

(No Model.)

2 Sheets—Sheet 1.

T. MURPHY.  
FIRE ENGINE HARNESS.

No. 505,410.

Patented Sept. 19, 1893.

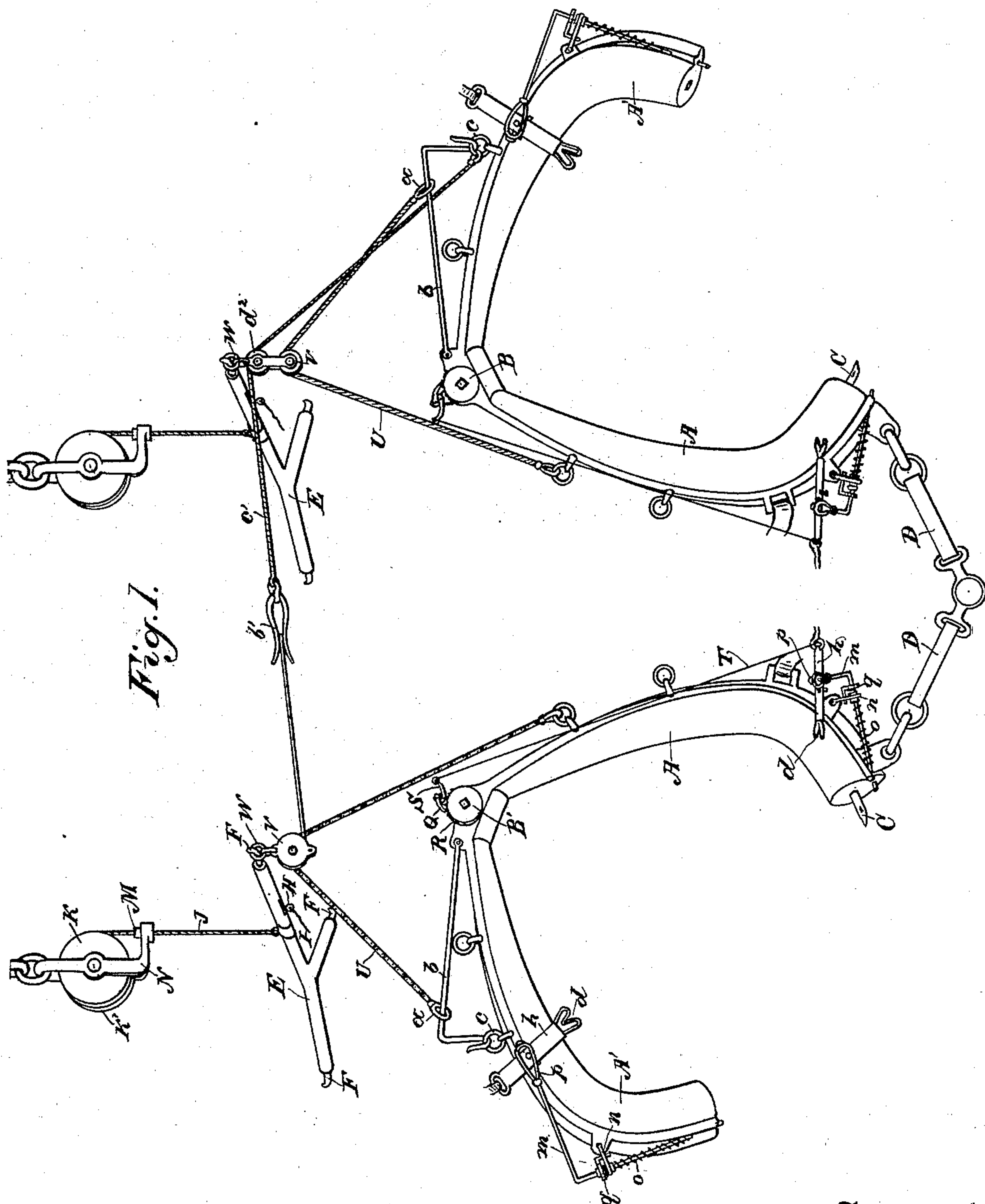


Fig. 1.

Witnesses,  
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Inventor,  
Thomas Murphy  
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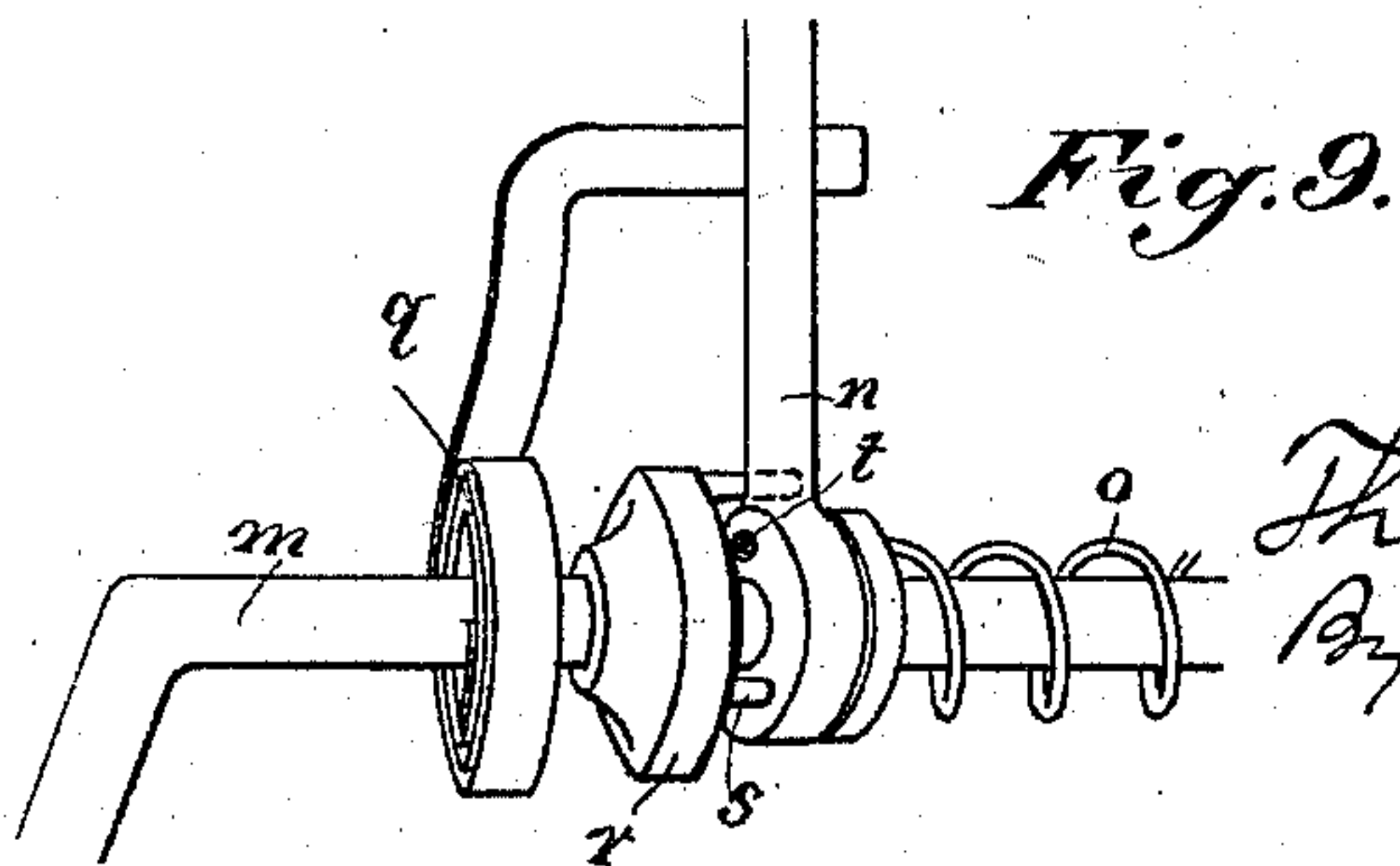
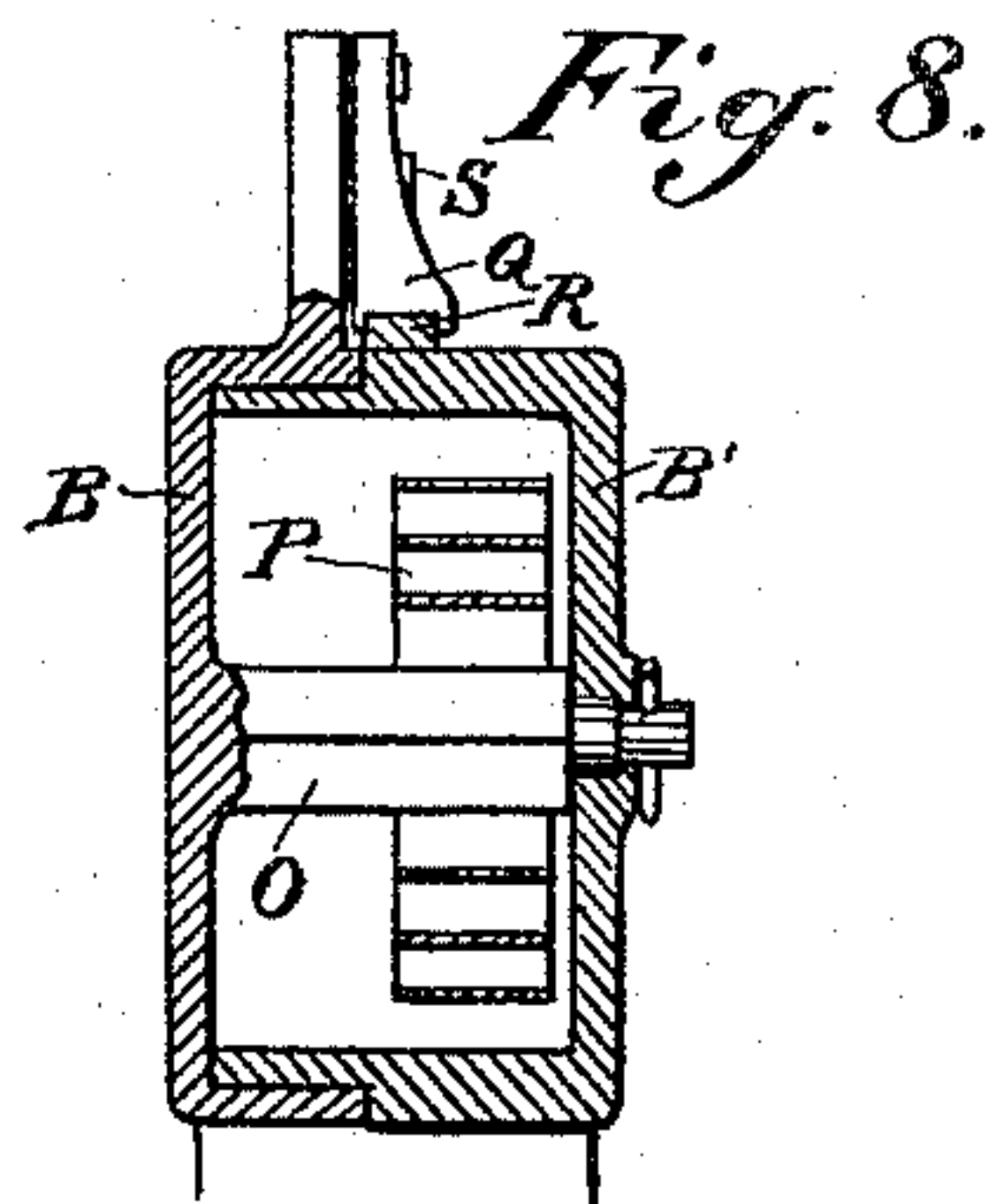
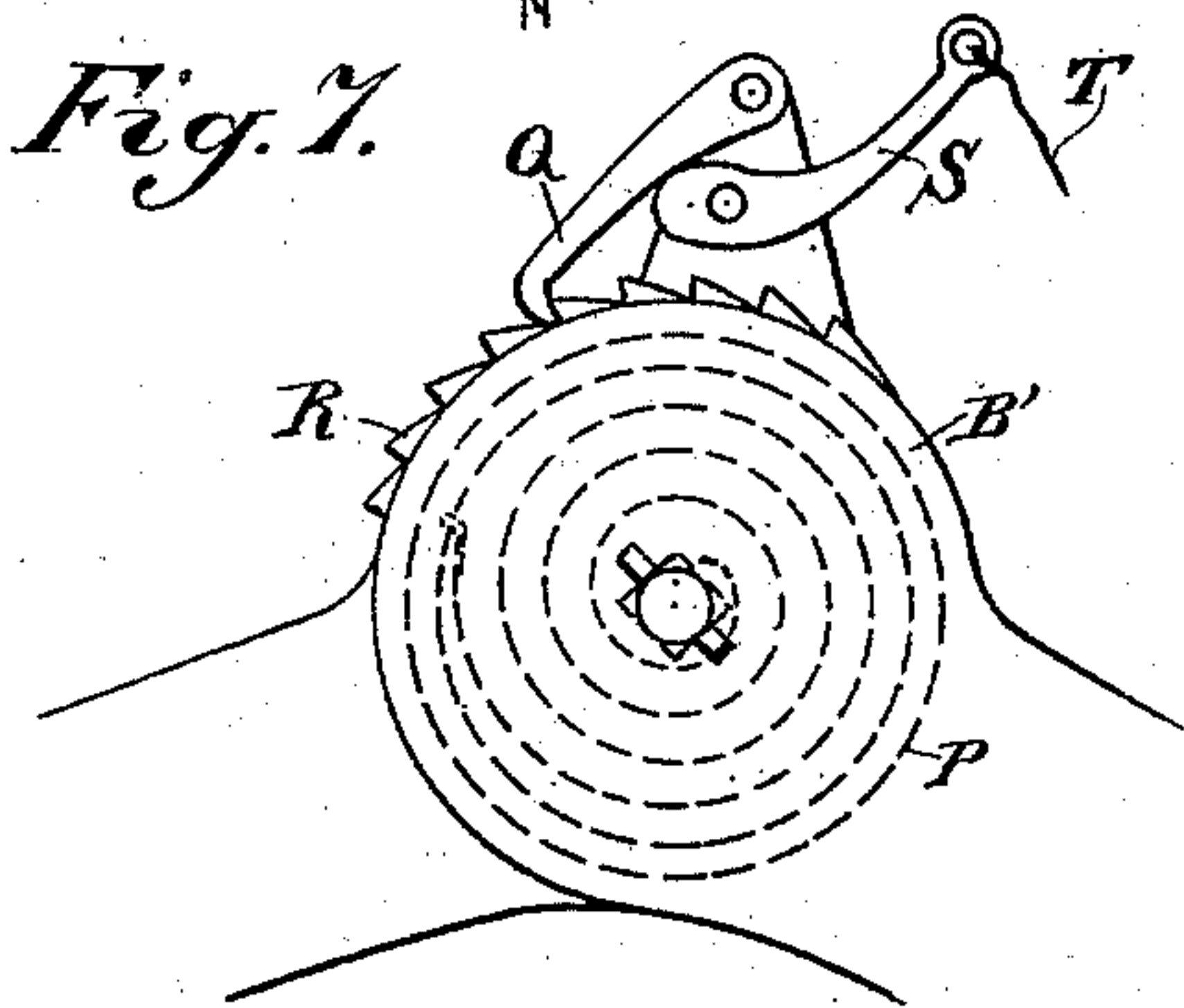
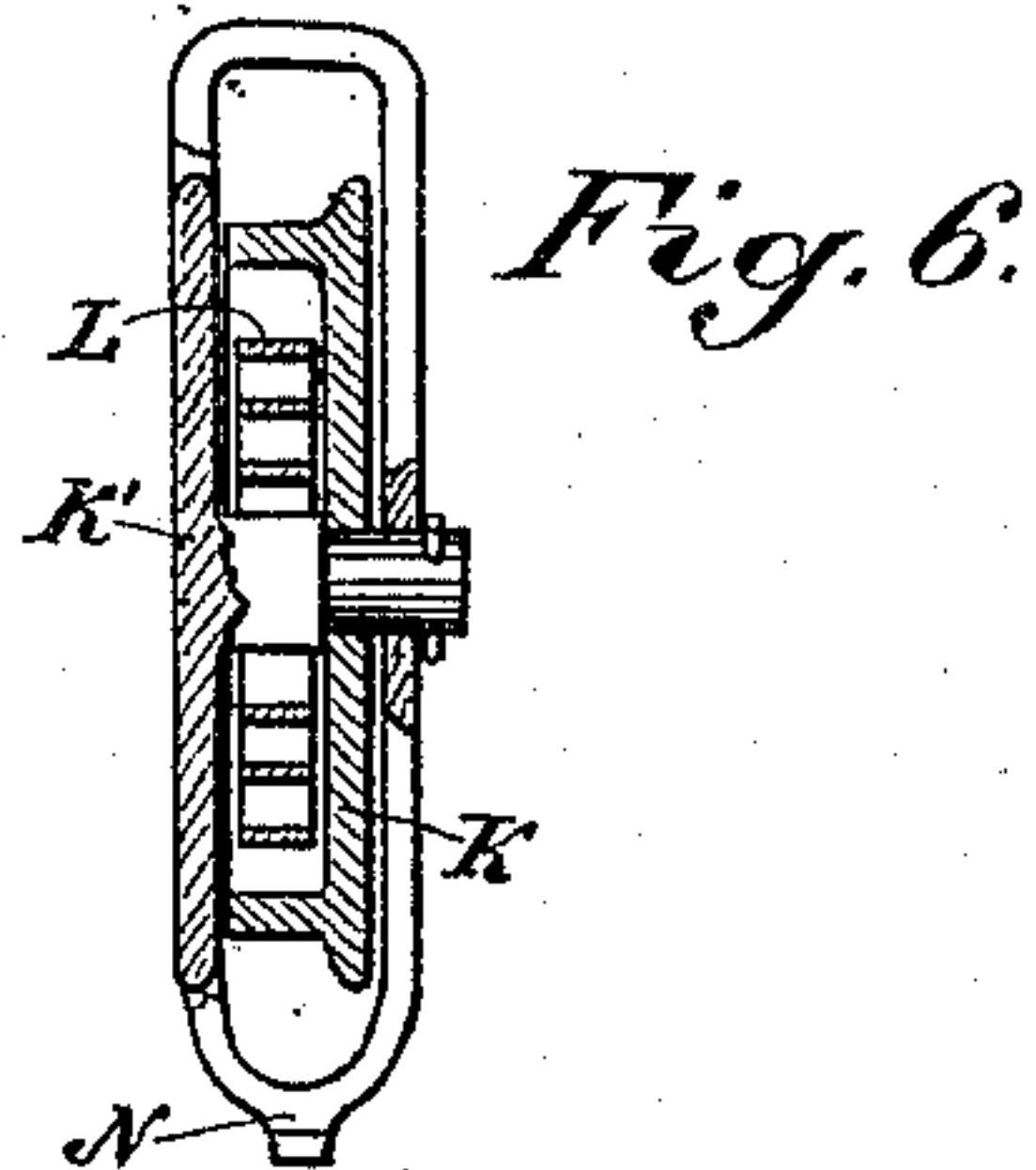
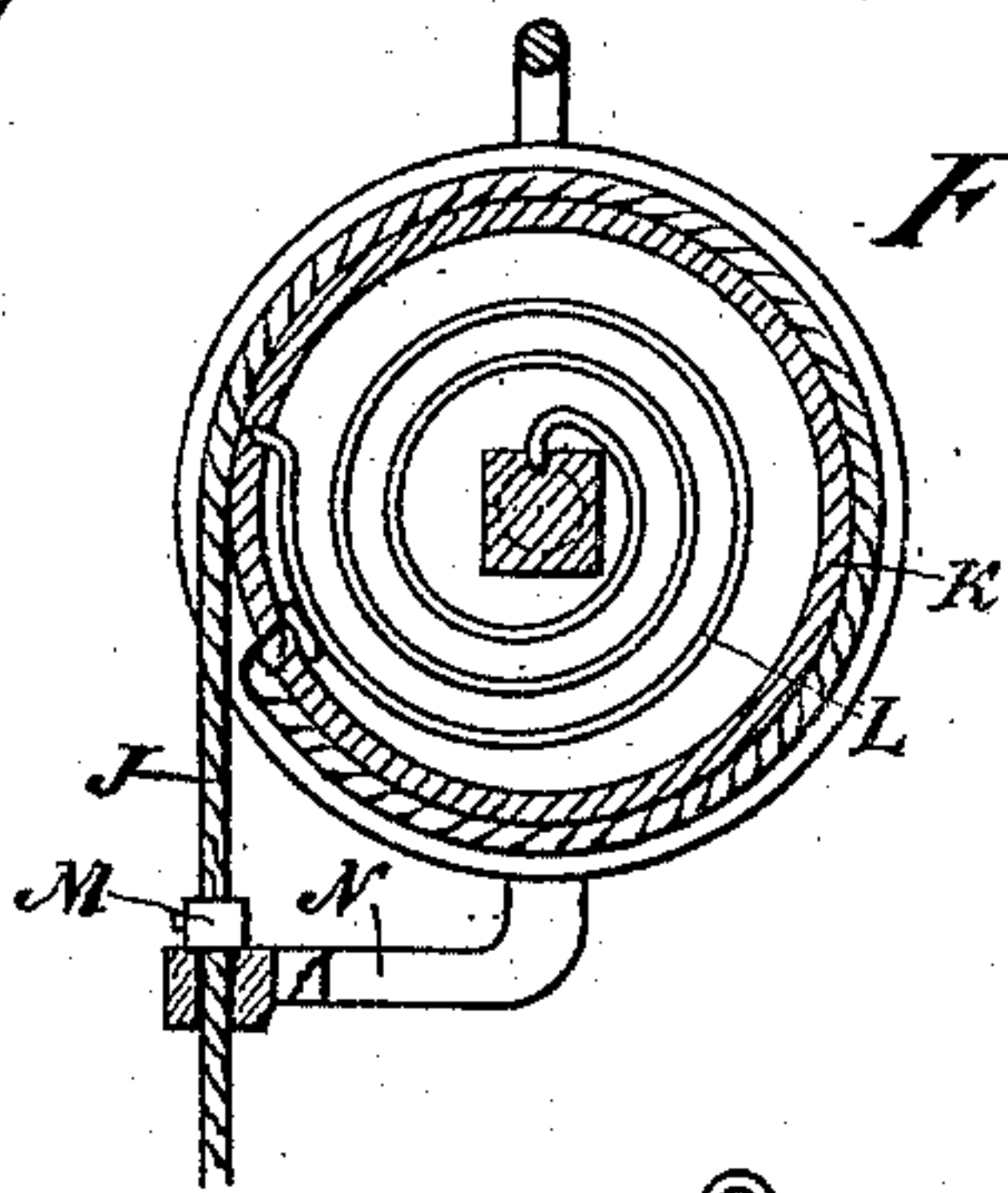
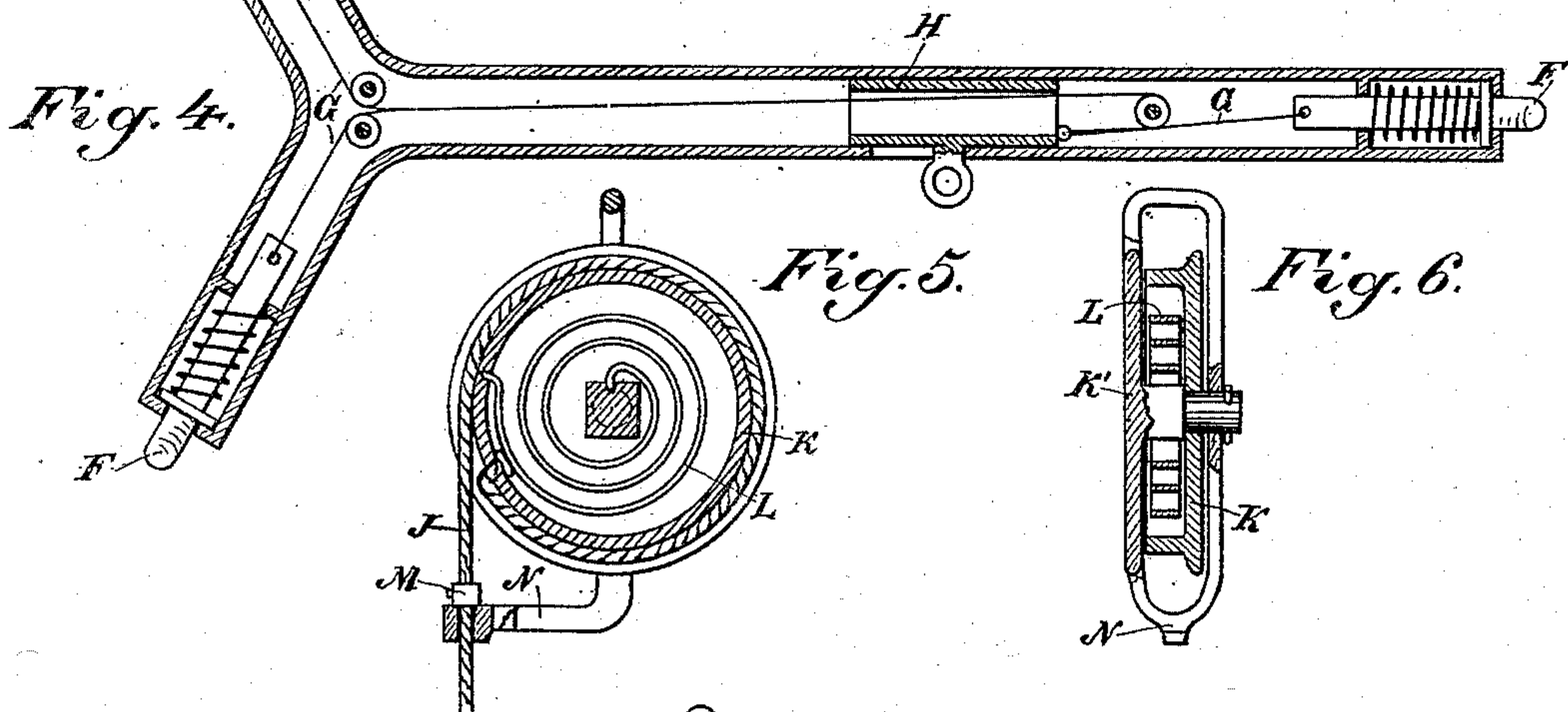
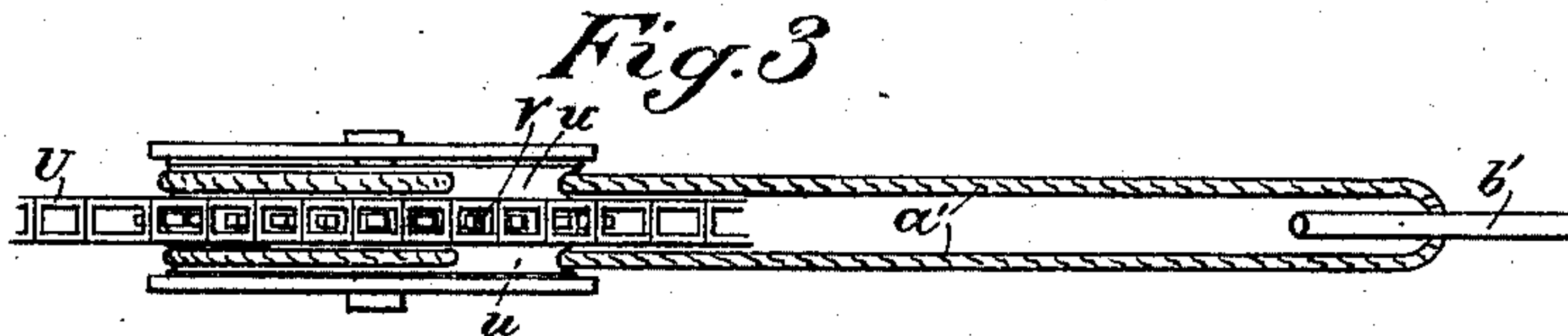
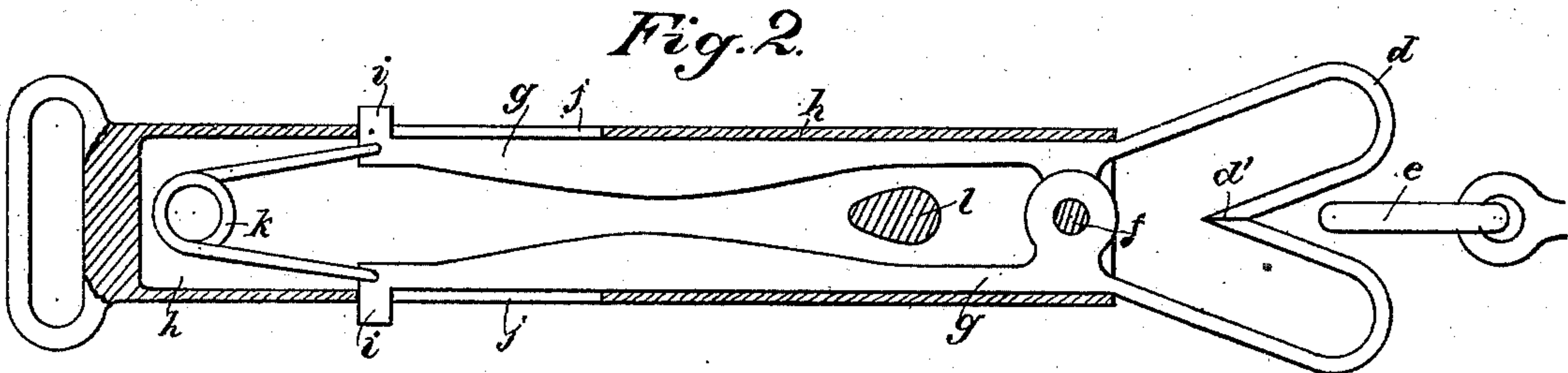
(No Model.)

2 Sheets—Sheet 2.

T. MURPHY.  
FIRE ENGINE HARNESS.

No. 505,410.

Patented Sept. 19, 1893.



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# UNITED STATES PATENT OFFICE.

THOMAS MURPHY, OF SAN FRANCISCO, CALIFORNIA.

## FIRE-ENGINE HARNESS.

SPECIFICATION forming part of Letters Patent No. 505,410, dated September 19, 1893.

Application filed May 13, 1893. Serial No. 474,108. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS MURPHY, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Fire-Engine Harnesses; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a harness and mechanism connected therewith whereby a harness is rapidly disengaged from the suspending devices, and is automatically secured upon the horses.

It consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a general view showing the collars of a double harness, and the suspending and automatically closing devices. Fig. 2 is a sectional view of a snap-hook. Fig. 3 is a plan view of the sprocket pulley V. Fig. 4 is a sectional view of a harness suspending frame. Figs. 5 and 6 are sectional views of the frame suspending device with counterbalance springs. Figs. 7 and 8 are similar views showing the hinging device of the collars. Fig. 9 is a detail view of the mechanism to operate the arms which carry the snap hooks.

The object of my invention is to provide a series of automatically operating devices whereby harnesses may be detached from their suspending mechanism, placed upon the horses and secured thereto with the least possible loss of time. This class of harness is especially adapted for use upon fire engine teams where it is desirable to attach the horses to the engine and get out in the least possible time. The collars which are placed around the horses' necks and from which the draft is accomplished by means of traces, and to which the back straps and breeching are attached, are here shown, the traces, breeching and back straps not being illustrated at this point. The collars are made in two parts A and A', and are hinged together at the top, as shown at B, and are adapted to abut together at the bottom. One side of the abutting ends is provided with a latching spur C which enters a corresponding hole or slot in

the opposite side when the collars are closed, and a spring catch engages the spur so as to lock the two together. The two parts are unlatched and separated by simply disengaging the latch and pulling them apart. It is usual in this class of harness to suspend the collars and the breeching at a sufficient height to allow the horses, when released from their stalls, to pass under the harness and take their positions by the side of the engine pole. The collars are then closed about the horses' necks and connected with the front pole straps D. The reins are connected with the bits which, with the head-stall, always remain upon the horses' heads. The traces remain constantly connected with the engine, so that when the driver takes his seat, by pulling a line he disengages the harness from the suspending device, and allows the back strap and breeching to fall into their place on the horses' backs, and the team is then ready to start out.

In my device the pole straps always remain in connection with the pole end and united with the inner portion A of the collar, the outer portion only is swung upwardly high enough to allow the horses to pass beneath and take their position beneath the collar, and the breeching is also suspended at a sufficient height.

The device which I employ for suspending the apparatus consists of a tubular Y-shaped frame E which is provided with sliding rods F, the outer ends of which are slightly upturned so that from the front bar the collars are suspended, and from the diverging rear bars the breeching of the harness is suspended. The inner ends of these sliding bars F are connected with cords G which pass around suitable guiding pulleys within the outer tubes and extend thence to a movable slide or lever H with which they are connected, as shown in the drawings, Fig. 4. This movable device H has a cord connected with it, as shown at I, and this cord extends backward, and is attached to some fixture above the driver's seat on the engine, so that after he takes his place on the seat by pulling this cord the harness is simultaneously detached from the suspending bars F by reason of their being



drawn into the tubes E so that the harness is pushed off the ends of the bars.

The frame E has attached to it a cord J at such a point between the ends that when the whole harness is suspended it will hang approximately level. This cord J passes around a pulley K which is journaled within an exterior casing K' so as to revolve freely therein, as shown in Figs. 5 and 6. A coil spring L within the pulley, has one end attached to the shaft, and the other to the pulley. The spring L is not sufficiently strong to suspend the whole weight of the two harnesses which amounts to about one hundred pounds. The suspending cord J has, therefore, upon it a stop M. The cord J passes through a hole made in the arm N, this arm being fixed to the pulley case K' in such a manner that the whole is in line with the cord J, so that the latter passes through it. When the harness is suspended from the frame E, the cord J will be uncoiled from the pulley K until the stop M comes in contact with the top of the arm N, and when this occurs the frame E will be at a sufficient height to suspend the harnesses in proper position above the horses' back and just high enough to allow the horses to readily pass in beneath the harnesses. The harnesses remain in this position, with the traces attached to the engine, and the inner sides of the collars connected with the pole, as previously described, until an alarm has been struck, when the horses are detached by the usual disengaging mechanism, and being properly trained will rush at once to their positions beside the engine pole.

The driver, standing at his position in front of the engine pole, drops the outer parts of the collars, and causes it to automatically close and lock with the inner portion by means of the following mechanism: The hinge point B of the two parts A and A' of the collar, consists of a two part case B and B' within which is fixed a shaft O having a spring P coiled around it, one end of which is connected with the part B' and the other end is connected with the shaft and the tension of this spring is such that when it is released and allowed to act it forces the outer part of the collar to close and latch with the inner part. When the outer part of the collar is thrown open, it is retained in this position against the tension of the spring by means of a pawl Q which is fulcrumed to the part B, and it engages ratchet teeth R upon the part B', thus holding the two parts of the collar open and separated, as shown in Figs. 7 and 8.

S is a lever so fulcrumed with relation to the pawl Q that by pulling the cord T connected with this lever, it will act to disengage the pawl Q, and thus allow the two parts of the collar to close automatically. This cord T is connected with the inner snap hooks d' so that by connecting the hook d' with the bit, this cord T is pulled simultaneously also.

The collars are suspended from the front bar F of the suspending device, by means of a chain U which passes around a sprocket pulley V, the journal shaft of which is supported in an inclosing pulley block, and this latter is suspended by a ring W from the arm F (Fig. 3). One end of the chain U is attached to a ring upon the stationary part A of the collar. The other end has a ring a which is adapted to slide upon a bar b, one end of which bar is pivoted to the collar near the hinge joint B. The other end extends outwardly and is connected with a ring c upon the outer movable part of the collar A'. When this outer portion of the collar has been lifted up, as previously described, the angle of the bar b will be such that the ring a will remain at the outer end of the bar so as to properly suspend the outer portion of the collar, but as soon as the collar begins to close, the inclination of the part b becomes such that the ring a will slide up close to the hinge joint of the collar, and offer no resistance to the closing of the latter, and at the same time, by reason of this motion, it will be prevented from pulling the suspending arm F downward when the collar is closed. The snap hooks d which are connected with the ends of the reins and are adapted to engage with the ring e of the bit, are made as shown in Fig. 2, of a heart shape, with the two ends meeting as shown at d' and forming the central depression of the top of the heart. The two sides of this snap hook are fulcrumed together as shown at f, at what constitutes the point or apex of the heart. From this fulcrum the two arms g, forming extensions of each of the sides of the snap hook, extend backwardly within an inclosing case h, and have outwardly turned lugs i projecting through slots in the sides of the case h. These arms g and the snap hook are allowed to move longitudinally with relation to the case, a distance equal to the length of the slots j, through which the lugs i project. The ends d' of the snap hook are normally retained in contact by means of a spring k which acts to separate the ends i within the case, and correspondingly close the ends d' of the snap hook. Whenever the ring e is pressed against the meeting ends d', it separates them by the spring k yielding to allow this separation, and immediately returning the points and closing the snap hook, so that the ring e will be drawn into one side or the other of the heart shaped space, and cannot be removed without inclosing and separating the points d'. This is effected when the lugs i are at the rear of the slot j in which they move by simply pressing upon these lugs which opens the points d' so that the ring e can be withdrawn.

In order to lock the snap hook so that it cannot possibly be opened accidentally by any contact of the lugs i with exterior objects, the extensions g are made with an open space between them which space is widest at a point



just behind the fulcrum *f*. This space becomes narrower by the thickening of the arms *g* toward the rear end. A pin *l* passes through the case *H* and between the arms *g*, as shown in Fig. 2. The space just behind the fulcrum point *f* is sufficiently large to allow this pin *l* to pass freely between the extensions *g* and to allow them to be closed together by pressing the lugs *i*, so that the points *d'* of the snap hook may be separated when the bar *l* is at the front of the space, but whenever by tension upon the reins, the casing *h* is drawn backwardly, thus allowing the snap hook to slide outward from it correspondingly until the lugs *i* have reached the front end of the slot *j*, the narrower portion of the space between the extensions *g* will be brought opposite the pin *l* and pressing upon each side of that pin, will form a lock which will prevent the lugs *i* from being closed together, and thus prevent the snap hook from being opened until it has first been pushed back into the casing to bring the pin to the front end of the space between the extensions *g*. In order to hold these snap hooks at the most convenient point for the driver to engage them with the rings of the bits, they are supported by bent arms *m*, (Figs. 1 and 9.) These arms are journaled in suitable projections from the lower part of the collar, as shown at *n*, and that portion of the arm which extends inwardly to the meeting ends of the collar is surrounded by spiral springs *o*. The inner ends of these rods *m* pass through the meeting faces of the collar, and the springs *o* cause them to project a little distance inside these meeting faces, but when the collar is closed together these points are forced backwardly against the tension of the springs, and the weight of the snap hook and its case *h* is sufficient to turn the up-turned portion of the arms *m* downward. The snap-hooks *d* are normally held to the up-turned portions of the arms *m* by means of spring clasps *p*, the ends of which close together with an elastic pressure in the manner of closing the thumb and finger. This pressure is sufficient to hold the snap hooks in place under ordinary conditions, but allows them to be pulled out from the springs when they are to be attached to the bits. Around the shafts *m* are coil springs *q*, the outer ends of which are extended and connected with the arms or attachments of the journals *n* in which the shafts *m* turn. Upon the shafts *m* and adjacent to the springs *q* are disks *r* having pins *s* projecting from them and adapted to enter holes *t* in the adjacent faces of the journal-boxes *n* in which the shafts *m* turn. The spring *o* acts normally to slide the shaft *m* in its journal, and to project the inner end between the meeting ends of the collar, as before described. At the same time, it causes the pin *s* to enter the hole *t*, and thus temporarily lock the upturned end of the arm *m* so that the snap hook *d* on the outer side of the collar is held up near

the collar. The object of this is to reduce the number of movements and distance of movements to be made by the driver in making connections to a minimum, and by reason of this snap hook being held in this position when the collar closes, it is in very close proximity with the bit ring and but a small movement is necessary to disengage it from its holding clamp *p* and attach it to the bit. As soon as this disengagement takes place, the action of the coil spring *q* will lift the bent portion of the arm *m* and turn it up against the collar where it will be out of the way. The inner snap hook *d* or the one nearest the pole is held in a similar manner by a spring clamp *p* upon the bent arm *m*, but upon this inner side, I do not employ the locking device *s*, as it is not desirable to hold this snap hook up against the collar. It is, in this case, desirable to allow it to hang down so that it is very near the pole strap and correspondingly convenient to the driver's hands, so that he attaches this snap hook to the ring bit upon the inside, and as he disengages it from its holding clamp *p* the spring *q* immediately throws the bent arm *m* up against the collar upon this side in the same manner as described for the outer one.

If desired the pawl *Q* and ratchet *R*, which are connected with the hinge joints *B* of the collars may be omitted from one of the collars. In this case I have shown a pulley or pulleys *u* upon one or both sides of the sprocket wheel *V* around which the chain *U* passes at the joint of the collar which has no pawl and ratchet. A cord or strap *a'* is attached to the pulley *u* and extends outwardly to the harness of the other horse, and is engaged by a spring clamp *b'* which is attached to a strap or cord *c'* passing over a pulley *d'* which is journaled just above the sprocket *V* of the other harness. This cord *c'* passing around this pulley is attached to the ring *c* of this other harness, which in the present case is shown as being the one belonging to the inner or left hand horse. In this case, the disengagement of the pawl *Q* from the ratchet *R* of the left hand harness allows the outer portion *A'* of that collar to be closed by the action of its spring *P*, and as it closes it draws upon the strap *c'* and through the spring clasp *b'* it pulls upon the cord *a'* and this rotates the ratchet *V* of the right hand or off harness by a positive movement, thus moving the chain *U* over this sprocket wheel, and allowing the outer part *A'* of the right hand harness to close simultaneously with the closing of the left hand harness.

The object in using the spring clasp *b'* is to allow it to disengage from the strap *a'* when the horses have been attached to the engine and are being driven, as they often pull apart and travel wide from the pole, and it is necessary to disengage these two parts for this purpose.

As before stated, when these operations of



locking the collars about the horses' necks and connecting the snap hooks of the reins with the bit rings have been accomplished, the driver immediately runs back, jumps upon his seat, and straps himself in place, and then by pulling the detaching cord I he disengages the front and rear arms F of the suspending apparatus which allows the latter to immediately rise above the height of the engine smoke stack. By reason of its counterbalance weight or spring wheel the breeching drops directly upon the horses' backs, and as the traces are already connected with the engine, the team can be started out instantly.

The light reins by which the breeching is suspended from the rear arms F, and the small pulleys V and the chains U by which the collars are suspended from the front arm simply fall upon the horses' backs, and as they are only about one and one-half or one and one-fourth inches in diameter, they are practically out of the way and of no obstruction, while the team is being driven.

The object of all these details of construction is to save time as even so short a time as one or two seconds saved in starting out is often of great value in cases of emergency.

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

1. In a harness, the two-part collars hinged together at the top and adapted to close and lock at the bottom, a pawl and ratchet mechanism for holding the parts of the collars normally open, and a spring at the hinge joint for automatically closing the parts of the collars when the said retaining mechanism is disengaged.

2. In a harness, collars hinged together at the top adapted to close and lock at the bottom, a spring contained in the hinge box by which the collars are automatically closed, a pawl and ratchet mechanism by which when they are opened they are retained in the open position, and a mechanism whereby the pawl and ratchet are disengaged whereby the spring is allowed to act to close the collars together, substantially as herein described.

3. In a harness, the hinge automatically closing collars, the two-part collars hinged together at the top adapted to close and lock at the bottom, a suspending chain, a pulley supported from a point above the collar over which the chain passes, a permanent attachment for the chain upon one side of the collar, and a bar connected with the other side of the collar upon which the outer end of the chain is slidable, substantially as herein described.

4. In a harness, the two-part collars hinged together at the top, adapted to close and lock at the bottom, the suspending chains connected with the collars, pulleys around which the chains pass, a frame situated above the harness having retractile bars projecting

from its front and rear ends, rings connected with the suspending pulleys adapted to hang upon side bars, and a mechanism whereby said bars are retracted within the frame and the harness disengaged therefrom, substantially as herein described.

5. In a double harness, the two collars hinged at the top, adapted to close and lock at the bottom, suspending chains and sprocket pulleys and frames suspended above each harness from which they are suspended above the backs of the horses, springs connected with the hinge joints of the collars whereby the collars are automatically closed when released, a pawl and ratchet mechanism connected with one section or part of each of the collars, whereby it is retained in an open position against the tension of the spring, means for disengaging the pawls and ratchets and allowing the collars to close, a cord or strap connecting the movable side of one of said collars with the sprocket wheel around which the suspension chain of the opposite collar passes, whereby the wheel is rotated and the outer portion of the second collar is allowed to close simultaneously with the closing of the first named collar, substantially as herein described.

6. In a harness, the collars hinged at the top adapted to close and lock at the bottom, bent arms *m* connected with and turning upon the lower part of the collar, spring clasps at the ends of the bent arms, in which the snap hooks of the reins are held, spiral springs surrounding the arms and retaining them normally with the inner ends projecting through the meeting ends of the collar when the latter is open, said ends being forced backward against the tension of the spring when the collar is closed, springs connected with said arms whereby the outer bent portions thereof are thrown up against a collar when released by the closing of the collar and the removal of the snap hooks, substantially as herein described.

7. In a harness having collars with hinged separable sections, and means for opening and closing the same, the snap hooks of the reins consisting of the heart-shaped sections hinged together at the point and adapted to open and close at the outer ends to receive the two ring extensions of the two parts of the snap hook slidable within an exterior case, and having lugs projecting through slots in the side of the case, a spring by which the inner ends of the arms are separated and the snap hook closed, substantially as herein described.

8. In a harness having collars with hinged separable sections, and means for opening and closing the same, the heart-shaped snap hooks hinged together at the apex and adapted to open and close at the opposite side for the reception of the bit ring, extensions rearwardly from the hinge joint slidable within



an inclosing case having a spring by which they are normally separated and the snap hook closed, and lugs projecting through slots in the side of the case by the compression of which the snap hook is opened, a pin 5 passing through the case behind the hinge of the snap hook, over which pin the extensions of the snap hook are slidable, whereby the snap hook may be opened when it is in its

rearmost position, and is locked to prevent re-opening when it is drawn forward, substantially as herein described.

In witness whereof I have hereunto set my hand.

THOMAS MURPHY.

Witnesses:

S. H. NOURSE,  
J. A. BAYLESS.