaft 4. This shaft 24 is held to the shaft 4 by means of a bolt 25, having its head embedded in a recess 26 in the end of the said shaft 4 and the opposite end screwed into the end of the shaft 24. Between the head of the bolt 25 and the end of the shaft 24 is a collar 27. A nut 28 is screwed over the end of shaft 4 and is provided with a shoulder 29, which impinges against the collar 27 and prevents the head of the bolt 25 from pulling out of the recess 26. The recess 26 in the end of the shaft 4 is sufficiently deep to allow the head of the bolt 25 to revolve freely therein. On the outer end of the shaft 24 is rigidly secured a hand-wheel 30, by means of which the shaft 24 is turned for the purpose of moving the friction-clutch 20 longitudinally on the shaft 4 and changing the contact of the said clutch from the gear-wheel 13 to the gear-wheel 16, or vice versa, thereby changing the mode of operation of the shaft 4.

When it is desired to work the device as a hand-power machine, the wheel 30 is turned until the friction-clutch 20 is forced against the gear-wheel 13, to which motion is transmitted through the gear-wheel 5 on the shaft 3, which latter is revolved by the crank 7. As the pulley 13 revolves, being in contact

with the clutch 20, it will carry the said clutch with it, which latter being keyed to the shaft 4 causes the latter to revolve. Power can be transmitted from the shaft 4 to any desired point.

When it is desired to work the device by steam, electricity, or other power except by hand, the wheel 30 is turned in the opposite direction from that just described until the friction-clutch 20 contacts with the gear-wheel 16, to which motion is transmitted from the shaft 10 through the medium of the worm-wheel 8 and gear-wheel 11. The result of driving the gear-wheel 16 will be identical with that described for the gear-wheel 13.

Having thus described our invention, what we claim is—

1. The combination of the crank-shaft; a gear-wheel keyed to said crank-shaft; a worm-wheel loosely mounted on said crank-shaft and having a gear-wheel keyed to the hub thereof; means for driving said worm-wheel; the main shaft; a gear-wheel loosely mounted on said main shaft and meshing with the gear-wheel on the crank-shaft; a gear-wheel loosely mounted on the main shaft and meshing with the gear-wheel upon the hub of the worm-wheel; a friction-clutch keyed to the main shaft; and means to throw the said clutch in or out of engagement with either of the gear-wheels on the main shaft.

2. The combination of the crank-shaft; a gear-wheel keyed to said crank-shaft; a worm-wheel loosely mounted on said crank-shaft and having a gear-wheel keyed to the hub thereof; means for driving said worm-wheel; the main shaft; a gear-wheel loosely mounted on the main shaft and meshing with the gear-wheel on the crank-shaft; a gear-wheel loosely mounted on the main shaft, meshing with the gear-wheel keyed to the hub of the worm-wheel, and having an integral hollow hub; a friction-clutch keyed to said main shaft and having an integral sleeve projecting into the hollow hub and screw-threaded on the inner surface; a secondary shaft secured to, and revoluble independent of, the main shaft and having screw-threads to mesh with the threads on the integral sleeve; and a wheel keyed to the secondary shaft for revolving the latter, whereby the said clutch is thrown in or out of engagement with either of the gear-wheels on the main shaft.

3. The combination of a housing; a crank-shaft projecting through the said housing and having a gear-wheel keyed thereto; a worm-wheel within the housing loosely mounted upon the crank-shaft and having its hub projecting through one side of the said housing; a gear-wheel keyed to the hub of the worm-wheel; a shaft projecting into the housing and having a worm thereon which meshes with the said worm-wheel; the main shaft; a gear-wheel loosely mounted upon the main shaft and meshing with the gear-wheel on the crank-shaft; a gear-wheel loosely mounted on the main shaft and meshing with the gear-wheel keyed to the hub of the worm-wheel; and having an integral hollow hub; a friction-clutch keyed to said main shaft and having an integral sleeve projecting into said hollow hub and screw-threaded in the inner surface; a secondary shaft secured to, and revoluble independent of, the main shaft and being screw-threaded to mesh with the threads on the integral sleeve; and a wheel keyed to the secondary shaft for revolving the latter, whereby the said clutch is thrown in or out of engagement with either of the gear-wheels on the main shaft.

4. The combination of a shaft having a fixed and a loose gear thereon, means for driving said shaft, means for driving said loose gear independently of the shaft upon which it is mounted, a second shaft having gears loose thereon meshing with the gears of the first-mentioned shaft, and means for locking either of said loose gears carried by the second-mentioned shaft to said shaft.

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

CHARLES E. ELLICOTT.
JOHN B. NORRIS.

Witnesses:
CHAPIN A. FERGUSON.
CHARLES H. MILLIKIN.