

No. 641,371.

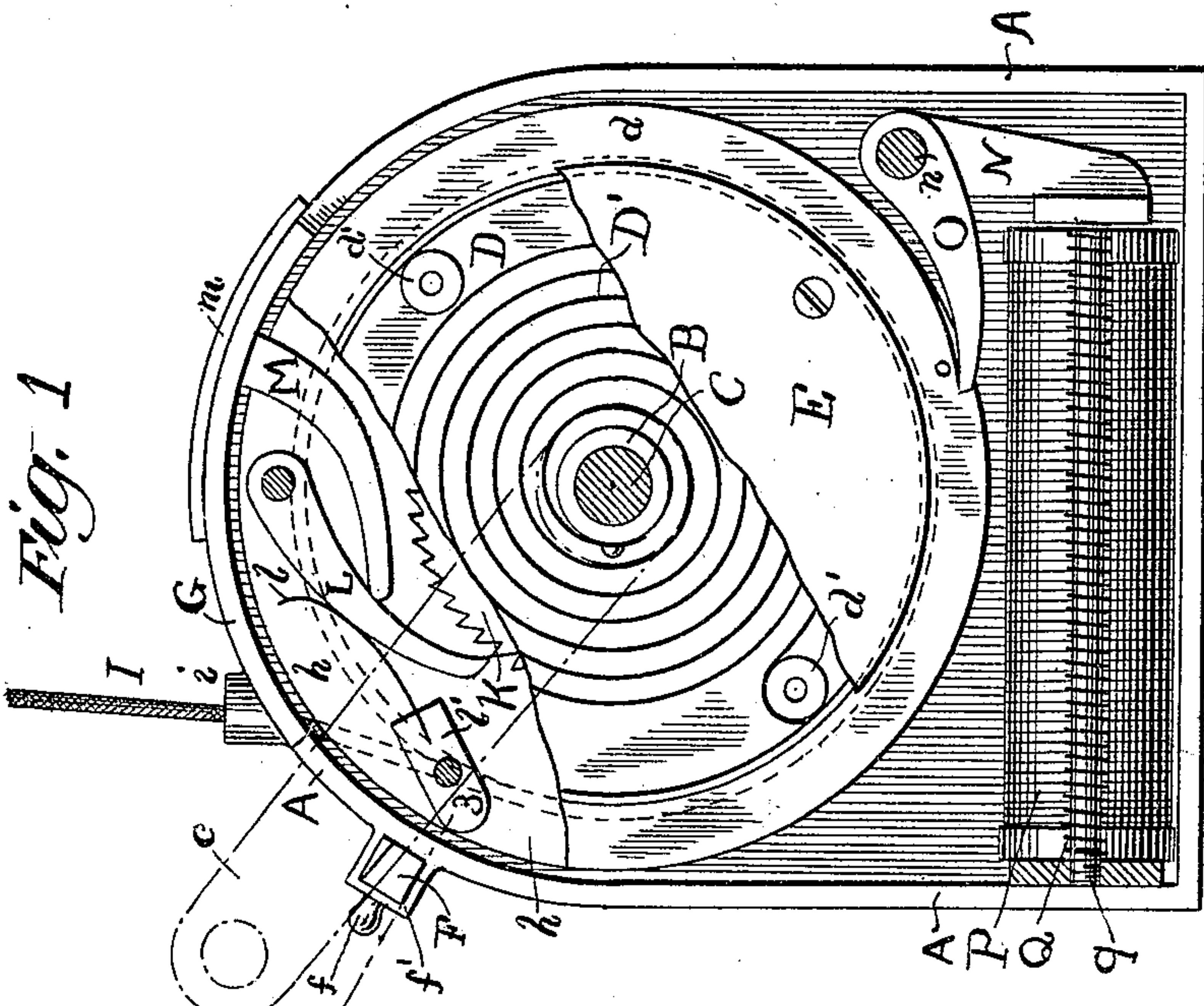
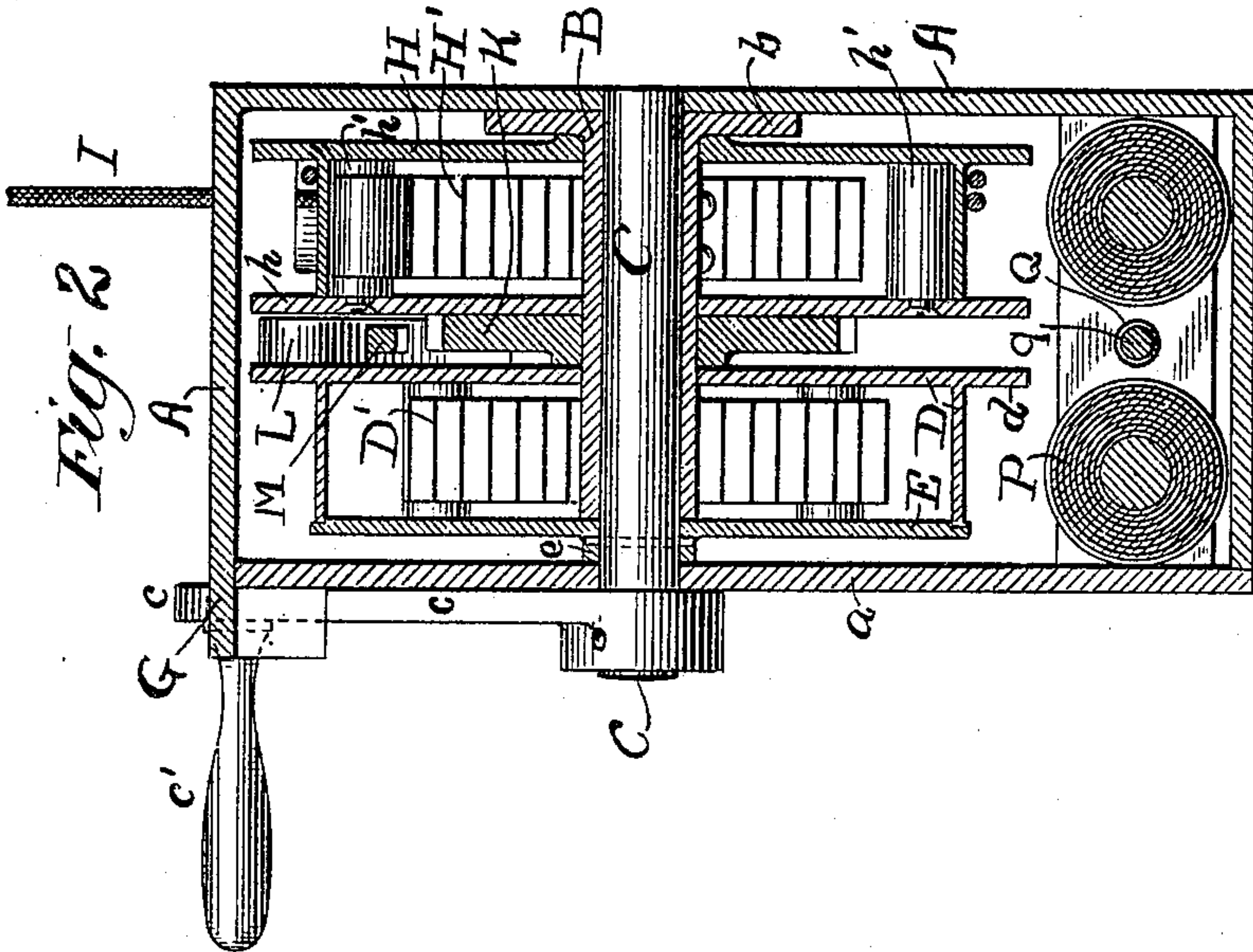
Patented Jan. 16, 1900.

W. E. CARLILE.
TROLLEY ARRESTER.

(Application filed May 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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Fig. 4

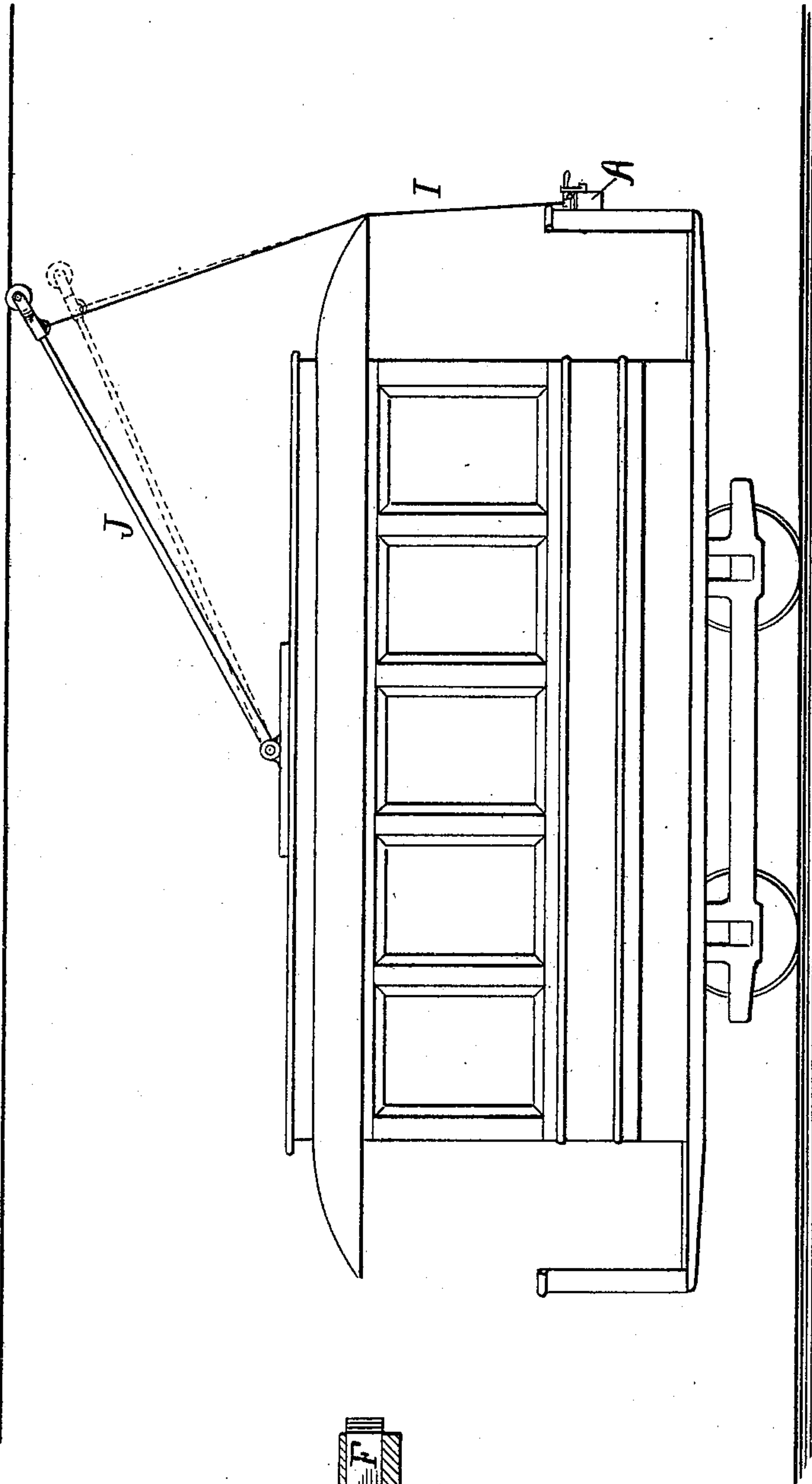
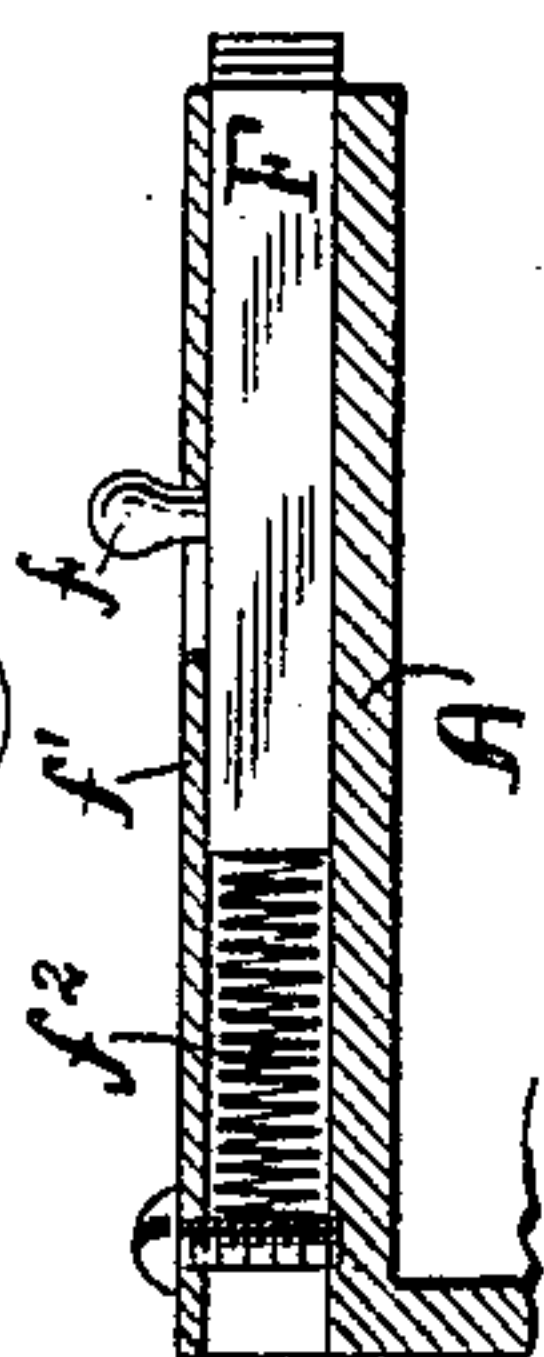


Fig. 3



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UNITED STATES PATENT OFFICE.

WILLIAM E. CARLILE, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND
EDWARD N. DICKERSON, OF SAME PLACE.

TROLLEY-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 641,371, dated January 16, 1900.

Application filed May 27, 1899. Serial No. 718,521. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. CARLILE, a subject of the Queen of Great Britain, residing in the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Trolley-Arresters, of which the following is a specification.

My invention relates to improvements in trolley-arresters.

The object of my invention is to provide a machine that will immediately on the trolley leaving the wire and preferably by acting upon the trolley-cord cause the latter to arrest the trolley-pole and then draw it down to prevent its contact with any overhead wires; and I accomplish this by means of a supplementary mechanism adapted to keep the trolley-cord taut, and by employing as an actuating device an electromagnet controlled by the current in the trolley, so that the breaking of contact between the trolley and the trolley-wire sets the machine in operation, causing it to engage the taut trolley-cord and to immediately control the trolley-pole and lower it a certain convenient distance.

I shall first describe a device embodying my invention and then point out the novel features in the claims.

In the drawings forming a part of this specification, Figure 1 is a side view of a device embodying my invention, in which the cover is removed and several parts are cut away to show the inner parts. Fig. 2 is a central vertical sectional view of Fig. 1. Fig. 3 is a section taken on the line 3-3 of Fig. 1. Fig. 4 represents a trolley-car, showing my invention applied thereto and illustrating the action of the device.

Similar letters of reference designate corresponding parts in the several figures of the drawings.

A represents a box for inclosing a mechanism embodying my invention. For convenience it may be detachably secured to the rear dashboard of the trolley-car. *a* represents a removable cover upon the front side of the box A.

B represents a cylindrical tube fixedly secured to the box A at the rear thereof by

means of a flange *b* upon the tube B and extending toward the front of the box A.

C represents a crank-shaft placed for convenience within the tube B, which serves as a bearing therefor. The shaft C extends through an opening in the cover *a*, and attached to its front end is a crank *c*, having a handle *c'* for turning it.

D represents a barrel loosely mounted on the tube B. It has a removable cover-plate E attached to the barrel by means of lugs *d'*.

d represents a flange which forms a continuation of the back wall of the barrel.

D' represents a spiral spring inclosed in the barrel D and attached at its inner and outer ends to the stationary tube B and one of the lugs *d'*, respectively.

The cover-plate E is extended inward to the crank-shaft C, to which it is secured by means of a sleeve *e* and a pin. By this arrangement the spring D' may be wound up by turning the crank *c*.

F represents a latch-bolt for holding the crank *c* and preventing its revolving under the action of the spring D' after the latter has been wound up. The latch-bolt F is inclosed in a slideway *f'*.

*f*² represents a helical spring acting to press the bolt F out to engage the crank *c*.

f represents a knob on the bolt F, by which the bolt may be pushed inward to release the crank.

G represents a stop formed by a forwardly-projecting portion of the box A and adapted to engage the crank *c* and prevent an over-rotation thereof in either direction.

H represents a second barrel, also loosely mounted on the tube B. It is provided with lugs *h'*, by which a cover-plate *h* is attached thereto.

H' represents a spiral spring inclosed in the barrel H and attached at its inner and outer ends to the stationary tube B and one of the lugs *h'*, respectively.

The back wall and the cover-plate *h* of the barrel H are extended laterally to form a spool, upon which is wound the trolley-cord I, which then passes out from the box A through an opening formed in a lug *i* on the box A and upward to the trolley-pole J, which

is attached in any usual manner to the car-roof. With this arrangement the spring H' exerts upon the trolley-cord a pull which is preferably sufficient only to keep the cord taut.

In the space left between the barrels D and H are located a ratchet K , attached to the cover-plate h of the barrel H and concentric therewith, and a pawl L , pivoted to the flange d of the barrel D .

l represents a spring attached to the flange d through a lug l' and adapted to press the pawl L into engagement with the teeth of the ratchet K .

M represents a stationary arm secured to the box A through a plate m integral with the arm. The purpose of the arm M is to raise the pawl L from the ratchet K , and it is so arranged that the pawl and ratchet will not be engaged when the crank c is held by the latch-bolt F' .

n represents an axle mounted in suitable bearings in the box A . It carries a downwardly-projecting arm N and a laterally-projecting arm O , which latter is adapted to engage a notch o in the periphery of the flange d . The notch o is so arranged that when it is engaged with the arm O and the barrel D is held thereby a very small rotation of the barrel will suffice to engage the crank c and the latch-bolt F . In whichever of these two ways the barrel is held the pawl L will be disengaged from the ratchet K , thus leaving the barrel H free to rotate.

P represent a pair of electromagnets, the coils of which are in circuit with the trolley-pole J .

p represents an armature attached to the arm N and adapted to be attracted by the magnets P as long as the trolley-pole carries a current.

Q represents a helical spring mounted on a rod q and adapted to press the armature away from the magnets P .

The operation of the device is best explained by reference to Fig. 1. The parts are shown therein ready for operation, the trolley being supposed to have been placed upon the overhead wire. The magnets P are excited, and exerting an attraction upon the armature p cause the arm O to be pressed against the flange d . The barrel D is held by the notch o resting upon the arm O , and consequently the pawl L and ratchet K are disengaged, and the barrel H being free to rotate permits the trolley to adjust itself to the varying heights of the overhead wire, the spring H' serving to keep the cord taut. Supposing now the trolley to jump the wire, the circuit is broken and the magnets P demagnetized. The spring Q , acting on the arm N , rotates the axle n and revolves the arm O out of the notch o . The barrel D being freed and acted upon by the strong spring D' rotates. The pawl L , carried by the barrel D , is released from the arm M and thereupon engages the ratchet K , attached to the barrel

H . This serves to check the rise of the trolley-pole, the cord I being wound upon the barrel H . Thereafter the barrel H rotates with the barrel D and pulls in the cord, thus lowering the trolley. This action takes place instantaneously and serves its purpose effectually. The spring D' is necessarily of great strength in order to overcome the spring of the trolley-pole. To replace the trolley and reset the device, the operator first turns the crank c until it is held by the latch-bolt F . This releases the barrel H and the cord, permitting the trolley to be replaced in the ordinary manner. The circuit being closed, the magnets P are excited and cause the arm O to be pressed again against the flange d . By now pushing the knob f to operate the bolt F the crank c is released therefrom, and it rotates a small amount until the notch o engages the arm O . The parts are then in the position shown in Fig. 1 and ready for a new operation.

The distance the trolley is drawn down may be governed by the diameter of the spool upon which the cord is wound or by the amount of revolution thereof.

When the car is run in the opposite direction, the device may be carried around the car and attached to the other dashboard, or if there be one device provided for each end of the car the trolley-cord may be simply detached and attached to the other device.

The magnet P , evidently, need not be normally in circuit with the trolley, but may be operated by that circuit through a relay or other means to release the spring D' .

What I claim as my invention is—

1. In a trolley-arrester the combination of a device for holding the trolley-cord taut, means for lowering the trolley-cord, and an electromagnet for causing the operation of said lowering means, substantially as specified.

2. In a trolley-arrester the combination of means for keeping the trolley-cord taut, a spring adapted to pull down the trolley-pole, and a device for setting in operation said spring, said device operated by the breaking of the circuit through the trolley, substantially as specified.

3. In a trolley-arrester the combination of an electromagnet operated by the current which passes through the trolley, a device operated by said magnet and adapted to arrest the trolley, and means for pulling down the trolley, whereby when the trolley leaves the wire it is lowered, substantially as specified.

4. In a trolley-arrester the combination of a spool on which the trolley-cord is wound, means for rotating said spool, and a device for causing the operation of said means, said device comprising an electromagnet operated by the current passing through the trolley, whereby when said current is broken, said spool will be rotated to draw in the trolley-cord, substantially as specified.

5. In a trolley-arrester the combination of means for holding the trolley-cord taut, a

spring for drawing in the cord, means for setting the spring, a device for holding the spring when set, an electromagnet in circuit with the trolley adapted to operate said device, and
 5 means for releasing said spring, whereby when said magnet is demagnetized, said spring will operate to draw in the trolley-cord, substantially as specified.

6. In a trolley-arrester the combination of a
 10 spool on which the trolley-cord is wound, means in connection therewith for keeping the cord taut, a device for engaging said spool to prevent the unwinding of the cord therefrom, and an electromagnet adapted to operate said
 15 device when the trolley jumps the overhead wire, substantially as specified.

7. In a trolley-arrester the combination of a spool on which the trolley-cord is wound, means for keeping the cord taut, a spiral
 20 spring, means for winding said spring, and a device for holding the spring when wound; an electromagnet adapted to release said spiral spring and means for coupling said spring with said spool when said spring is released by
 25 said magnet whereby said spool may be rotated by said spring to draw in the trolley-cord, substantially as specified.

8. In a trolley-arrester the combination of a spool on which the trolley-cord is wound,
 30 means for keeping the cord taut, a spiral spring for causing the rotation of the spool to wind the cord thereon, means for winding said spiral spring, and a device for holding the

spring when wound, a pawl and ratchet for connecting said spool and said spiral spring, 35 means for causing the engagement of said pawl and ratchet, and an electromagnet for releasing said spiral spring, whereby when the circuit of the magnet is broken, said spring will act upon said spool to draw in the trolley- 40 cord, substantially as specified.

9. In a trolley-arrester the combination of a spool on which the trolley-cord is wound, a spiral spring acting on said spool to keep said cord taut, a second spring, a barrel inclosing 45 said second spring, means for turning said barrel to wind said second spring, means for holding said barrel when the spring is wound, a ratchet on said spool, a pawl on said barrel adapted to engage said ratchet, means for 50 causing the engagement thereof, a device adapted to cause the disengagement of said pawl and ratchet when said second spring is wound, whereby said spool is free to rotate, and an electromagnet in circuit with the trol- 55 ley, and adapted to release said second spring, whereby said spool is rotated to draw in the trolley-cord when the circuit through said trolley is broken, substantially as specified.

In testimony whereof I have signed my 60 name to this specification in the presence of two subscribing witnesses.

WILLIAM E. CARLILE.

Witnesses:

W. LAIRD GOLDSBOROUGH,
 DONALD CAMPBELL.