

(No Model.)

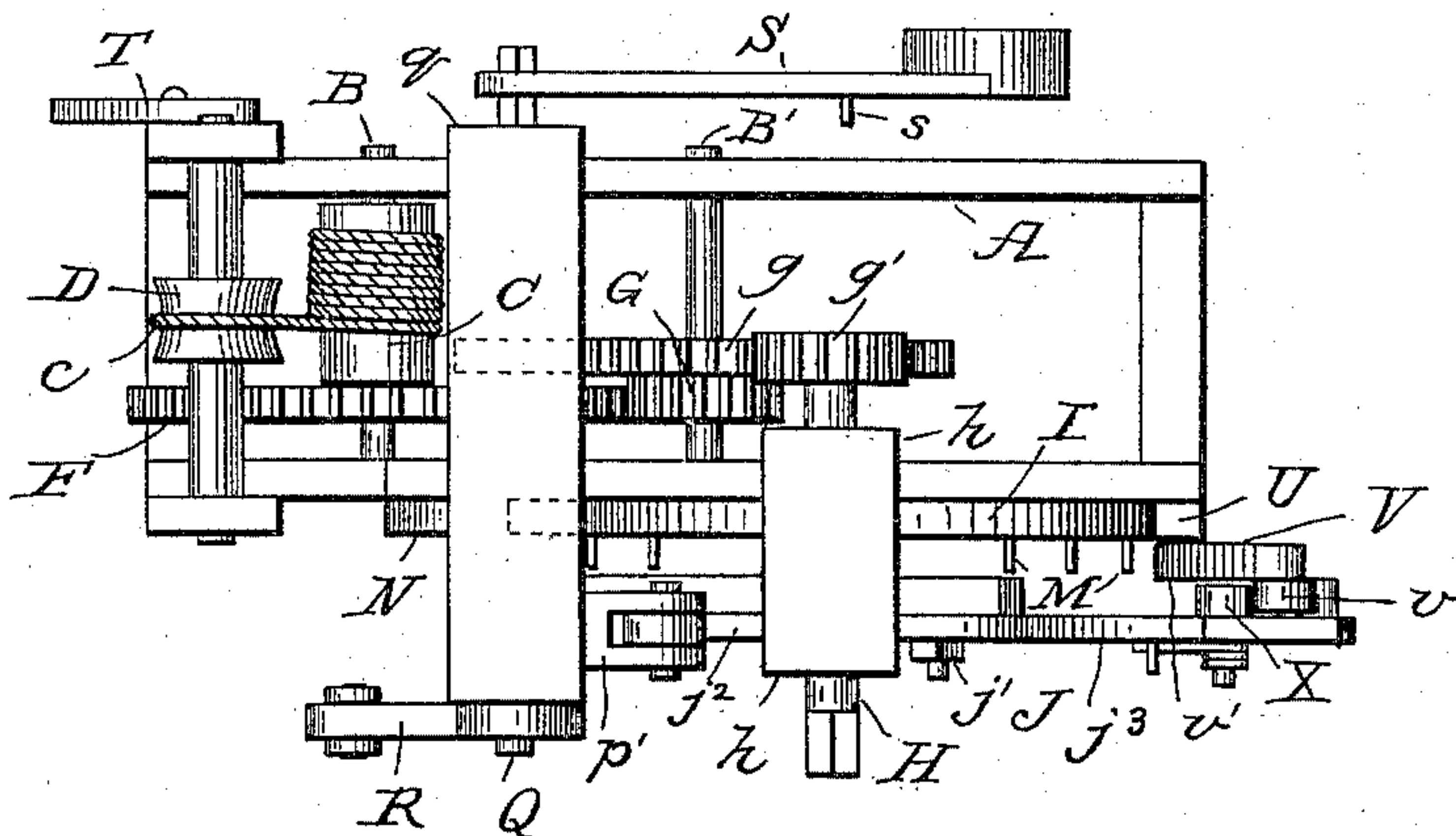
2 Sheets—Sheet 1.

G. F. BERG.  
MECHANICAL MOTOR.

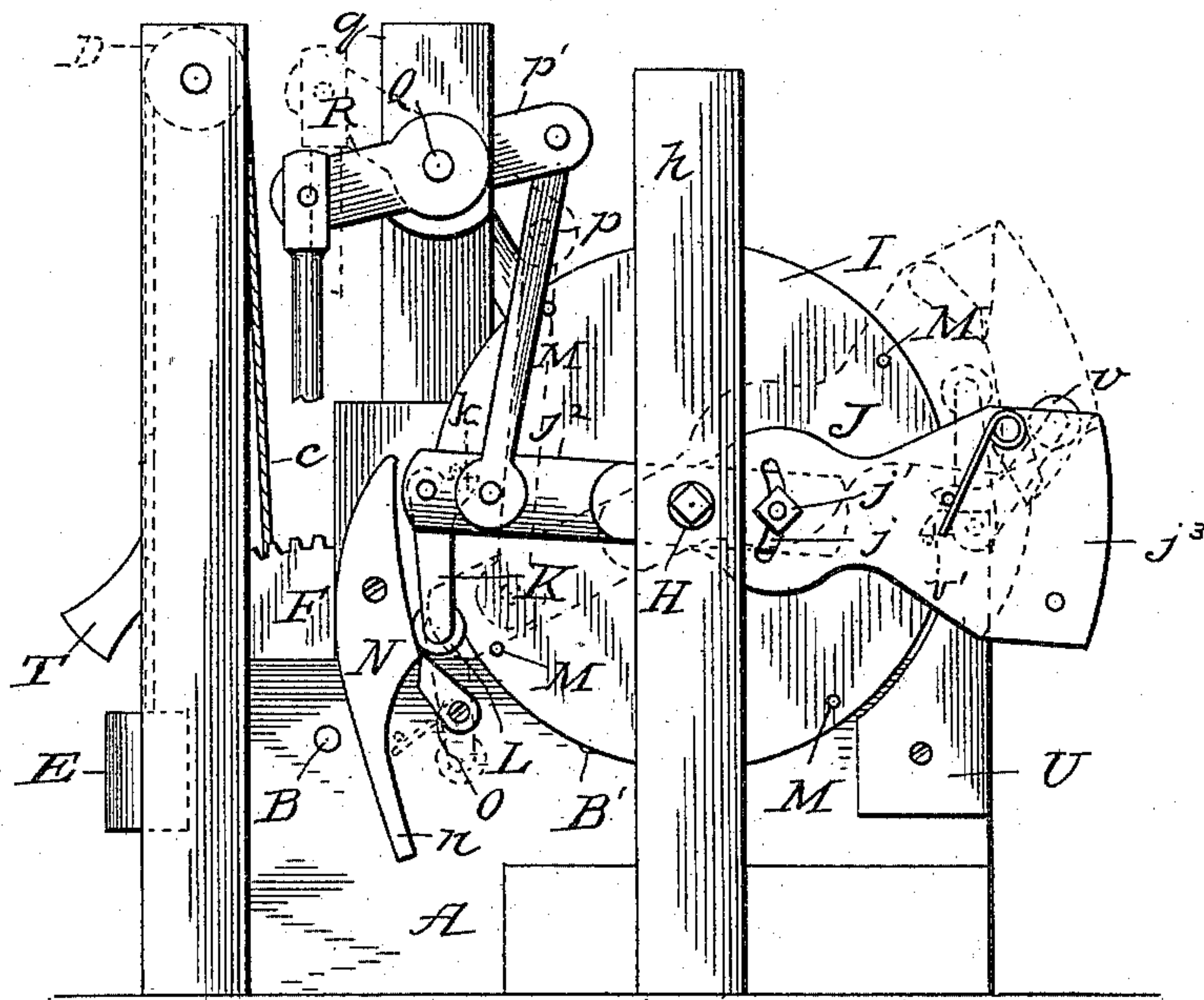
No. 488,260.

Patented Dec. 20, 1892.

*Fig. 1.*



*Fig. 2.*



Witnesses

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Inventor

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By his Attorneys,

*C. A. Snow & Co.*

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Fig. 3.

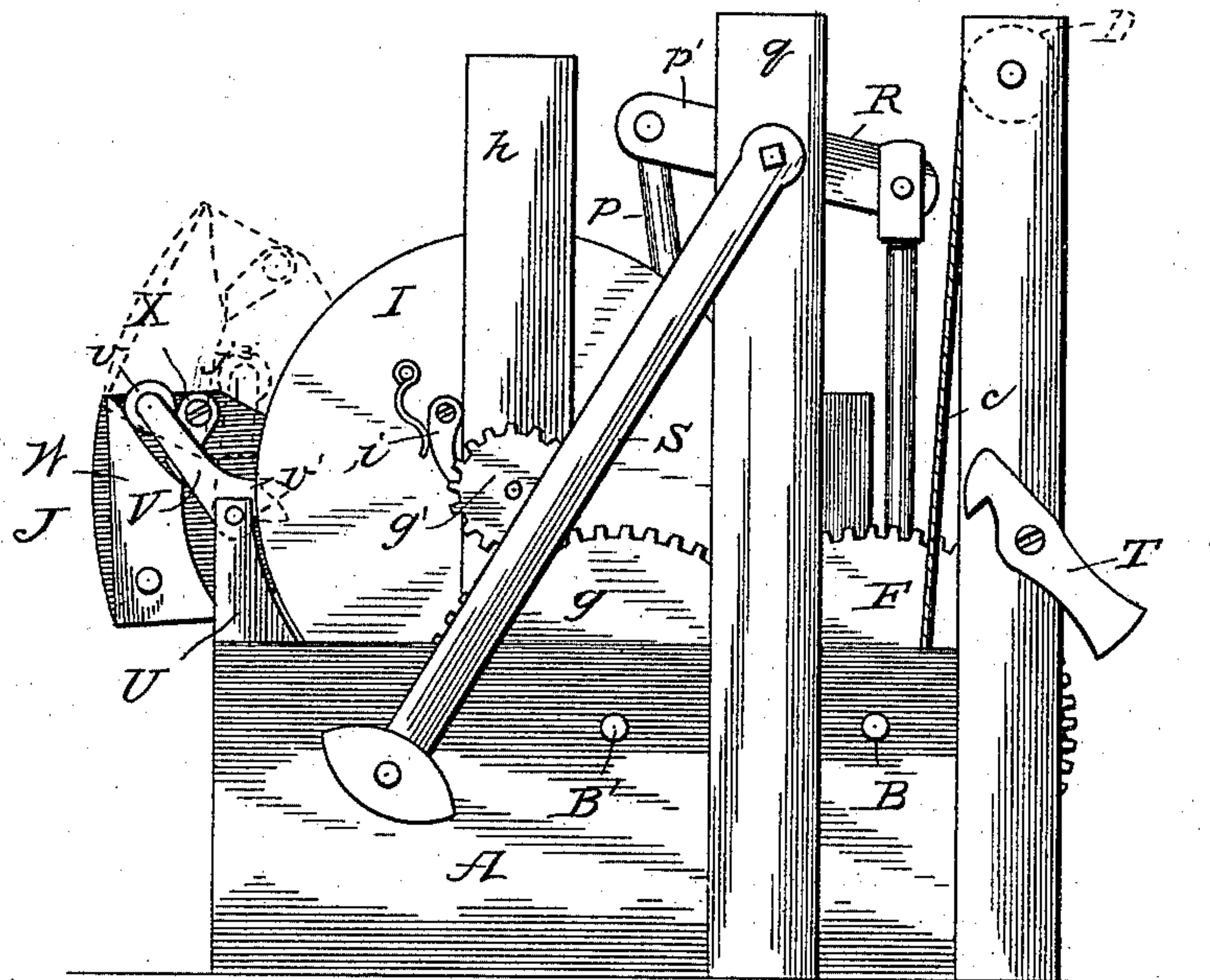


Fig. 4.

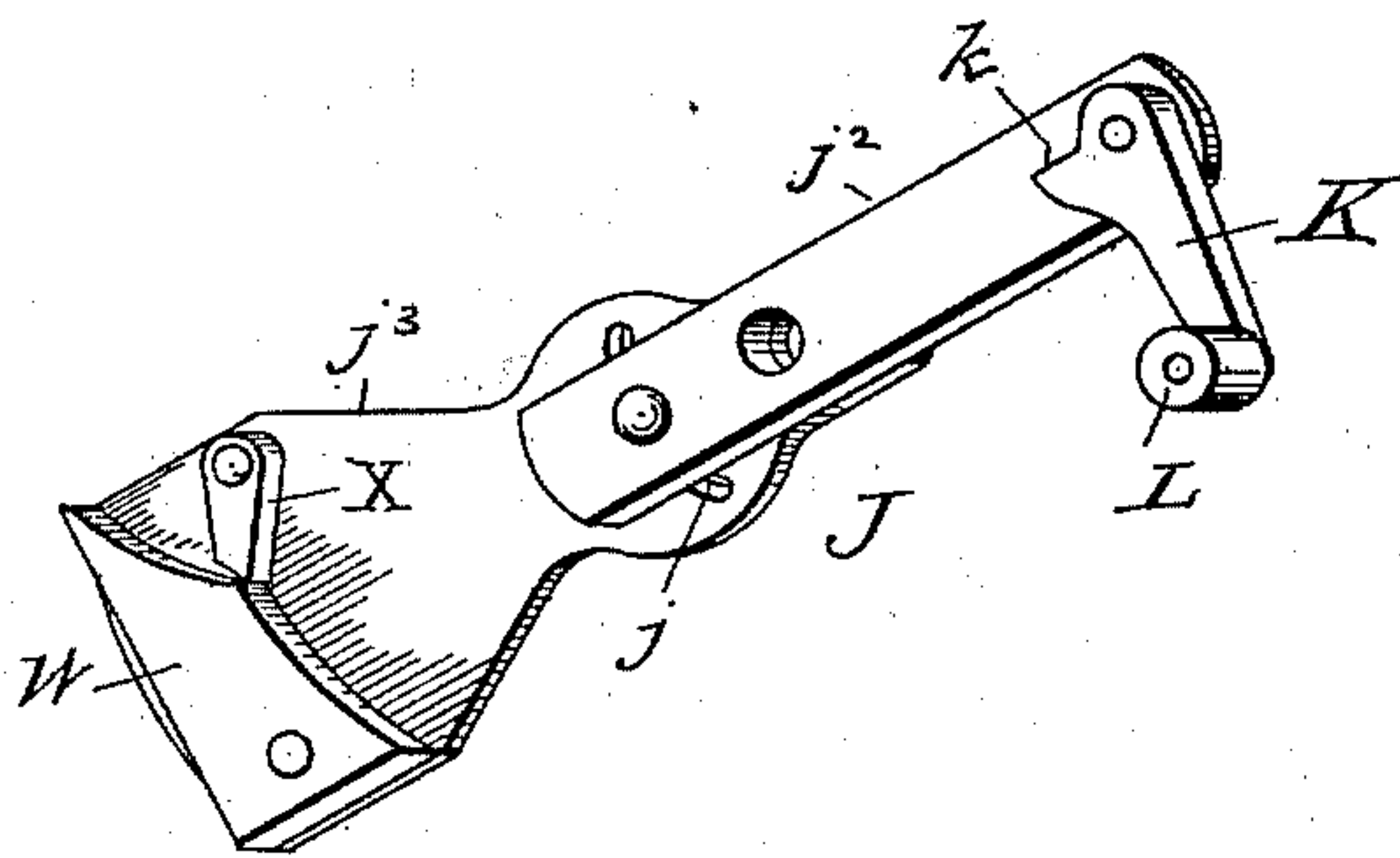
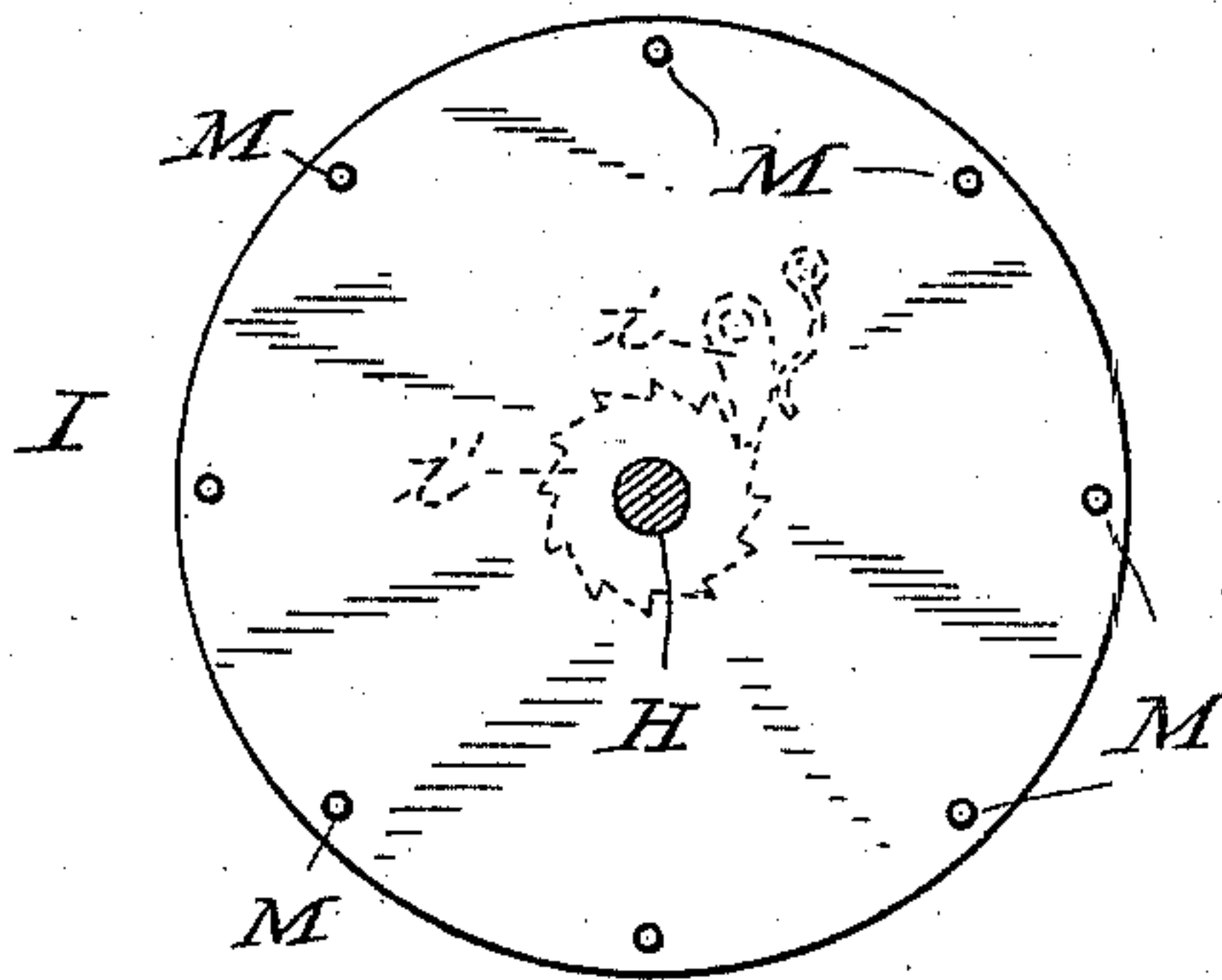


Fig. 5.



Witnesses

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# UNITED STATES PATENT OFFICE.

GEORGE F. BERG, OF DE WITT, NEBRASKA, ASSIGNOR OF TWO-THIRDS TO  
S. L. BERG AND J. M. MANN, OF SAME PLACE.

## MECHANICAL MOTOR.

SPECIFICATION forming part of Letters Patent No. 488,260, dated December 20, 1892.

Application filed August 23, 1892. Serial No. 443,864. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE F. BERG, a citizen of the United States, residing at De Witt, in the county of Saline and State of Nebraska, have invented a new and useful Mechanical Motor, of which the following is a specification.

This invention relates to mechanical motors; and it has for its object to provide an improved mechanical motor adapted particularly for pumping purposes; but one which can also be advantageously employed for other analogous purposes requiring a reciprocatory movement.

To this end the invention contemplates certain improvements upon ordinary weight motors in use.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully understood, illustrated and claimed.

In the accompanying drawings;—Figure 1 is a top plan view of a mechanical motor constructed in accordance with this invention. Fig. 2 is a front elevation of the same. Fig. 3 is a rear elevation thereof. Fig. 4 is a detail in perspective of the sectional vibrating lever. Fig. 5 is a detail view of the intermittently rotating strike wheel.

Referring to the accompanying drawings;—A represents a suitable frame in which are mounted the shafts B and B' respectively. The shaft B carries a drum C upon which is adapted to be wound the rope or chain c, which passes therefrom over the guide pulley D supported above one end of the frame A. Said rope or chain has connected to one end thereof the weight E which unwinds the rope or chain from the drum and communicates motion to the shaft B which in turn drives the spur wheel F, fastened thereto. The spur wheel F meshes with the pinion G, upon the adjacent shaft B', which shaft also carries the spur wheel g, which latter wheel is adapted to mesh with the small cog wheel or pinion g', upon one end of the winding shaft H, which shaft is journaled in the uprights h extending above the main frame A. Loosely mounted upon the winding shaft H is the in-

termittently rotating strike wheel I, carrying upon one face thereof the spring-pressed pawl i, adapted to engage the adjacent ratchet wheel i', fixedly secured to the shaft H, so that while the drum is unwinding the rope or chain thereon, or at least is revolved by the weight itself, motion will be communicated through the train of gears to the wheel I to rotate the same intermittently by the means hereinafter described. One end of the shaft H is extended in order to accommodate a winding crank to draw up the weight and wind the rope or chain upon the drum, the pawl and ratchet device upon the winding shaft allowing the same to rotate without turning the wheel I or interfering with the other mechanism of the motor.

A sectional vibrating lever J has its connected ends pivotally mounted upon the winding shaft H, directly in front of the strike wheel thereon, one of the lever members being provided at a point adjacent to the shaft H with the adjustment slot j, through which passes the set screw j', adapted to engage the inner end of the other lever member so as to provide means for adjusting said slotted member with respect to the other lever member in order to provide for the proper operation of the motor. The lever members may be designated as j<sup>2</sup> and j<sup>3</sup> respectively. Pivotaly secured to the outer end of the lever member j<sup>3</sup>, is the depending swinging lever arm K, carrying upon its lower end and one side thereof the contact roller L, while the upper end of said lever near its point of pivot is provided with an off standing strike lug k, that is adapted to be struck at regular intervals by the strike pins M secured to the front face of the strike wheel I, and projecting therefrom in a concentric series. The contact roller at the lower end of said lever arm is adapted under the force of the strike pin bearing against the strike lug thereof, to travel against the curved guide plate N secured to the frame adjacent to the strike wheel. The said guide plate N is provided with a lower reduced guide arm n, while adjacent to the same is pivoted the spring-pressed guide dog O which is normally held against the guide plate N in a line with the main curved contact face or track, and off from the reduced guide arm n



thereof. Now it will be readily seen that one of the strike pins M bearing against the offstanding strike lug  $k$  will hold the contact roller L against the guide plate and guide dog, until the same has passed over the lower pivoted end of the guide dog, at which moment the said contact roller will be thrown against the reduced guide arm  $n$ , between the same and the dog O, and the off-standing strike lug clear of the strike pins to place the lever arm in a proper position to be raised. To the outer end of the lever member  $j^2$  is also pivotally connected the upwardly extending connecting arm  $p$ , which is connected at its upper end to the rock arm  $p'$ , fixedly secured at one end upon the oscillating pendulum shaft Q. The said pendulum shaft Q is mounted in suitable supports  $q$ , and carries upon one end thereof the connecting arm R, which may be connected with a pump rod or other device to be reciprocated, while to the other end of said shaft is secured the swinging weighted pendulum S. The said pendulum S is provided with an inwardly projecting pin  $s$ , which is designed to be engaged by the notched controlling lever T pivoted to a suitable point of attachment, so as to hold the pendulum out of a vertical line in order to provide means for stopping and starting the motor at will.

Pivotally secured at one end to the upright U near the outer end of the lever member  $j^3$ , is the stop lever arm V. The said stop lever arm V is similar in construction to the lever arm K and is provided at its upper end with a contact roller  $v$ , while at its lower end, near its point of pivot, the same is provided with an off-standing strike lug  $v'$  which is adapted to be engaged by one of the strike pins M, to stop the strike wheel I at the very moment that the contact roller L of the lever arm K clears the lower pivoted end of the guide dog O, and leaves the arm K free to ascend under the weight of the pendulum, which will continue to oscillate the shaft Q after the strike wheel has been thus stopped, and thereby draw the contact roller between the guide arm  $n$  and the spring actuated guide dog O, which dog yields to the upward pull of the contact roller, and allows the same to pass onto the main portion of the guide plate N to bring the strike lug  $k$  under the next strike pin. Then said guide dog springs back into alignment with the main portion of the guide plate so that the roller L can again commence its downward travel when the stop arm V has released the wheel I.

As stated, when the contact roller L has cleared the lower pivoted end of the guide dog, one of the strike pins engages the strike lug of the stop V which holds the strike wheel fast. The tendency of the wheel I to turn holds the contact roller of said stop lever arm V against the stop or guide plate W, adjacent to the upper end of which is pivoted the spring actuated guide dog X, the lower end of which normally contacts with said guide plate to form a continuation thereof and a

face over which the roller  $v$  bears. The wheel I is held fast while the pendulum is raising the lever arm K, as already described, up to the next strike pin. This movement lowers the outer lever member  $j^3$ , and causes the contact roller of the stop arm V to pass over the guide dog X. When the contact roller of said stop arm reaches the top of the guide dog X, the same is thrown thereover by the strike wheel, which thus releases itself from the stop arm and again lowers the other end of the lever as already stated. The contact roller of the stop arm V has now passed between the upper end of the plate W and the dog X, so that as the lever member  $j^2$  lowers, the other lever member  $j^3$  rises and allows the contact roller of said stop arm to pass back to its proper position for catching and holding the next strike pin as will be readily apparent.

By the adjustment of the sectional lever as already described, it can be readily seen that the two members thereof can be so set that the lever arms K and V will be placed into engagement with and disengagement from the pins of the strike wheel at the proper time.

Having thus described my invention, what I claim and desire to secure by Letters Patent is;—

1. In a mechanical motor, the combination with a train of gearing; of an intermittently rotating strike wheel connected with said gearing, and having a concentric series of strike pins near its edge, a sectional adjustable vibrating lever arranged adjacent to and mounted to oscillate on the same shaft as said strike wheel and moved in one direction by the same, stop and releasing devices carried by and arranged at opposite ends of said lever, and a pendulum shaft connected with one end of said lever and adapted to move the same in the other direction, substantially as set forth.

2. In a mechanical motor, the combination of the automatically controlled gearing, a shaft mounted in suitable bearings and carrying a pinion at one end meshing with said pinion, a ratchet wheel fixedly secured to said shaft, an adjacent intermittently rotating wheel having a pawl engaging said ratchet wheel and a series of strike pins near its edge, a sectional adjustable vibrating lever mounted to vibrate upon the same shaft as and moved in one direction by the adjacent wheel, stop and releasing devices carried by said lever and engaging said pins, and an oscillating pendulum shaft connected with one end of said vibrating lever and adapted to move the same in the other direction, substantially as set forth.

3. In a mechanical motor, an intermittently rotating strike wheel having a concentric series of strike pins near its edge, a vibrating lever mounted adjacent to the pin-face of said strike wheel, a swinging lever arm pivoted to one end of said lever and adapted to be en-



gaged by one of said strike pins to lower the lever, a guide arranged adjacent to said lever arm, a stop lever arm arranged adjacent to the other end of the lever and adapted to hold the wheel while the opposite lever arm is being raised, and an oscillating combined pendulum and drive shaft connected with one end of said vibrating lever, substantially as set forth.

- 10 4. In a mechanical motor, an intermittently rotating strike wheel having a concentric series of strike pins, a sectional adjustable lever mounted adjacent to said strike wheel, a curved guide plate arranged adjacent to one  
15 side of said wheel and having a reduced guide arm, a spring-actuated guide dog pivoted adjacent to said guide arm and normally contacting with the said guide plate, a swinging lever arm pivoted to one end of said vibrating  
20 lever and having an off-standing strike lug adapted to be engaged by one of said strike pins to force the lever down, and a contact roller adapted to move over said guide plate, the guide dog, and said guide arm, an  
25 oscillating pendulum shaft, means for holding and releasing said shaft, an arm connecting said pendulum shaft with said vibrating lever, and means for holding the strike wheel

stationary while the swinging lever arm is being raised, substantially as set forth.

5. In a mechanical motor, an intermittently rotating strike wheel having a series of concentric strike pins, a sectional adjustable vibrating lever mounted adjacent to said strike wheel, a swinging lever arm pivoted to one end of said lever and lowered by said strike pins, an oscillating pendulum shaft connected with the same end of said vibrating lever to raise the lever arm to the next pin, a guide plate secured to the other end of said lever, a spring actuated guide dog pivoted adjacent to the upper end of said guide plate and having the lower end thereof normally contacting with the same, and a stop lever arm pivoted adjacent to said guides and having an off standing strike lug adapted to form a stop for said strike pins, and a contact roller moving over said guide plate and guide dog, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE F. BERG.

Witnesses:

JOHN FREEMAN,  
GEO. W. COLLMAN.