

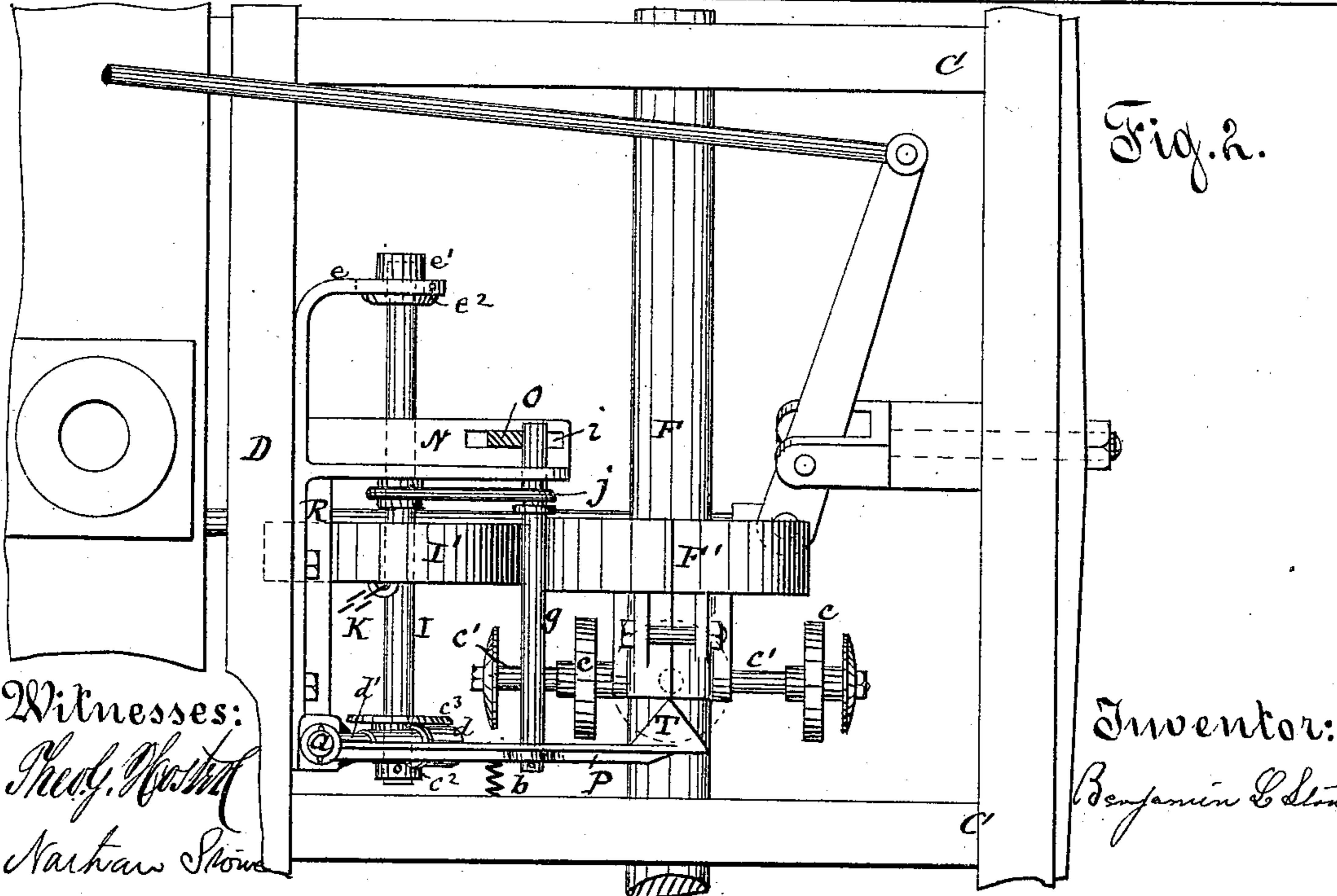
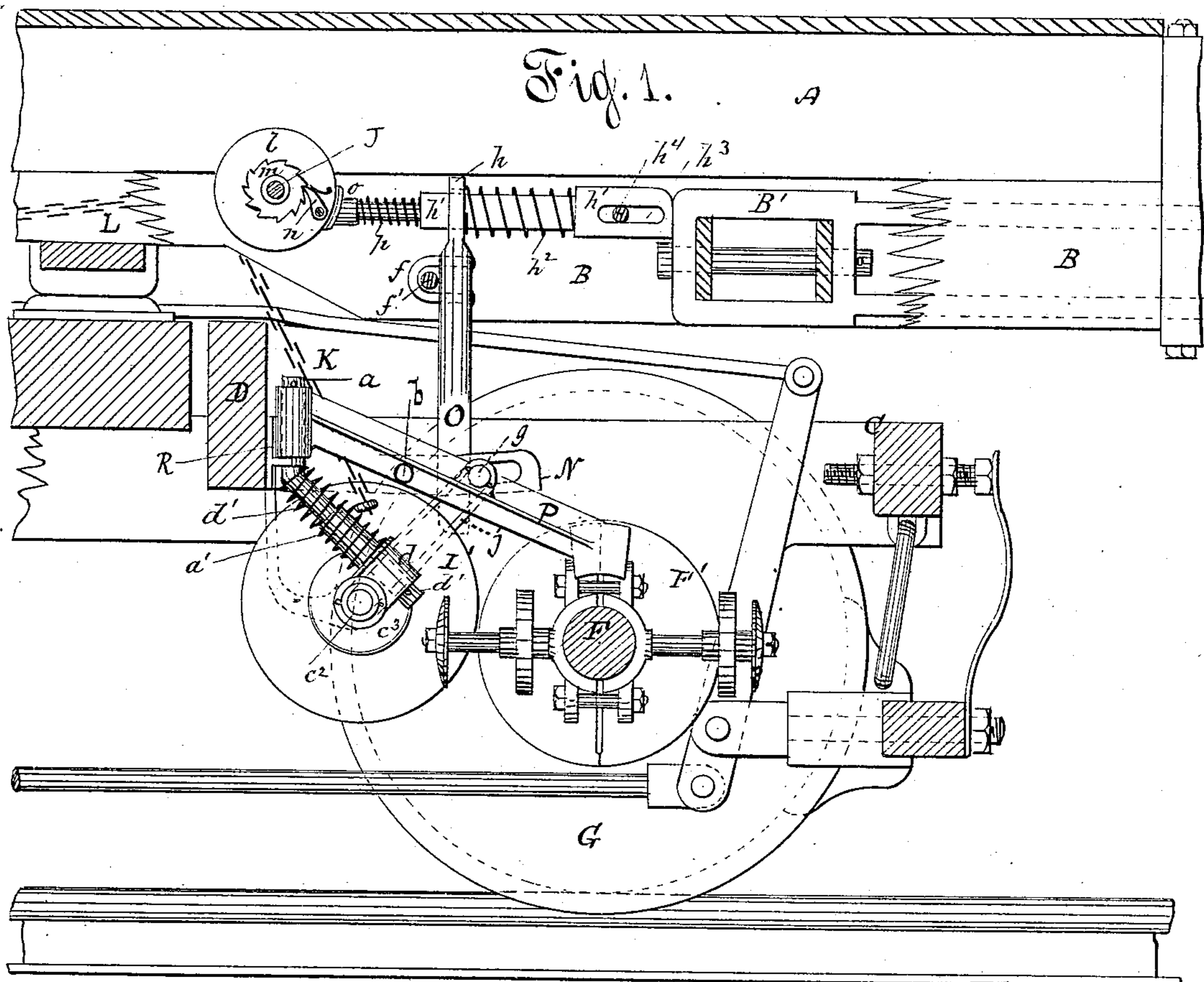
(No Model.)

3 Sheets—Sheet 1.

B. L. STOWE.
CAR BRAKE.

No. 250,852.

Patented Dec. 13, 1881.



Witnesses:

Theo. Norton
Nathan Stone

Fig. 2.

Inventor:

Benjamin L. Stowes

(No Model.)

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Fig. 3.

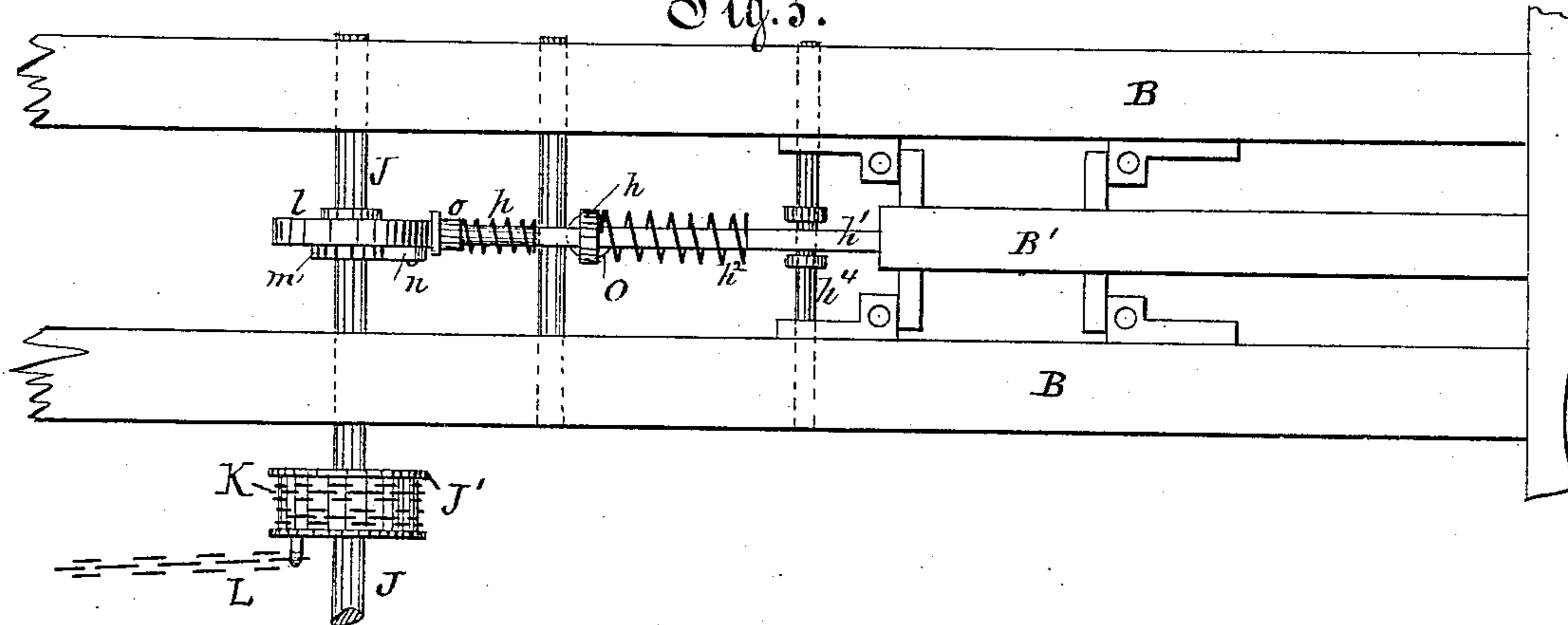


Fig. 4.

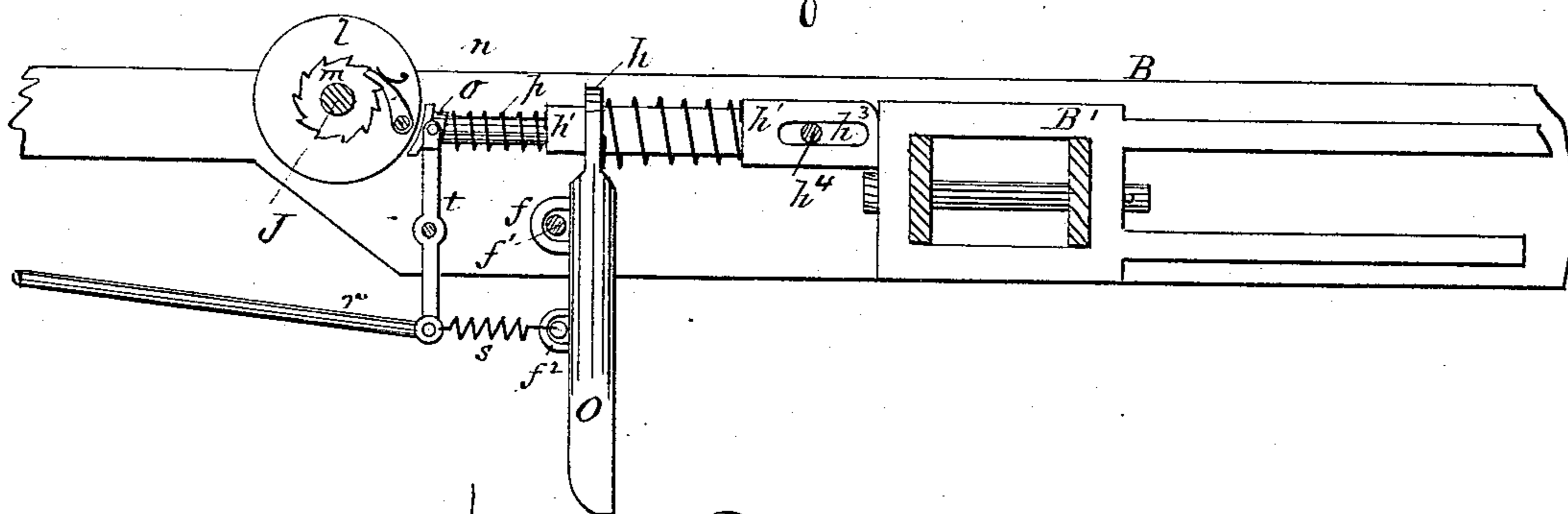
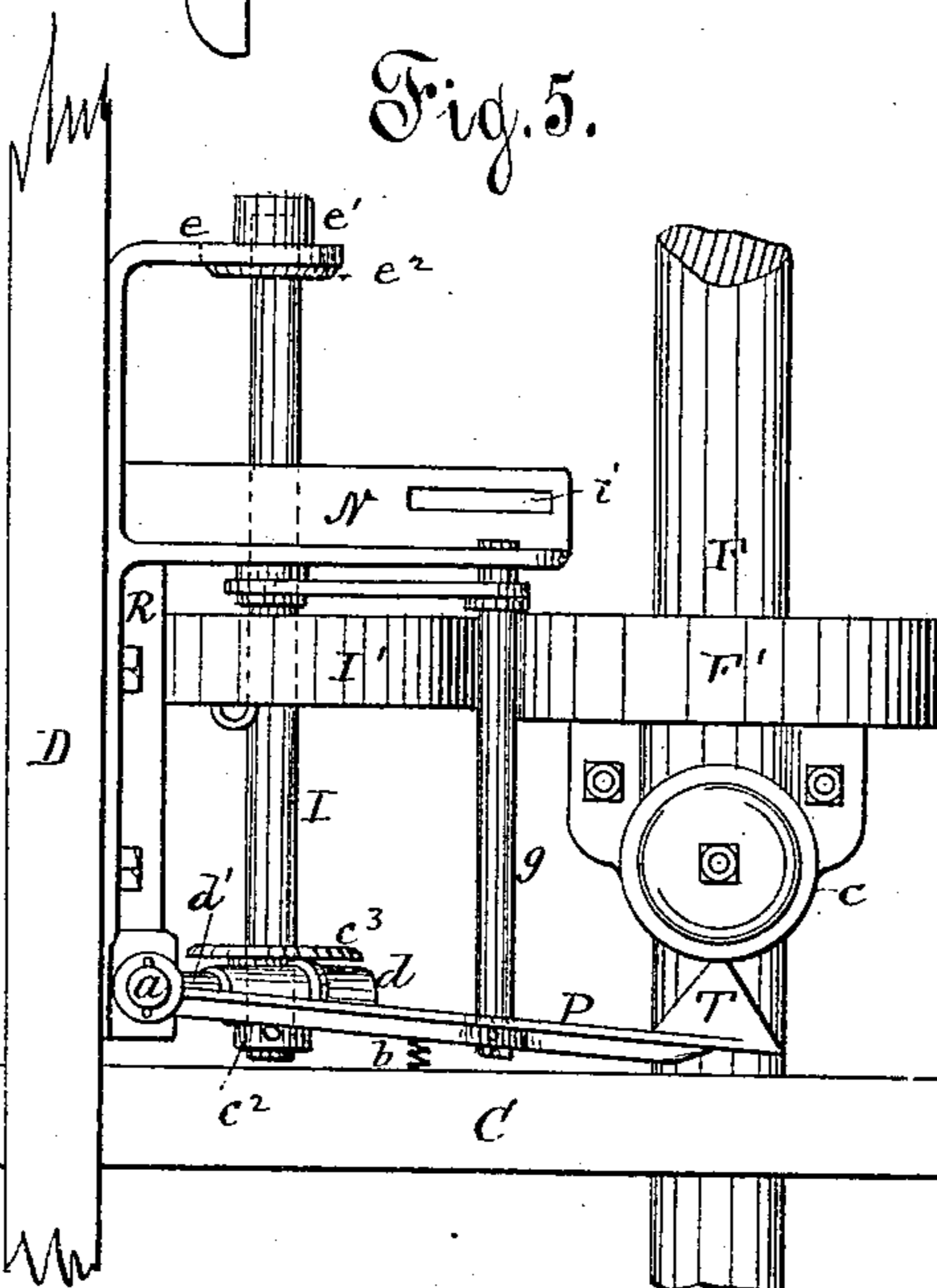


Fig. 5.



Witnesses:

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(No Model.)

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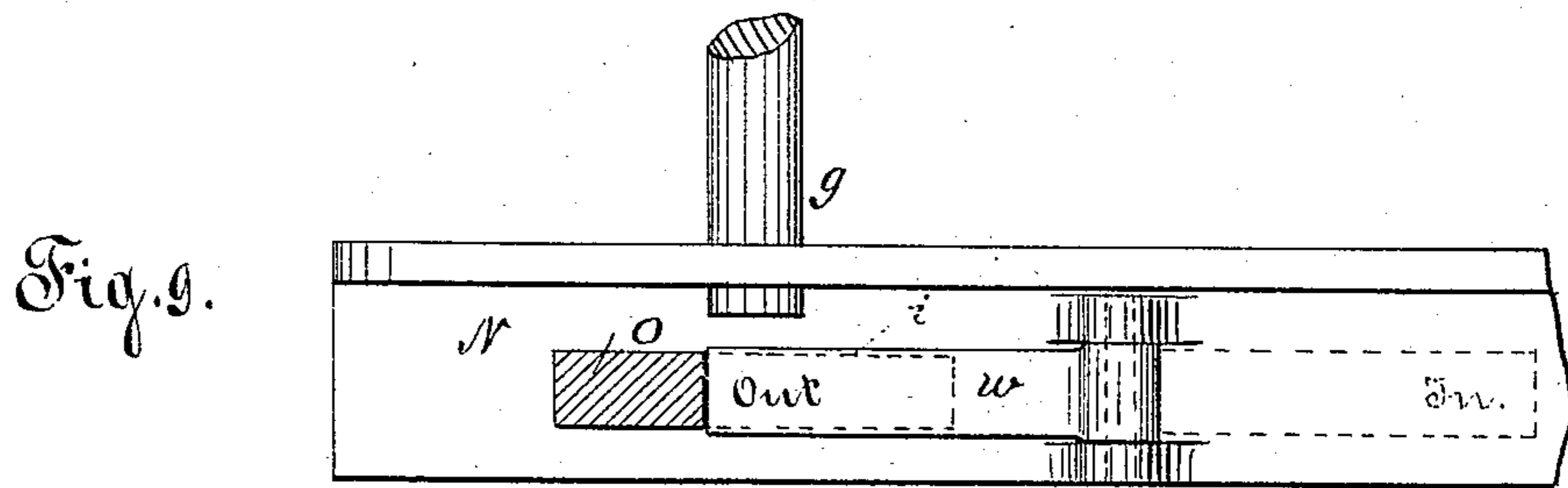
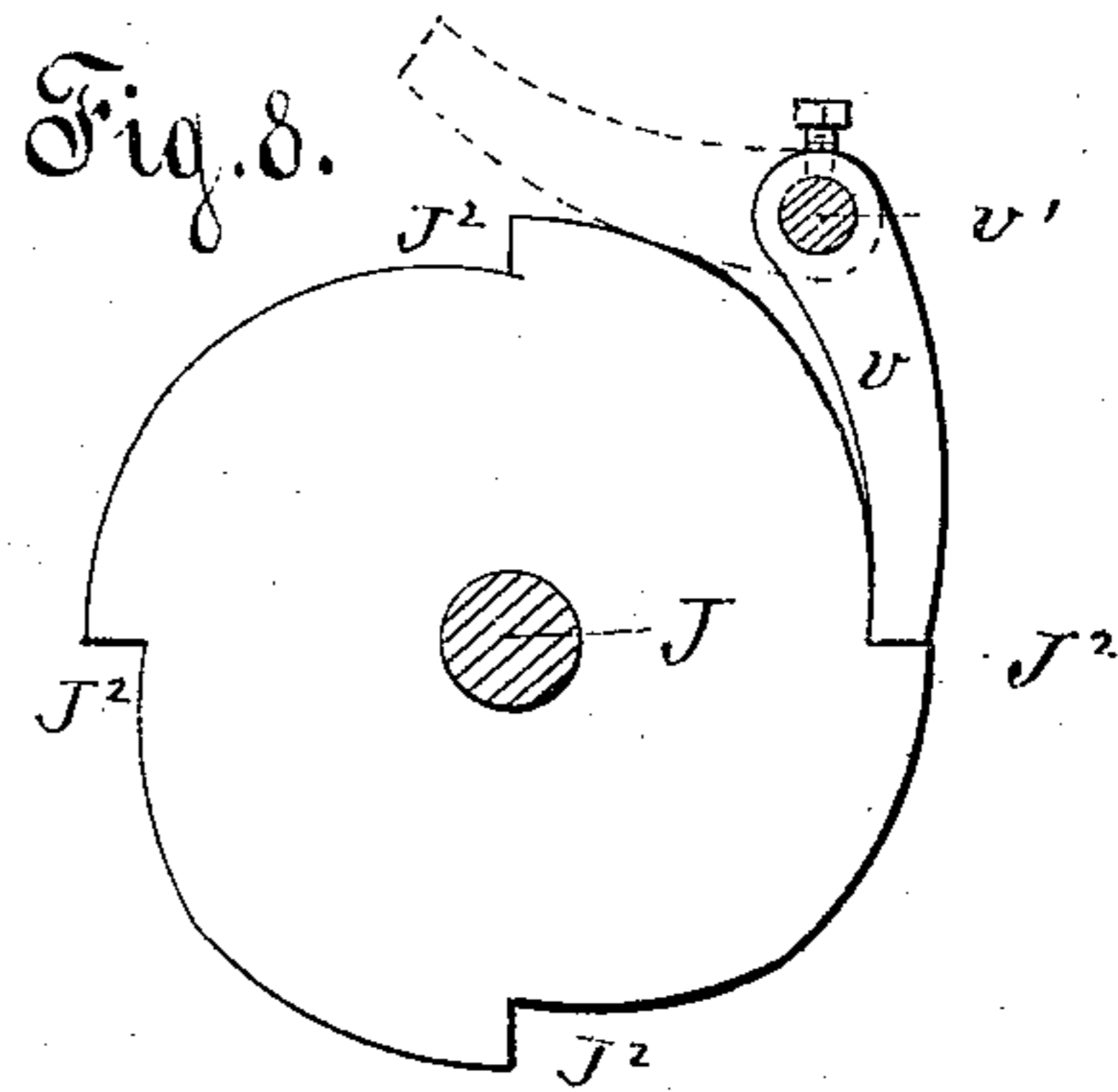
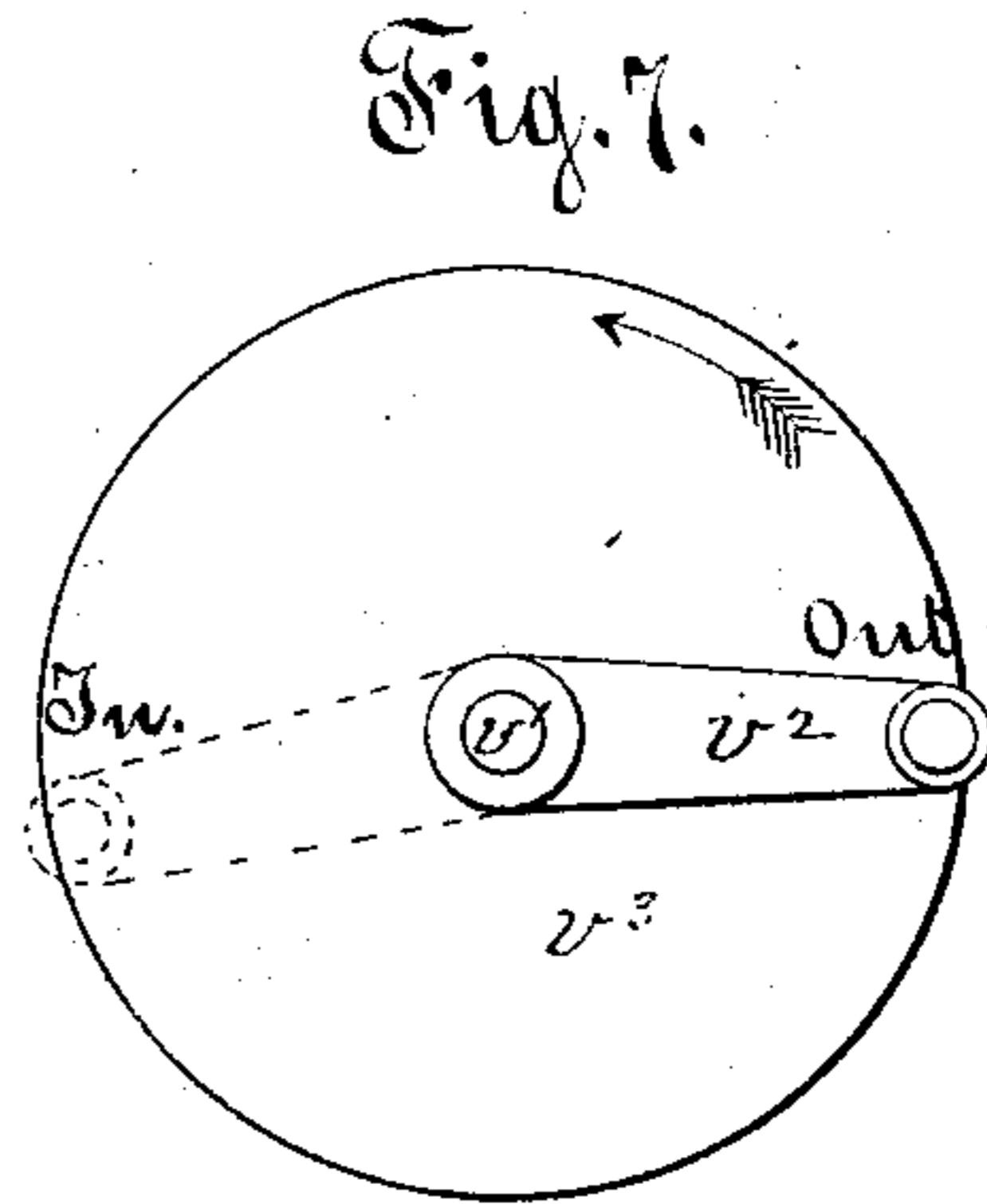
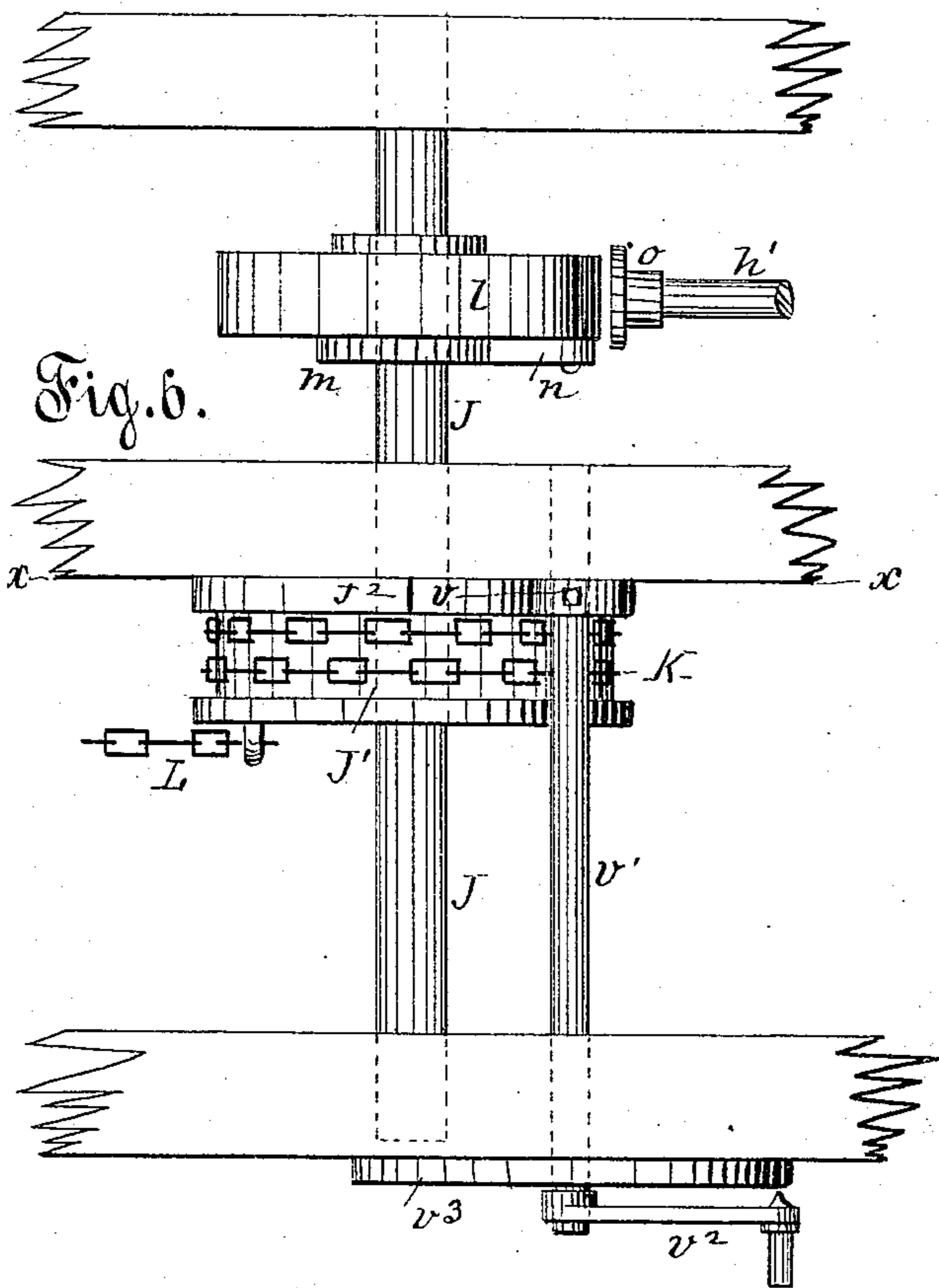
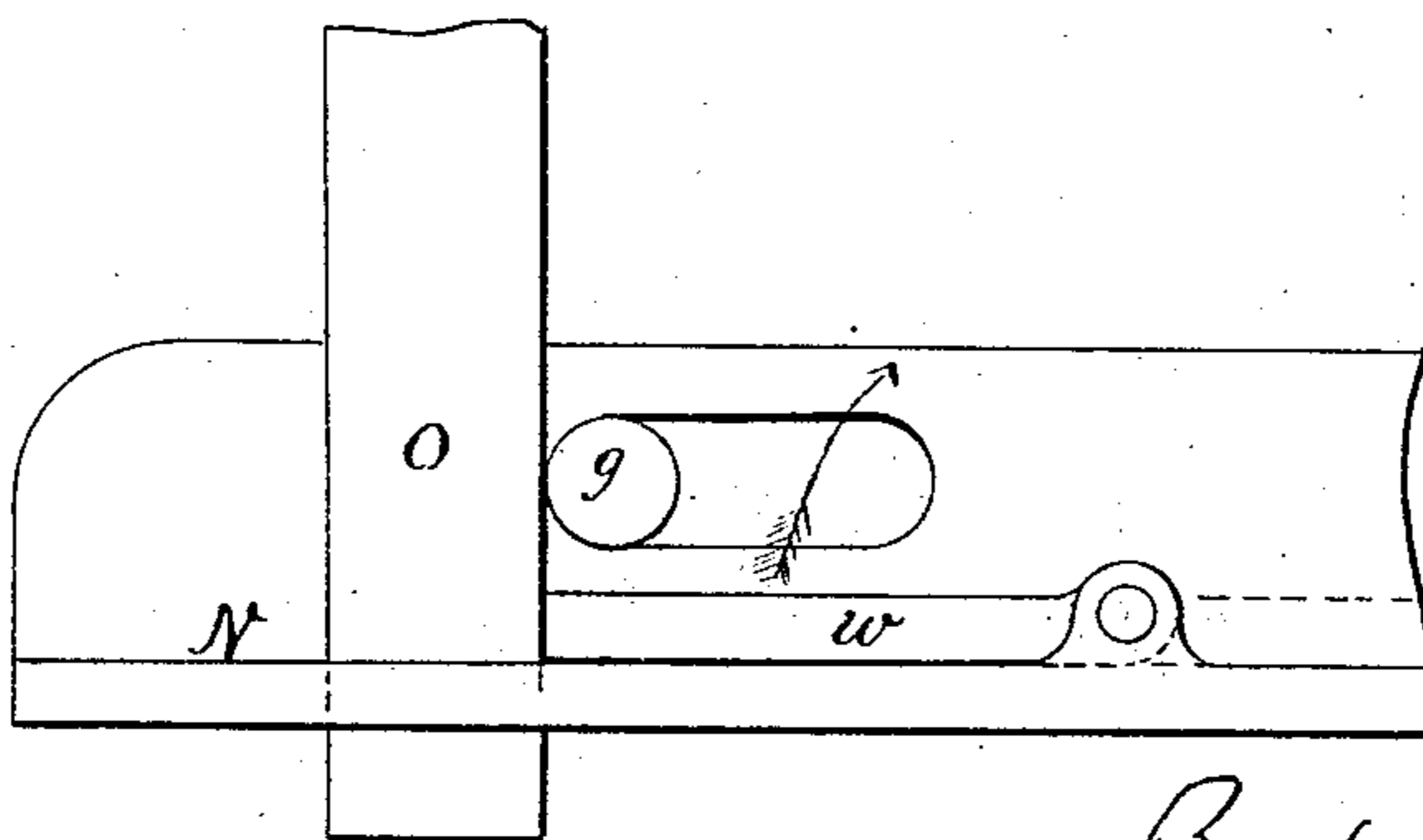


Fig. 10.



Witnesses:

Theo. G. Boston
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Inventor:

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UNITED STATES PATENT OFFICE.

BENJAMIN L. STOWE, OF NEW YORK, N. Y., ASSIGNOR TO J. VAN D. REED,
OF SAME PLACE.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 250,852, dated December 13, 1881.

Application filed October 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN L. STOWE, of the city, county, and State of New York, have invented certain new and useful Improvements in Automatic Brakes for Railway-Cars, of which the following is a specification.

My invention consists, mainly, in certain improvements in automatic car-brakes of the kind shown and described in my Letters Patent Nos. 231,115 and 231,116, dated August 10, 1880, and Nos. 245,576 and 245,577, dated August 9, 1881.

The improvements consist in a novel construction and arrangement of the vertical or draw-bar lever and its accessories, through whose instrumentality the friction-pulley shaft is moved toward one of the car-axles (provided with a like friction drum or pulley) for the purpose of putting in motion the brake mechanism.

They also consist in the combination, with the automatic-brake-applying devices and the centrifugal arrangement by which those devices are caused to release control of the brake when the car moves slowly, of mechanism arranged and operating, as hereinafter described, to hold the winding-shaft of the automatic-brake mechanism in position in which the brakes will remain applied so long as the draw-bar is pressed in a direction contrary to that in which the car was moving; and they further consist in combining with the automatic-brake mechanism a device for throwing the said mechanism out of and into action, as desired, and an indicator by which the position of said device can be ascertained and determined, so that by inspecting the indicator the train-men may know at once whether the automatic-brake mechanism is in or out of action.

The nature of my improvements and the manner in which the same may be carried into effect will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of a portion of one end of a car provided with my improvements. Fig. 2 is a plan of the same with the car body or frame removed. Fig. 3 is a plan of the draw-timbers and mechanism carried by the same. Fig. 4 is a modification

hereinafter referred to. Fig. 5 is a plan of a portion of the car-truck representing the centrifugal arrangement in position in which one of the wheel-weights is pushing back the cam. Figs. 6 to 10 will be hereinafter referred to.

Portions of the car-frame are represented at A. B are the draw-timbers. C is the truck-frame. D is the transom. F are the axles, and G the wheels, all of ordinary or suitable construction.

I is the friction-pulley shaft, provided with pulley or hub I', adapted to move to and from the adjoining axle F, so as to bring at required times its hub I' into contact with the axle-drum F'.

J, Fig. 3, is the upper brake or winding shaft, connected to shaft I by a chain, K, attached to the side of pulley I' and to the periphery of a drum, J', on shaft J, around which the chain passes once or twice. The winding-shaft is to be provided with a throw-off spring (not shown) for purposes indicated in my Letters Patent hereinbefore named. From one side of the drum on winding-shaft J extends the chain L, which at the other end is attached to the equalizing-lever at the same point at which the hand brake-rod is also attached to that lever. This feature is described and claimed in my aforesaid Letters Patent No. 245,576.

The friction-drum F' is provided with prolongations, which carry the wheel-weights *c* and their radial guide studs or rods *c'*, the weights being designed, when the car is moving slowly, to act upon a cam, T, which normally projects into the plane of revolution of the wheel-weights, and is connected through suitable intermediaries with the locking-pin *g* in such manner as to draw it back at the proper time from across the slot *i* of the arm N, in which slot lies the lower end of the vertical or draw-bar lever O.

The pin *g* is connected by a link or loop, *j*, with the friction-pulley shaft I, so that when it is pushed forward by the draw-bar lever O it will draw the shaft I toward the axle F, thus pressing together the drums F' I', and consequently applying the brakes.

The parts thus described in their general combination and mode of operation resemble the like parts shown and described in my Let-

ters Patent No. 245,577, and referred to therein by the same letters of reference. They therefore require no further description here.

The cam T in the present instance is part of a gate, P, which is hinged to turn on a vertical stud, *a*, projecting upward from a flange on the bracket R. This bracket is fast to the transom, and carries all the parts of the automatic-brake mechanism, which, in my heretofore-patented arrangements, were carried by the truck-frame.

The gate is free to move to and from the centrifugal arrangement, and is pressed in toward the latter by a spring, *b*. The locking-pin *g* is carried by and moves with the gate, being pinned loosely thereto, and extends directly therefrom through a guide-slot in a vertical flange on arm N and across the slot *i* in the horizontal part of the said arm. The pin will be crowded in or drawn out according to the direction of movement of the gate, and the action of the cam upon it is positive and direct. A collar on the pin forms a stop to limit inward movement.

The shaft I is supported in bearings in bracket R in the following way: A sleeve, *c*², with a wide flange, *c*³, upon one of its ends, is pinned upon one end of shaft I. The flange *c*³ prevents the chain from winding too far out upon the shaft, and the sleeve *c*² prevents the shaft from becoming worn by its turning. This sleeve passes loosely through the journal-bearing *d*, and the shaft is thereby supported, the bearing *d* itself being supported by an arm, *d'*, which, projecting downward and forward from a flange upon the bracket R at an angle of about forty-five degrees, passes loosely through the bearing at right angles to the shaft. The bearing *d* is prolonged at its upper end to give a longer bearing upon the arm *d'*, and the relief-spring *a'* encircles this prolongation and the arm, the said spring pressing at its lower end against the bearing and at its upper end against the flange of the bracket, and acting to permit the shaft to recede from the axle when the strain upon the brakes becomes excessive, as described in my Patent 245,577, hereinbefore referred to. An arm, *e*, of the bracket R extends downward and forward and supports the other end of the brake-shaft I. A sleeve, *e'*, having its outer end closed and a flange, *e*², upon its other end, fits loosely upon the end of the shaft, and this sleeve passes through an oblong bearing-slot in the end of the bracket-arm. The oblong slot is to allow the shaft sufficient lateral motion at this end to permit the pulley I' to be brought into contact with the drum F' upon the axle when the brake is being applied, or to recede from it when the brake is loosened. The flanged sleeves upon the ends of the shaft prohibit the shaft from slipping longitudinally in either direction.

Figs. 1 and 3 illustrate the improved form of draw-bar lever and its connections which I now use. The vertical draw-bar lever O is simi-

lar in form and action in its lower part to the one described in my Letters Patent No. 245,577. It differs, however, in other respects from the latter in that it is so hung that its lower end normally stands at the rear end of the slot *i* in arm N. For this purpose, above its center it has a loop, *f*, upon its rear side, and through this loop a bolt, *f'*, which reaches from one to the other of the draw-timbers, passes and forms a fixed fulcrum and support for the lever; but the loop should be large enough to permit considerable freedom of motion to the lever, so as to allow it to twist or turn somewhat as well as to swing. This support being upon the rear side of the lever, the weight of the lever has a tendency to carry the lever out of a vertical position, and this tendency is relied upon to keep the lower end of the lever at the rear end of the slot *i* in the arm, except when it is forced forward.

In the upper end of the lever is an eye, *h*, and through this eye a spring-bar, *h'*, passes loosely. A spring, *h*², encircles the spring-bar between the lever and a shoulder upon the spring-bar. The forward end of the spring-bar has a long slot, *h*³, in it, and through this slot a bolt, *h*⁴, reaching from one to the other of the draw-timbers, passes for the purpose of supporting this end of the spring-bar.

The spring-bar and spring should be of sufficient length, so that when the lever is vertical and the draw-bar B' is in its normal position they should just reach from the lever to the draw-bar. When the draw-bar B' is drawn out the weight of the lever O will cause the spring-bar to follow the draw-bar until the lower end of the lever is at the rear end of the slot *i*, but no farther. When the draw-bar B' is crowded in, the bar *h'* will be pushed back and the upper end of the lever O will be crowded back with all the force of the spring *h*². The effect of this movement will be, when the pin *g* is in front of the lever O, to apply the brakes.

The spring-bar should extend through the eye in the lever O far enough to prevent it from ever being drawn out therefrom; but it need not be longer than is requisite for that purpose, although, as shown in the drawings, it is continued back and is made part of a mechanism designed to hold the brake on, or to keep it applied when it has once been applied, so long as the draw-bar remains crowded back, even though the pulley I' shall be released from contact with the drum F' through the agency of the centrifugal arrangement when the train is stopping.

The winding-shaft J is prolonged sufficiently to reach through both of the draw-timbers B; and midway between the draw-timbers is placed upon the shaft a friction-wheel, *l*, which can turn freely thereon. This wheel is between a collar, which is fixed to the shaft upon one side, and a ratchet-wheel, *m*, which is also fixed to the shaft and must revolve with it upon the other.

A spring-pawl, *n*, fastened to the friction-wheel, engages the ratchet and prevents the friction-wheel from turning relatively to the shaft in one direction while it permits such

5 turning in the opposite direction.
A brake-shoe, *o*, made to fit the periphery of the friction-wheel, is applied to the prolonged end of the spring-bar *h'*, so as to be capable of moving lengthwise thereon, and is pushed back
10 by a spring, *p*, between it and a shoulder on the bar. The length of the spring-bar should be such that when the draw-bar is in its normal position the brake-shoe will be just clear of the friction-wheel.

15 The action of this mechanism is as follows: Supposing the car is running forward and the brake mechanism is ready for action, then if the draw-bar be crowded back the pulley *I'* will be brought against the drum *F'* and the
20 brake thereby applied. When the draw-bar is pushed back the brake-shoe *o* will be forced against the friction-wheel *l* with the force of the spring *p*, and the said wheel will thereby be prevented from turning with the winding-shaft *J*; but the direction of the shaft's revolution is such that the pawl *n* does not interfere with its rotation so long as that rotation continues to be in the direction in which the shaft *J* always turns when the brakes are being applied. But now suppose that the brakes
30 are applied and the forward motion of the car is retarded sufficiently to bring the centrifugal arrangement into operation and relieve the pulley *I'* from its contact with the drum *F'*, although the draw-bar *B'* still remains crowded in. The result of this would be to relieve the brakes were it not for the action of the mechanism just described; but with the said mechanism the brake-shoe *o* will be held against the
40 friction-wheel *l*, and the said wheel will thereby be prevented from turning, and its pawl *n*, engaging the ratchet *m*, will prohibit the shaft from revolving in the direction necessary to unwind the upper brake-chain and release the
45 brake. Consequently the brake cannot be released so long as the inward pressure upon the draw-bar *B'* continues.

Fig. 4 illustrates a method of connecting the present brake mechanism with the draw-bar at
50 the other end of the car, as it may sometimes be desirable to do. A rod, *r*, extends to and is fastened to the draw-bar at the opposite end of the car by means of the draw-bar bolt or in any other convenient manner. A loop, *f*², is
55 inserted in the vertical lever *O* below the one *f*, through which the supporting-bolt *f'* passes, and a pull-spring, *s*, connects this loop with the end of the rod. A lever, *t*, fulcrumed at its center upon a bolt passing through the draw-timbers, is pinned to the rod *r* at its lower end
60 and to the brake-shoe *o* at its upper end. The result of an outward pull upon the draw-bar at the opposite end of the car will be to draw the lower end of the vertical lever *O* back, and
65 also to pull the brake-shoe *o* away from the

friction-wheel *l*, thus releasing the brakes, even though the draw-bar *B'* at this end of the car remains crowded back.

The lower or pull spring, *s*, should be of sufficient power to overcome to a considerable extent the tension of the upper push-spring, and both of the springs upon the spring-bar should be capable of greater motion than would be necessary without the connection with the other draw-bar.

It may sometimes be desirable to throw the brake mechanism out of working connection by hand, and Figs. 6, 7, and 8 illustrate mechanism intended for that purpose.

In the periphery of the flange nearest the
80 draw-timbers of the pulley *J'*, upon the winding-shaft *J*, I cut a few notches, as shown at *J*². A pawl, *v*, pivoted to the draw-timbers, engages these notches when thrown in one direction, and prevents the pulley *J'* from turning in the direction necessary to apply the
85 brake, but will leave it free to turn in an opposite direction. If the pawl be thrown in an opposite direction, it will not engage the notches in the pulley's flange, but will permit the pulley
90 to turn in either direction.

The pivot of the pawl is a shaft, *v'*, which may reach out to one of the floor-timbers of the car, or to the outside of the car, where it is within easy reach of the train-men. On its
95 outer end is a small crank, *v*², which serves the double purpose of a handle with which to shift the pawl, and of a pointer, which, by pointing while it is in either position to a word or character upon a plate, *v*³, behind it, will indicate
100 whether the brake mechanism is in or out of working connection.

The mechanism just described, while it does not prevent the mechanism upon the truck from performing its functions, does prohibit it from
105 operating to apply the brakes when the pawl is in the proper position for that purpose by causing all the pull of the lower brake-chain to be expended upon the pawl; but the arrangement illustrated in Figs. 9 and 10 may be used
110 instead, and this, when it is in the proper position for that purpose, will render the mechanism upon the truck inoperative by prohibiting the lever *O* from securing a working position behind the pin *g*. This device consists
115 merely of a flap, *w*, hinged to the upper surface of the arm *N* in such a way that when in one position (indicated in full lines) it covers all of the slot *i* in the arm except a portion at the front, into which part the vertical lever is forced
120 and held by it, so that the lever can never get behind the pin *g* and into a working position until the flap is thrown over by hand and the whole of the slot is left uncovered, as indicated in dotted lines.

Upon the side of the flap which will be up or exposed when the flap is covering a part of the slot I put the word "out," or such other word or character as will indicate that the
125 brake is out of working connection, while up- 130

on the other side, which will be exposed when the flap is not covering any part of the slot, I put the word "in," or such other word or character as will indicate that the brake is in working connection. In this way, while leaving the hand-brake mechanism free to act at all times, I throw the automatic-brake mechanism into and out of action, as desired, and at the same time provide an indicator by which the position and condition of the latter mechanism can be readily ascertained and determined by the train-men—an arrangement very desirable and necessary on a car which is liable to run over many different roads, and among train-men who may not understand the action of the brake.

It is obvious that other means for throwing the automatic-brake mechanism into and out of action may be employed; and I do not therefore restrict myself to the employment of the indicator with the special means hereinbefore specified for that purpose.

Having described my improvement, what I claim as of my own invention is as follows:

1. The draw-bar lever hung at a point above its center so as to normally incline at its lower end to the rear, in combination with the slotted arm in which the lower end of said lever works, and the locking-pin, substantially as and for the purposes hereinbefore set forth.

2. The draw-bar lever, in combination with the draw-bar and intermediate spring-bar, h' , and spring h^2 , substantially as and for the purposes hereinbefore set forth.

3. The draw-bar lever, hung or pivoted substantially as described, the slotted arm in which the lower end of said lever works, and the locking-pin, in combination with the draw-bar and the spring-bar and its spring intermediate between the said draw-bar and draw-bar lever, substantially as hereinbefore set forth.

4. In combination with the centrifugal weights, the cam, the cam-supporting gate and its spring, and the locking-pin, jointed or pinned loosely to said gate and operated thereby, substantially as and for the purposes hereinbefore set forth.

5. In combination with the automatic-brake-applying mechanism and the centrifugal arrangement by which the same is caused to re-

lease control of the brakes when the car moves slowly, of mechanism, arranged and operating substantially as described, to hold the winding-shaft of the automatic-brake-applying mechanism in position in which the brakes, when once applied, will remain so applied as long as the draw-bar is pressed back, substantially as hereinbefore set forth.

6. The combination of the draw-bar, the spring-bar and its spring, the draw-bar lever, the brake-shoe o and its spring, and the upper brake or winding shaft, J , provided with loose disk or pulley l , having a pawl-and-ratchet connection with said shaft, the combination being and acting substantially as hereinbefore set forth.

7. The rod r , lever t , and pull-spring s , in combination with the draw-bar, the draw-bar lever, the spring-bar and its spring, the brake-shoe and its controlling-spring on said spring-bar, and the winding-shaft J , having loose pulley l connected with it by ratchet and pawl, these parts being arranged for joint operation substantially as hereinbefore set forth.

8. The friction-pulley shaft, in combination with the journal-bearing d , the bracket provided with arm d' , supporting said bearing, and the relief-spring a' , substantially as hereinbefore set forth.

9. The bracket provided with arms d' and e , in combination with the friction-pulley shaft, the flanged sleeves e^2 e' thereon, the journal-bearing d , and the relief-spring a' , substantially as hereinbefore set forth.

10. The combination, with automatic-brake-applying mechanism and means for throwing the same into and out of action without interfering with the operation of the hand-brake-applying mechanism, of an indicator by which the position of the automatic-brake mechanism, whether in or out of action, is exposed and pointed out, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 4th day of October, 1881.

BENJAMIN L. STOWE.

Witnesses:

NATHAN STOWE,

THOMAS B. REILLY.