

J. T. ACKLEY.
STOP MOTION FOR STEAM ENGINES.

No. 16,779.

Patented Mar. 10, 1857.

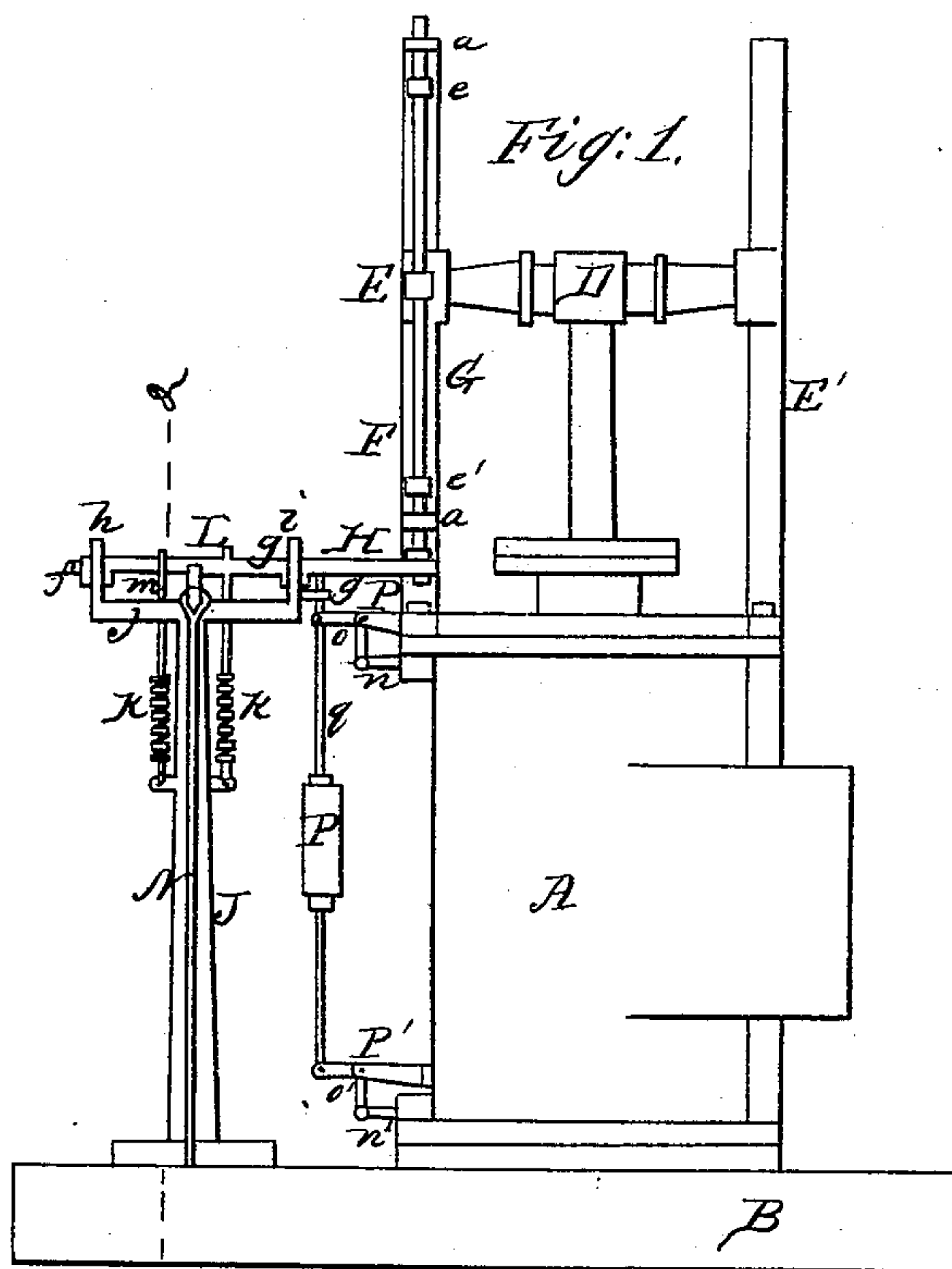


Fig. 1.

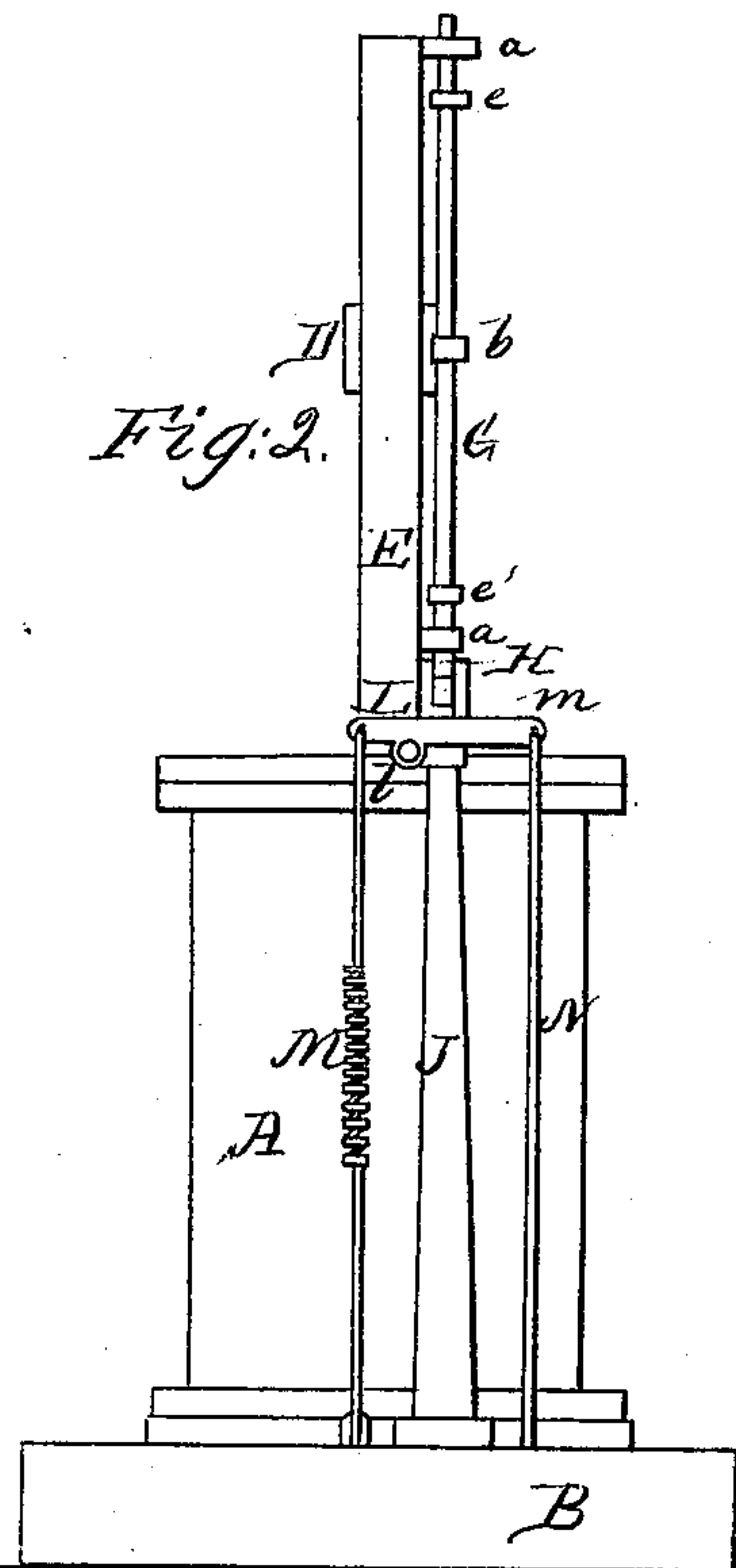


Fig. 2.

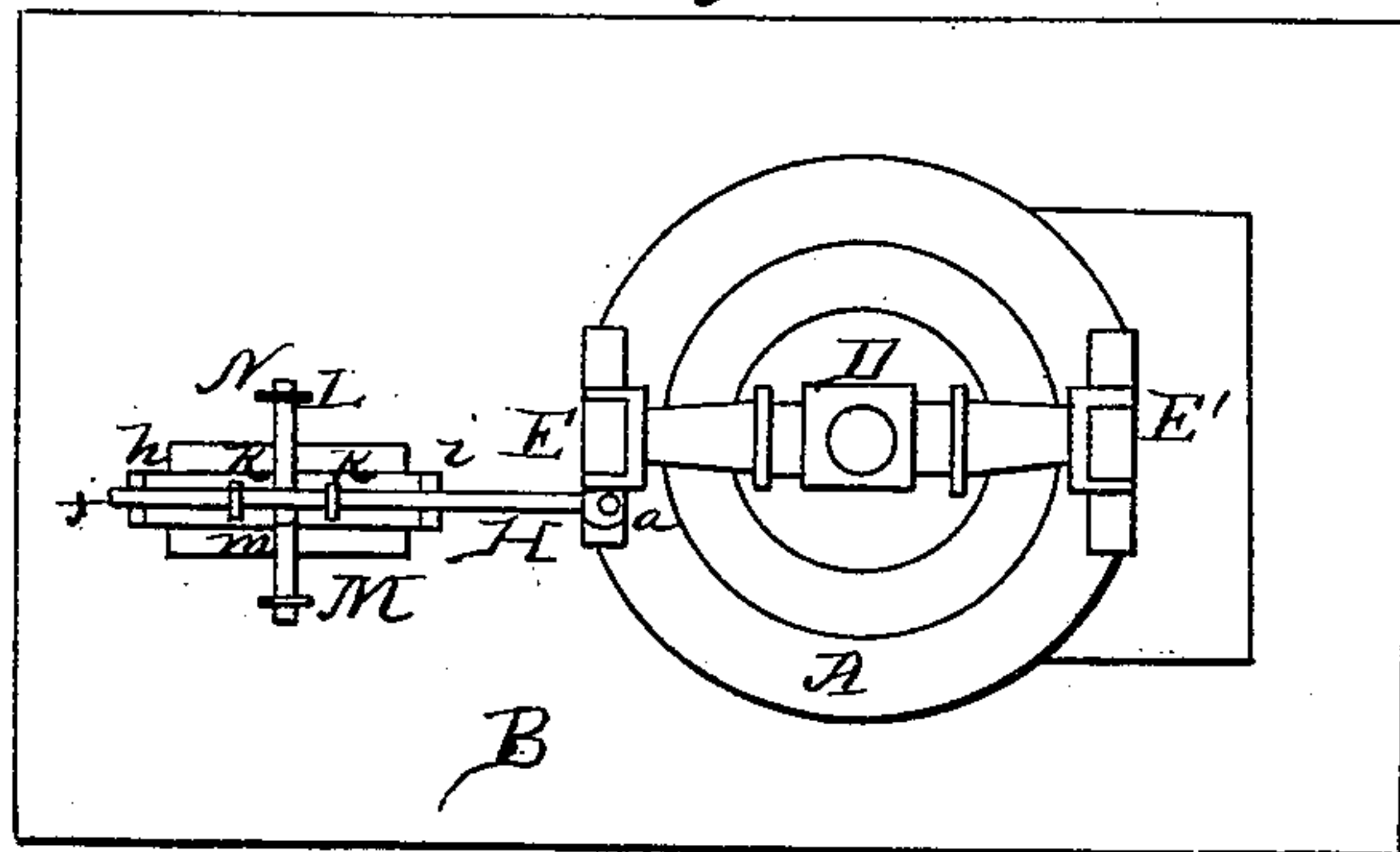


Fig. 3.

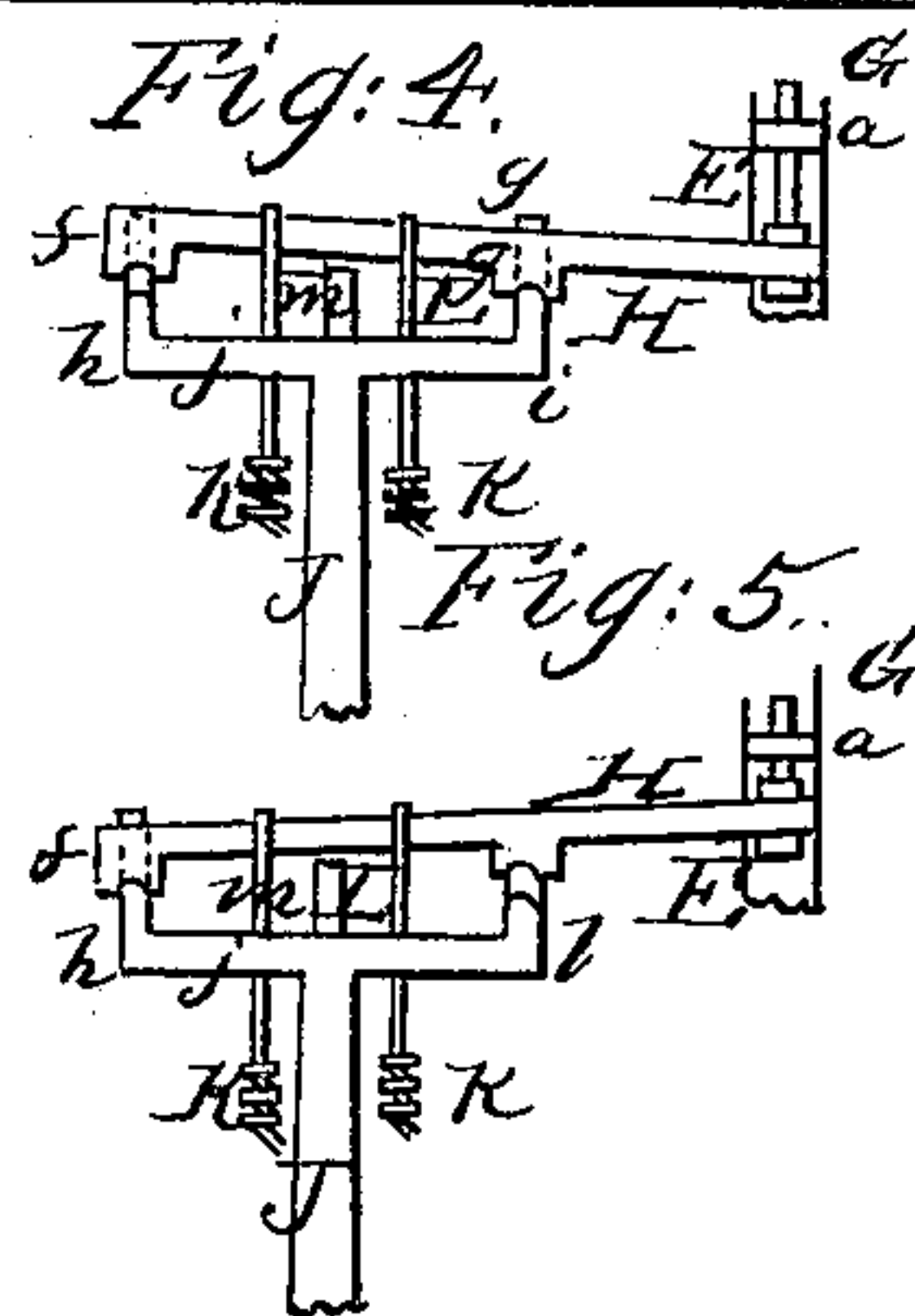


Fig. 4.

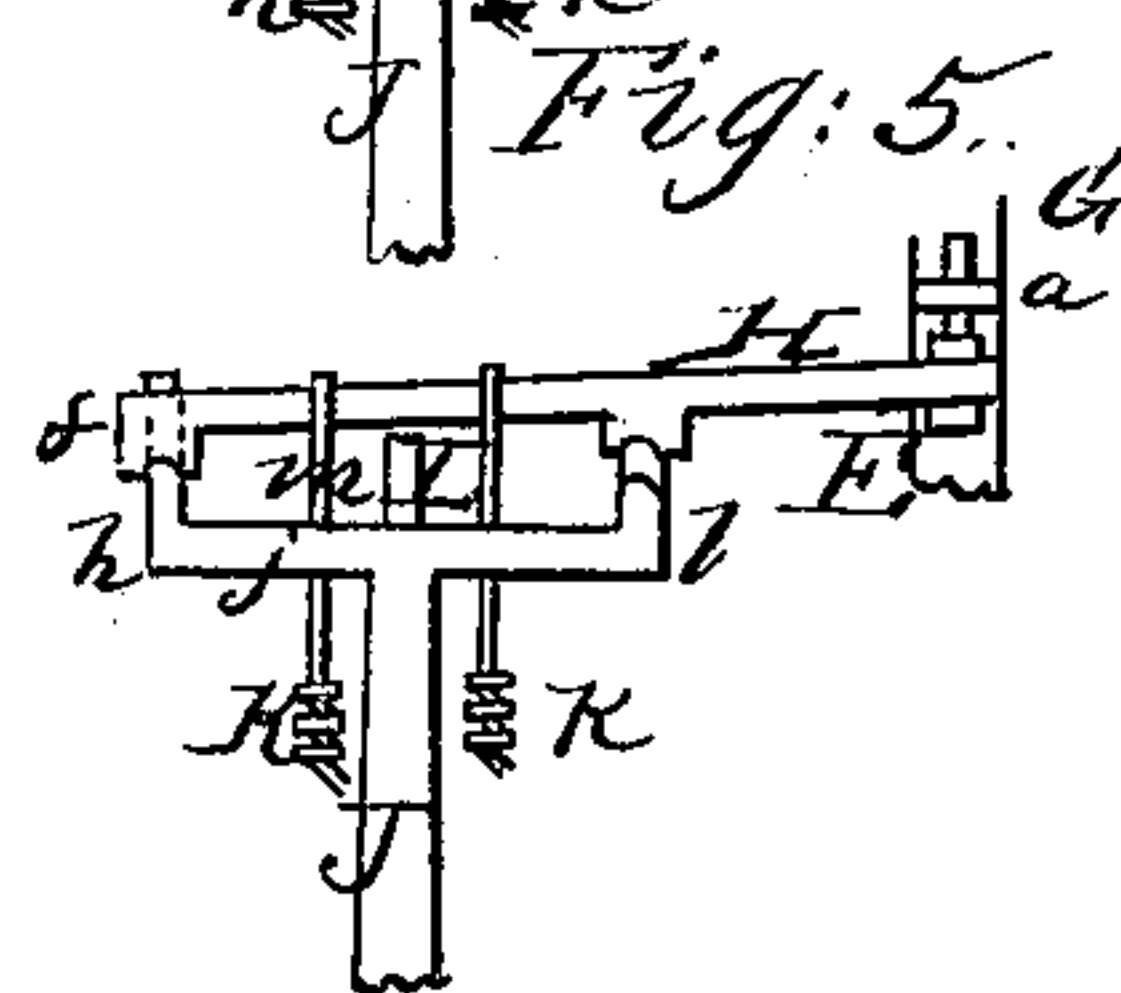


Fig. 5.

Witnesses.

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STOP-MOTION FOR STEAM-ENGINES.

Specification of Letters Patent No. 16,779, dated March 10, 1857.

To all whom it may concern:

Be it known that I, JOHN T. ACKLEY, of the city of Philadelphia and State of Pennsylvania, have invented a new and Improved
5 Stop-Motion for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked
10 thereon.

My invention relates to a means of suddenly stopping the motion of steam engines when a defect or breakage takes place in any of the working parts, and consists in the
15 employment of a rod furnished with nuts or collars so arranged on one of the guides of the engine that the crosshead may, when any defect or breakage takes place in any of the main working parts of the engine, strike one
20 or other of the said nuts, thereby moving the rod and operating a lever in such a manner as to allow another lever to suddenly move and throw out of gear the eccentric rod or otherwise close a valve so as to cut
25 off the supply of steam from the cylinder, thereby preventing further damage.

In order to enable others skilled in the art to make and use my invention I will now proceed to describe its construction and operation.
30

On reference to the drawing which forms a part of this specification, Figure 1 is a front view of a portion of a vertical steam engine with my improved stop motion attached to the same. Fig. 2, a sectional edge
35 view on the line 1, 2 (Fig. 1). Fig. 3, a ground plan, and Figs. 4 and 5 detached sectional views showing one of the levers in different positions.

40 The same letters of reference allude to similar parts throughout the several views.

A is the steam cylinder resting on and secured to the base B.

C is the piston rod and D the cross-head
45 arranged to slide in the guides E and E' in the usual manner. The guide E has two projections *a a* in which slides the perpendicular rod G which also passes freely through a lug *b* on one end of the cross-head D, the rod is furnished with two nuts or collars *e, e'*, and has its lower end connected in any convenient manner to the end of the lever A. This lever has notches or recesses *f* and *g* which rest in the forks *h* and *i*
50 on each end of the cross-bar *j* which is secured to and forms a part of the pillar J the latter

being permanently attached to the base plate B. Two spiral springs *k, k* which are attached at one end to projections on the pillar J and at the other end to the lever H serve
60 to retain the latter in the position shown in Fig. 1, until it is disturbed by the action of the crosshead D and rod G as hereafter described. Underneath the lever H and at right angles to the same is another lever L
65 which is jointed to lugs *l l* on the pillar J; one arm of this lever is connected by means of a spiral spring M to a staple in the base plate, the other arm is connected by means of a rod N to the eccentric rod of the steam
70 engine or to the throttle valve or other stop valve in the steam pipe.

On the top of the lever L is a projection *m* which is caused by the spiral spring M to bear against the side of the lever H and is
75 so arranged that when the said lever H is disturbed, by the action described hereafter, the projection *m* will be free from contact with the side of the lever, when the spiral spring M will so operate the lever L as to
80 raise the rod N thereby throwing out of gear the eccentric rod or otherwise closing a stop valve.

Communicating with the interior of the cylinder at a point near the top of the same
85 and above the piston when the latter is in its most elevated position, as well as at a point near the bottom of the cylinder below the piston when the latter is at its lowest position, are orifices having cone shaped
90 seats for receiving the valves *n* and *n'*; these are connected to the vertical arms of the bell-crank levers *o* and *o'* which have their fulcrums on brackets *p* and *p'* projecting from the cylinder A. The horizontal
95 arms of the two bell crank levers are connected together by means of the rod *q* to which is attached the weight *r* the latter being more than sufficient to resist the pressure of the steam in the cylinder against the
100 valves *n* and *n'*. To the horizontal arm of the upper bell-crank lever *p* is jointed the rod *s* which is guided by a projection *t* on the cross-piece *j*, and which comes in contact when raised with the underside of the
105 lever H.

I would here remark that the main cause of excessive damage to steam engines when any of the working parts become broken, or otherwise out of order is the difficulty of
110 shutting off the steam suddenly enough to prevent further damage. Thus should the

crank pin or connecting rod of a steam engine running at full speed become broken there is every possibility of the cylinder base plate and framework being also broken and
 5 of the whole engine becoming a complete wreck. This can be accomplished by the above described arrangement the operation of which is as follows: The nuts *e* and *e'* are so adjusted on the rod *G* that when the
 10 engine is in proper working order the lug *b* on the crosshead *D* shall be in close proximity to, but not in immediate contact with the said nuts, at the end of the upward and downward stroke. Should any of the keys
 15 or other fastenings of the working parts become loose or fractured the piston will ascend or descend beyond its usual and originally regulated limits, and the lug *b* must necessarily strike either the upper nut
 20 *e* or lower nut *e'* on the rod *G*. Should the lower nut be struck, the fork *i* becomes the fulcrum of the lever *H*, and should the upper nut be struck the fork *h* becomes the fulcrum. In both instances however that
 25 part of the lever immediately over the second lever *L* is raised and consequently the projection *m* on the latter is released from contact with the side of the first lever thus allowing the spring *M* to act on the lever *L*
 30 so as to raise the rod *N* and either throw the eccentric rod out of gear or close a stop valve, thus cutting off the steam from the cylinder preventing further damage.

Should an excessive amount of water ac-

cumulate either above or below the piston 35 the valves *n* or *n'* will be projected outward overcoming the resistance of the weight *r* and will raise the rod *s* so that the latter will elevate the lever *H* thereby releasing the lever *L* when the desired movement of 40 the rod *N* takes place.

It will now be seen that the above described arrangement not only gives notice to the attendant engineer when even a slight derangement of the working parts takes 45 place, but instantly cuts off the steam when a fracture takes place or when the water accumulates in the cylinder to a dangerous extent.

What I claim and desire to secure by Let- 50 ters Patent is—

The rod *G* with its nuts *e* and *e'* in combination with the spring lever *H* having two fulcrums *h* and *i* and the spring catch lever *L*, the said rod *G* being operated (in 55 case of accident) by the crosshead of the steam engine or other convenient working part of the same, and the said catch lever *L* being connected to the eccentric rod or to a stop valve in the steam pipe and the whole 60 being arranged and constructed substantially in the manner and for the purpose herein set forth.

JOHN T. ACKLEY.

Witnesses:

HENRY HOWSON,
 CHARLES D. FREEMAN.