

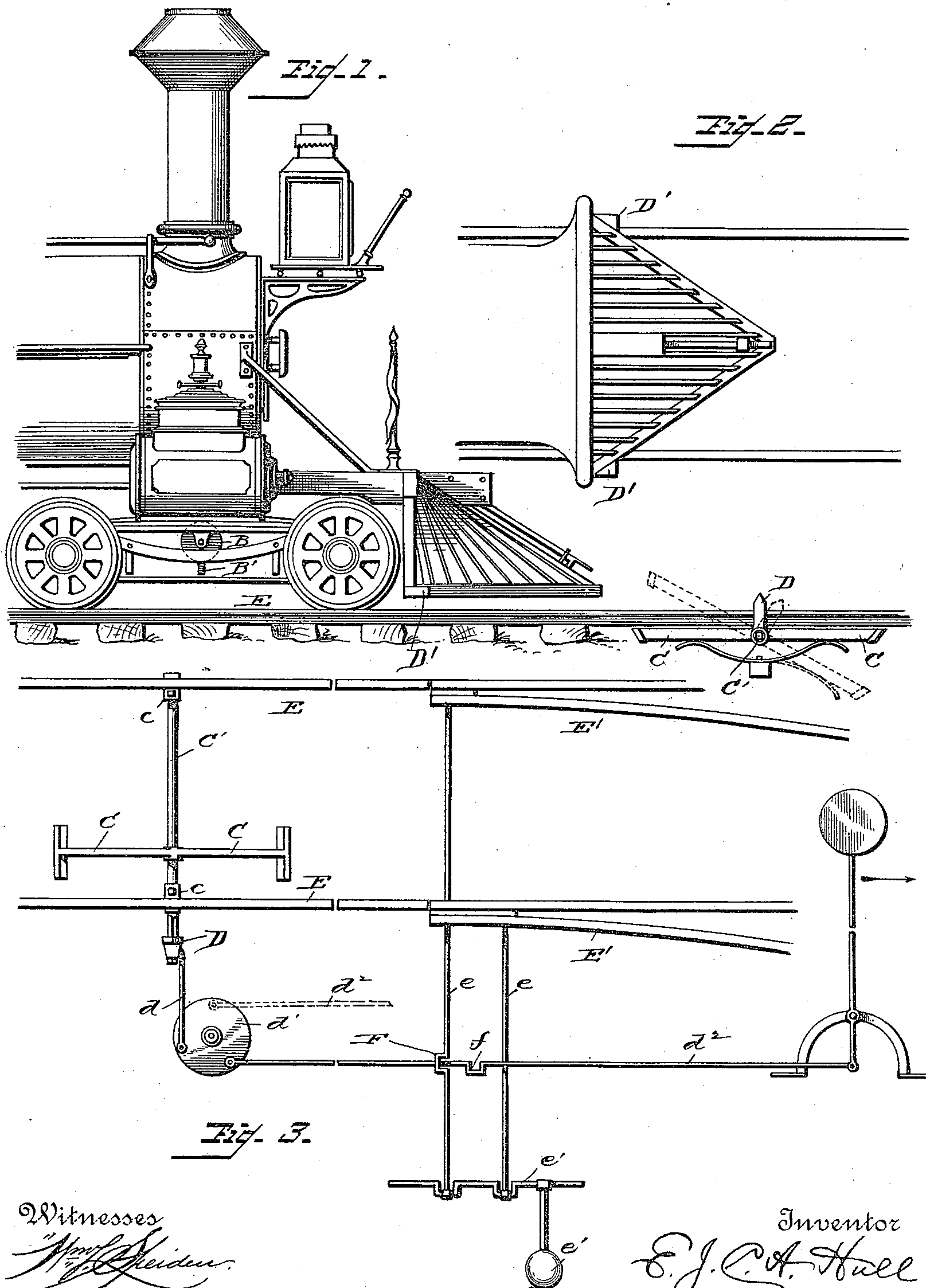
(No Model.)

2 Sheets—Sheet 1.

E. J. C. A. HULL.
TRAIN STOPPING DEVICE.

No. 442,584.

Patented Dec. 9, 1890.



Witnesses

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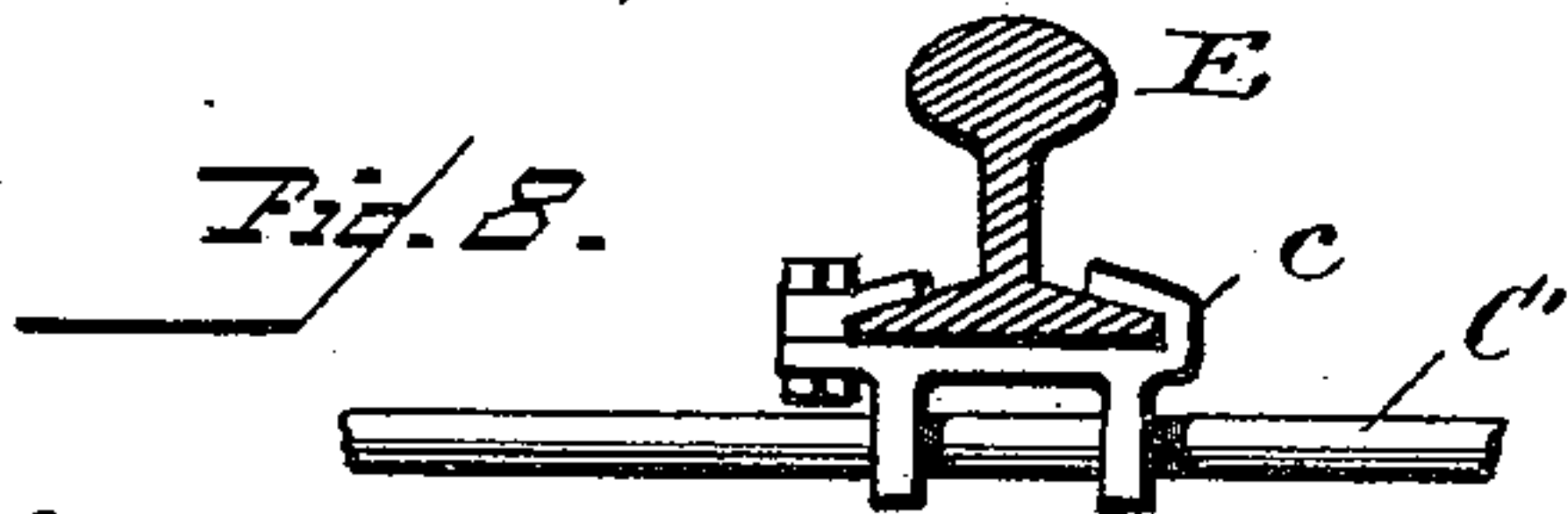
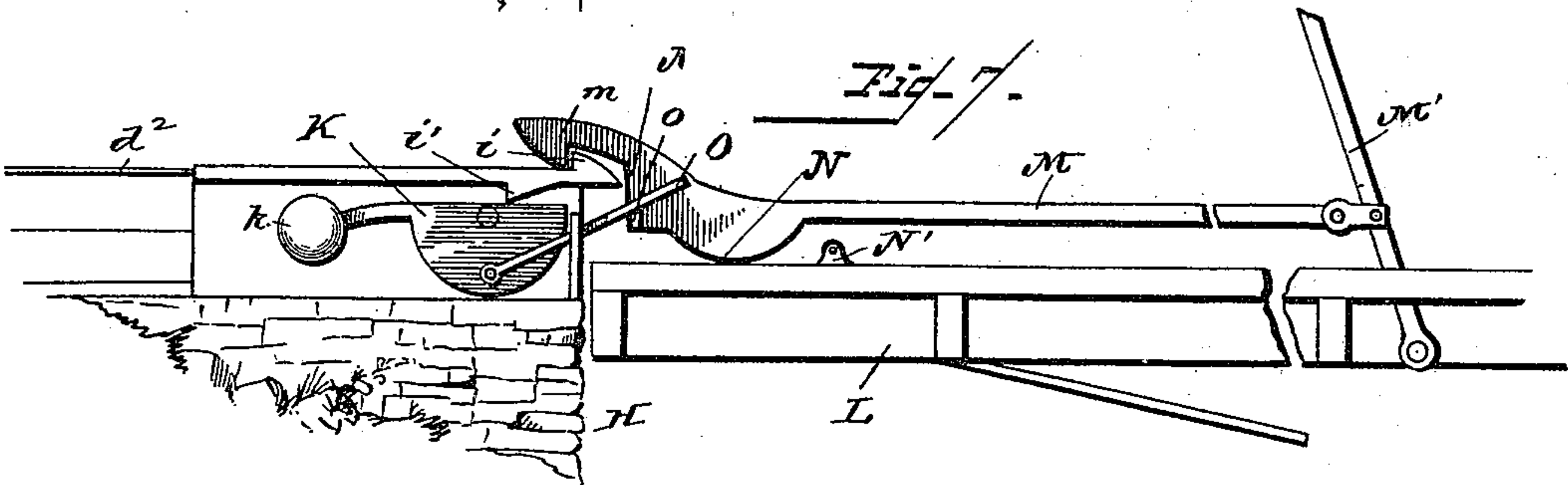
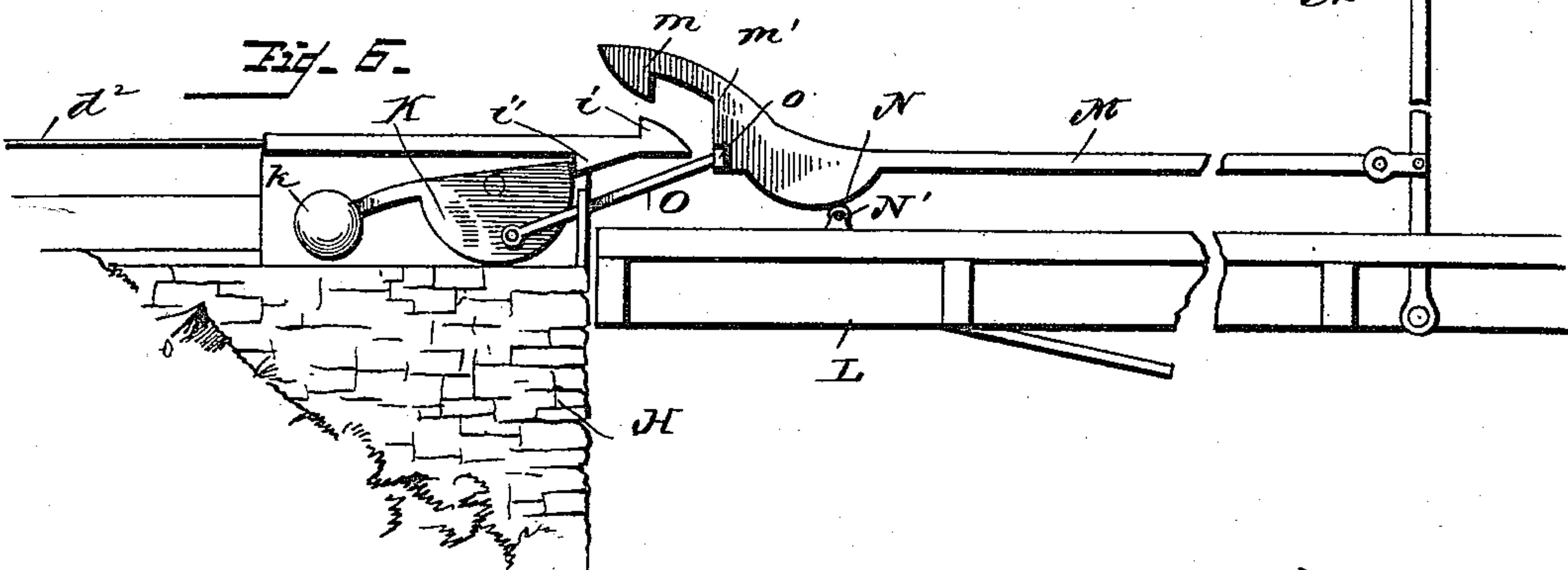
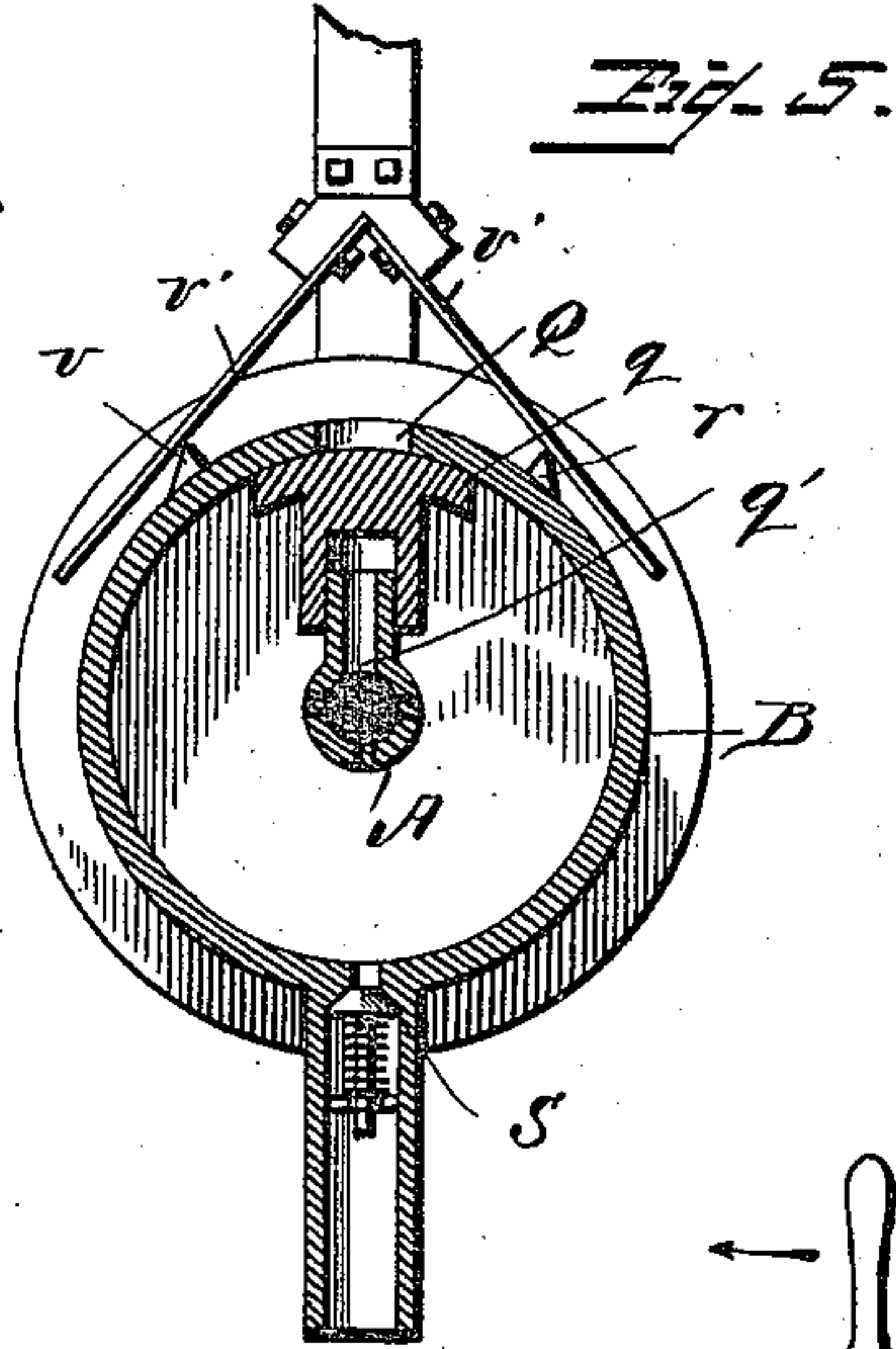
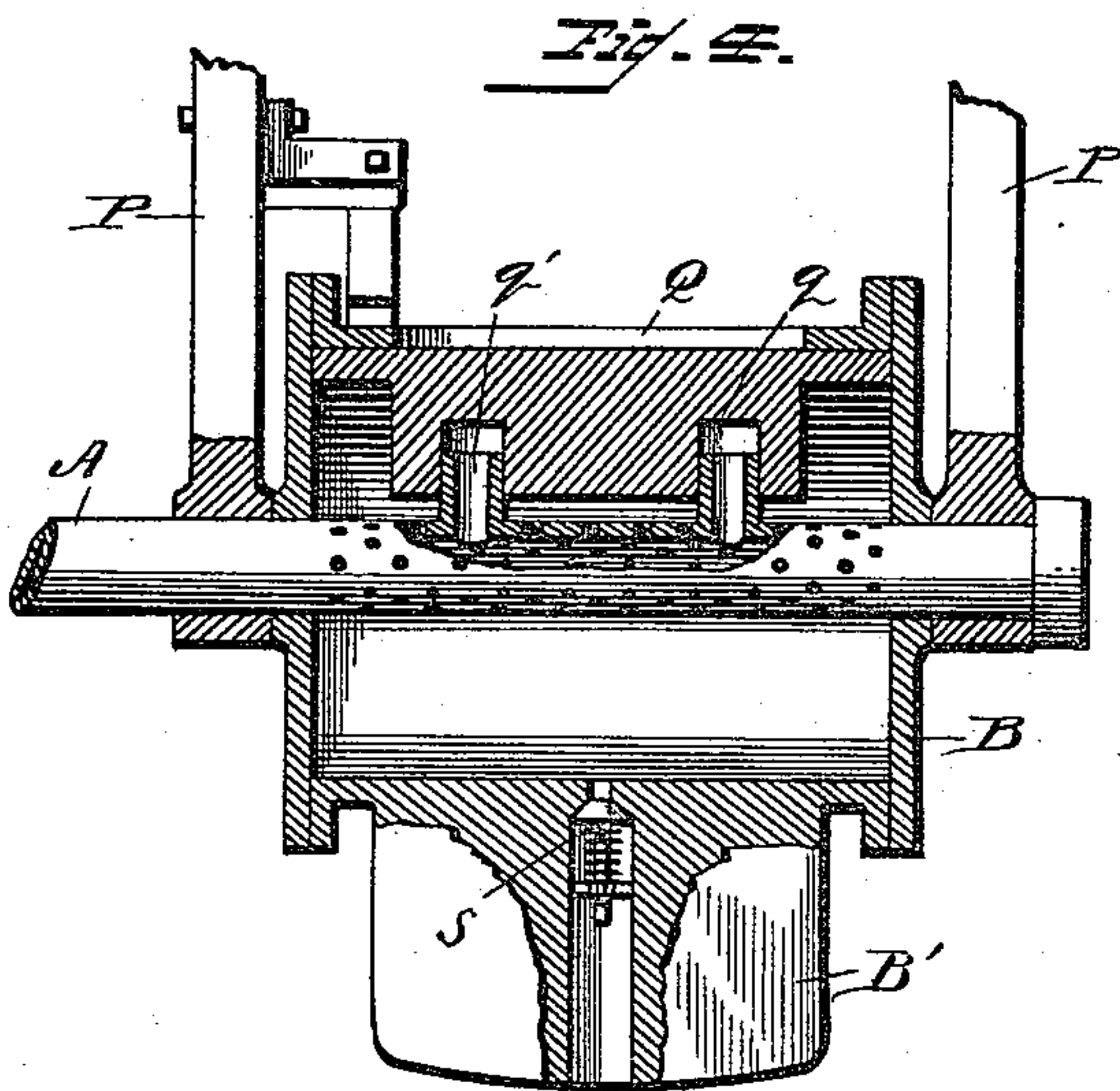
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Witnesses

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UNITED STATES PATENT OFFICE.

EUGENE J. C. A. HULL, OF BALTIMORE, MARYLAND, ASSIGNOR OF TWO-THIRDS
TO CHARLES L. HENTZ AND DAVID W. FIELD, BOTH OF PHILADELPHIA,
PENNSYLVANIA.

TRAIN-STOPPING DEVICE.

SPECIFICATION forming part of Letters Patent No. 442,584, dated December 9, 1890.

Application filed July 2, 1890. Serial No. 357,527. (No model.)

To all whom it may concern:

Be it known that I, EUGENE J. C. A. HULL, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Train-Stopping Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to devices for automatically applying the brakes on a railway-train when it is desirable to stop the train entirely independent of the engineer's will—as, for instance, when the train is approaching an open switch or draw-bridge, and under other conditions which will at once occur to those skilled in the art.

The object of the invention is to provide a mechanism which when set in shifting the rails of a switch or the turn-table of a draw-bridge or otherwise will without fail operate the brakes of a train when moving in either direction, so as to bring the same to a standstill before reaching the point where disaster might occur.

Broadly stated, the invention may be said to consist of a trigger, set by suitable extraneous means into position to encounter some part of the locomotive, and when operated thereby to throw a retarder or operating-arm into position to engage a valve controlling the pressure within the brake-pipe, whereby the latter may be located above the level of the bottom of the pilot of the engine and out of the way of stones or other slight obstructions which might happen to be on the track.

Further than this, the invention consists in certain novel details of construction and combinations and arrangements of parts to be hereinafter described, and pointed out particularly in the claims at the end of this specification.

Referring to the accompanying drawings, Figure 1 is a side elevation of the front portion of a locomotive, showing the application of my invention. Fig. 2 is a top plan view of the pilot. Fig. 3 is a diagrammatic view of a switch and the brake-operating mechanisms, showing the interlocking feature. Fig. 4 is a sectional view through the cylinder control-

ling the pressure of air in the brake-pipe. Fig. 5 is a similar view taken at right angles to Fig. 4. Fig. 6 is a side elevation of the interlocking mechanism employed to operate the trigger where used in connection with a draw-bridge. Fig. 7 is a similar view showing the position of the parts when the draw-bridge is closed and the trigger out of operative position. Fig. 8 is a detail.

Like letters of reference indicate the same parts in all the figures.

In carrying my invention into practice I preferably extend the train or brake pipe, which it will be understood is the one through which the power is transmitted to operate the brakes, out in front of the drive-wheels beneath the locomotive, and upon the end of the same journal a cylinder B, to be hereinafter more particularly described, which constitutes one member of the valve controlling the pressure within the pipe. The cylinder has an extended side or projection B', which when in normal position directly below the pipe is some distance above the level of the bottom of the pilot, but below the truck-axles or other parts of the locomotive mechanism, thus being entirely removed from any danger of being struck by stones or other small obstructions which might pass the pilot. In order now to operate this cylinder when it is desired to stop the train, two retarding devices or arms C are mounted upon a shaft C', journaled in clips c, Fig. 8, on the bottom of the rails at the proper point. The retarder or arms C are long enough to engage the projection B' on the cylinder when elevated, and for the purpose of elevating them behind the pilot, so as not to be struck thereby, a trigger D is mounted on one end of the shaft C' and adapted to be struck by one of the projections D' at the side of the pilot, thereby turning the shaft and causing one or the other of the arms C to be elevated in the position indicated in dotted lines, Fig. 1.

The trigger D is mounted upon a squared end of the shaft C', preferably outside of the rails, and is adapted to be moved in and out longitudinally of the shaft, or into and out of the path of the projections D' by means of the rod d, disk d', and a lever and its connecting-rod d².

When the device is used in connection with a sliding and switch-operating mechanism, it is desirable to have the parts so depend upon each other as that it is impossible to open the switch to admit a train to a siding without setting the trigger in position to be struck by the first approaching locomotive. Thus it will be seen that if a train has been side-tracked to permit another train to pass and the operator should carelessly leave the switch open the approaching train will be stopped before reaching the switch, and, on the other hand, should the train which had been side-tracked endeavor to move away without returning the switch to close positions, the train would be brought to a standstill at the point where the trigger is located, and which, it will be understood, may be any desired distance away from the switch proper. The interlocking mechanism for carrying this idea into effect is shown diagrammatically in Fig. 3, E E representing the rail of a main line and E' E' the switch-rails operated by means of the rods *e e* and crank-shaft and weight *e'*, as in the ordinary construction. One or both of the rods *e* is provided with a recess *F*, preferably formed by bending the rod upward, and through this recess the rod *d*² of the trigger-operating mechanism passes, the latter rod *d*² being in turn provided with a corresponding recess *f*, which, when the trigger is out of operative position, is at one side of the rod *e*, as shown in Fig. 3. The rod *d*² thus normally acts as a lock for the rod *e*, preventing the same from being moved longitudinally in either direction; but when the rod *d*² is shifted to bring the recess *f* into line with the rod *e* and at the same time move the trigger into operative position the rod *e* may be readily moved to shift the rails.

When used in connection with a draw-bridge, it is desirable that an interlocking mechanism shall be employed which will enable the bridge-attendant stationed at the center of the draw to set the trigger, located some distance along the track, without leaving his post, which result I preferably accomplish as follows: Referring particularly to Figs. 6 and 7, it will be seen that the rod *d*², which controls the trigger and locks the switch-shifting rods, terminates at one of the bridge-abutments *H* in a section having hooks *i* and *i'*, projecting, respectively, above and below the same. The hook *i'*, adapted to engage a pivoted catch or weight *K* when the draw is to be opened, as will be presently explained, the catch *K* being held in operative position by a counter-weight *k*. On the draw *L* of the bridge a second rod *M* is located, connected at one end to an operating-lever *M'* and terminating at the opposite end in a hook *m*, adapted to engage the hook *i* when in the position indicated in Fig. 7, but to be released therefrom when drawn back and elevated by the inclined surface *N*, which rides up on the projection *N'*, as shown in Fig. 6. The latch *K* has a link *O*, pivoted thereto and extended

forward into position to engage a lug or projection *o* on the hook *m*. The operation is as follows: Assuming that the draw has been opened and returned to normal position without the interlocking mechanism having been operated to withdraw the trigger from set position, the parts occupying the relation shown in Fig. 6, with the rod *d*² held retracted by the latch *K*, now, when it is desired to withdraw the trigger from set position, the handle *M'* is pushed forward in the direction indicated by the arrow, causing the lug *o* to engage the link *O*, push the same forward, and release the rod *d*². At the same time the end of the hook *i* comes in contact with the surface *m'* of the hook *m* and pushes the rod *d*² back to the position indicated in Fig. 7, the hooks *m* and *i* falling into engagement and the link *O* slipping off the lug, as shown. With the parts in this relation the trigger is out of operative position, it being necessary, however, to connect the rod *d*² to the opposite side of the disk *d'*, as shown in dotted lines, Fig. 3.

When it is desired to open the draw, the operations just mentioned are reversed, the hook *m* drawing the rod forward until the hook *i'* engages the latch *K*, when the said hook *m* rides up on the projection *N'* and releases from its engagement with the hook *i*, leaving the bridge free to turn.

Returning now to Figs. 4 and 5, it will be seen that the end of the brake or train pipe is supported in hangers *P*, secured to any convenient part of the locomotive-frame, and the cylinder *B* is journaled directly upon the said pipe between the hangers. At the top of the cylinder an elongated opening or port *Q* is formed of sufficient size to instantly reduce the pressure in the pipe to zero, and the pipe within the cylinder is provided with a large number of perforations, their aggregate areas being as great as, if not greater than, that of the opening *Q*. The opening *Q* is closed under normal conditions by means of a valve *q*, mounted upon outwardly-extending tubular studs or projections *q'* on the train-pipe, whereby when the pressure is admitted to the cylinder it exerts its force in a direction to keep the valve at all times closed; but should the cylinder be turned it will be seen that the valve would remain stationary and the whole opening *Q* uncovered, instantly bringing the train to a standstill. For the purpose of holding the cylinder in position when turned, so as to keep the opening *Q* uncovered, small projections *r* are provided on each side of the cylinder and co-operating pawls *r'* on one of the hangers *P*, the operation of which is apparent and need not be further described.

A valve *S* is located in the bottom of the cylinder and is loaded to withstand the normal pressure within the brake or train pipe, but to open when a greater pressure is brought to bear on the same. Hence any accumulation of water or condensation in the bottom of the cylinder will increase the pressure,

open the valve, and permit the water to pass out, the valve being immediately closed when the pressure is reduced to normal.

While I have described specifically the interlocking mechanism for the switch and have shown the same separately, it is obvious that they may be used in connection with each other, inasmuch as the trigger is necessarily located some distance from the bridge—say a thousand feet. It is further obvious that the particular mechanical structure of the valve and its operating mechanism may be considerably modified without departing from the spirit of my invention.

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

1. In a device for automatically applying the brakes of a railway-train, the combination of the train-pipe and a valve controlling the pressure within the same, located in proximity to the rails, of a retarder or arm for operating said valve, and a trigger for setting said retarder or arm into operative position, projecting into the path of some part of the locomotive and adapted to be struck thereby, substantially as and for the purposes set forth.

2. In a device for automatically applying the brakes of a railway-train, the combination, with the train-pipe and a valve controlling the pressure within the same, located on the locomotive and above the level of the bottom of the pilot, of a retarder or arm for operating said valve, and a trigger projecting into the path of the pilot and adapted to be struck thereby to throw the retarder or arm into operative position, substantially as described.

3. In a device for automatically applying brakes of a railway-train, the combination, with the train-pipe and a valve controlling the pressure within the same, located on the locomotive and above the level of the bottom of the pilot, of a retarder or arm for operating said valve, mounted on a shaft journaled in stationary bearings along the track, and a trigger mounted on and movable longitudinally of the shaft and adapted to be struck by the pilot to shift the retarder, and mechanism, substantially as described, for shifting the trigger into or out of operative position, substantially as described.

4. In a device for automatically applying the brakes of a railway-train, the combination, with the train-pipe, a valve controlling the pressure within the same, and a retarder mechanism or arm for operating the said valve, located along the track, of a rod for operating said retarder mechanism, terminating in a hook, a latch for holding said hook in set position, a co-operating hook and operating-lever located on a movable section or draw, having cam-surfaces for disengaging said hooks, and a link for releasing the latch when the hooks are in engagement, substantially as described.

5. In a device for automatically applying the brakes of a railway-train, the combination, with the train-pipe, a valve controlling the pressure within the same, and a retarder mechanism or arm for operating the said valve, located along the track, of a rod for operating said retarder mechanism, terminating in a section having two hooks *i i'* thereon, a latch *K*, engaging hook *i'* when in set position, a co-operating hook *m* on a movable section or draw, having a cam-surface thereon, a stationary projection for releasing the hooks, and a link connected to the latch, operated by the hook *m* to release the latch when the hooks are in engagement, substantially as described.

6. In a device for automatically setting the brakes of a railway-train, the combination, with the train-pipe, of a cylinder journaled thereon and in communication with the said pipe and having an opening therein, a valve for closing the opening, and a retarder mechanism located along the track for operating said cylinder to turn the same and open the valve, substantially as described.

7. In a device for automatically setting the brakes of a railway-train, the combination, with the train-pipe, of a cylinder journaled thereon and in communication with the said pipe and having an opening therein, a valve for closing the opening, mounted on the pipe and held out by the pressure within the cylinder, a projection on one side of the cylinder, and a retarder mechanism located along the track for engaging said projection to turn the cylinder and set the brakes, substantially as described.

8. In a device for automatically setting the brakes of a railway-train, the combination, with the train-pipe, of a cylinder journaled thereon and in communication with the said pipe and having an opening therein, a valve for closing the opening, mounted on the pipe, a projection on the cylinder, a retarder mechanism along the track for engaging the projection and operating the cylinder, and a loaded valve in the bottom of the cylinder for the escape of water of condensation, substantially as described.

9. In a device for automatically setting the brakes of a railway-train, the combination, with the train-pipe, a valve controlling the pressure within the same, located beneath the engine, and a retarder mechanism for opening said valve, of pawls for holding the valve open, located beyond the reach of the engineer while the engine is in motion, whereby the valve cannot be reset until the engine is brought to a standstill, substantially as described.

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

EUGENE J. C. A. HULL.

Witnesses:

A. B. KELLY,
W. M. HATCH.