

No. 789,846.

PATENTED MAY 16, 1905.

R. ELDER & E. H. McHENRY.

SCALE.

APPLICATION FILED JUNE 17, 1902.

3 SHEETS—SHEET 1.

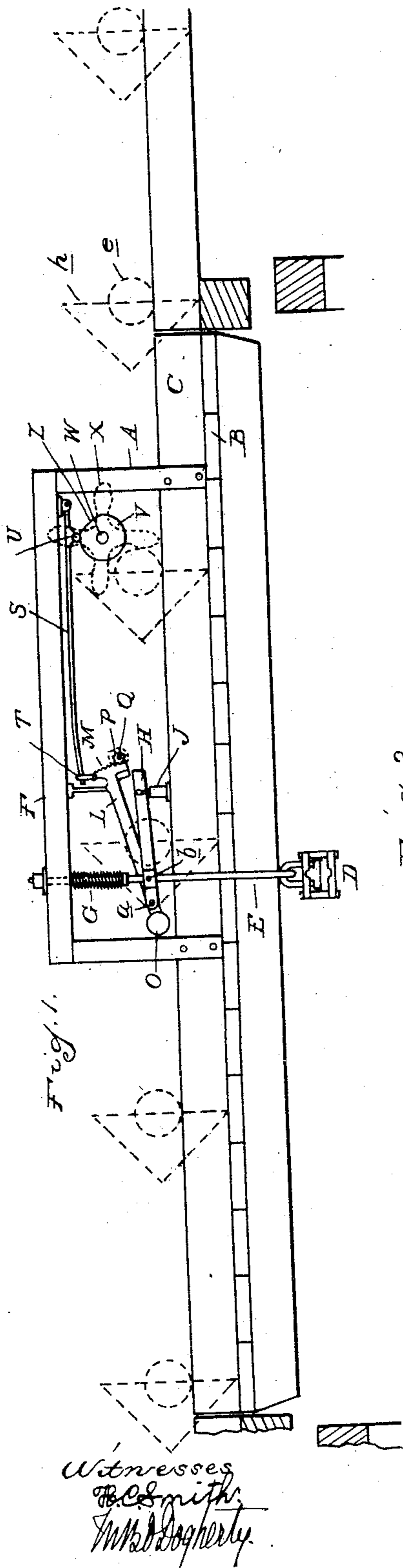
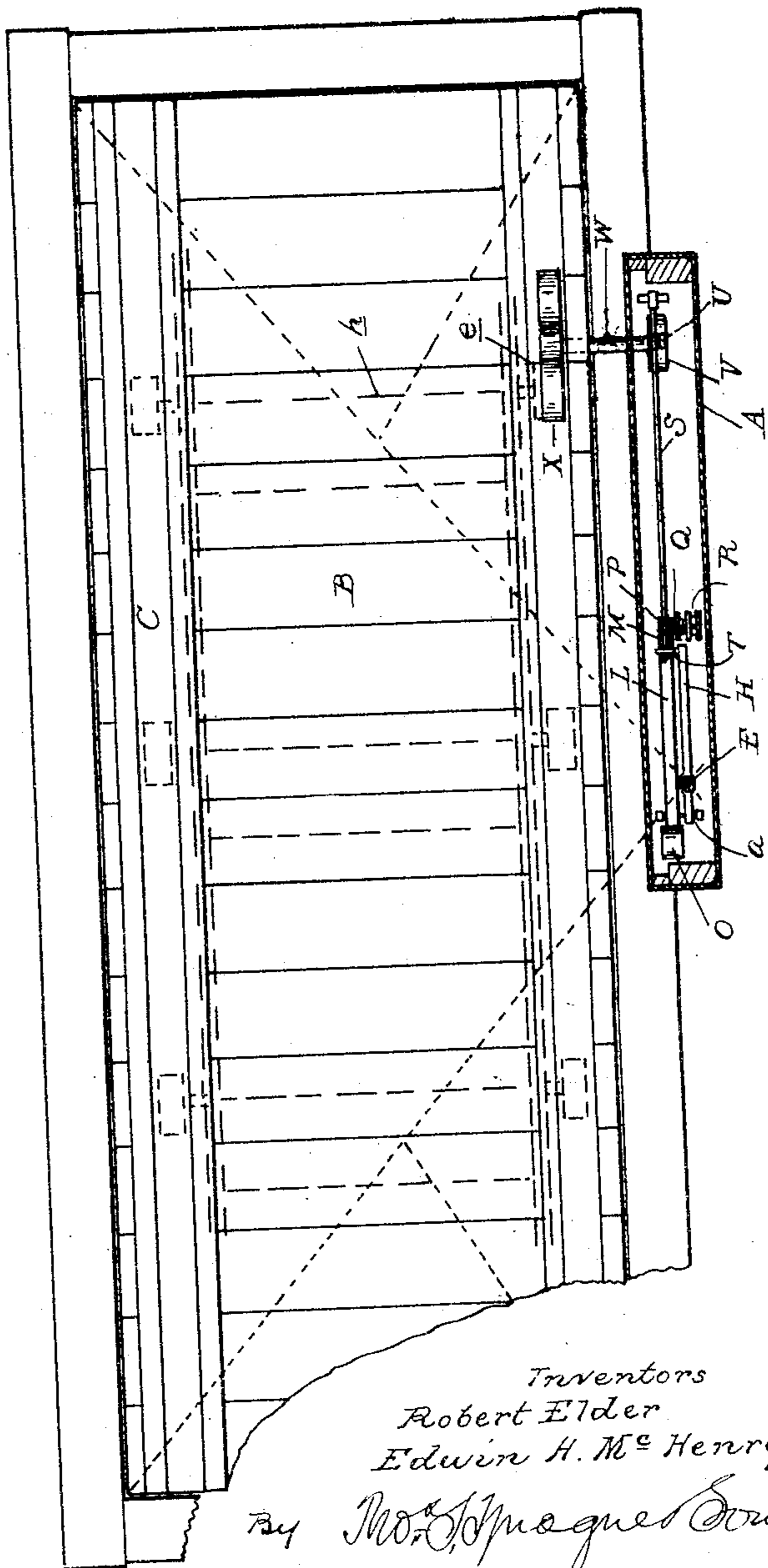


Fig. 2.



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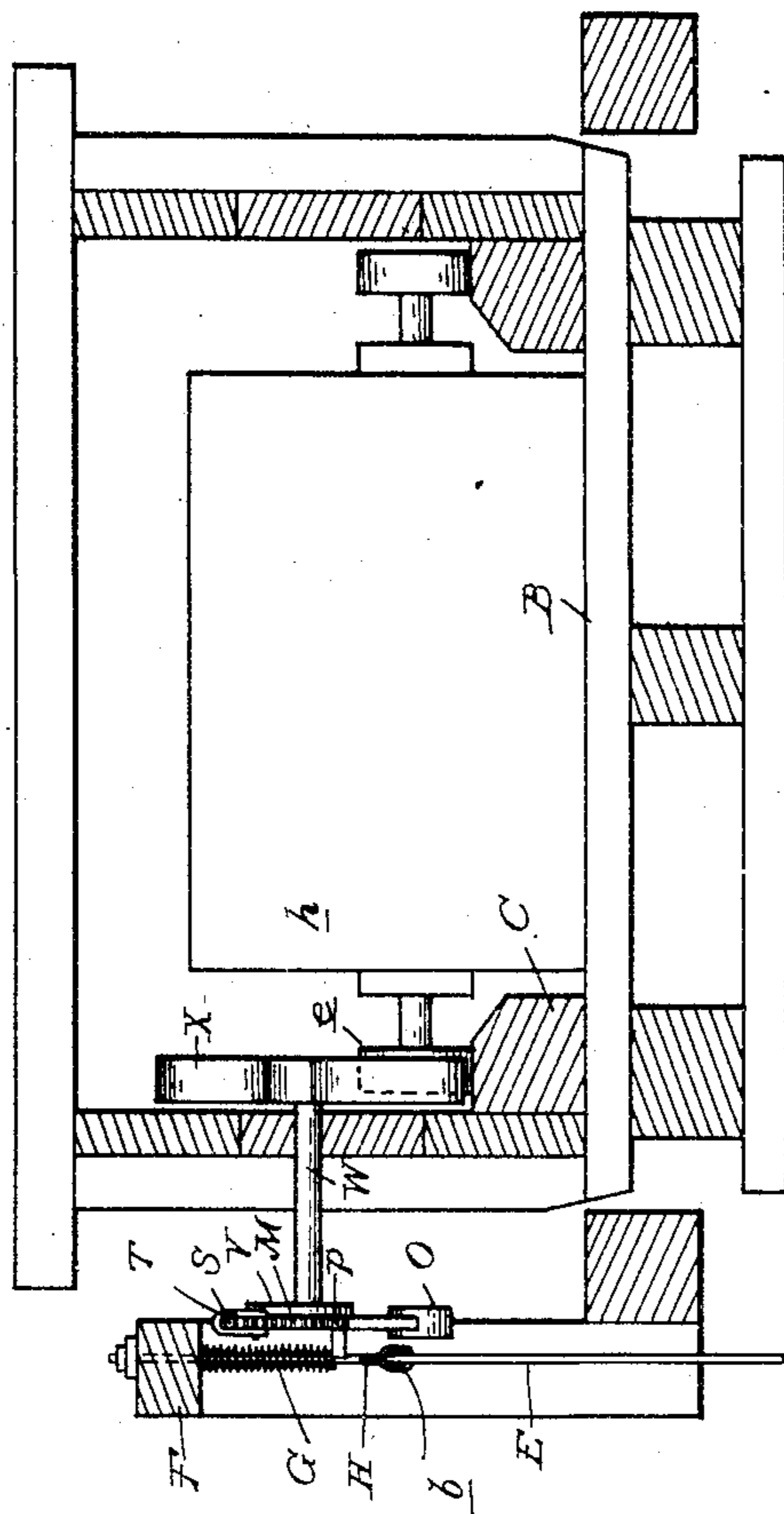
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3 SHEETS—SHEET 2.

Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

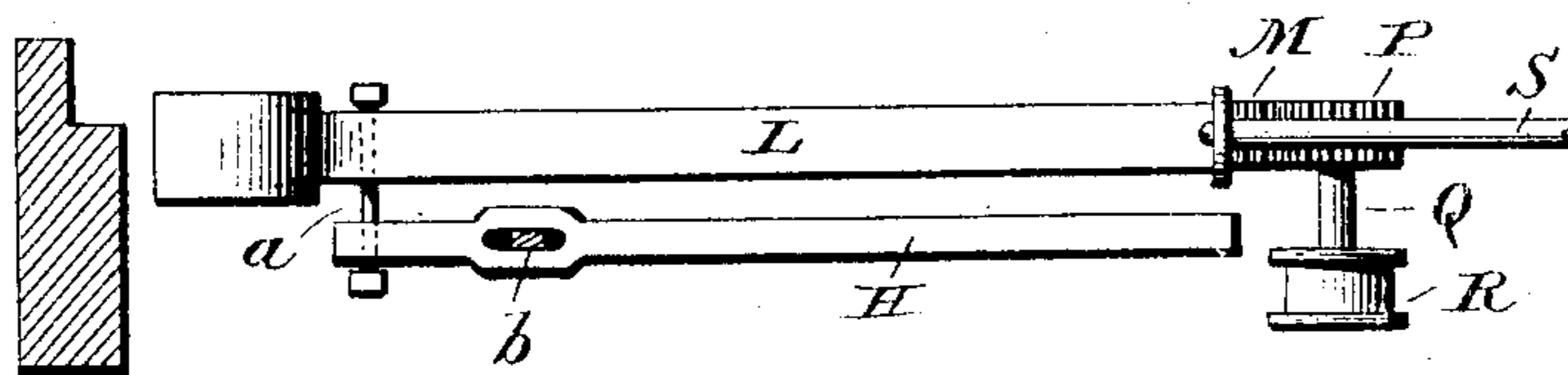


Fig. 5.

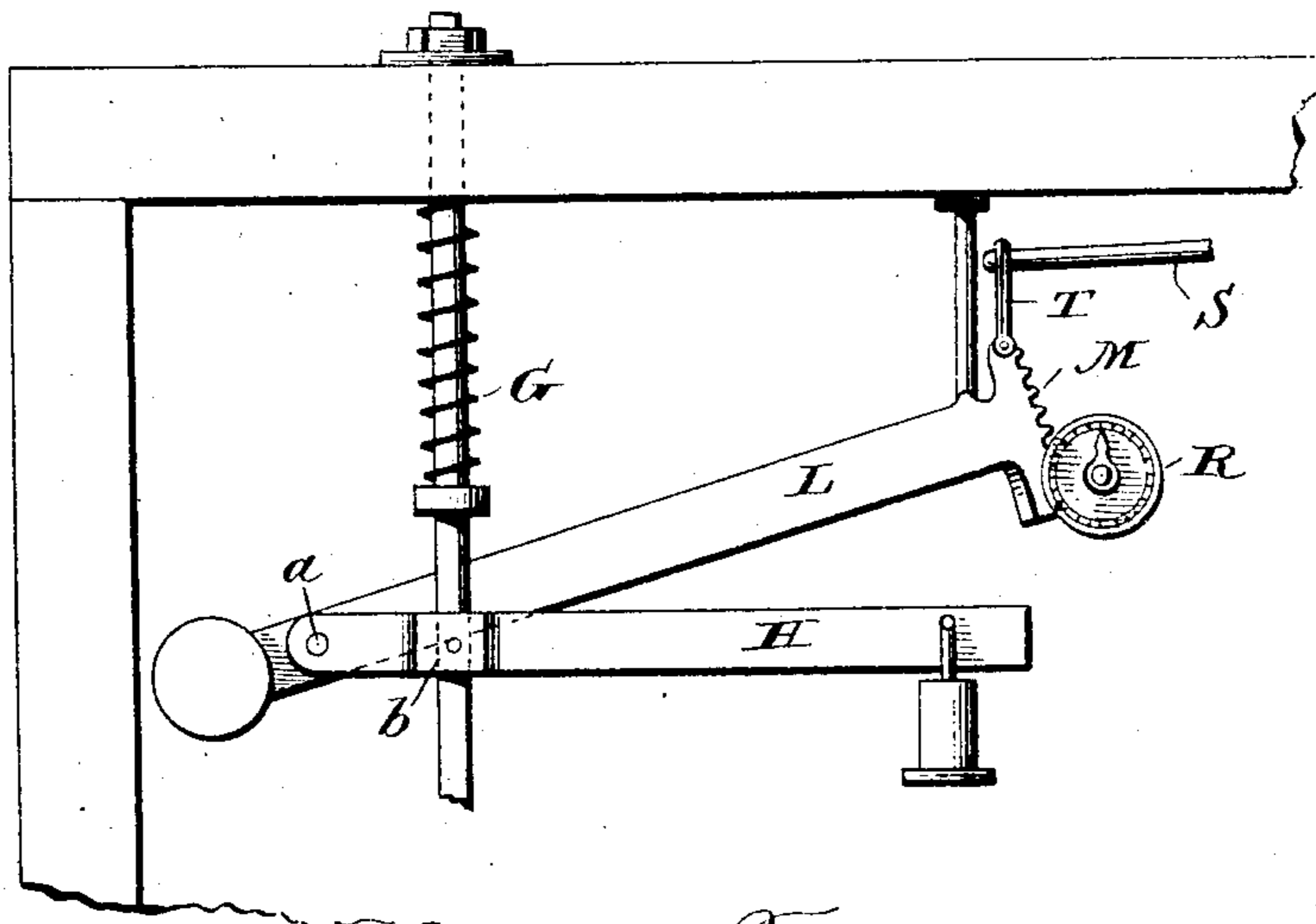
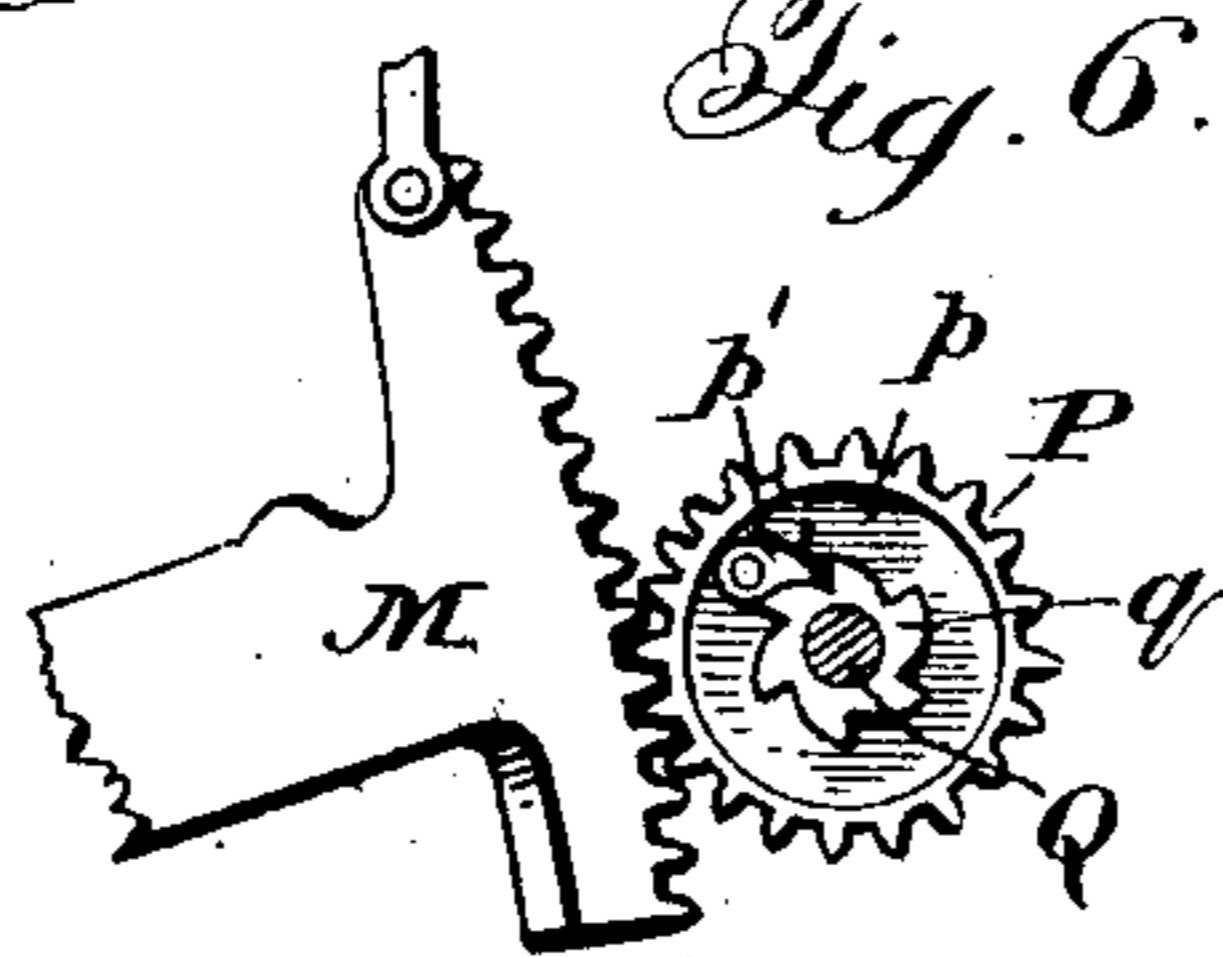


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SCALE.

SPECIFICATION forming part of Letters Patent No. 789,846, dated May 16, 1905.

Application filed June 17, 1902. Serial No. 112,025.

To all whom it may concern:

Be it known that we, ROBERT ELDER, residing at St. Paul, county of Ramsey, State of Minnesota, and EDWIN H. McHENRY, residing at Tacoma, in the county of Pierce and State of Washington, citizens of the United States, have invented certain new and useful Improvements in Scales, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to improvements in scales; and it consists particularly in a mechanism for registering or recording automatically loads upon the platform and scale or which may be automatically weighed and registered or recorded while the weight is passing thereover, as more fully hereinafter described and shown, and particularly pointed out in the claims.

In the drawings, Figure 1 is an elevation showing the end of the platform and the end of the weighing-levers with the weighing connection therefrom, the movable member or weighing-beam, the recording mechanism, and the actuating device therefor. Fig. 2 is a plan view thereof. Fig. 3 is a cross-section, and Figs. 4, 5, and 6 are enlarged detail views showing the recording device and the actuating means therefor.

A represents the frame of the scale, B the platform, and C, in Fig. 2, shows the ordinary four-lever scale—such as used for wagon-scales, for instance, by various manufacturers—comprising two long levers (shown in dotted lines) which come together at D and are supported upon the steelyard E, and two short levers, as more fully illustrated in the patent to F. Fairbanks, No. 285,600 of September 25, 1883, connecting intermediate the long levers. The steelyard in this case is connected at its upper end to a cross-bar or frame F and has an intermediate spring G, which in this case is the weighing-spring, the weight being indicated by the extent of movement of the steelyard-rod, which is lowered by expanding the spring proportionately to the load upon the platform. This spring is secured at its

upper end to the frame F by means of a bolt *f*. (See Fig. 4.)

H is a lever pivoted at *a* to a stationary part of the frame and connected by a pivot *b* with the steelyard E, so that the motion of the steelyard E is multiplied at the outer end of the lever. To prevent undue vibration in the lever H, we employ a dash-pot J, connected therewith in the usual manner.

L is a lever pivoted to the stationary part of the frame. In this case we have shown it pivoted upon the same pin *a* as the lever H. It is provided at one end with a segment M, which may be counterbalanced by a weight O at the opposite end. This segment meshes with a gear-wheel P, having a dished central portion *p*, in which is a ratchet *q* rigid with the shaft Q and rotatable with said shaft independently of the gear-wheel P. Within this dished portion and upon the gear P we mount a spring-pressed pawl *p'*, so arranged that in the downward movement of the segment M the pawl will ride over the teeth of the ratchet and the shaft will not be rotated, but in the upward movement thereof the pawl will engage the teeth of the ratchet, and the shaft will be rotated to actuate the counting mechanism R. (See Figs. 4, 5, and 6.) The segment M is connected with a spring-arm or needle S by means of a loop T. This spring-arm is pivoted at the opposite end to a stationary part of the frame and preferably has a roller-bearing U intermediate its ends resting upon the cam V on a shaft W, likewise pivoted in stationary bearings, the shaft being provided at its opposite end with a star-wheel X.

The device here shown is adapted to weigh in connection with an endless carrier or chain having buckets, the carrier having wheels *a*, which run on rails upon the platform of the scale, and buckets *b*, carried thereby. The wheels of the carrier are adapted to strike the star-wheel X and turn the same and likewise rotate the cam.

In Fig. 1 there are shown four buckets upon the scale-platform, and the parts are in

position just after the weight has been recorded. To weigh another load, the progress of the chain will carry four succeeding buckets upon the platform, and the wheel of each one will strike the star-wheel and rotate it a quarter of a turn. The third wheel of the four last referred to will turn the cam so that the roller-bearing U is opposite the reduced portion Z on the cam, which will cause the needle or spring-arm S to descend by gravity, carrying with it the segment M, which will lower until it strikes the weighing beam or lever H. This operation, however, will not take place, preferably, until the fourth bucket is on the scale-platform, but before the fourth bucket shall have reached the star-wheel. The load on the scale-platform, therefore, will be equal to the four buckets plus the length of chain thereon, which of course should be upon the scale when it is balanced at zero. The further movement of the fourth bucket from its initial impact upon the platform to a position beyond the star-wheel will not change the load on the platform, but will operate the star-wheel the succeeding quarter of a turn and turn the cam in the position shown in Fig. 1. The extent of lowering movement of the segment will be determined by the position of the lever H, which in turn will be determined by the load on the scale. In other words, the lever H will act as an adjustable stop for the movement of the segment, and its adjustment will be determined by the weight on the scale.

The rotation of the cam by the fourth bucket in the manner described to operate the spring-arm S will cause the segment to raise from its position on the lever H to its highest position and register on the registering or recording mechanism the weight of the load.

It is evident that each succeeding group of four buckets will correspondingly be registered or recorded, so that the total weight passing over the scale may be maintained.

Instead of balancing the scale with the carrier subtracted it is evident that the carrier may be weighed in with the load, and in figuring the total the weight of the carrier may be deducted. It is also obvious that this device may be used for other purposes than herein shown—for instance, cars traveling over railway-track scale or for other purposes—by simply arranging the actuating means for the particular use to which it is applied.

The invention clearly comprehends a scale wherein the star-wheel X is turned by hand.

What we claim as our invention is—

1. The combination with a weighing-scale having a movable member indicating the load by the extent of its movement, of a recording

device, an actuating-gear therefor having a clutch connection therewith, an actuating-lever having a rack engaging the gear, the movable member serving as a stop to determine the movement of the actuating-lever, and means for operating the actuating-lever while the load is on the scale, including an arm pivoted at one end to a stationary portion of the scale and connected at its opposite end to the actuating-lever, and a cam-wheel operatively associated with said arm.

2. The combination of a weighing-scale having a movable member indicating the load by the extent of its movement, of a recording device, an actuating-gear therefor having a clutch connection therewith, a pivoted actuating-lever having a segmental rack engaging the gear, the movable member serving as a stop to determine the movement of the actuating-lever, and means for operating the actuating-lever including an arm pivoted at one end to a stationary portion of the scale and connected at its opposite end to the actuating-lever, and a cam-wheel operatively associated with said arm.

3. The combination with a movable load-carrier, of a movable part of a weighing-scale, and a weight-recording mechanism adapted to be controlled by the load-carrier including an actuating member, the movable member serving as a stop to determine the movement of said actuating member, an arm pivotally secured to a stationary portion of the scale, a connection between said arm and said actuating member, a cam-wheel operatively associated with said arm, and an arm secured to the cam-wheel shaft and projecting in the path of the movable load-carrier.

4. The combination of a weighing-scale having a movable member H indicating the load by the extent of its movement, a recording device, an actuating-gear P therefor having a clutch connection therewith, a pivoted actuating-lever L having a segment M engaging the gear P and overlying the movable member H, whereby said movable member will serve as a stop to limit the downward movement of said actuating member L, and means for operating the actuating-lever while the load is on the scale.

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

ROBT. ELDER.

EDWIN H. McHENRY.

Witnesses to the signature of Robert Elder:

HARRY E. VERGOSEN,

F. L. DAGGETT.

Witnesses to the signature of Edwin H. McHenry:

HARRY E. VERGOSEN,

I. S. HENDRICKS.