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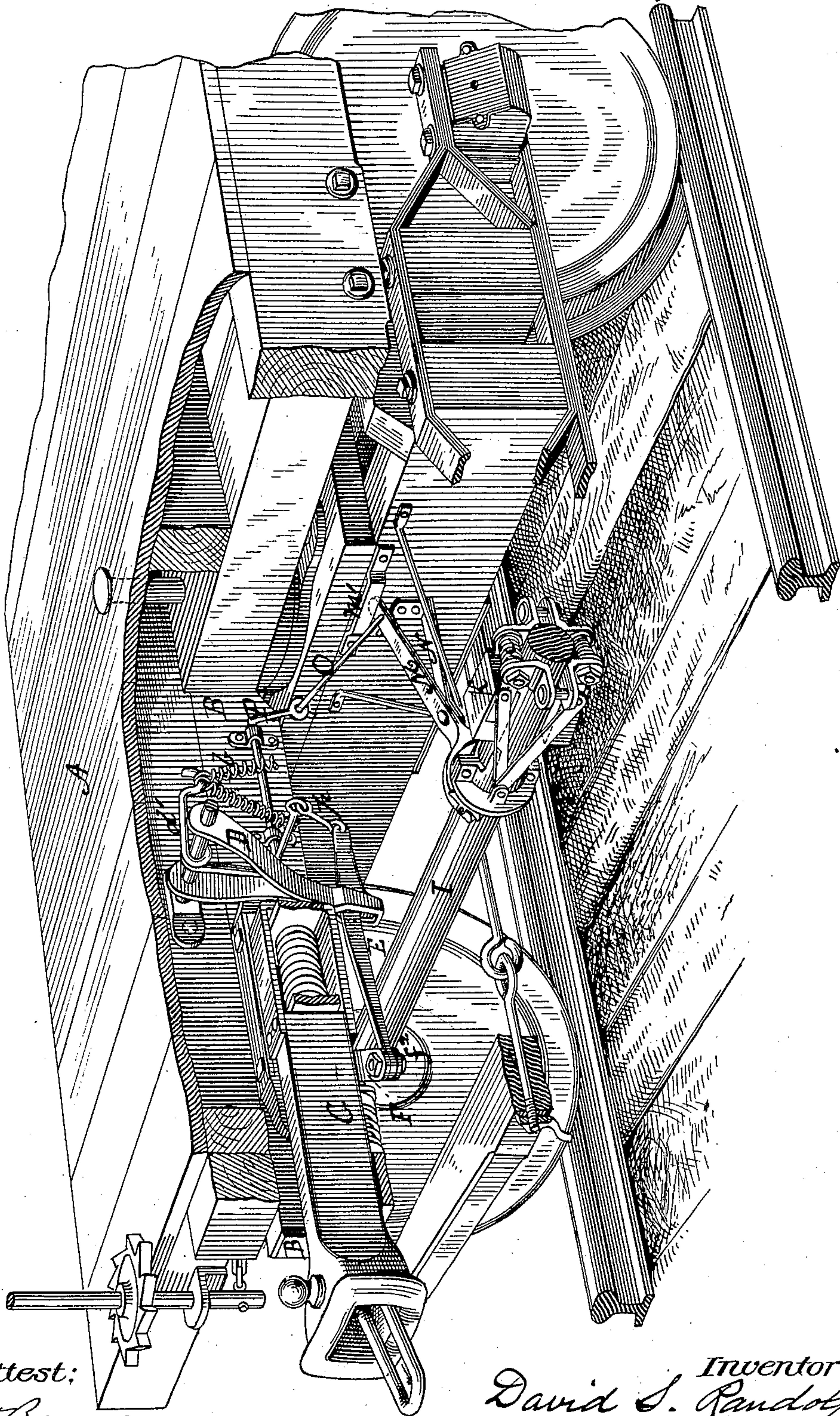
3 Sheets—Sheet 1.

D. S. RANDOLPH.
Automatic Car Brake.

No. 241,156.

Patented May 10, 1881.

Fig. 1.



Attest;
R. J. Barnes.
W. A. Root

Inventor:
David S. Randolph
by F. M. Ritter
att'y

(No Model.)

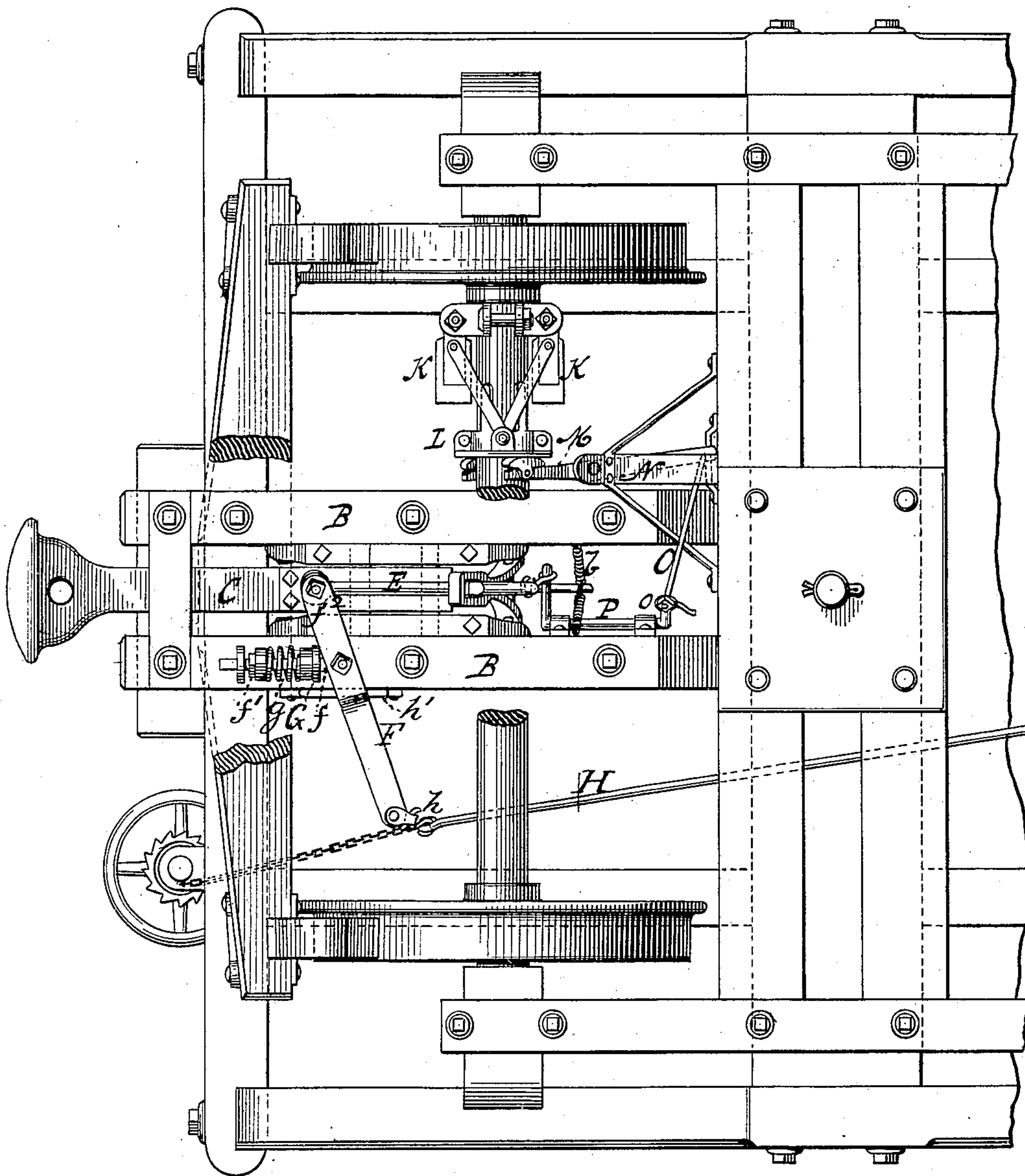
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Patented May 10, 1881.

Fig. 2.



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(No Model.)

3 Sheets—Sheet 3.

D. S. RANDOLPH.
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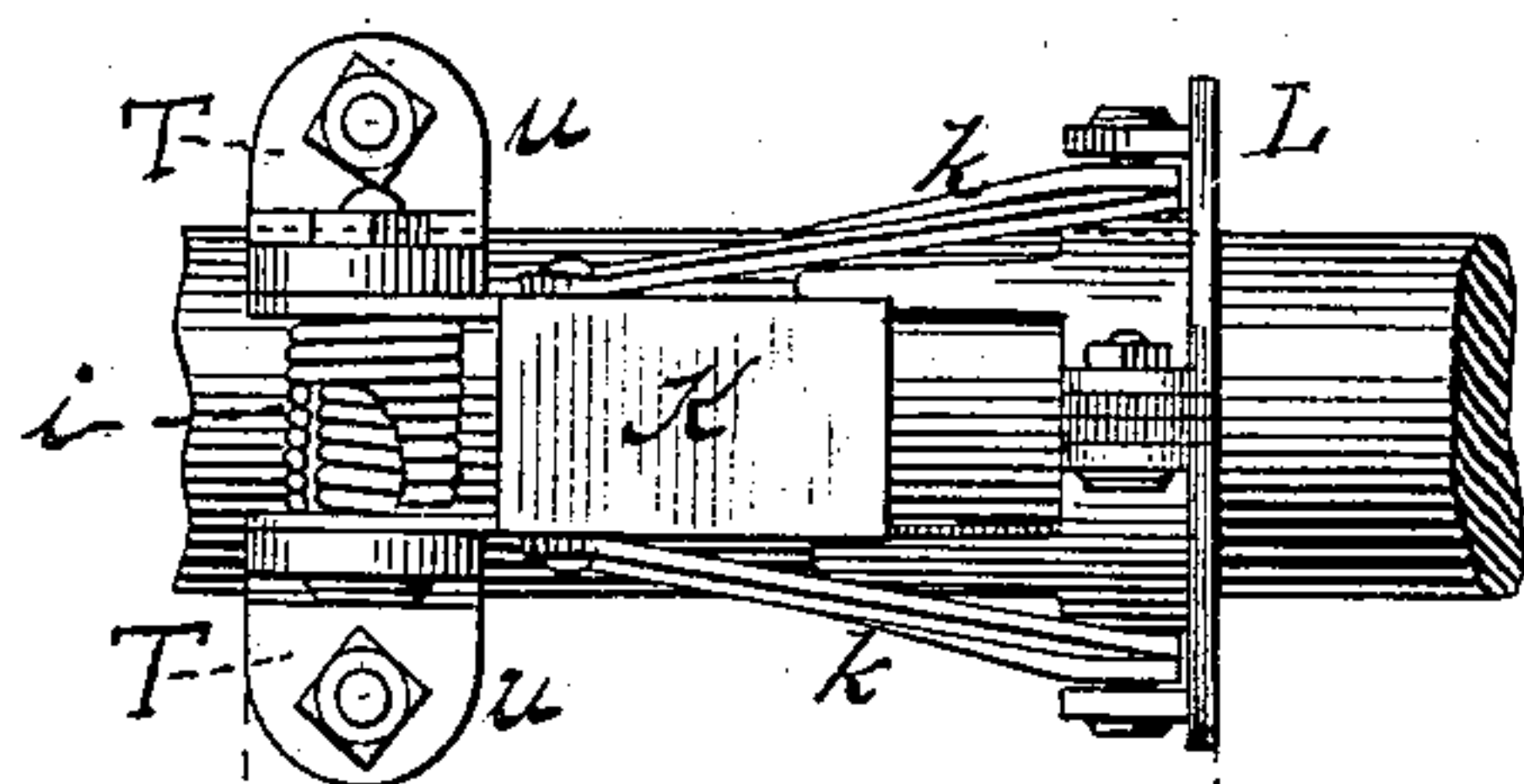


Fig. 3.

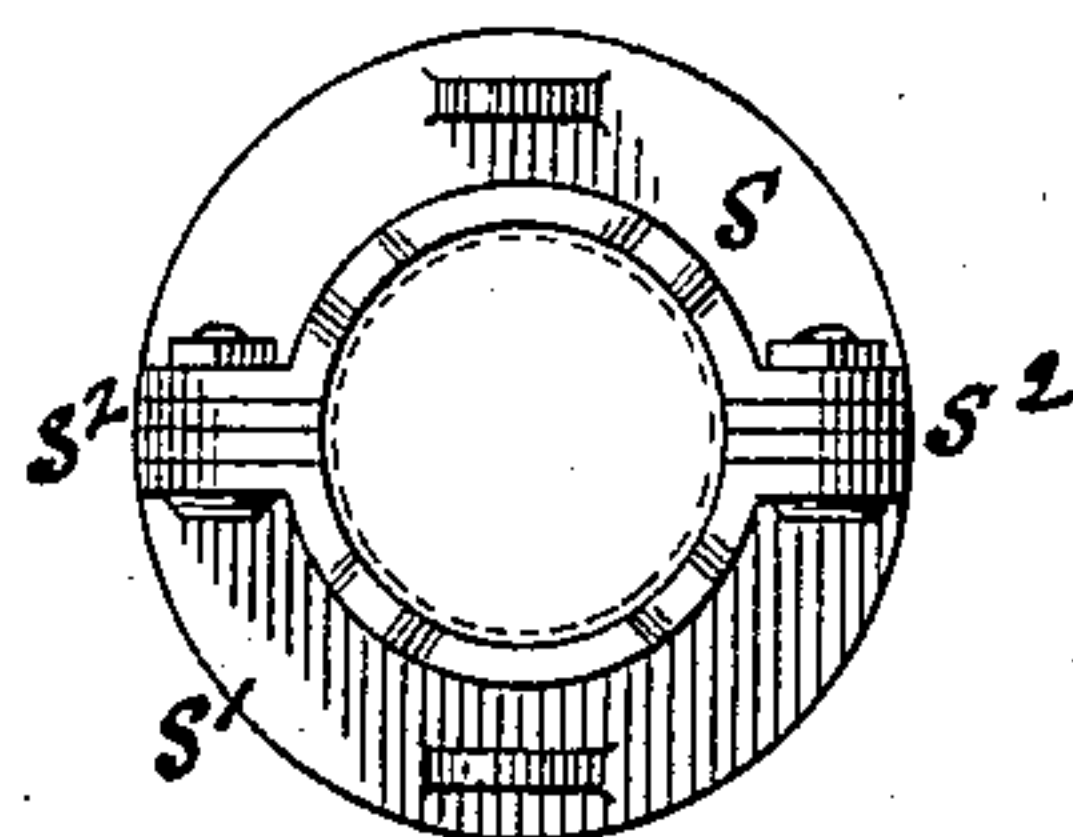


Fig. 4.

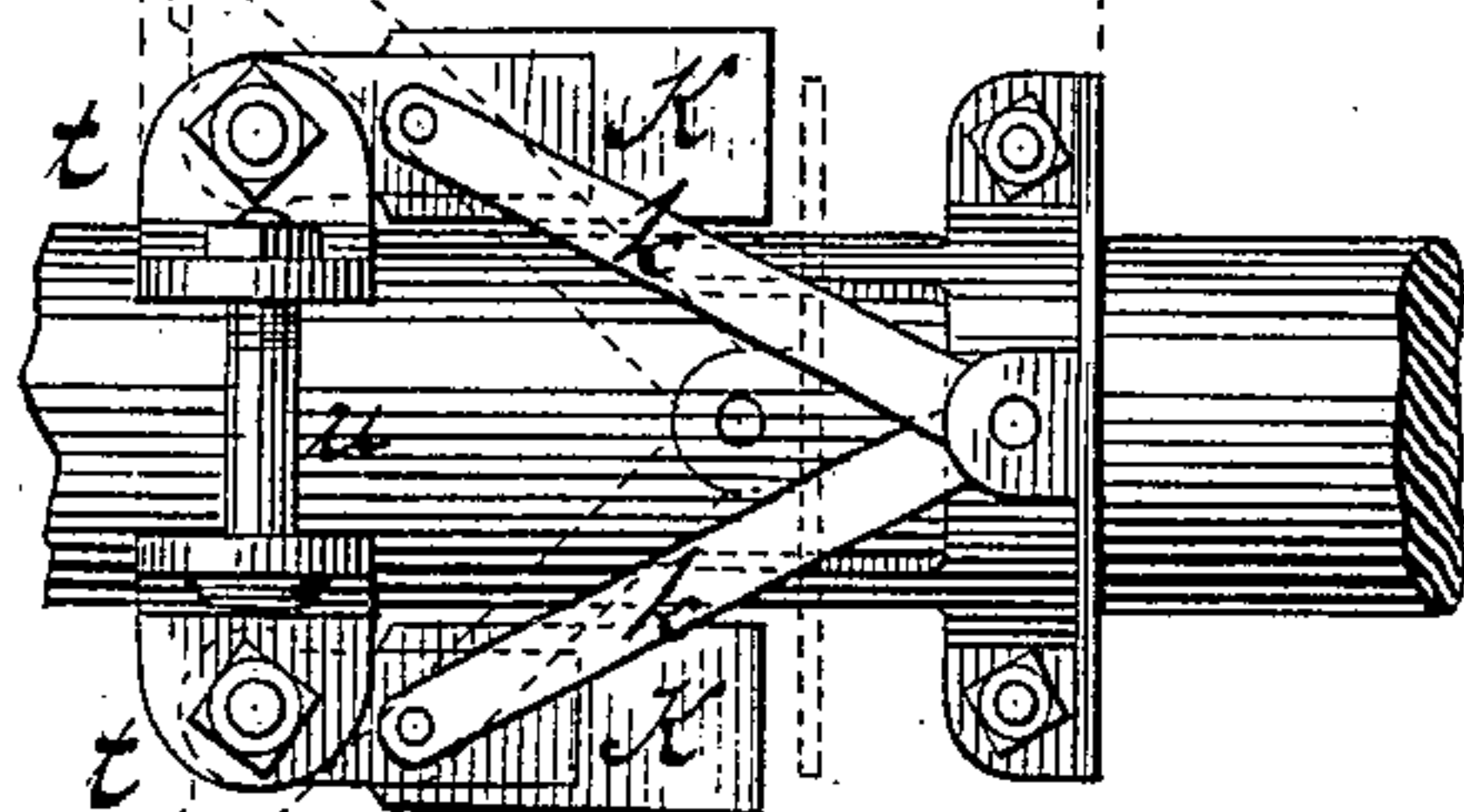
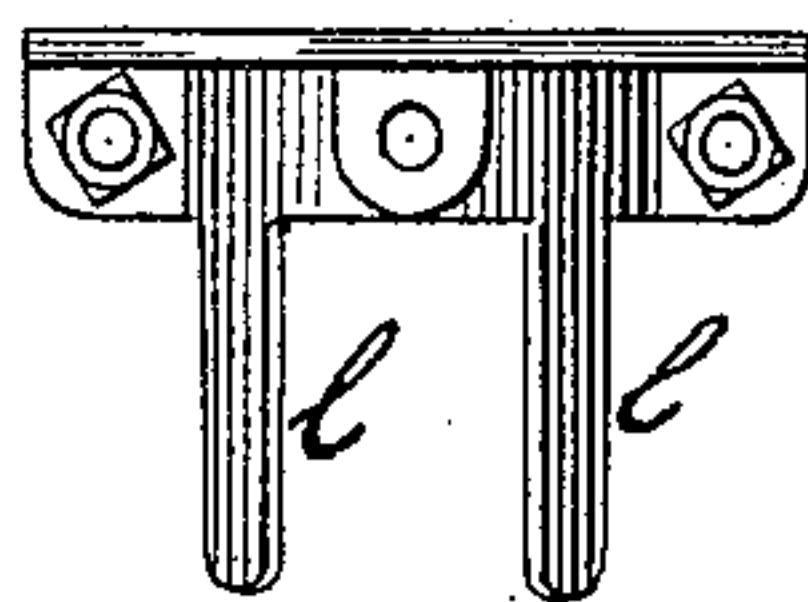


Fig. 7.

Fig. 5.

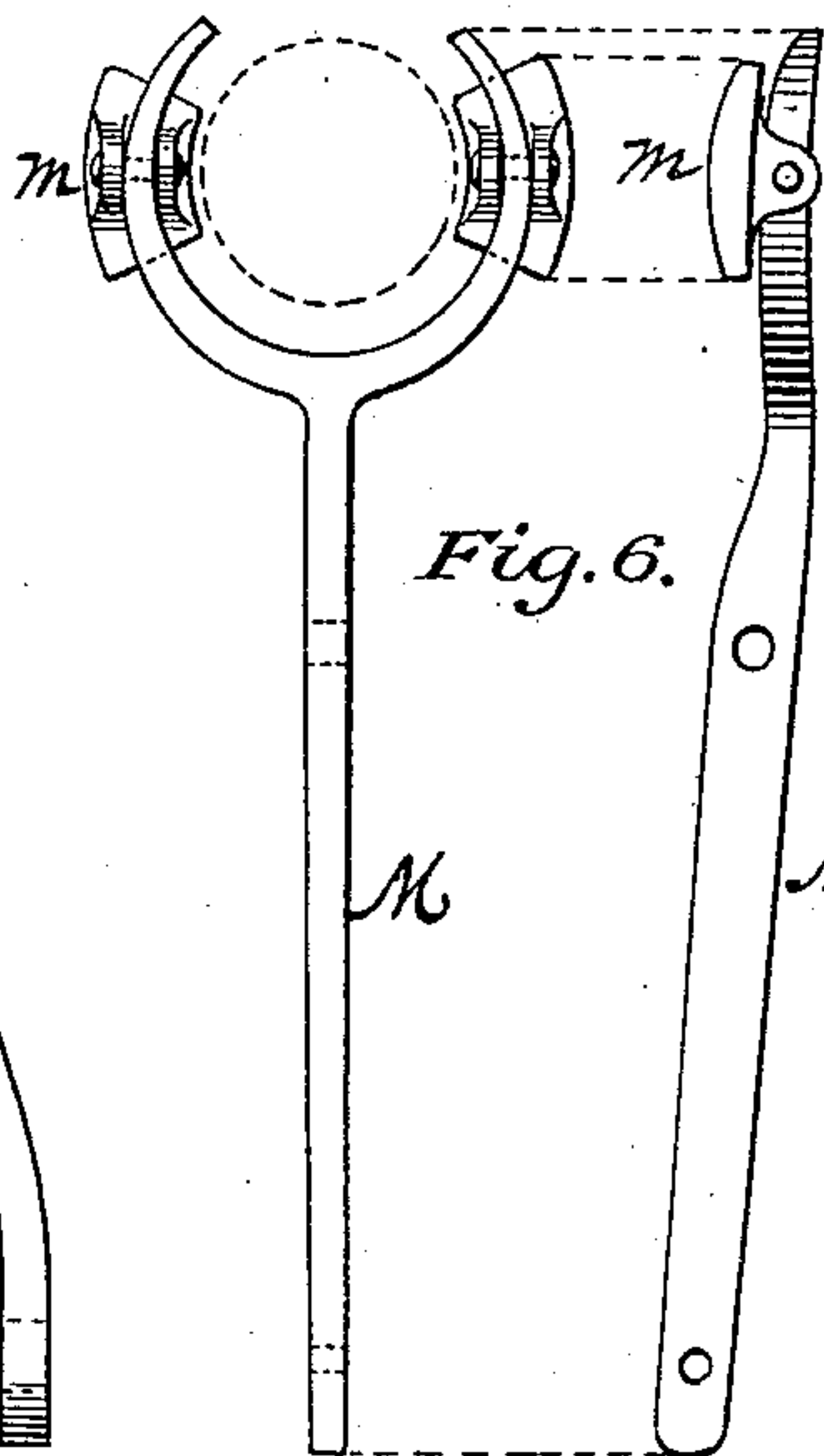


Fig. 6.

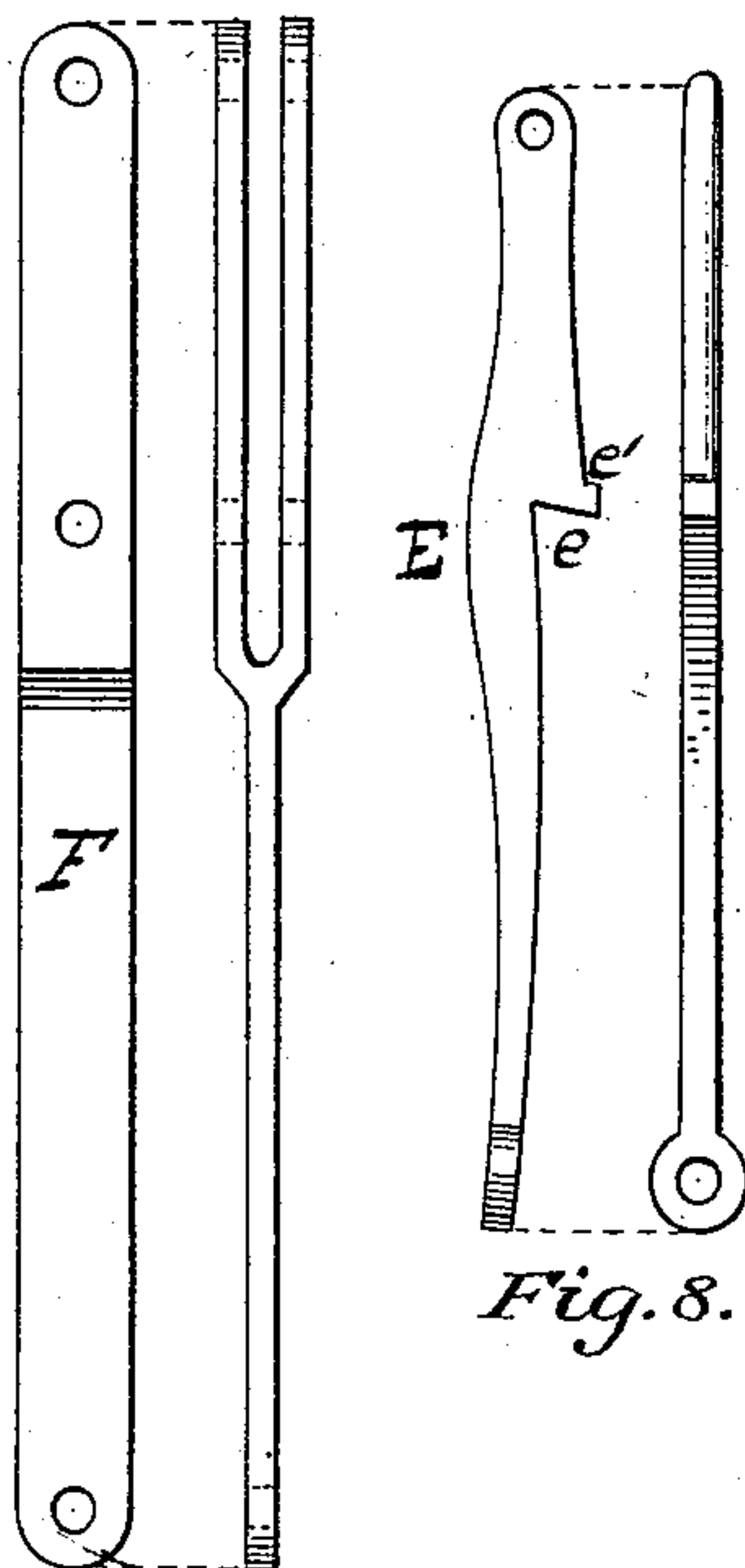
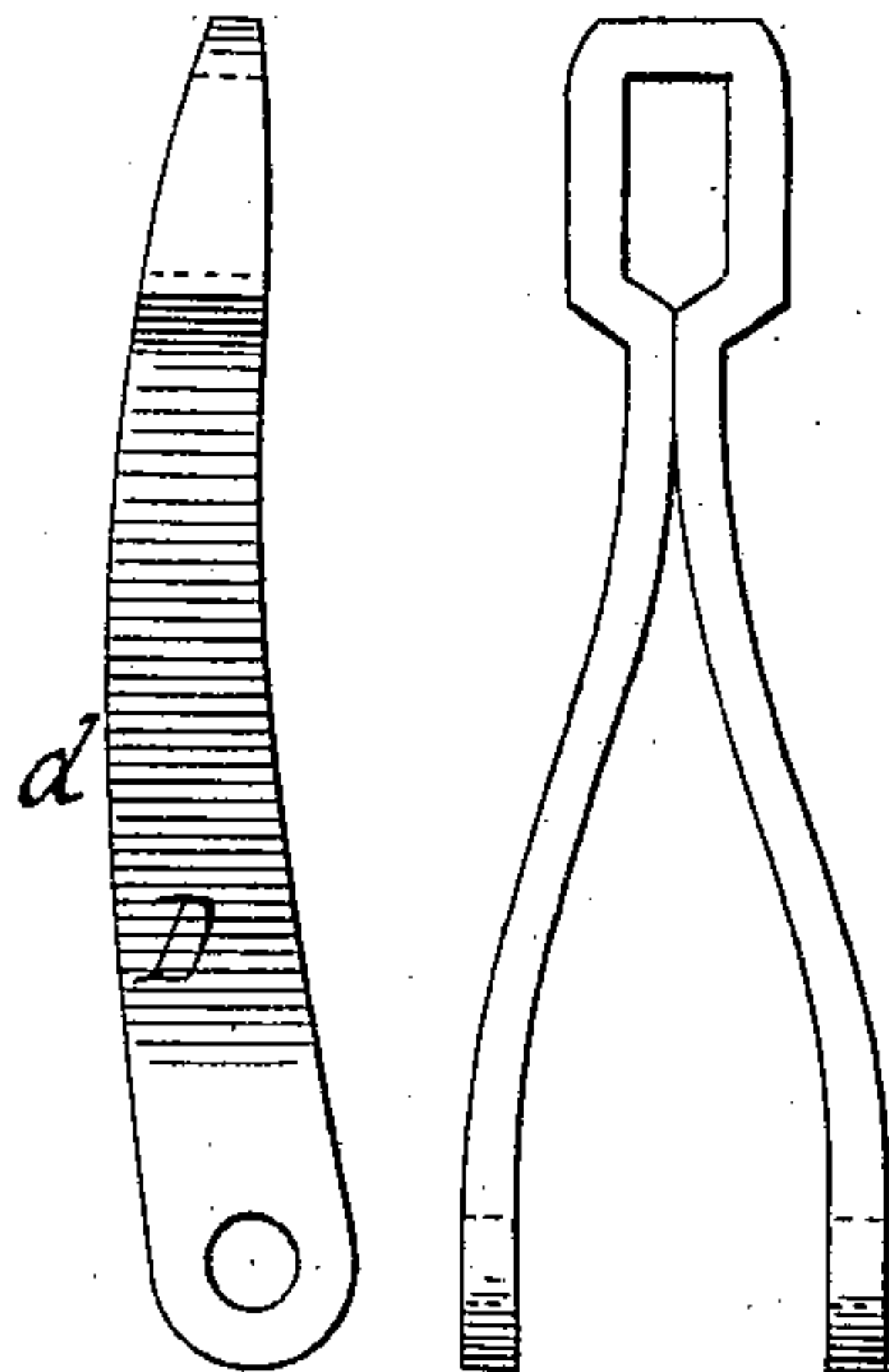


Fig. 8.

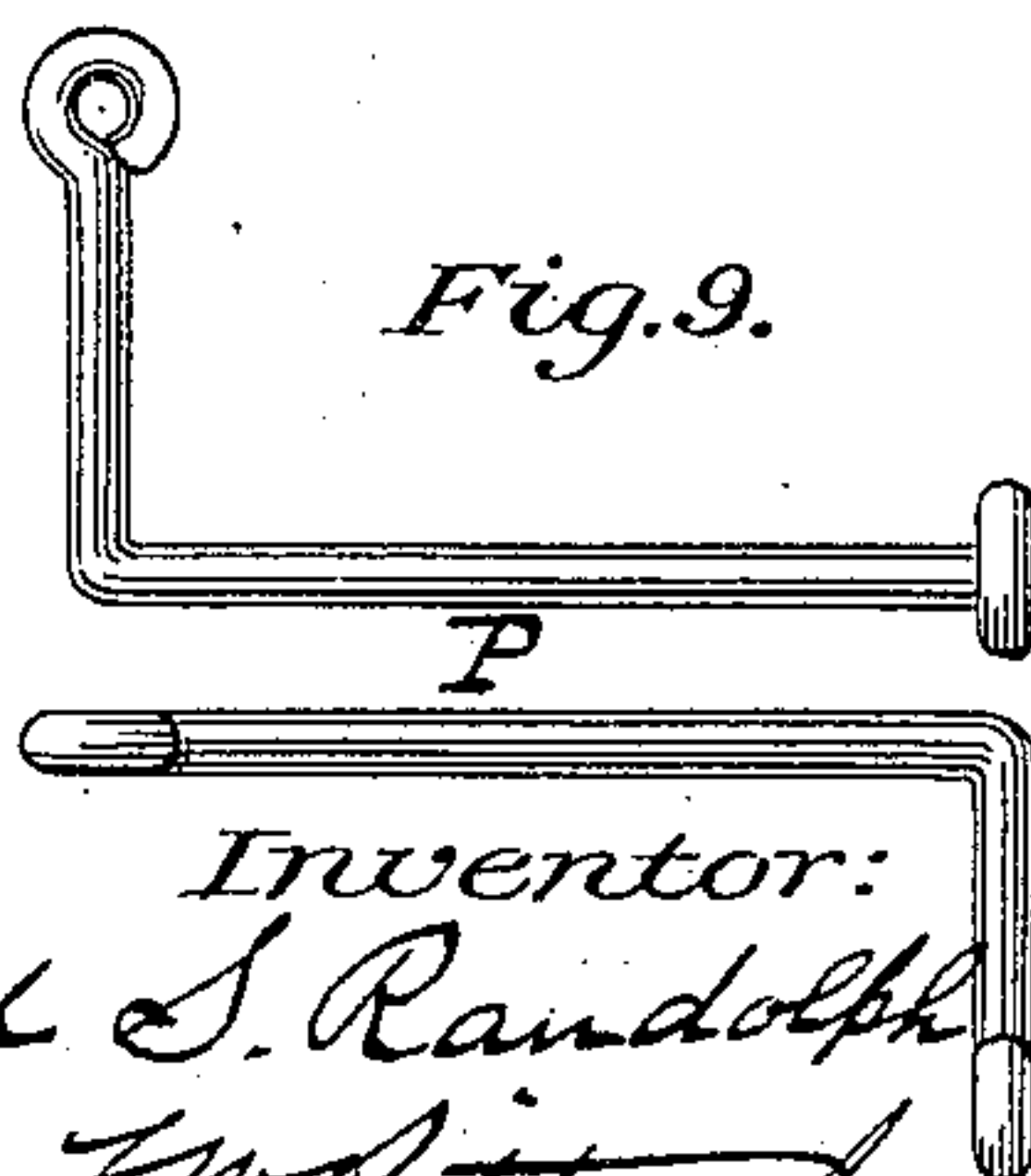


Fig. 9.

Attest:

R. J. Barnes
M. A. Doolittle

Inventor:

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UNITED STATES PATENT OFFICE.

DAVID S. RANDOLPH, OF ST. LOUIS, MISSOURI.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 241,156, dated May 10, 1881.

Application filed March 12, 1881. (No model.)

To all whom it may concern:

Be it known that I, DAVID S. RANDOLPH, a citizen of the United States, residing at St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Automatic Car-Brakes; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

In the drawings hereunto attached, and forming a part of this specification, Figure 1 is a perspective view of my invention, partly in section; Fig. 2, a plan view from beneath. Fig. 3 represents a detail view of the governor; Fig. 4, a detail view of the sliding collar; Fig. 5, a detail view of the pendent lever; Fig. 6, a detail view of the bifurcated lever; Fig. 7, a detail view of the forked brake-lever; Fig. 8, a detail view of the pull-rod, and Fig. 9 a detail view of the bell-crank lever.

Like letters refer to like parts wherever they occur.

My present invention relates to that class of automatic car-brakes for which Letters Patent No. 223,317 were granted to Card and Noble, January 6, 1880, and No. 231,535 were granted to Card and Randolph, August 24, 1880. In the class of car-brakes referred to a movable draw-bar transmits motion to a pendent lever, (or its equivalent, the pull-rod direct,) which lever actuates a pull-rod that applies the brakes through the medium of a brake-lever, the usual brake-rod, &c., the position of the pull-rod and the manner of its engagement with the pendent lever being controlled by an automatic or centrifugal governor, so that the impact of the cars will apply the brakes when a pulling-engine is used, but will not effect the setting of the brakes when a pusher is employed or in backing a train.

The present invention is directed mainly to simplifying the mechanism and rendering it more durable, certain, and readily applied; and to these ends it consists, first, in connecting the governor and pull-rod by a bell-crank and link mechanism, whereby the weight of

the pull-rod is utilized to insure its engagement with the pendent lever, and less power is required in the governor-springs; second, in providing the brake-lever with a movable yielding compensating-fulcrum, whereby any complicated connection between the pull-rod and brake-lever is avoided, the device rendered more durable and easily applied, and pull-rod and brakes guarded against strain, which might destroy them or cause injury to the wheels by slipping or sliding; and, finally, in details of construction which facilitate the separation of the truck from the car, all as will hereinafter more fully appear.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

A indicates part of a car-body, having the usual draft-timbers, B B, and between them the movable draw-bar C. The draw-bar C may have a spring-pocket and be of the ordinary or any approved construction.

D indicates a pendent lever or swinging yoke operated by the draw-bar. This lever is, by preference, hung or pivoted on the floor-timbers, and swings just back of and in line with the draw-bar C, and has a curved anterior face, *d*, (see Fig. 5,) which lessens the friction and wear between the draw-bar and pendent lever and causes the movement imparted by the draw-bar to the pendent lever to be continuous and progressive. In order to preserve the contact between the pendent lever and draw-bar, an elbow-lever, *d'*, is pivoted on the pivot-bolt of the pendent lever, or in other suitable manner, and has one arm bearing against the rear face of the pendent lever, while its opposite arm is connected to the two draft-timbers B B by diverging spiral or equivalent springs *b b*.

E indicates the pull-rod, which extends through the pendent lever or yoke D, and is attached at its front or outer end to a brake-lever, F, and at its rear or inner end to the governor, as will be hereinafter described. This pull-rod E has the form of a hook or latch, as at *e*, (see Fig. 8,) to engage with the pendent lever D when the pull-rod is to be drawn or forced back by the lever in applying the brakes, and has also a lug or detent, *e'*, to prevent the engagement of the pull-rod E and pendent lever D when the brakes are not to be applied.

The relation of these parts will more fully appear in the description of the operation of the devices.

F indicates the brake-lever, to which the front end of the pull-rod is attached. This brake-lever is a forked bar pivoted on the end of a rod, f , which passes through an eye or opening in a bracket, G, which is secured to one of the draft-timbers B. Encircling the rod f , back of the bracket, is a spiral or equivalent spring, g , inclosed between disks or plates, and on the end of the rod f , which is threaded, is an adjustable nut, f' , by means of which the tension of the spiral spring may be adjusted. By this or equivalent means a yielding or movable fulcrum is provided for the brake-lever, which will relieve the pull-rod of undue strain under all circumstances, and will prevent the brakes from causing the sliding of the wheels and injury attendant thereon. The connection between the brake-lever and pull-rod is by means of a loose pivot-joint, f^2 , at the forked end of the brake-lever, which will permit both the lateral and vertical play required in the pull-rod. The opposite end of the brake-lever is connected to the ordinary brake-rod, H, by a clevis or a link, h , or in other suitable manner; and in order to prevent this arm of the brake-lever from being carried too far back by the swing of the brakes, which would often prevent the engaging of the pull-rod E and pendent lever D, a bracket-stop, h' , may be used, and, if desired, may pass through the fork of the brake-lever, as shown in the drawings. The brake-beams, hangers, shoes, &c., which may be of the usual or any approved form, are no part of the present invention, and therefore need not be specifically pointed out.

I will next describe the governor and the mechanisms by which it is made to control the brake mechanism.

Pivoted to or between ears or lugs upon the hub of the car-wheel, or to a collar attached to the axle, (as shown in Patent No. 231,535,) or secured by angle-irons, as shown in the drawings, are centrifugal blocks K, provided with springs i , which, when the car is at rest, hold the centrifugal blocks in contact with the axle. These springs i (see Fig. 3) are preferably double—that is to say, one coiled spring within the other, the coils being reversed, as in forming rests. This is done in order to get an elastic and durable spring, which cannot be done where large wire is necessarily used, as in case of a single spring.

The centrifugal blocks may be secured to the axles in the following manner, which will permit of adjustment to axles of any diameter. Instead of a collar, I employ a set of four angle-irons, T, as shown in Figs. 1 and 3, which are arranged around the axle, the centrifugal blocks being pivoted or bolted between the same, as at t , and the free flanges bolted to each other, as at u , while the angles of the irons T bite or bear on the axle. These centrifugal blocks are connected with a flanged sliding collar, L, by means of toggle-links k k , preferably on

both sides, as seen in Fig. 2, which, when the blocks K are thrown out by centrifugal action, cause the sliding collar L to approach the wheel. The sliding collar may be made sufficiently wide to prevent its canting or binding when moved by the centrifugal blocks; but as great width would give increased friction between it and the shaft and require the springs i to be more powerful, I prefer to prevent the canting or binding of the collar L by providing it with guide-fingers l , which will accomplish the purpose and avoid material increase of friction. These guide-fingers l extend to the inner surface of the collar as projecting ribs, as shown in Fig. 4.

It frequently happens that the diameter of the axles vary; and in order that the collar L may be adapted to any shaft, I form it in two sections, s s' , each of which is slightly less than a semicircle, and provide a series of liners, s^2 , each of which has a hole for the passage of the bolts which connect the sections, and a rib and groove or equivalent device for preventing the canting or change of position of the liner. By inserting one or more liners the internal diameter of the collar may be increased to suit different-sized axles.

M indicates a bifurcated lever, which is pivoted on a bracket, N, secured to the timbers of the truck. The bifurcated ends of this lever inclose the axle I in the path of the sliding collar, and are provided with side shoes, m , which bear upon the flange of the sliding collar. In order to avoid friction, &c., care is taken that neither the lever nor shoes m come in contact with axle I, and this may be accomplished in several ways, either by weighting the arm of the lever, or by a strap on the bracket N, or, as shown in the drawings, by a strap, m' , on the truck-timbers. The lever M and the sliding collar are not connected; the sliding collar simply pushes the arm of the lever along. This lever should be so placed that while its bifurcated end incloses the axle I its opposite end is directed backward toward the truck-timbers, and this is of material advantage, as thereby the point where the motion is communicated from the governor to the brake mechanism (pull-rod) is placed near the king-bolt, and the changes of relation between the car and truck are least and have less disturbing effect on the devices. The lever M being placed substantially as specified, its inner end is connected by a rod or equivalent, O, to a bell-crank lever, P, (see Figs. 2 and 6,) pivoted on one of the draft-timbers B. The connecting-rod O may be pivoted to the bifurcated lever M; but its opposite end should pass loosely through a hole in the end of the bell-crank lever and be provided with a nut, o , so that by screwing up the nut any slack between the lever M and bell-crank lever P may be taken up to assure the proper operation of the parts. The opposite arm of the bell-crank lever P is connected with the pull-rod by a short link, p .

The construction of the parts being substantially as specified, they will operate as follows;

While the train is at rest the centrifugal arms of the governor will be held down by springs *i* against the axle I, which carries the collar L in along the shaft, pushing the bifurcated arms of lever M inward and its opposite arm outward, so that the bell-crank lever is rotated and the pull-rod F lifted, so that it cannot engage with the pendent lever D. At this time the draw-bar C can be pushed in or out, and vibrate the pendent lever D without affecting the brakes. If, now, the train is backed or a pusher-engine is used, as soon as sufficient speed is attained to carry out the centrifugal blocks, the collar L will be drawn toward the wheel, which will release the bifurcated arm of lever M, and the weight of the pull-rod will cause it to drop down, rotating the bell-crank and carrying the bifurcated end of lever M up toward collar L. The pull-rod, in falling, will be arrested by pendent lever D; but as the draw-bar is pushed in and has carried lever D back of hook or latch *e* and detent *e'*, it cannot engage and operate the pull-rod and brakes. If the train slows up or the draw-bars are partially drawn out, as in passing a sag in the road, the detent *e'* will arrest the forward movement of pendent lever D and prevent its engaging with hook or latch *e* as long as the governor is in operation. If, on the contrary, a pulling-engine is employed, the draw-bar will be pulled out and the springs *i* will carry the lower end of pendent lever D forward in front of notch *e*, so that when the speed of the train is sufficient to operate the centrifugal governor and the pull-rod falls the hook or latch *e* will engage with the pendent lever D, and upon the impact of the cars and the pushing in of the draw-bars the pendent lever D will be forced back, carrying the pull-rod with it and applying the brakes. As soon as the motion of the train has been reduced to a point where the spring *i* can overcome the centrifugal action of the blocks the blocks will be brought against the axle, the collar L will slide inward away from the wheel, and will push in the bifurcated arm of the lever M, turn bell-crank lever P, and raise the pull-rod out of contact with pendent lever D, so that the train can be pushed or pulled at will without again operating the brakes until speed to operate the governor is reached.

If there is excessive force applied to the pull-rod and brakes by pushing in the draw-bar, which force might otherwise cause the sliding of the wheels, their flattening in places, and consequent destruction, or the destruction of

the pull-rod, the spring *f* will yield and permit the fulcrum of the brake-lever to change its position, and thus relieve the whole mechanism of undue strain.

If at any time it is desirable to remove the car-body from the truck, that portion of the brake mechanism secured to the truck can be separated from that secured to the car-body by removing nut *o* from rod O and slipping the rod out of the eye in the end of lever M.

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

1. In an automatic car-brake, the combination, with a governor located on the car-axle, a movable draw-bar, and a pull-rod for actuating the brake mechanism, of a bell-crank located on the car-body, and link mechanism for connecting the governor and pull-rod, substantially as specified.

2. In an automatic car-brake, the combination of a movable draw-bar, a pull-rod arranged on the car-body and actuated by the movable draw-bar, a governor arranged on the axle, a lever pivoted on a bracket secured to the frame of the swiveling truck and arranged on a line drawn from the governor to the frame of the truck, and intermediate devices for connecting the pull-rod and pivoted lever, substantially as described and shown.

3. In an automatic car-brake, the combination of a movable draw-bar, a pull-rod actuated thereby, and a brake-lever for actuating the brakes from the pull-rod, said brake-lever having a movable or yielding spring-fulcrum, substantially as specified.

4. In an automatic car-brake, the combination, with a movable draw-bar, a pull-rod arranged on the car-body, and brake mechanism operated by the pull-rod, of a pendent lever or swinging yoke arranged back of and in line with the draw-bar, said lever or yoke having a curved anterior face, substantially as and for the purpose specified.

5. In a centrifugal governor, the combination, with the shaft and centrifugal blocks, of a series of angle-irons inclosing the shaft and forming pivot-bearings for the centrifugal blocks, substantially as described.

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

DAVID S. RANDOLPH.

Witnesses:

H. B. MOULTON,
F. W. RITTER, Jr.