No. 658,581. Patented Sept. 25, 1900.

A. PITON.

TROLLEY.

(Application filed Apr. 17, 1900.)

(No Model.) 5 Sheets—Sheet 1.

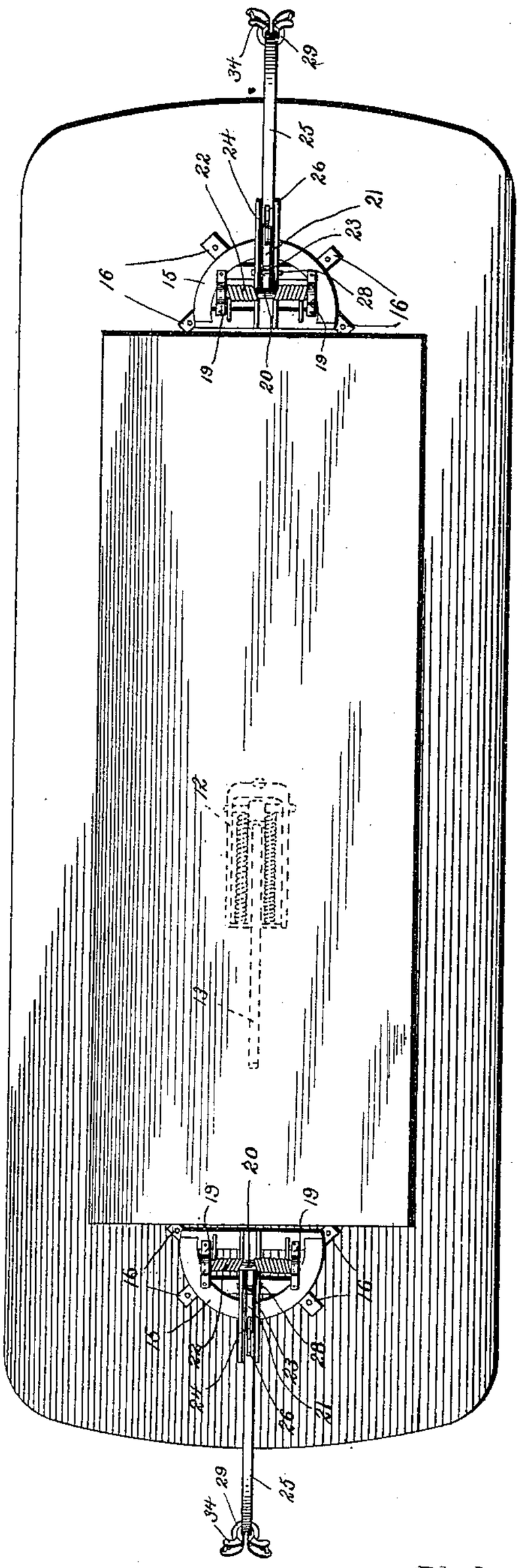

Fig. 1.

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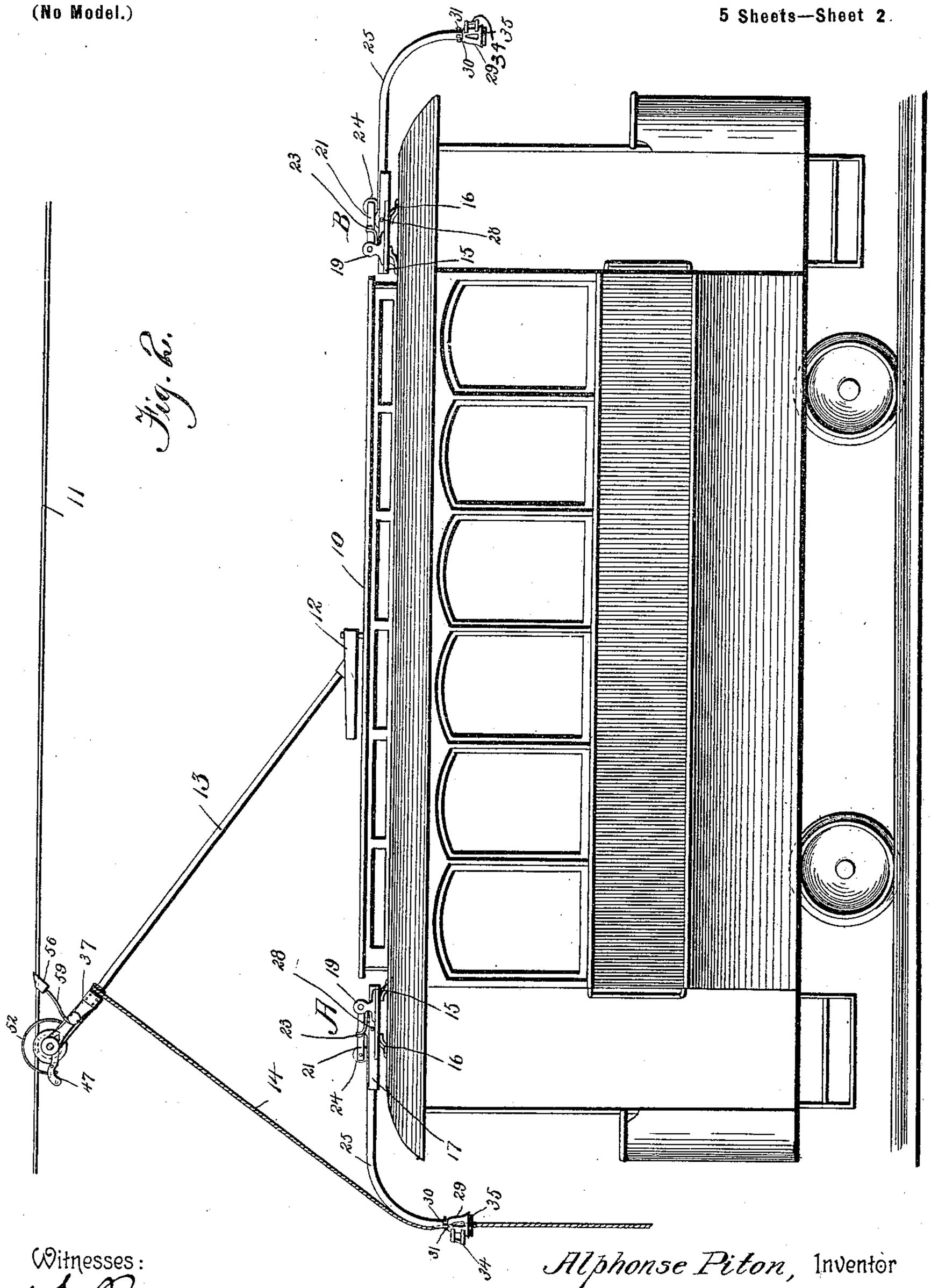
(No Model.) 5 Sheets—Sheet 2.

Fig. 2.



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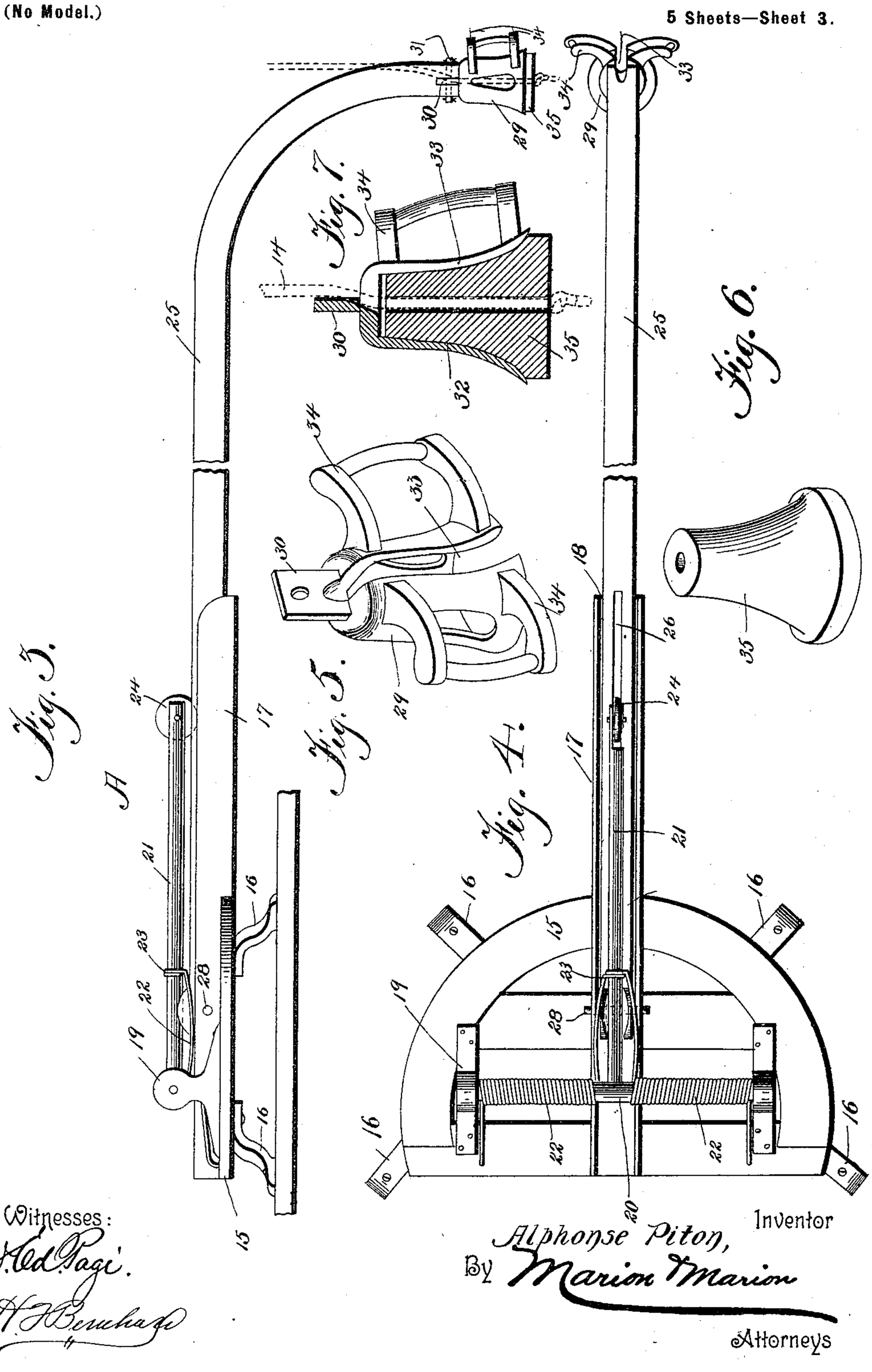
(No Model.) 5 Sheets—Sheet 3.



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(No Model.) 5 Sheets—Sheet 4.

Fig. 8.

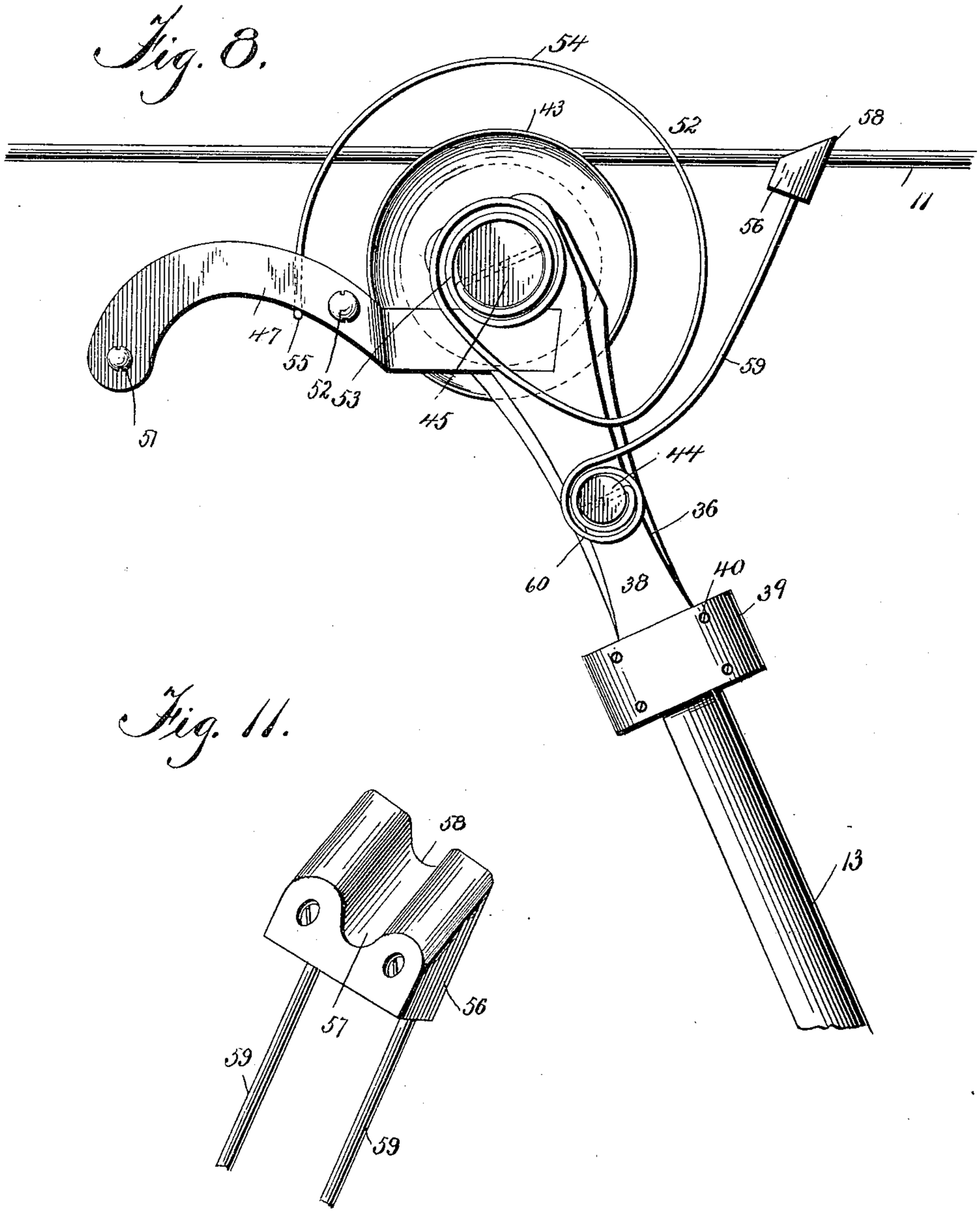

Fig. 11.

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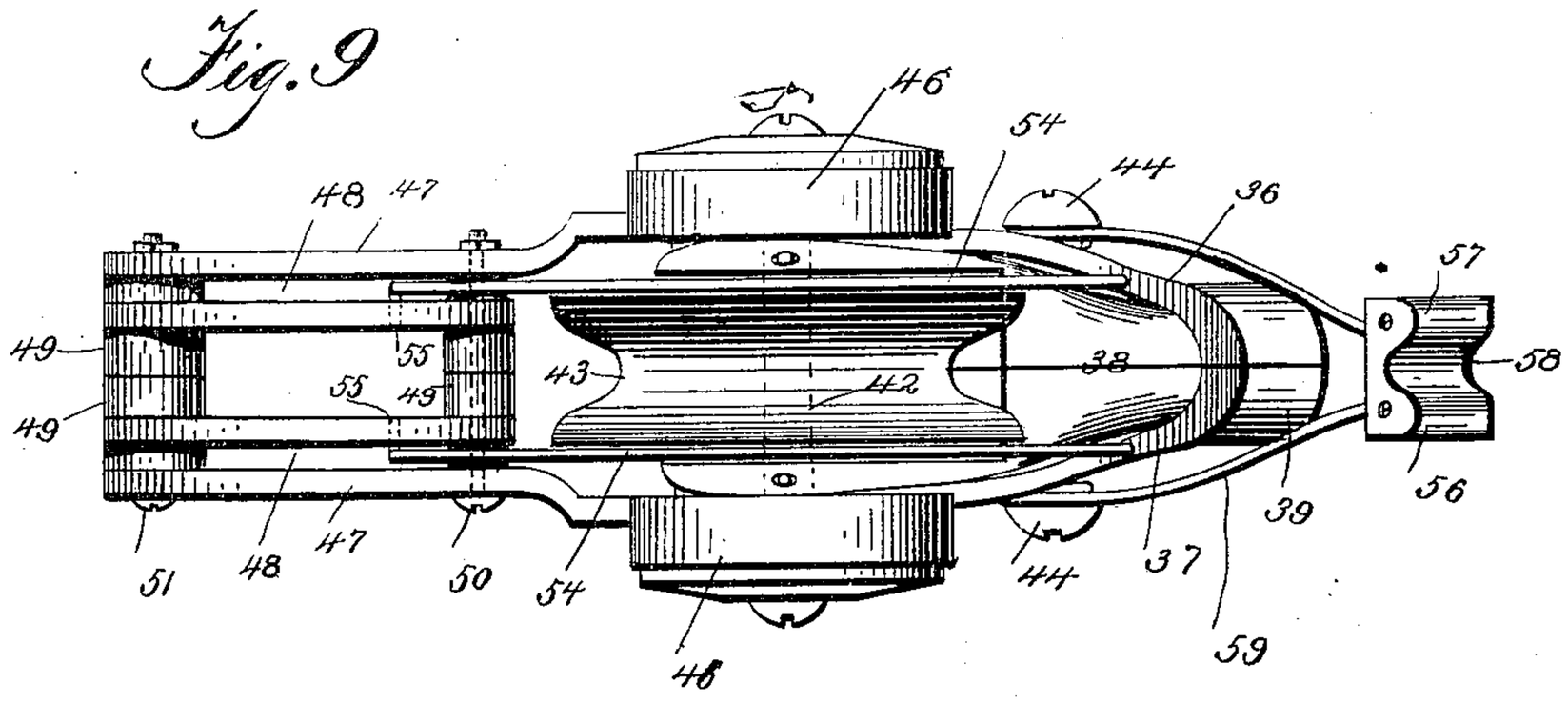
(Application filed Apr. 17, 1900.)

(No Model.) 5 Sheets—Sheet 5.

Fig. 9



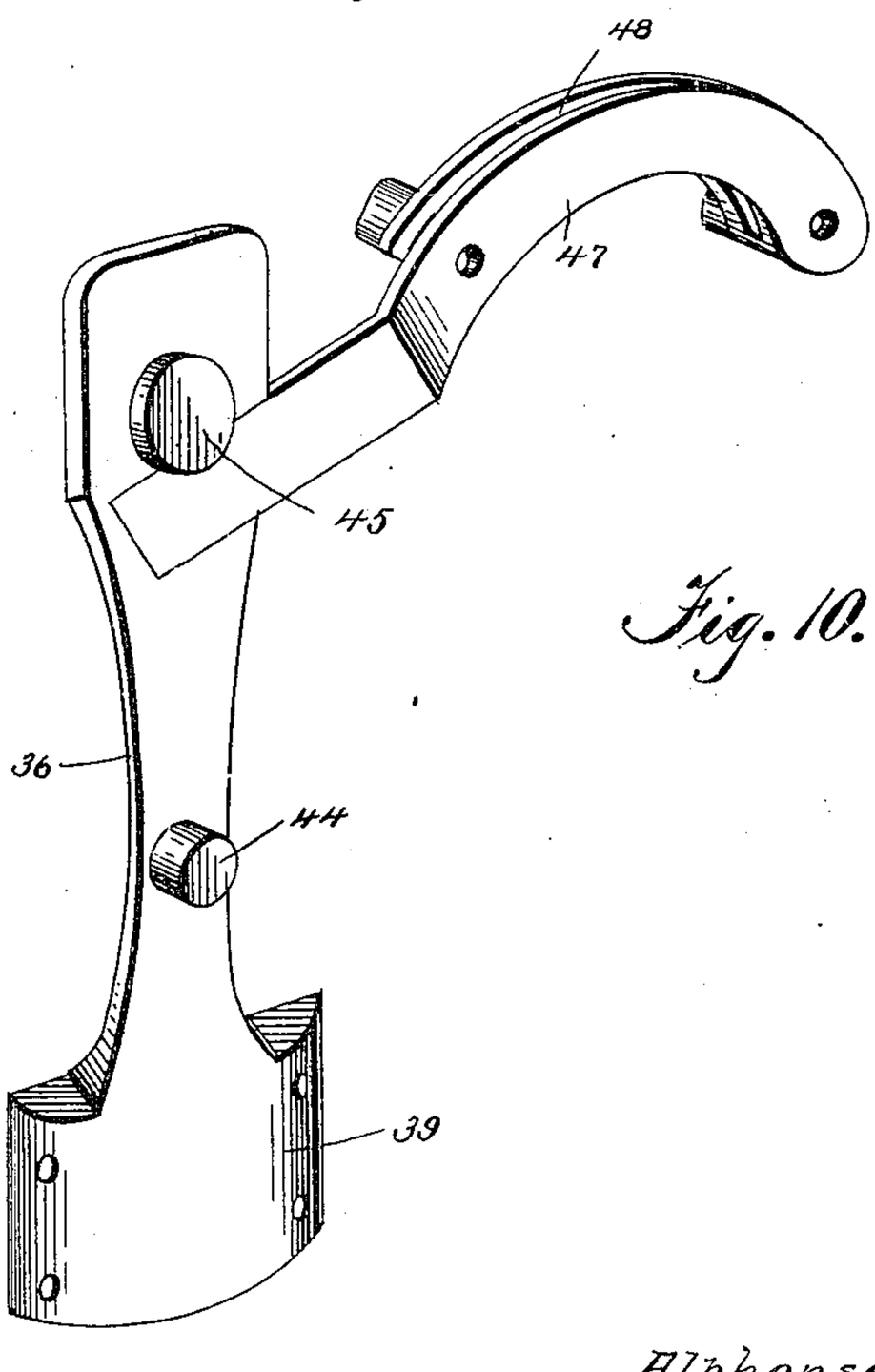


Fig. 10.

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UNITED STATES PATENT OFFICE.

ALPHONSE PITON, OF ST. SAUVEUR DE QUEBEC, CANADA.

TROLLEY.

SPECIFICATION forming part of Letters Patent No. 658,581, dated September 25, 1900.

Application filed April 17, 1900. Serial No. 13,280. (No model.)

To all whom it may concern:

Be it known that I, ALPHONSE PITON, a subject of Her Majesty the Queen of Great Britain, residing at St. Sauveur de Quebec, county of Quebec, Province of Quebec, Canada, have invented certain new and useful Improvements in Trolleys for Electric-Railway Cars; and I do hereby declare that the following is 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.

My invention relates to improvements in trolleys for electric-railway cars; and one object in view is to provide a means for holding the pole-cable taut under all conditions of service and to minimize the tendency of the pole under the repression of the spring from being thrown up to such a height as to assume a perpendicular position when the trolley-wheel slips off the overhead conductor, thereby reducing the tendency of the pole to strike switches or crossings and obviating injury to the overhead elements of the railway system.

A further object is to provide means by which the pole-cable is securely held in place within convenient reach of the car conductor or attendant, so that it may be detached easily when reversing the trolley-pole, and, furthermore, to arrange the parts so that they will yield or give to a sudden upward movement of the pole, whereby the strain on the trolley is reduced.

A further object is to simplify the construction of the trolley-head and to equip the same with yieldable guards that serve to keep the wheel in contact with the overhead conductor and are yieldable when passing under a crossing or a switch.

A further object is to provide the trolley-head with a clearer or scraper adapted to traverse the under side of the overhead conductor for the purpose of clearing the same from accumulations of ice or snow, said scraper being yieldably held in position to make way for crossings and switches.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the novelty in the combinations of devices and in the construction and arrangement of parts will be defined by the claims.

In the drawings, Figure 1 is a plan view of one type of an electric car equipped with a part of my improvements, the trolley-stand being indicated by dotted lines. Fig. 2 is a side elevation of a car equipped with a trolley of my invention. Fig. 3 is a side elevation, on an enlarged scale, of one of the tension devices for the pole-cable. Fig. 4 is a plan view of the parts shown by Fig. 3. Fig. 5 is a detail perspective view of the knob-socket. Fig. 6 is a like view of the cable-knob. Fig. 7 is a vertical sectional view of the knob-socket and a knob fitted therein, the dotted lines representing the pole-cable. Fig. 8 is an enlarged view in side elevation of the trolley-head, with certain parts omitted to show the arrangement of the springs. Fig. 9 is a plan view of the trolley-head. Fig. 10 is a detail perspective view of one member of the trolley-head, and Fig. 11 is a detail perspective view of the scraper or clearer.

The same characters of reference are used to indicate like parts in each of the several figures of the drawings.

The improvement in trolleys which I have invented may be applied to the deck 10 of any style of electrically-propelled car employing an overhead trolley adapted to traverse the ordinary overhead conductor 11. An ordinary trolley-stand 12 is erected on the middle portion of the car-deck 10, and it actuates the trolley-pole 13. It is usual to connect a cable 14 to this trolley-pole for the purpose of enabling the car-attendant to easily place the trolley-wheel into engagement with the conductor and for reversing the position of the trolley-pole preparatory to starting the car on its return trip; but ordinarily this cable is allowed to remain slack, and its looped end is merely slipped over a hook or stud, which is liable to become detached, owing to the motion or swaying of the car, whereby there is a permanent allowance of slack in the cable, and it is not always accessible to the car-attendant.

According to my invention I have devised a means for keeping the cable taut and for securely confining it in a certain position where it may always be reached by the car-

attendant, and this device I will hereinafter designate as a "tension" device. One tension device, as A, is placed on the car-deck near one end of the car, and another tension device, as B, is placed on the car-deck near the opposite end thereof, whereby the pole-cable is adapted for engagement with either tension device when it is in the position shown by Fig. 2 or is reversed with the trolley-pole, so that it may be engaged with the other tension device B. The construction of these tension devices is identical, and a description of one will answer for the other. Each tension device has a base 15, provided with the depending feet 16, adapted to be fastened securely to the car-deck. The base is provided with a horizontal socket-arm 17, having a longitudinal channel 18, adapted for the reception of the tension-arm 27 in the normal position of the latter, as shown by Figs. 2, 3, and 4, said socket-arm being made fast or integral with the base. Bearings 19 are also made integral with the base near the sides thereof for the accommodation of the horizontal rock-shaft 20. This shaft is provided with an outwardly-extending finger 21, and around the shaft are coiled the pressure-springs 22, each having one end extended to rest upon the base and its other end formed into a loop 23, that engages with the finger 21, whereby the two springs coact to normally force the finger in a downward direction. The free end of this finger carries a roller-shoe 24, that is adapted to travel in the groove or channel 26, which is provided in the elongated tension-arm 27, the latter being pivoted at 28 to the horizontal socket-arm 17, the tension-arm being thus mounted on the stand or base to turn on a pivot independently of the rock-shaft. This spring-actuated tension-arm 27 normally occupies a horizontal position, so as to draw down on the pole-cable and keep the latter in a taut condition, and, furthermore, said tension-arm fits between the flanges afforded by the channel in the socket-arm 17, so that the strain on the pivot 28 due to the pull of the pole-cable when the car travels around a curve is minimized. The tension-arm 27 may be of any suitable length, and its outer end is curved in a downward direction, (see Figs. 2 and 3,) and this curved extremity of the arm 27 is equipped with a socket-casting 29, details of which are shown by Figs. 5 and 7 of the drawings. This casting may have a stem 30, adapted to fit in a notch or slot of the arm 27 and to be fastened thereto by the transverse pin 31, (see Fig. 3;) but any other means for attaching the socket-casting to the arm 27 may be adopted. Said casting 29 is provided with a socket 32, preferably of tapering form and open at the lower end, and said casting is also provided with the longitudinal slot 33, which opens into the socket and through the lower edge of the casting. (See Fig. 5.) Furthermore, the casting is provided with the curved guides 34, which are disposed on opposite sides of the slot 33 and are curved in reverse directions therefrom, whereby the guides are adapted to direct the pole-cable into the slot of the socket-casting. The lower end of the pole-cable is made fast with the knob 35. (See Figs. 6 and 7.) This knob is fashioned and proportioned to conform to the socket 32 in the casting 29, and through this socket is a cord-passage 25, through which passes the cord or cable 14, as shown by Fig. 7, the extremity of the cord or cable being knotted. The knob is thus attached to the cable, so that it may serve as a hand-grasp in the manipulation of the cable and the trolley-pole, and said knob is adapted to be fitted in the socket 32 of the casting which is carried by the free extremity of the spring-actuated tension-arm. To reverse the trolley-pole, the attendant pulls down on the knob and slips the cable through the slot 33 in the casting, thus disconnecting the cable from the tension device and permitting the cable and the pole to be manipulated and reversed in the ordinary way. The cable may thus be disconnected from one tension device, as A, and on reversal of the pole the knob of the cable may be connected to the socket-piece on the other tension device, as B. To do this, the attendant pulls down on the knob and cable to adjust the trolley-wheel in engagement with the overhead conductor and so that the cable or cord will be directed by one of the guides 34 into the slot 33 of the casting, while the knob will enter the socket of said casting, thus affording a secure means for holding the cable in place. The tension of the springs 22 on the elongated arm takes up the slack in the cord or cable; but this arm 27 is free to have an upward yielding movement against the repression of the springs 22 when the trolley-pole moves upwardly in a sudden manner, thus overcoming liability of injury to the tension device.

I will now proceed to describe the improved construction of the trolley-head and the parts associated therewith, as shown by Figs. 2 and 8 to 11, inclusive. The trolley-head consists of two complemental members or sections 36 37, which are formed by bisecting the trolley-head in the plane of its longitudinal axis. The members are assembled to form a shank 38, having the enlargements 39, which may be united by the screws or bolts 40, so as to securely clamp the head on the upper end of the trolley-pole 13. The members of the trolley-head have the plates or bearings 41, adapted to support the axle 42, on which turns the ordinary trolley-wheel 43. Each member or section of the trolley-head is provided on its outer side at a point intermediate of its length with a headed stud 44, and near its upper end each member is also provided with an integral pin 45, having a cap 46, the head of the stud 44 and the cap of the pin 45 being shown removed for the purpose of better illustration of the guard-springs and the scraper-springs. The members or

sections of the trolley-head have formed integral therewith the curved arms 47, which are extended rearwardly beyond the trolley-wheel, so as to lie below the horizontal plane of the overhead conductor 11, and each arm is provided with a longitudinal slot 48. The curved arms of the two-part trolley-head are kept in spaced parallel relation by the collars 49, through which pass the bolts 50 51, thus holding the rear part of the trolley-head members firmly together.

The trolley-head is equipped with the guard-springs 52, which are disposed on opposite sides of the vertical axis of the trolley-pole and its head. Each spring is coiled at one end, as at 53, so as to fit around the capped pin 45 within the cap thereof, and said spring is bowed or arched in an upward direction, as at 54, to extend above the horizontal plane of the overhead conductor, whereby the springs minimize the lateral displacement of the trolley-wheel on said conductor. The guard-springs are provided with the bent ends 55, which are loosely fitted in the slots 48 of the curved arms 47, and these guard-springs are slidably held in place at one end, so that the springs may be depressed when the trolley-head passes beneath an overhead switch or crossing. I have also equipped the trolley-head with means for scraping the accumulation of ice, snow, and dirt from the under side of the overhead conductor 11, thereby insuring good electrical contact between the trolley-wheel and the conductor. This means consists of a scraper 56, which is provided in its upper side with a groove 57 and has a cutting edge 58. This grooved face and cutting edge of the scraper are held under pressure against the under side of the conductor by the springs 59, which are coiled at 60 around the headed studs 44 of the trolley-head. The springs carry the scraper and force the same against the under side of the conductor, so that the cutting edge of the scraper will have a tendency to remove accumulations from said conductor; but the scraper and its springs are free to yield on the engagement of said scraper with a switch or crossing.

Changes within the scope of the appended claims may be made in the form and proportion of some of the parts, while their essential features are retained and the spirit of the invention is embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described my invention, what I claim as new is—

1. In an electric railway, the combination with a trolley-pole, and a cable, of a spring-repressed arm having detachable connection with said cable and acting in opposition to the spring of said trolley-pole, substantially as and for the purposes set forth.

2. In an electric railway, the combination with a spring-actuated trolley-pole, and a cable, of a spring-repressed tension-arm supported independently of said pole, and means for connecting the cable detachably to said arm, substantially as and for the purposes set forth.

3. In an electric railway, a tension device for the pole-cable comprising a base, a tension-arm mounted thereon, means for normally forcing said tension-arm in one direction, and a cable-connector carried by said arm, substantially as described.

4. In an electric railway, a tension device for the trolley-pole cable comprising a base, a tension-arm pivoted thereon, a spring-actuated finger mounted on the base and having slidable engagement with said arm, and a cable-connector carried by the arm, substantially as described.

5. In an electric railway, a tension device for the trolley-pole cable comprising a base, a tension-arm pivoted thereto, a rock-shaft having a finger engaging slidably with said tension-arm and a spring for normally depressing the finger and the tension-arm, substantially as described.

6. In an electric railway, a tension device for the trolley-pole cable comprising a base, a tension-arm pivoted thereto and provided with a longitudinal groove, a rock-shaft, a finger fast with said shaft and provided with a roller-shoe adapted to the groove of the tension-arm, and a spring, substantially as described.

7. In an electric railway, a tension device for the trolley-pole cable comprising a base provided with a horizontal socket-arm, a tension-arm pivoted to occupy said socket-arm, and a spring operatively related to the tension-arm to normally force the latter toward the socket-arm, substantially as described.

8. In an electric railway, a tension device for the trolley-pole cable, comprising a yieldable arm, a socket-casting at the free end of said arm, and a cord-knob adapted to the socket-casting, substantially as described.

9. In an electric railway, a tension device for the trolley-pole cable comprising a yieldable arm, a socket-casting provided with the communicating slot and socket, and the cord-knob adapted to fit in the socket and to have the cord enter the slot, substantially as described.

10. In an electric railway, a tension device for the trolley-pole cable comprising a yieldable arm, a socket-casting provided with a slot and with guides on opposite sides of the slot, and a cord-knob adapted to the socket in the casting, substantially as described.

11. In an electric railway, the combination of a trolley-head provided with the extended arms, a wheel, and guard-springs fastened to the head and having their free ends slidably confined in said arms, substantially as described.

12. In an electric railway, the combination

of a trolley-head provided with the slotted arms and the capped pins, a wheel, and the guard-springs coiled around said pins, arched above the wheel, and slidably connected to the slotted arms, substantially as described.

13. In an electric railway, the combination of a trolley-head provided with studs, springs coiled around the studs and extended upwardly in advance of said head, a wheel, and a scraper supported by the springs in advance of the wheel, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ALPHONSE PITON.

Witnesses:
MICHEL MERCIER,
ALBERT JOBIN.