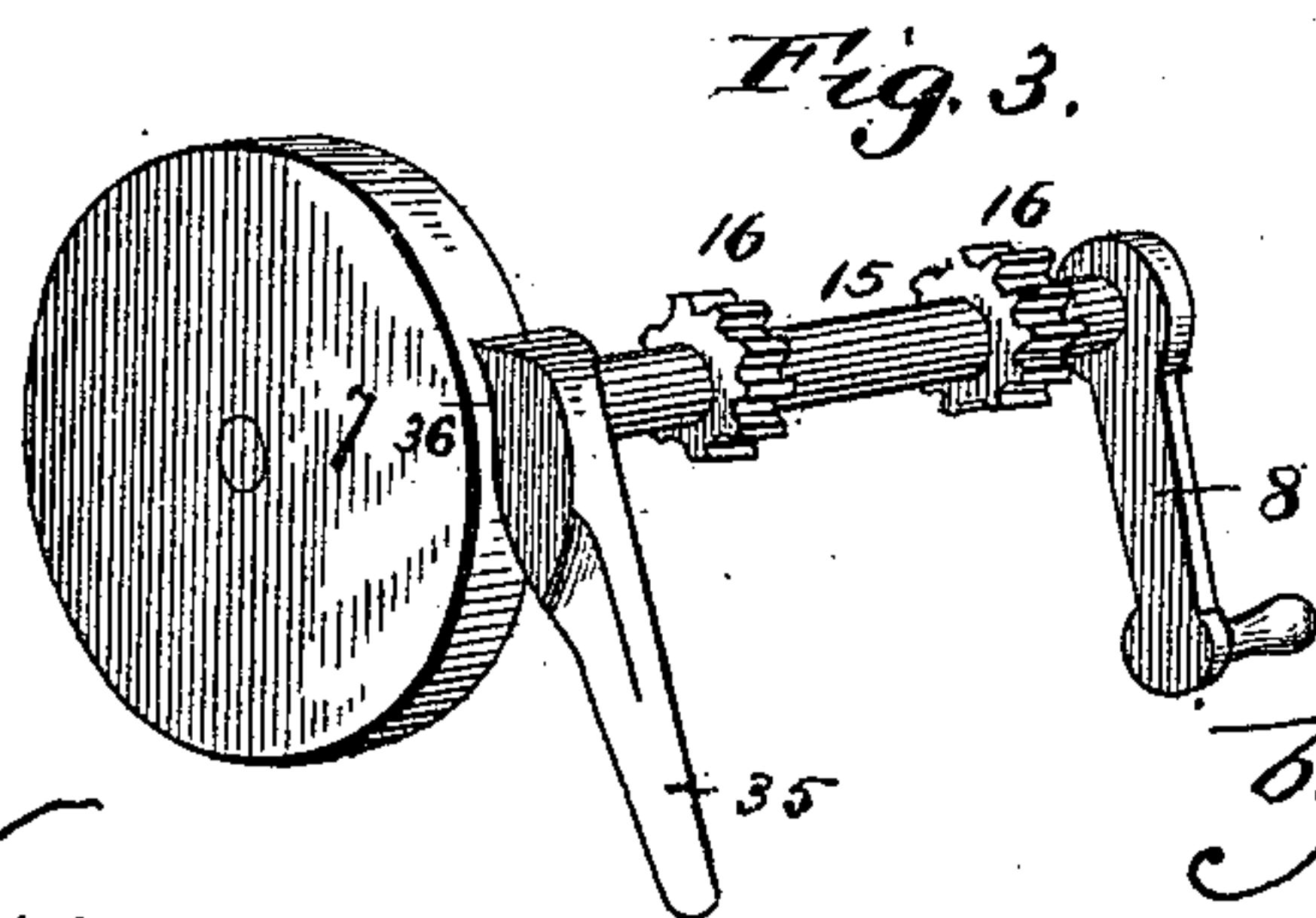
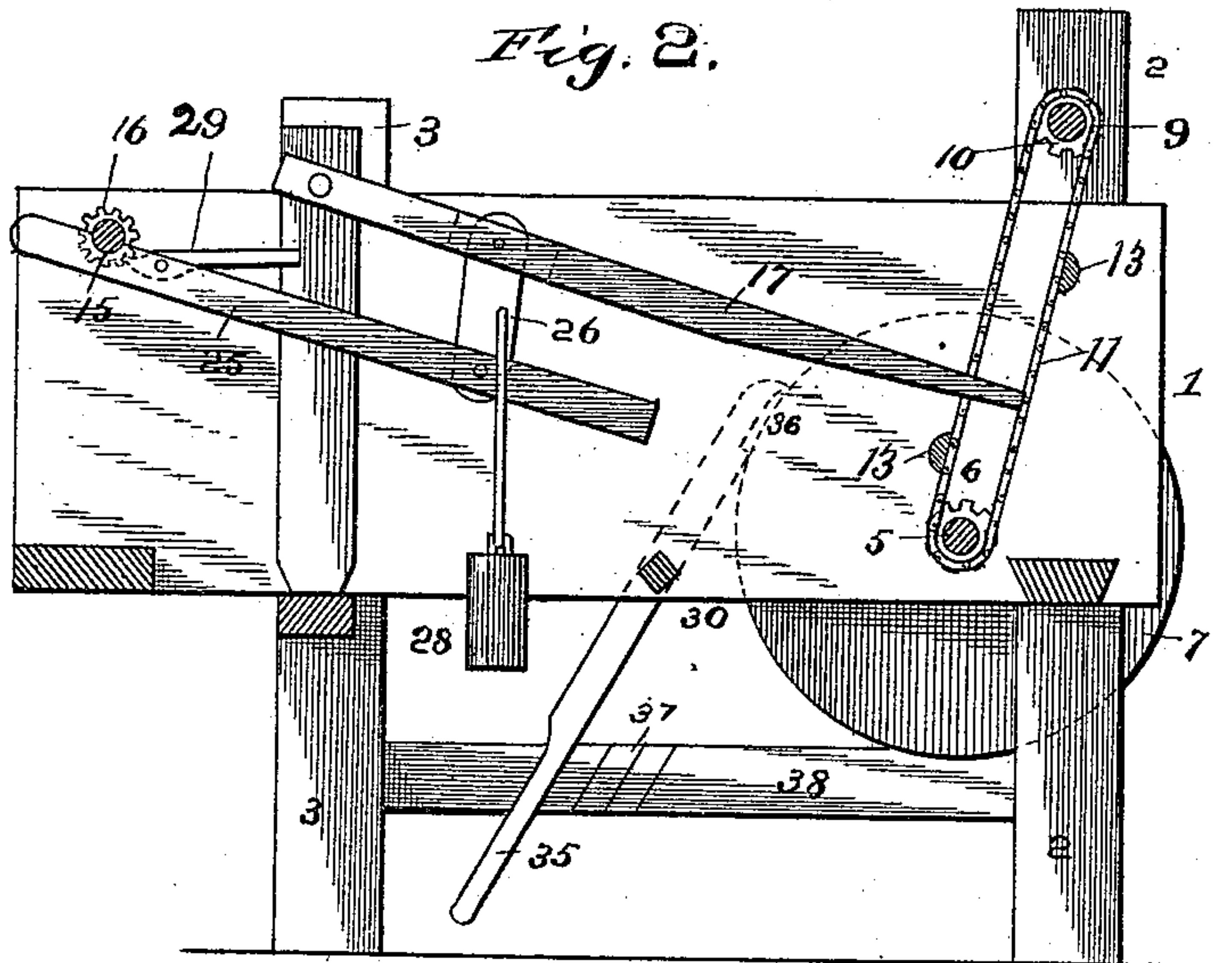
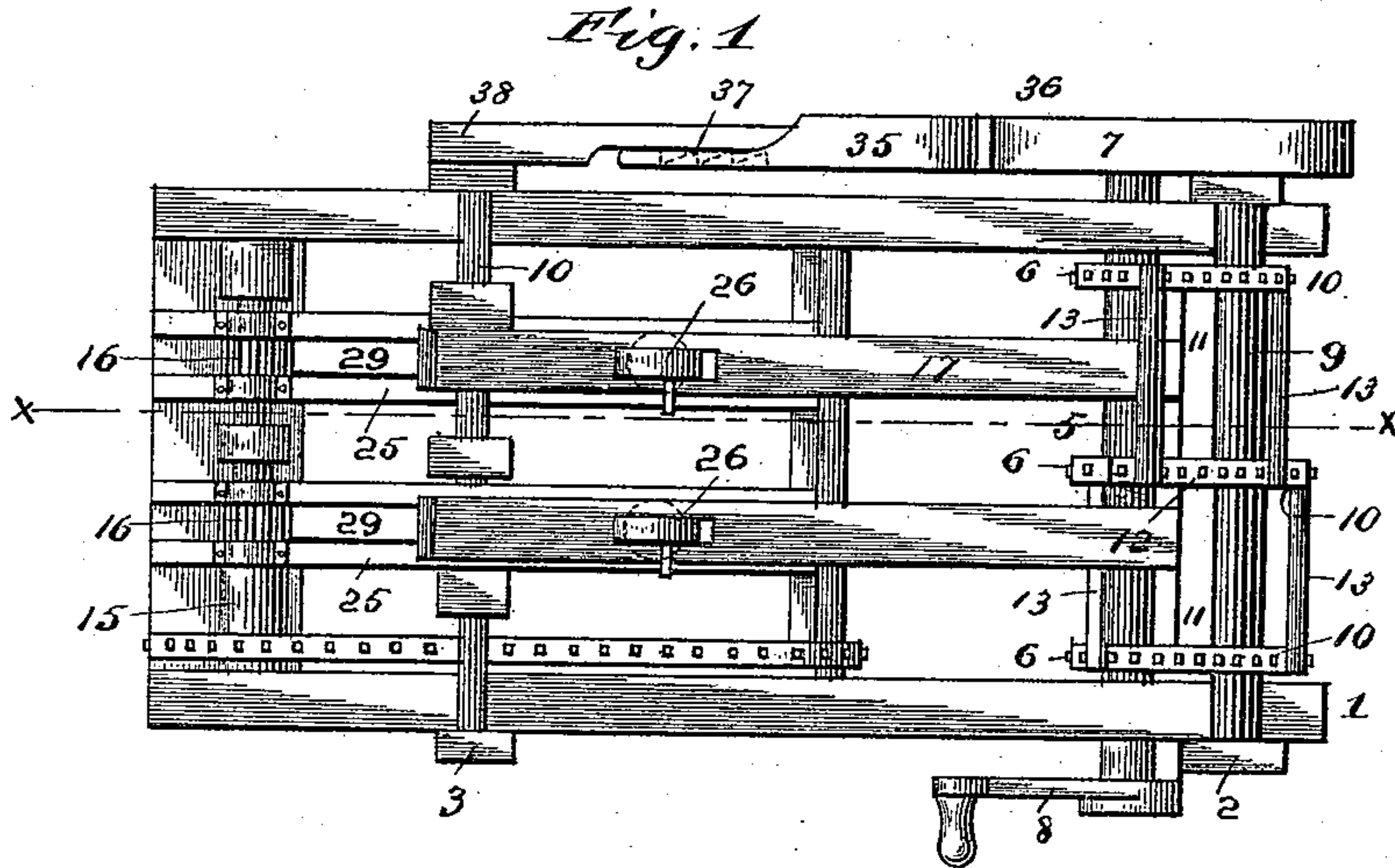


(No Model.)

J. R. G. HUFFMAN.  
MOTOR.

No. 446,134.

Patented Feb. 10, 1891.



Witnesses:

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Chas. F. Miller,

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by *Wm. Moore*  
Attorney.



# UNITED STATES PATENT OFFICE.

JAMES R. G. HUFFMAN, OF BEARDSLEY, KANSAS.

## MOTOR.

SPECIFICATION forming part of Letters Patent No. 446,134, dated February 10, 1891.

Application filed June 7, 1890. Serial No. 354,563. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES R. G. HUFFMAN, a citizen of the United States of America, residing at Beardsley, in the county of Rawlins and State of Kansas, have invented certain new and useful Improvements in Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

My present invention relates to an improved mechanical motor; and it has for its objects to increase the power expended to operate the machine and thus from a comparatively small amount of power to generate sufficient power to run mechanical appliances of various kinds, as a churn or other light mechanisms.

With this end in view the invention consists, essentially, in the combination of a primary shaft, an idle-shaft, a series of two or more endless belts passing around the primary and idle shafts and having lifter-bars or their equivalent set at different distances on said endless belts, a series of two or more weighted levers arranged to be alternately raised by the lifters on the endless belts, a shaft having ratchet-wheels and levers or pawl-carriers connected with the weighted levers to be operated thereby and provided with pawls which engage the ratchet-wheels on the power-shaft, whereby said power-shaft is rotated continuously in one direction by the depression of the series of levers, as will be more fully hereinafter described and claimed.

To enable others to understand my invention I have illustrated the same in the accompanying drawings, in which—

Figure 1 is a plan view of a mechanical motor constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view through the motor on the line  $x x$  of Fig. 1. Fig. 3 is a detail view of the primary shaft, showing the balance-wheel, the crank thereon, and the brake for arresting or retarding the motion of the wheel and shaft.

Like numerals of reference denote corresponding parts in all the figures of the drawings, referring to which—

1 designates the frame of the motor, which is provided with the upright standards 2 3, that protrude above the sides of the frame to

form supports for the shafts and also extend below the frame to form legs for the proper support of the machine. In suitable bearings in the sides of the frame I journal the primary shaft 5, which is provided with a series of toothed or sprocket wheels 6, the ends of the shaft being extended beyond the sides of the frame, and one end having the balance-wheel 7 and the other end a crank 8, by which power may be applied to the shaft in order to start and drive the motor.

9 is the idle-shaft, which is arranged in the upper part of the frame parallel with the primary shaft and having a series of sprocket or toothed wheels 10, which correspond to the wheels on the primary shaft. Around the toothed or sprocket wheels on the primary and idler shafts are passed a series of endless sprocket-chains 11 12, which are actuated by the primary shaft, and each of these sprocket-chains or endless belts carries a series of lifters 13, which preferably comprise the friction-rollers loosely fitted on pins secured to the chains or belts.

The lifters on the series of belts are spaced at regular intervals, and the lifters on one belt or apron are arranged alternately with relation to the lifters on one or both of the adjacent belts or aprons, whereby the weighted levers are lifted and depressed alternately by the lifters on the endless belts or aprons.

At the opposite end of the machine from the primary and idle shafts I provide another shaft 15, which I denominate a "power-shaft," and which is provided with a series of ratchet-wheels 16.

17 designates two weighted levers, which are arranged between the sides of the frame and the endless chains and the power-shaft. One end of each lever is fulcrumed on a rod or shaft 20, which is fixed in the sides of the frame and is common to all of the weighted levers, and the opposite ends of the weighted levers are arranged in the path of the lifters on the endless chains or belts, so as to be lifted by the same.

25 designates the series of pawl-carriers, which are arranged below the weighted levers, one pawl-carrier being below one of the weighted levers, and the forward ends of the pawl-carriers are forked or bifurcated, so as to straddle or embrace the ratchet-wheels,



while the pawl-carriers are loosely fitted on the power-shaft, so as to be free to oscillate on said shaft without affecting the position of the same. The pawl-carriers are connected  
 5 with the weighted levers by means of links 26, which are secured to the free ends of the pawl-carriers and to the levers at intermediate points of the length of the same, and from the pawl-carriers and links hang or are suspended the drop-weights 28, which serve to  
 10 increase the ponderosity and power of the levers. It will be noted that each lever is raised by one of the lifters on its corresponding endless chain or belt until said lifters clear the  
 15 ends of the levers, thus raising the latter to their fullest extent without affecting the power-shaft, and when the lever is released from the lifter the weight suddenly draws the lever and pawl-carrier downward, and this  
 20 motion is utilized to rotate the ratchet-wheel and power-shaft by means of a pawl 29, which is pivoted to the pawl-carrier and arranged to engage the ratchet-wheel, said pawl slipping freely on the ratchet when the weighted  
 25 lever is raised and dropping by gravity into one of the teeth when the lever is lowered. While one lever is being raised without affecting the power-shaft the other lever or levers of the series are being depressed by the  
 30 action of the weight or weights thereon, and the power-shaft is thus rotated or driven continuously in one direction by the rising and falling levers.

The power of the shaft may be taken directly from the shaft itself or from a counter-shaft 30, which is journaled in the frame and belted to the power-shaft; and, if desired, the counter-shaft may be belted, as at 31, to the power-shaft to assist in propelling the same;  
 40 but this is optional.

35 designates the brake-lever, which is fulcrumed at an intermediate point of its length on the frame, and one end of this lever has a friction-shoe 36, by which the motion of the  
 45 balance-wheel can be retarded, while the opposite end of the lever is adapted to engage with one of a series of teeth 37, formed on a

bar 38 of the frame, so as to hold the brake-lever in the desired position.

The operation of my motor will be readily understood from the foregoing description, taken in connection with the drawings.

Changes in the form and proportion of parts can be made without departing from the spirit or sacrificing the advantages of my invention.

Having thus described my invention, I claim—

1. In a mechanical motor, the combination of the endless belts or aprons carrying the lifters, the primary shaft, the power-shaft, a series of levers arranged to be lifted at suitable intervals by the lifters on the endless belts, and mechanism intermediate of the levers and the power-shaft for driving the same continuously in one direction at each descent of each lever, substantially as described.

2. In a mechanical motor, the combination of the endless chains or belts having the alternately-disposed lifters, the primary and idle shafts, the power-shaft having the ratchets, the weighted levers arranged in the path of the lifters, to be raised at suitable intervals by the same, and the pawl-carriers connected with the levers and having the pawls arranged to rotate the ratchets at the descent of each lever, substantially as described.

3. In a mechanical motor, the combination of the primary shaft, the idle-shaft, the endless belts or aprons encompassing said shafts and having the alternately-disposed lifters, the power-shaft having the ratchet-wheels, the weighted levers fulcrumed on a common bar or rod and having the free ends arranged in the path of the lifters, the pawl-carriers connected to the levers and having the pawls engaging the ratchet-wheels, and the counter-shaft geared to the power-shaft, substantially as described.

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

JAMES R. G. HUFFMAN.

Witnesses:

J. S. TROUT,

J. C. WHITAKER.