

O. A. EN HOLM.
ELECTRIC HAND SETTING MECHANISM.

(Application filed Aug. 30, 1901.)

(No Model.)

Fig. 2.

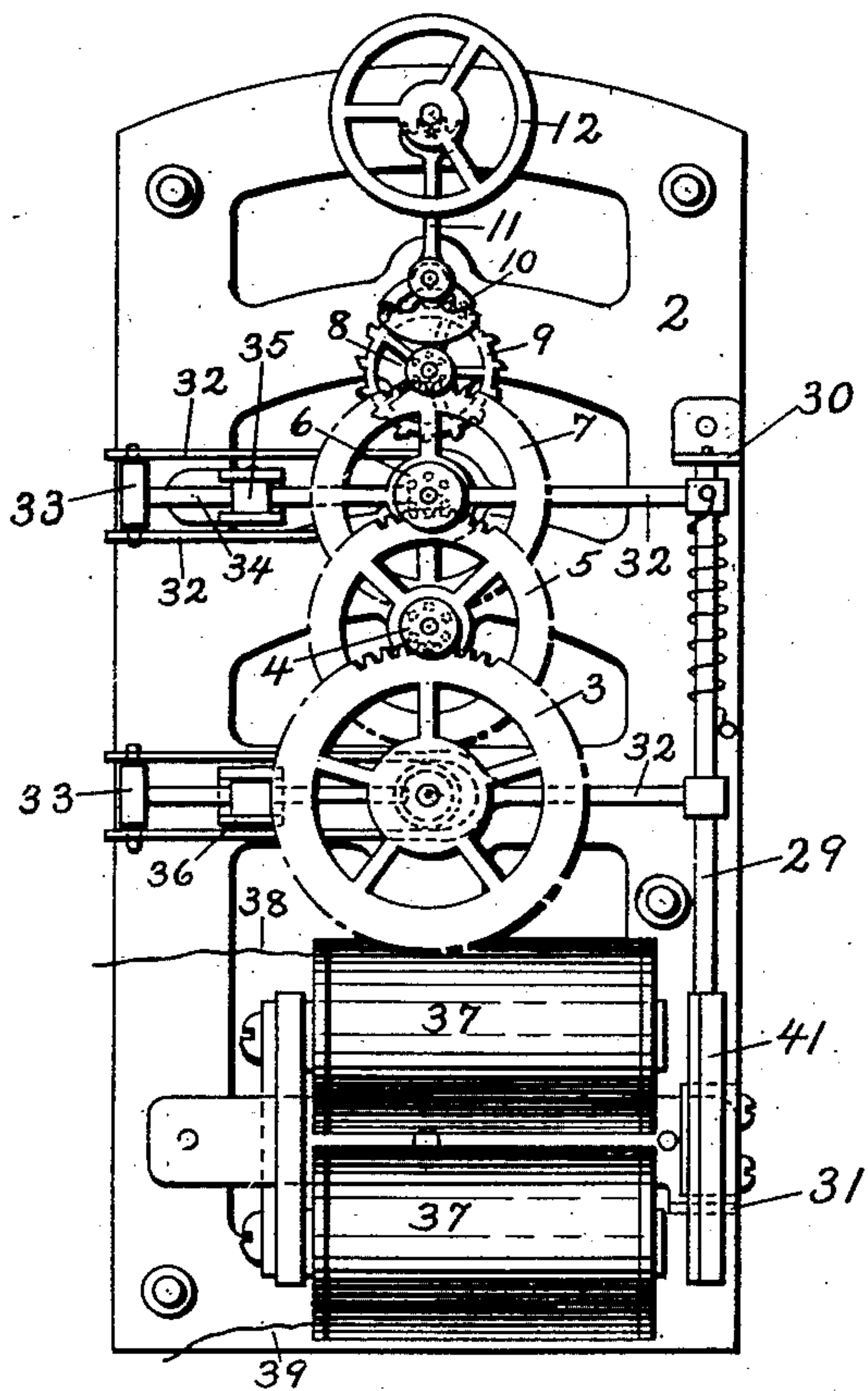


Fig. 1.

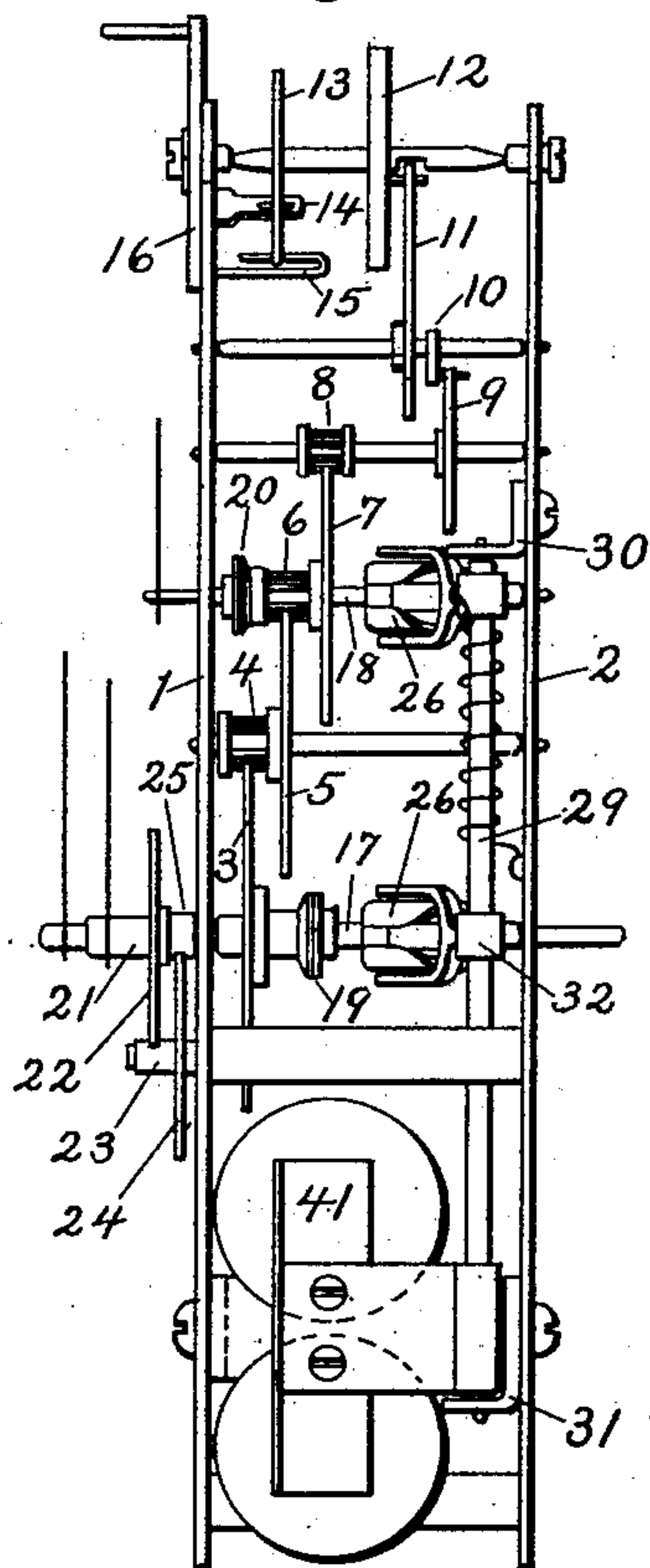


Fig. 3.

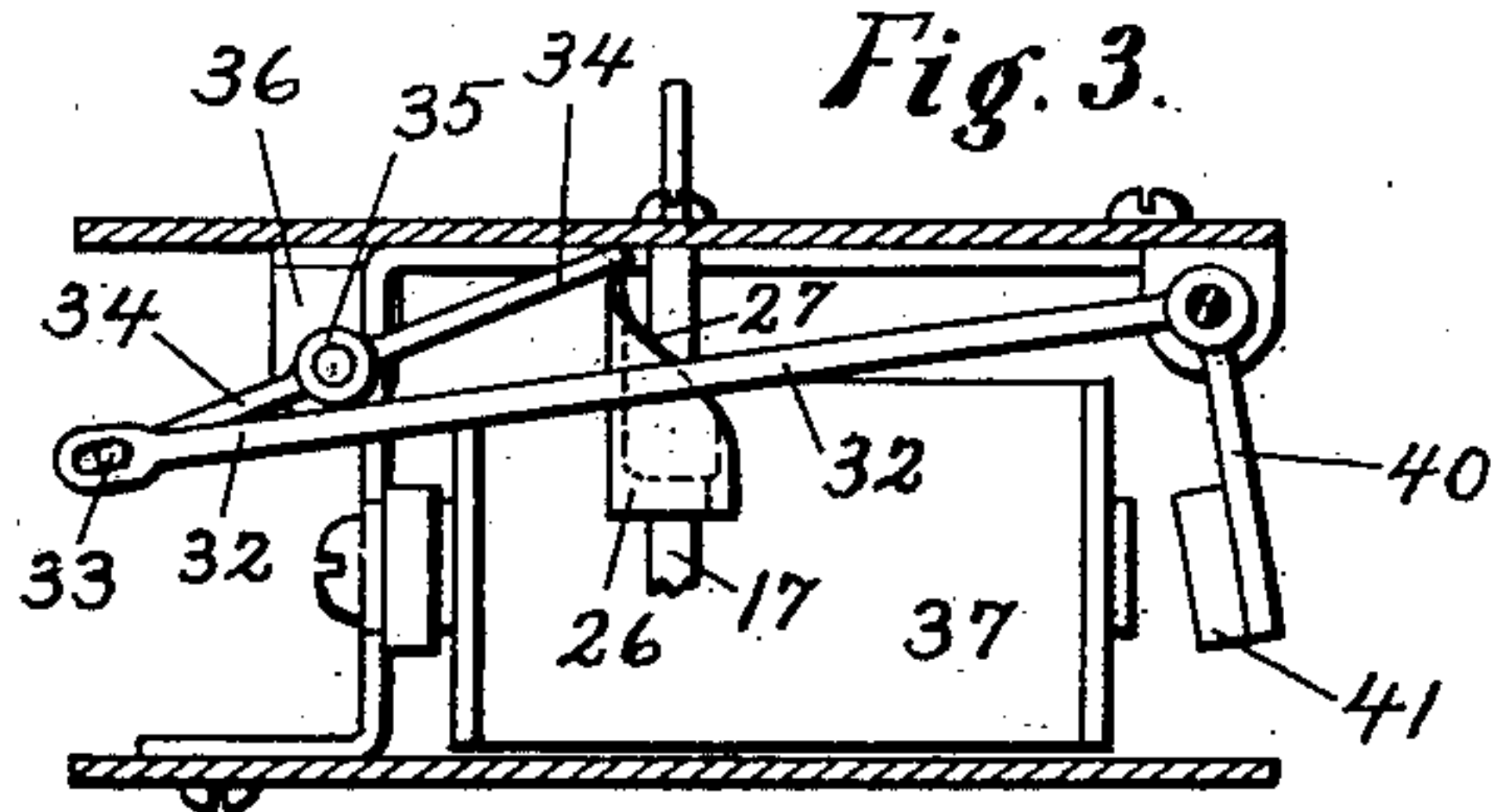
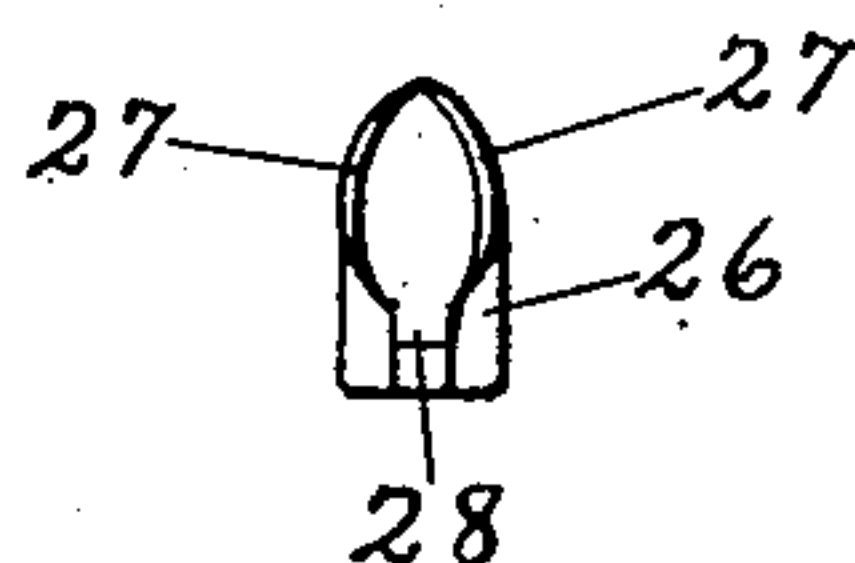


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

OSCAR A. EN HOLM, OF NEW YORK, N. Y.

ELECTRIC HAND-SETTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 713,864, dated November 18, 1902.

Application filed August 30, 1901. Serial No. 73,791. (No model.)

To all whom it may concern:

Be it known that I, OSCAR A. EN HOLM, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Synchronizing Devices, of which the following is a full, clear, and exact specification.

This invention relates to synchronizing devices, and its object is to provide improved means for regulating one or more clocks to cause the same to operate in unison with a master-clock.

A further object of the invention is to provide means whereby the movement of all the hands of the clock may be synchronized.

The invention will be more particularly described with reference to the accompanying drawings, in which—

Figure 1 is a side view of a clock mechanism embodying my invention. Fig. 2 is a front view of the mechanism shown in Fig. 1, from my point of view the front frame-piece. Fig. 3 is a top detail view showing the mechanism and connections to one of the synchronizing-cams, and Fig. 4 is a detail view of one of the cams.

Referring more particularly to the drawings, 1 and 2 represent the frames in which the clockworks are mounted, these works being of any suitable construction. In the drawings a train of gears and pinions 3, 4, 5, 6, 7, and 8, driven by any suitable power, terminate in an escapement 9, governed by a balance 10, the latter, through the usual balance-lever 11, being regulated by the balance-wheel 12 and spring 13.

14 is the standard, to which one end of spring 13 is fixed, and 15 is the projecting end of lever 16, to which end the spring 13 is attached, whereby the tension of the spring may be regulated by the lever 16. The gear 3 and also pinion 6 and gear 7 are frictionally mounted on the respective shafts 17 and 18, whereby normally when the shafts are turned the gears will also be turned; but under an excessive power the shafts may be turned without turning the gears. Preferably spring-washers 19 20 of ordinary construction are employed for this purpose. The second-hand is mounted upon shaft 18 and the minute-hand upon shaft 17. The hour-hand is mount-

ed, as is usual, upon a collar 21, loosely mounted upon shaft 17 and connected through a reducing-gear 22, 23, and 24 to a pinion 25, fixed to shaft 17.

In carrying out my invention I rigidly mount upon each of the shafts carrying the hands—viz., 17 18—a cam 26. Preferably this cam is of the form shown in the drawings, wherein the two cam-surfaces 27 27 are so arranged as to lead into a common slot or recess 28. The slot is the preferred form, because greater accuracy in the operation of the device is thereby secured without interfering with the free movement of the operating-arms, to be hereinafter described. The shaft 29 is mounted in suitable standards 30 and 31, carried by the frame-clock, and the rotation of this shaft is arranged to turn the cams 26 26. In the construction shown in the drawings this is done by rigidly attaching to the shaft 29 the bifurcated rods 32 32, which straddle the cams 26 and at their outer ends are loosely pivoted to a cross-head 33, carried by the operating-arm 34, the latter being pivoted at 35, and a standard 36, carried by the frame. The ends of the arms 34 are adapted to engage the cam-surfaces 27 27 of the cams 26. The cams are so mounted upon their respective shafts that when the arm 34, moving against the cam-surfaces 27, turns the cam and shaft 17 around until the arm 34 enters the slot 28, that then the hands will point to the time at which the clock is to be synchronized. For instance, if the clock is to be synchronized at twelve o'clock each day, then the hands of the clock should point to twelve o'clock at the time that the arm 34 enters the slot 28. Attached to the frame of the clock is a magnet 37, in this instance shown as a double magnet, operated from the circuit 38 39, and an arm 40, rigidly attached to the shaft 28, carries an armature 41, which is under influence of the magnet 37.

In order to secure a more compact arrangement of the parts of the clock and a simpler application of the power, it will be found of advantage to arrange the shafts of the respective gears in line with each other, as I have illustrated herein.

In the operation of the device, the circuit 38 39 having been connected with a master-clock in the usual manner at the time the

clock is to be synchronized, the circuit will be closed by the master-clock, and thus the magnet 37 will be energized. This attracts the armature 41 and through the arm 40 turns the shaft 29 in its bearings, thus through the rods 32 sending the arms 34 upon their pivots. As the arms 34 swing upon their pivots their ends engage the cam-surfaces 27, and thus rotate the shaft 17 until the ends of the arms 34 enter the slots 28, at which time the hands of the clock will stand at the proper hour. As the shaft 17 is rotated the turning of pinion 28, which is rigidly attached thereto, turns the hour-hand to its proper position. As soon as the circuit is broken at the master-clock the armature 41 is drawn back by spring or other suitable means, thus moving the arms 34 out of engagement with the cams and permitting operation of the clock mechanism.

With the construction shown in the drawings the cams, by reason of the fact that the operating-arms enter the slots 28, are turned to their proper positions without endangering the apparatus by bringing the arms to a dead stop. Furthermore, in such construction the arms 34, by reason of swinging in the same plane in which the hands-carrying shafts lie, are permitted to have a maximum length of travel, and thus the pitch of the cam may be increased to the maximum, so that the shafts will be turned with a minimum application of power to the operating-arms.

It will be understood, of course, that the various parts shown herein and the connections between the same may be modified in numerous respects without departing from the invention, and I therefore desire it to be understood that I do not limit myself to the precise construction shown.

Having thus described my invention, I declare that what I claim as new, and desire to secure by Letters Patent, is—

1. In a clock mechanism, a rod adapted to be oscillated, means for oscillating said rod, a hand-carrying shaft, a cam mounted on said hand-carrying shaft for turning the same, and an arm pivoted intermediate of its ends and having a hinge connection at one end with said rod and engaging at the other end with said cam to rotate the latter.

2. In a clock mechanism, a rod adapted to be oscillated, a magnet for oscillating said rod, a hand-carrying shaft, a cam mounted on said hand-carrying shaft for turning the same, and an arm pivoted intermediate of its ends

and having a hinge connection at one end with said rod and engaging at the other end with said cam to rotate the same.

3. In a clock mechanism, a rod adapted to be oscillated, a magnet for oscillating said rod, a hand-carrying shaft, a magnet for oscillating said rod, a cam mounted on said hand-carrying shaft for turning the same and provided with an open slot, and an arm pivoted intermediate of its ends and having a hinge connection at one end with said rod and engaging at the other end with said cam to rotate the latter and adapted to enter said slot.

4. In clock mechanism, a rotatable shaft, means for partially rotating said shaft, a rod bifurcated at one end and carried by said shaft at the other end and oscillated by said shaft, a hand-carrying shaft, a cam mounted on said hand-carrying shaft for turning the same and registering with the bifurcation of said rod, and an arm pivoted intermediate of its ends and hinged at one end between the members of the bifurcation of said rod and engaging at the other end with said cam to rotate the latter.

5. In clock mechanism, a rotatable shaft, an electric magnet for partially rotating said shaft, a rod bifurcated at one end and secured to said shaft at the other end and oscillated by said shaft, a hand-carrying shaft, a cam mounted on said hand-carrying shaft for turning the same and registering with the bifurcation of said rod, and an arm pivoted intermediate of its ends and loosely hinged at one end between the members of the bifurcation of said rod and engaging at the other end with said cam to rotate the same.

6. In clock mechanism, a rotatable shaft, an electric magnet for partially rotating said shaft, a rod bifurcated at one end and attached to said shaft at the other end and oscillated by said shaft, a hand-carrying shaft, a cam mounted on said hand-carrying shaft for turning the same and provided with an open slot, and an arm pivoted intermediate of its ends and loosely hinged at one end between the members of the bifurcation of said rod and engaging at the other end with said cam to rotate the latter and adapted to enter said slot.

In testimony whereof I affix my signature in presence of two witnesses.

OSCAR A. EN HOLM.

Witnesses:

C. V. EDWARDS,
RALPH JONAS.