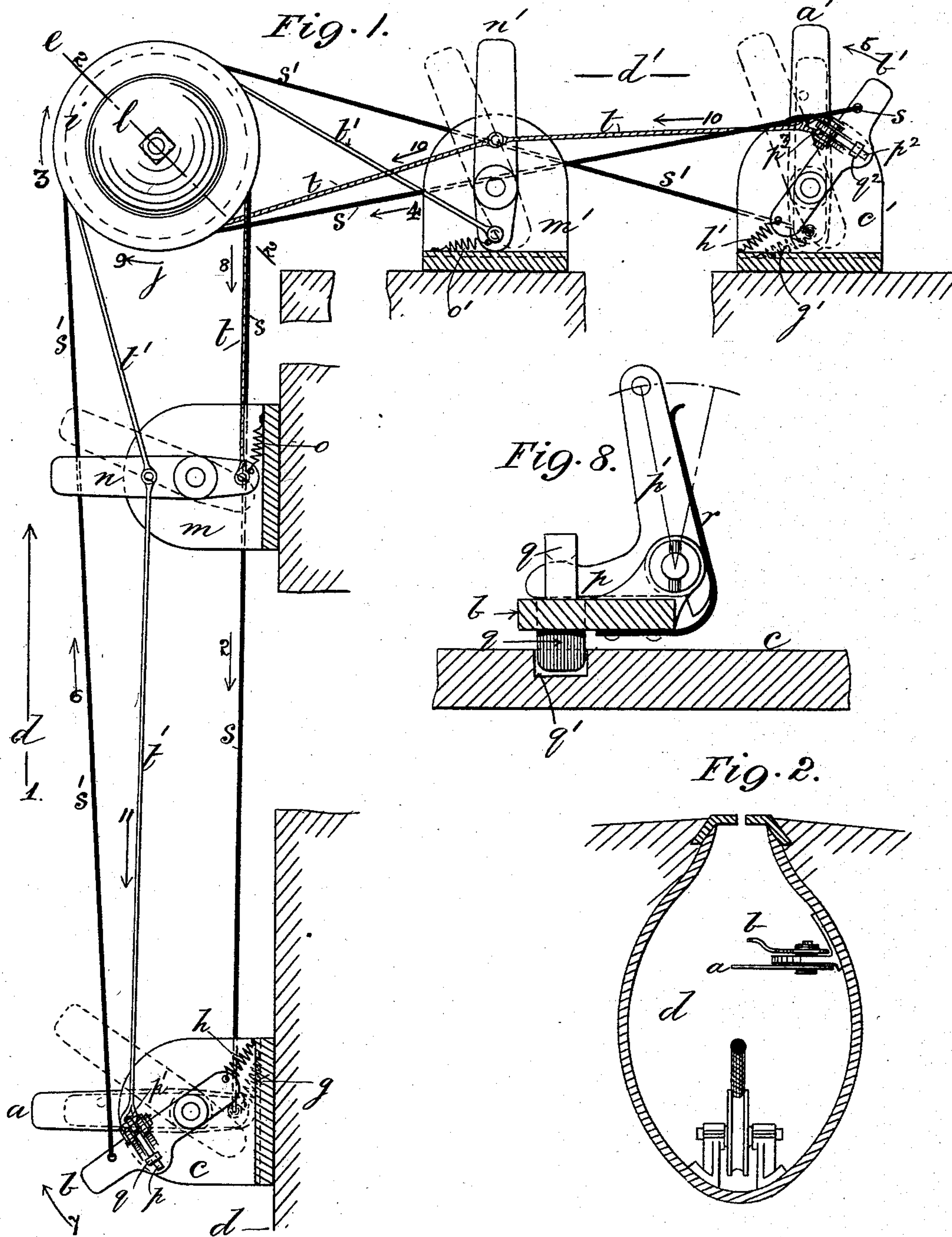


H. W. SMITH.

SIGNALING APPARATUS FOR CABLE STREET RAILROADS.

No. 388,459.

Patented Aug. 28, 1888.



WITNESSES.
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INVENTOR.
Henry W. Smith,
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his attorney.

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Fig. 3.

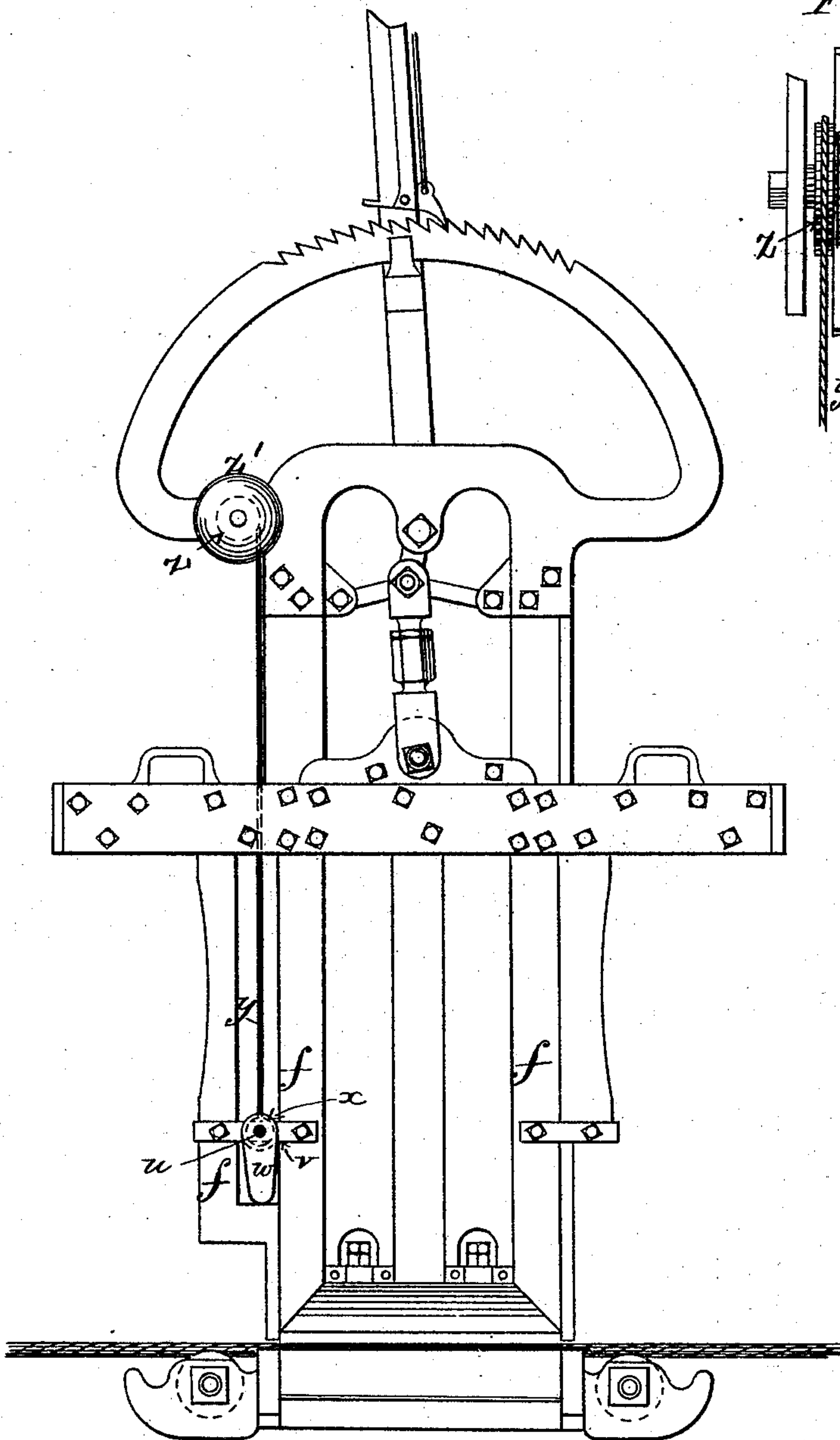
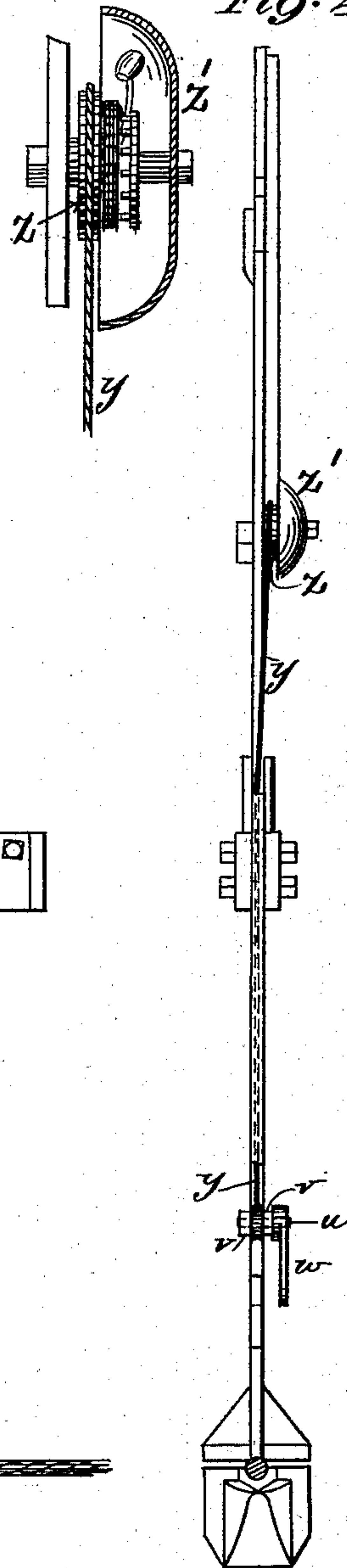


Fig. 5.

Fig. 4.



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(No Model.)

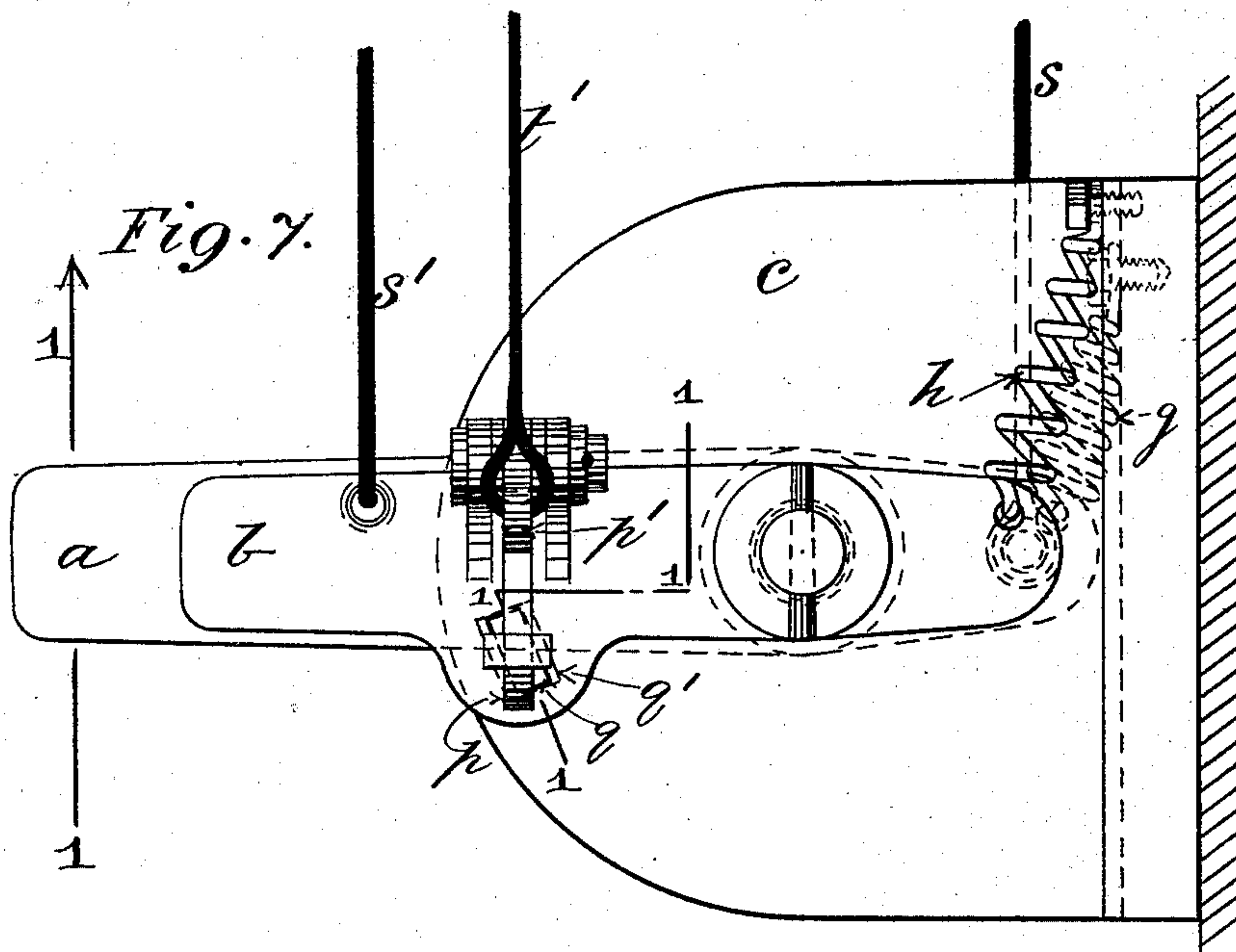
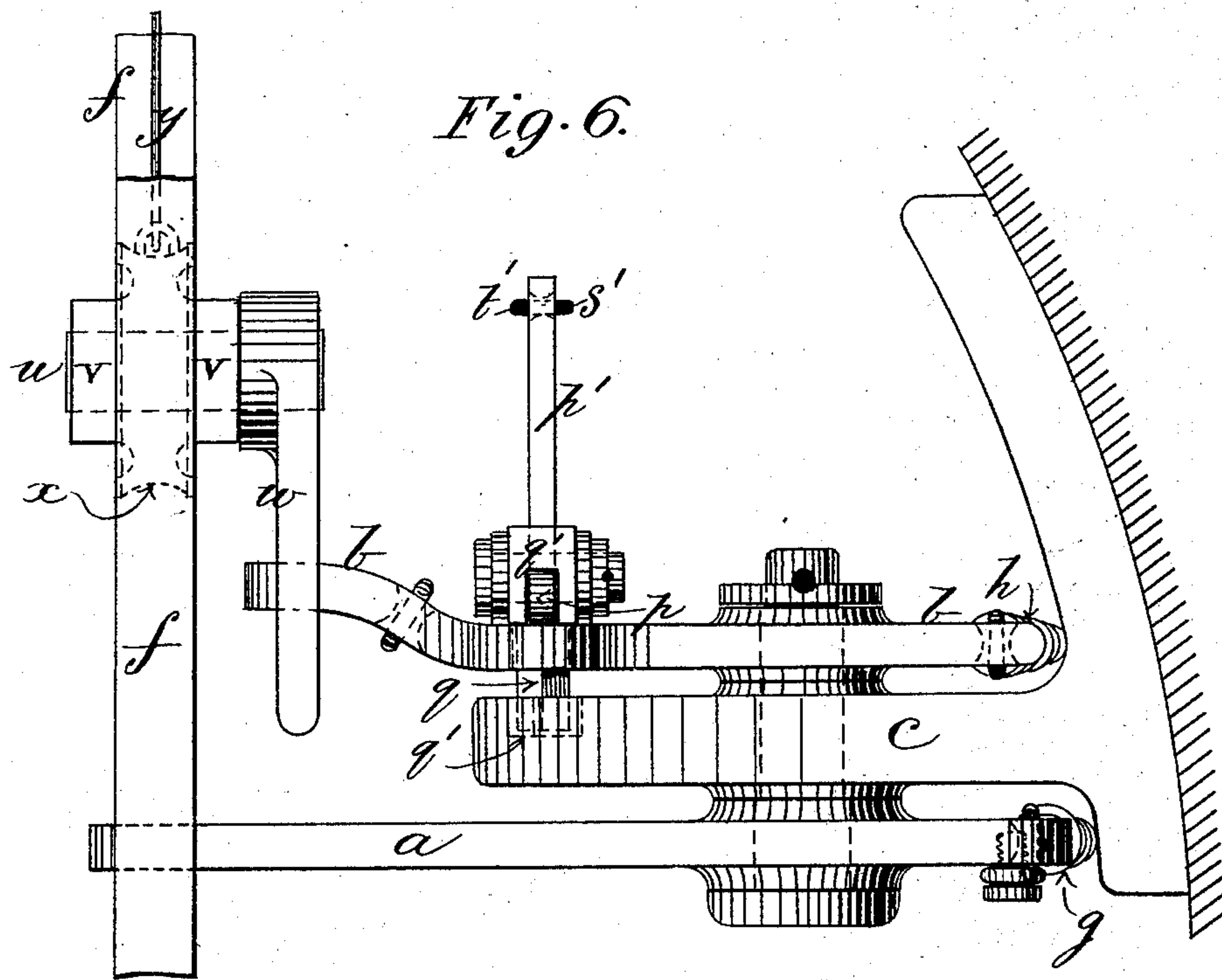
4 Sheets—Sheet 3.

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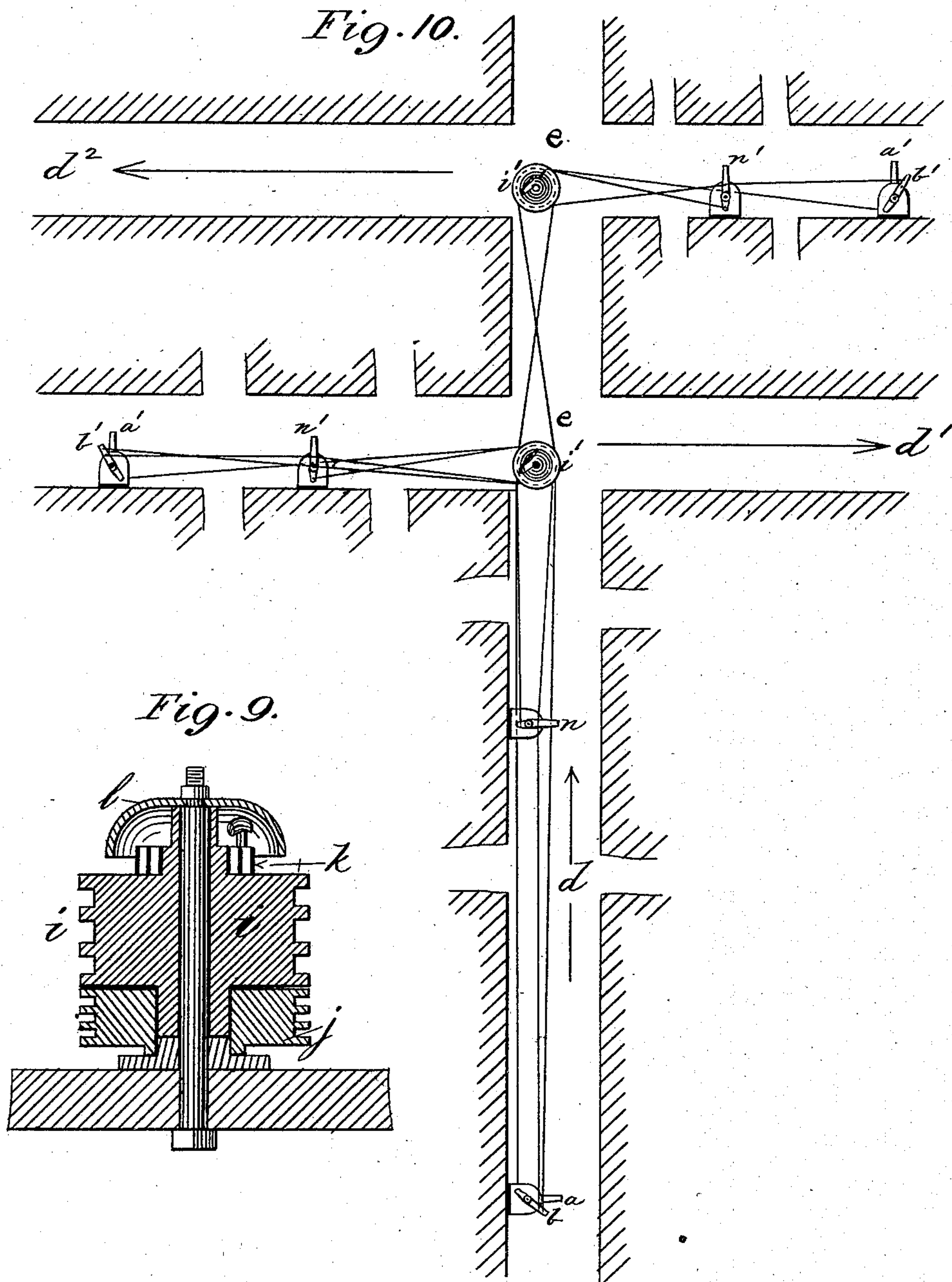
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UNITED STATES PATENT OFFICE.

HENRY W. SMITH, OF ST. LOUIS, MISSOURI.

SIGNALING APPARATUS FOR CABLE STREET-RAILROADS.

SPECIFICATION forming part of Letters Patent No. 388,459, dated August 28, 1888.

Application filed January 19, 1888. Serial No. 261,271. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. SMITH, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Signaling Apparatus for Cable Street-Railroads, of which the following is a full, clear, and exact description.

My invention relates to improved means of signaling on cable street-railroads, whereby a car on arriving at and passing a certain point on the track causes a signal or notification thereof to be transmitted to the gripman of another car on the arrival of the latter at a corresponding point on a cross-track and at the same time warns pedestrians and drivers of vehicles of the approach of the signaling-car to the crossing, thereby avoiding the danger of collisions.

My invention consists in the application within the respective cable-tunnels of cross-tracks at certain distances from a crossing of a series of pivoted spring arms or levers, one of which to each track farthest from the crossing is provided with a locking device, said levers being connected with each other, respectively, by chains or cords passing round and fixed to sheaves or pulleys, in combination with the grip attachment of the "dummy-car" and with a pivoted lever thereon, the whole operating to sound a gong or bell at the crossing and a gong or bell on the "dummy," so that when a car arrives at and passes the levers on either cross-track these levers are thereby vibrated and sound the gong or bell at the crossing, and at the same time the vibration of one of the outer levers farthest from the crossing moves the outer locking arm or lever on the cross-track into such position wherein it is automatically locked that on the arrival and passage of a car thereat the gong or bell on its dummy is thereby sounded.

On the accompanying drawings, Figure 1 is a plan representing the series of levers and combined mechanism forming part of my improved signaling apparatus as applied within the cable-tunnels; Fig. 2, a transverse section through the tunnel, showing the relative location of the levers therewith; Fig. 3, a side elevation of the ordinary grip attachment of the dummy with part of my apparatus applied thereto; Fig. 4, an end view thereof, partly

broken away; and Fig. 5, a vertical transverse section through the gong or bell mounted on the grip attachment and shown in Figs. 3 and 4. Fig. 6 is an elevation, on an enlarged scale, of the outermost levers on either track, as shown in Fig. 1. Fig. 7 is a plan of the same, showing a portion of the operating grip attachment and combined lever seen in Figs. 3 and 4; and Fig. 8, Sheet 1, a transverse section through one of the levers, following line 1 1 in Fig. 7; Fig. 9, a vertical cross-section through the pulleys and gong on line 2 2 in Fig. 1; and Fig. 10, a general plan, on a reduced scale, showing the adaptation of my invention to a double cross-track, like letters of reference denoting like parts in all the figures.

a b represent arms or levers of the first order, which are pivoted or fulcrumed horizontally one above the other to a bracket, *c*, affixed to the inside of the cable-tunnel *d* at a certain distance from the crossing *e*. The outer end of the lower arm or lever *a*, when in its normal position projects at right angles with and somewhat beyond the vertical plane of the grip attachment *f* of the dummy-car, where it is held by a spring, *g*, extending between the inner end of the lever *a* and the base of the bracket *c*. The outer end of the upper arm or lever, *b*, on the contrary, is normally inclined outward or away from (toward an approaching car) that of the lever *a*, so as to be clear of the grip attachment *f* and its appendages, and is retained in such position by a spring, *h*, similar to *g*.

At the crossing *e*, within the tunnels *d d'* at their junction, are mounted horizontally in the sense of their rotating two sheaves or pulleys, *i j*, (see Figs. 1 and 9,) the pulley *i* when rotated on its spindle in one direction winding up a spring, *k*, and in the other direction allowing the spring *k* to unwind, and thereby actuate a gong or bell, *l*, adjacent thereto, the other pulley, *j*, being loose on its spindle and unaffected by the pulley *i*; or, in lieu of two pulleys, *i* and *j*, as shown, a series of fast and loose pulleys may be employed, arranged in any convenient manner to effect the same result. Within the tunnel *d*, intermediate to the arms or levers *a b* and the crossing *e*, is fulcrumed horizontally on a bracket, *m*, an arm or lever, *n*, which is in the same plane, or thereabout, with the lever *a*, and, as in the case

of the latter, normally projects slightly beyond the path of the grip attachment f at right angles, in which position it is constrained by a spring, o , in a similar manner to the springs g and h , acting on the levers a and b .

The arm or lever b , hereinafter termed the "locking-lever," is provided with a locking device (see, also, Fig. 8) composed of a bell-crank, p p' , which is fulcrumed on the locking-lever b , the end portion of its horizontal arm p passing through and having easy play within the slotted head or handle of a bolt, q , which is fitted and slides vertically through the locking-lever b . The lower end of the bolt q is normally constrained against the upper surface of the bracket c by a spring, r , fixed to the locking-lever b and bearing against the outer edge of the upright arm p' of the bell-crank. In the upper side of the bracket c is formed a hole or depression, q' , which is located immediately beneath the bolt q when the locking-lever b is at right angles with the path of the grip attachment f .

Within the tunnel d' of the cross-track are arranged arms or levers a' n' , with their brackets c' m' , springs g' h' o' , and locking-lever b' at corresponding distances from the crossing e and similar in all respects to the corresponding parts above described.

To the inner end of the arm or lever a is attached one end of a chain or cord, s , which passes round and is fixed to the sheave or pulley i , whence it extends and is attached at its other end to the outer end portion of the locking-lever b' , a similar chain or cord, s' , extending from the inner end of lever a' over and fixed to pulley i to the outer end portion of locking-lever b . To the inner end of arm or lever n is attached one end of a chain or cord, t , which passes round and is fixed to pulley j , thence coupled to the outer portion of arm or lever n' , and from the latter to the upright arm p^3 of the bell-crank p^2 p^3 on the locking-lever b' , where its other end is attached. A similar chain or cord, t' , passes from the inner end of arm or lever n' around and made fast to pulley j , thence to outer portion of arm or lever n to the upright arm p' of bell-crank p p' on locking-lever b .

Mounted on its spindle u in suitable bearings, v , carried by the forward end of the grip attachment f , is an arm or lever, w , which depends vertically at such a distance from one side of the grip attachment f that in traveling with the latter its forward edge comes in contact with the end rear edge portion of the locking-lever b (or b' , as the case may be) when this is in a position at right angles with the path of the grip attachment f , as hereinafter more particularly described. On the spindle u of the arm or lever w is fixed a drum or sheave, x , to the circumference of which centrally, at top or in line with the lever w , is attached one end of a chain, cord, or wire, y , which extends upward above the floor of the dummy, and is attached at its other end to a spring-barrel, z , for actuating the gong or bell z' , car-

ried on the grip or other convenient place in the car.

The operation of my invention is as follows: The various parts being in their normal positions, as described, and a car approaching the crossing e along, say, the track d , as indicated by arrow 1 in Figs. 1 and 7, the forward part of the grip attachment f strikes the end of the arm or lever a and carries it over horizontally about its fulcrum into the position shown by dotted lines in Fig. 1. This causes the cord s to be pulled in the direction of arrow 2, partially rotating pulley i , as arrow 3, thereby winding up spring k and pulling the cord s on the other track, d' , in the direction of arrow 4, so as to pull over the locking-lever b' , as arrow 5, into a position at right angles with the path of the "striking-lever" w on the grip attachment of another car which may be approaching that point on the track d' , in which position the locking-lever b' is locked by the springing of the bolt q^2 of its locking device into the hole therefor in the bracket c' . Simultaneously by the movement of the pulley i the cord s' on track d is pulled, as arrow 6, and throws over the locking-lever b , as arrow 7, into the locked position or at right angles with the path of striking-lever w on the grip attachment f , the cord s' on the track d' falling slack. On the grip attachment f clearing the lever a the latter is returned by its spring g to its original position, and the spring k , being thereby allowed to unwind, sounds the gong or bell l and returns the pulley i to its normal position, thereby tightening cord s and slackening cord s' on track d , and slackening cord s while tightening cord s' on track d' . On the arrival of the car at the intermediate arm or lever, n , the grip attachment f strikes and throws over the lever n into the dotted position, and in so doing pulls upon cord t , as arrow 8, partially rotating pulley j , as arrow 9, and, pulling upon cord t on track d' , as arrow 10, throws over the bell-crank p^2 p^3 , so as to withdraw the bolt q^2 from the bracket c , and so release the locking-lever b' . Simultaneously cord t' on track d is pulled, as arrow 11, and withdraws the bolt o of the locking-lever b , which is thereby also released. On the grip attachment f clearing lever n the locking-levers b b' are returned to their normal positions clear of the paths of the grips by their respective springs h h' . Now, by the foregoing arrangements, if a second car should arrive at the locking-lever b' on the other track, d' , while the first car on the track d is passing between the levers a and n , the locking-lever b' , being in the locked position or at right angles to and in the path of the striking-lever w on the grip attachment of this second car, is struck by the striking-lever w , and the latter is thereby vibrated backward, and, partially rotating the drum or sheave x on its spindle u , pulls down the cord or wire y , so as to wind up the spring-barrel z of the gong or bell z' on the dummy. On the striking-lever w clearing the locking-lever b' it is returned to its

normal position by the release of the spring-barrel z , which in unwinding sounds the gong or bell z' and gives warning to the gripman of the approach of the first car on the track d to the crossing e .

The same description will apply to a car approaching the crossing e along the track d' in advance of a second car along track d , the operation of the parts being the same in reverse order.

In Fig. 10 the principle is shown extended to a double cross-track, d'' , the parts applied thereto being the same as those to track d' , and the operation thereof transmitted from one to the other by endless bands and pulleys i' .

I claim—

1. The combination of an arm or lever having a spring and pivoted to a bracket secured within the tunnel of a cable street-railroad, a chain or cord attached to said lever and to a sheave or pulley, and a spring located between the pulley and a gong or bell, with the grip attachment of a cable-road car, substantially as and for the purpose set forth.

2. The combination of two outermost arms or levers having springs and pivoted to a bracket within the tunnel of a cable street-railroad, one of said levers being provided with a locking device, a chain or cord attached to each of said levers and to a sheave or pulley, a spring located between the pulley and a gong or bell, an arm or lever intermediate to the outermost levers and the pulley, and a chain or cord attached to the intermediate lever and to the locking device of one of the outermost levers and attached to a sheave or pulley, with the grip attachment of a cable-road car and

with a lever and spindle mounted thereon, said spindle having a drum or sheave from which a cord or wire extends to the spring mechanism of a gong or bell on the dummy, substantially as and for the purpose set forth.

3. In two cross-tracks of a cable street-railroad, the combination of the outermost arms or levers and intermediate lever and their appendages of one track and the corresponding parts of the other track, chains or cords extending, respectively, between the levers and locking device of one track to those of the other track and secured to intermediate sheaves or pulleys, and a spring located between one of said pulleys and a gong or bell, with the grip attachment of a cable-road car and with a lever and spindle mounted thereon, said spindle having a drum or sheave from which a cord or wire extends to the spring mechanism of a gong or bell on the dummy, substantially as and for the purpose set forth.

4. The combination of a lever and spindle mounted on the grip attachment of a cable-road car, said spindle having a drum or sheave from which a cord or wire extends to the spring mechanism of a gong or bell on the car, with a pivoted lever or other intercepting device within the tunnel, substantially as and for the purpose set forth.

In testimony whereof I affix my signature, in presence of two witnesses, this 16th day of January, 1888.

HENRY W. SMITH.

Witnesses:

S. L. SCHRADER,
PAUL BAKEWELL.