

No. 625,796.

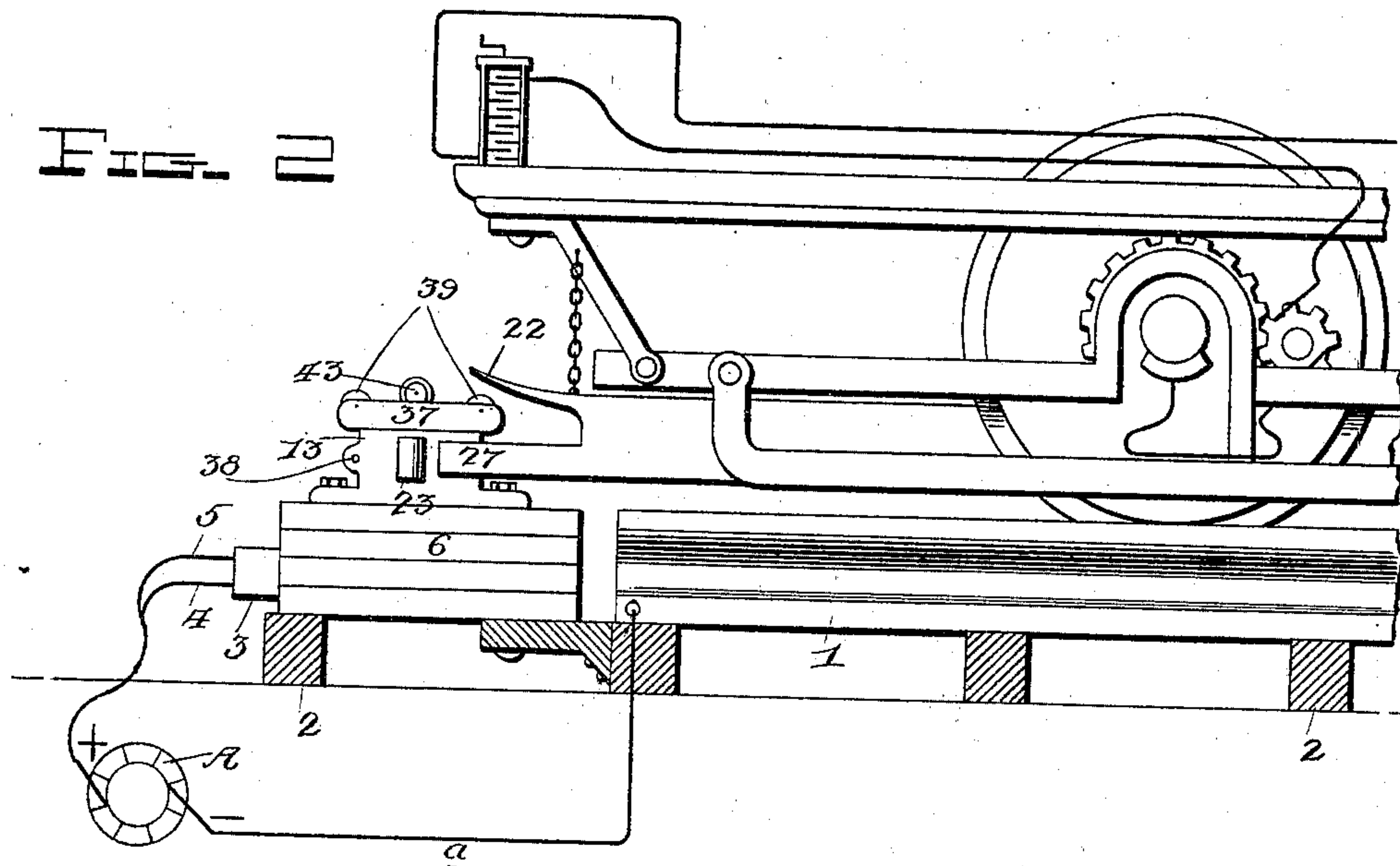
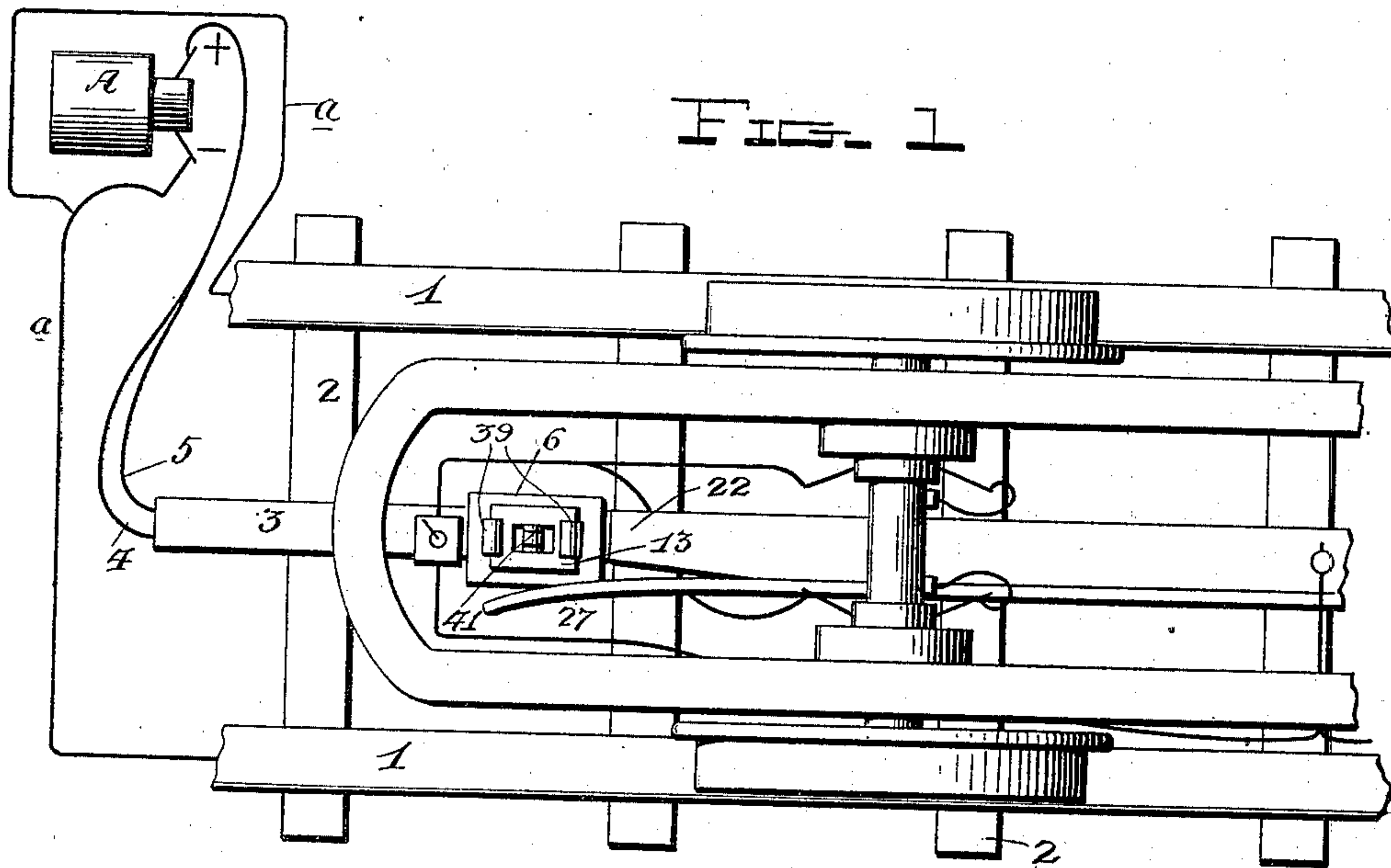
Patented May 30, 1899.

B. E. OSBORN.  
ELECTRIC RAILWAY SYSTEM.

(Application filed Apr. 12, 1898.)

(No Model.)

3 Sheets—Sheet 1.



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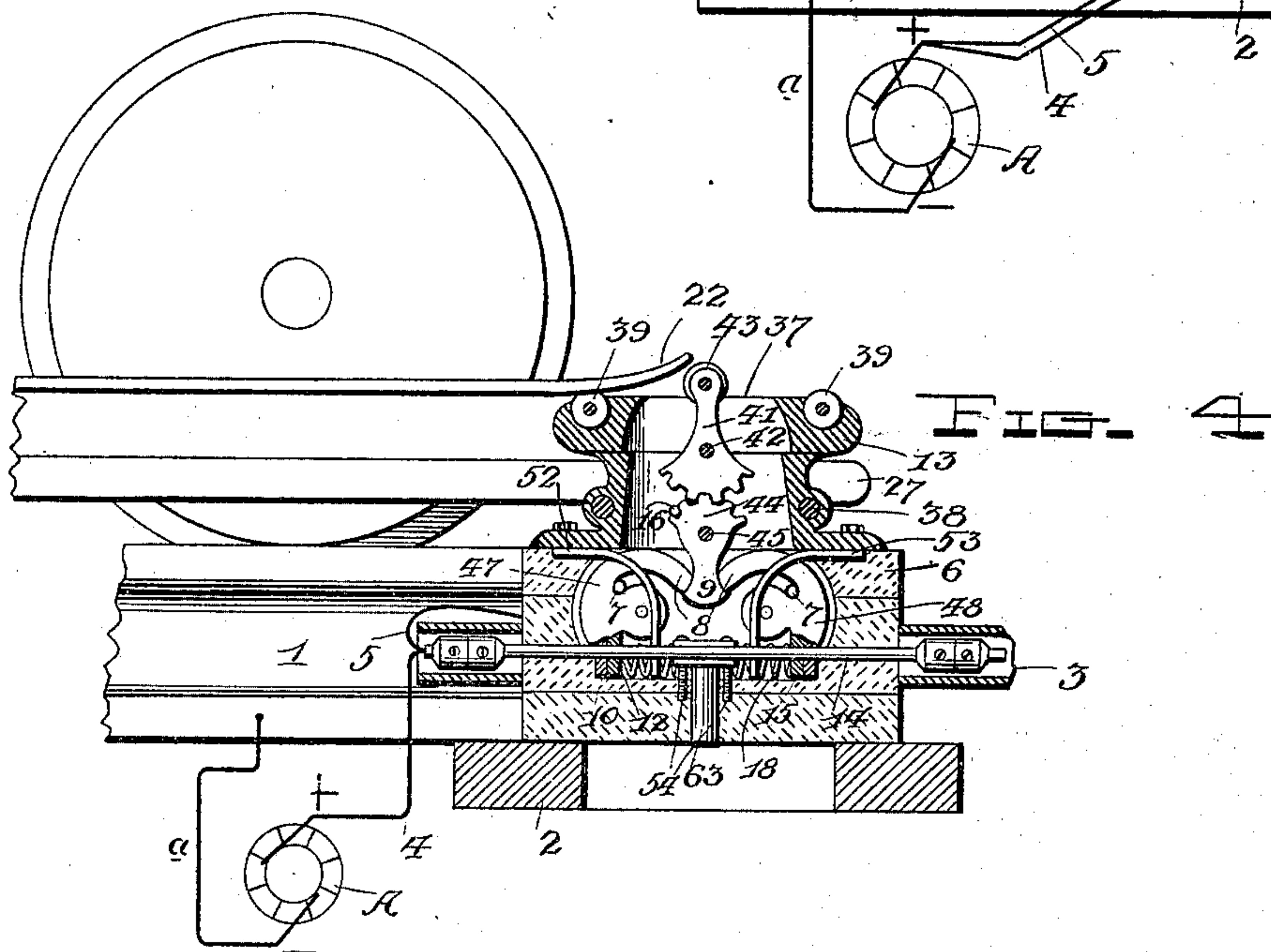
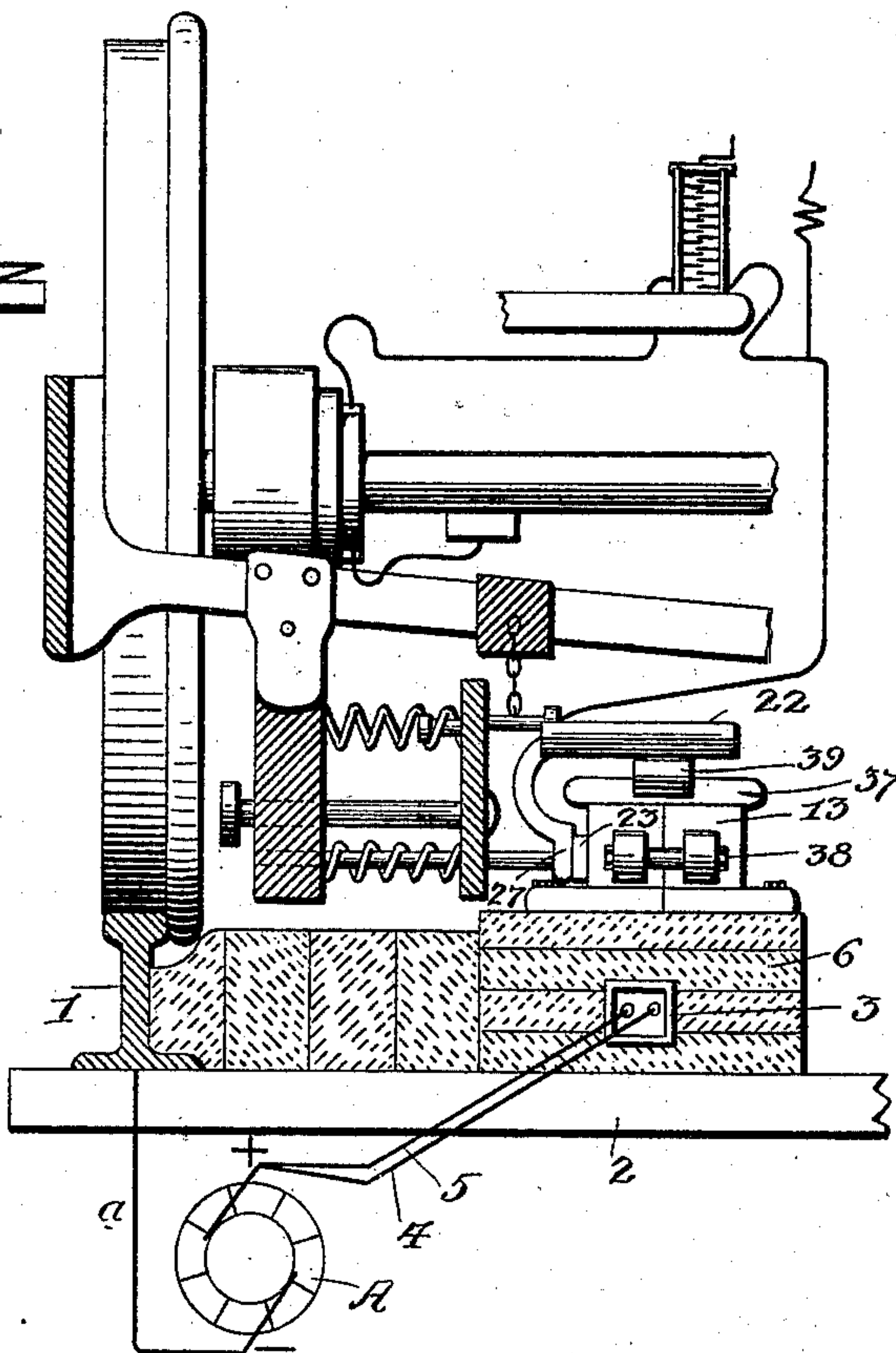
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3 Sheets—Sheet 2.

FIG. 3



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FIG. 1

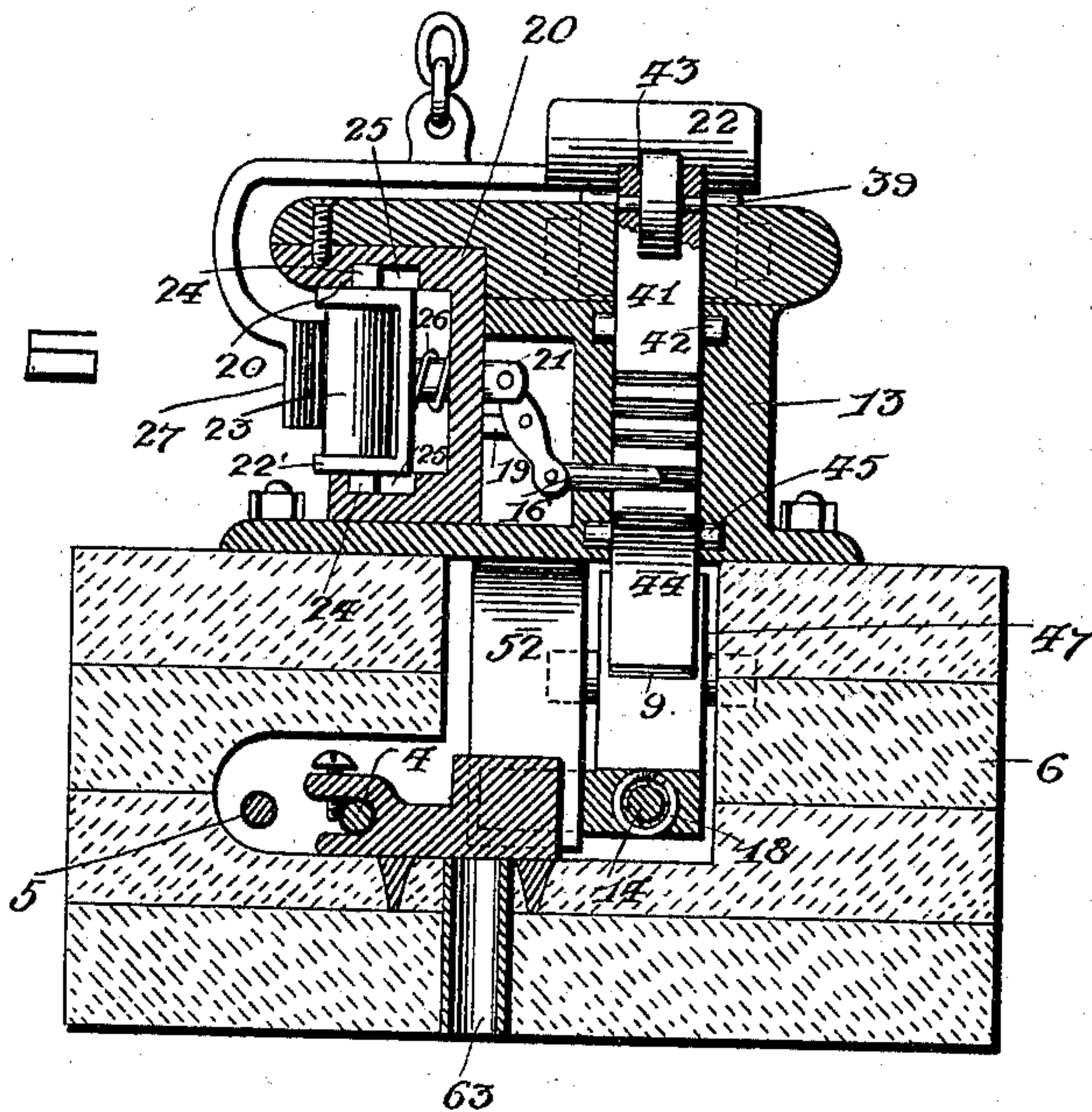
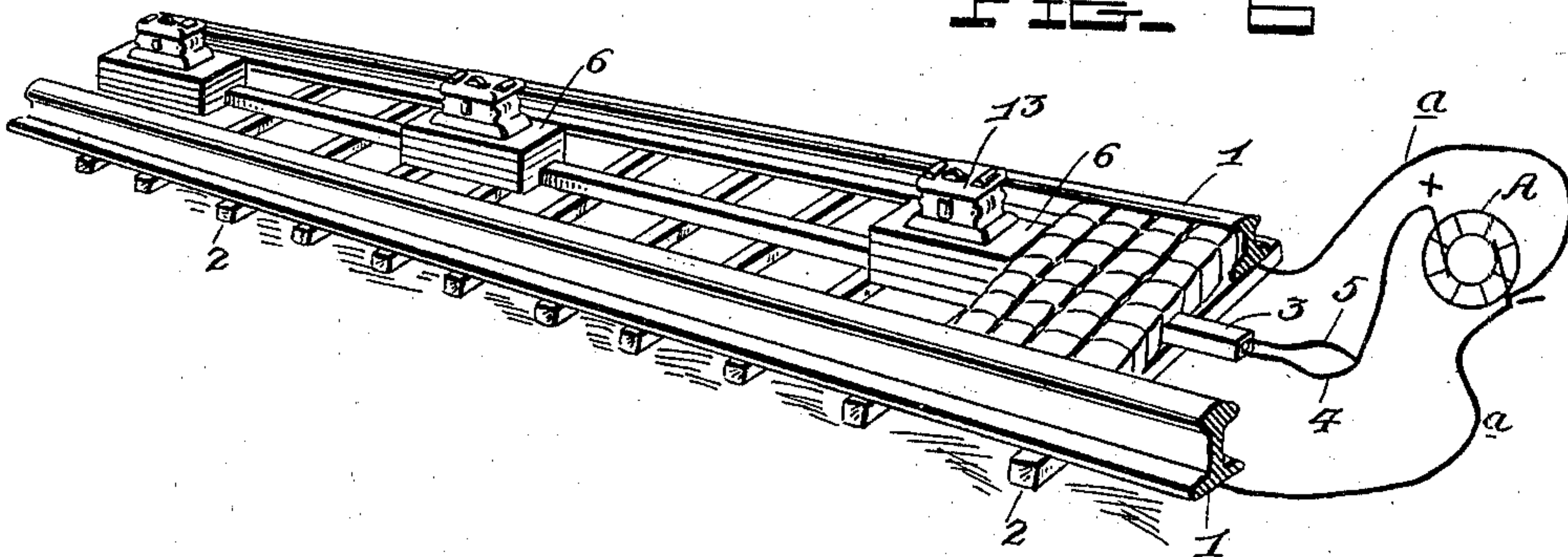


FIG. 2



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# UNITED STATES PATENT OFFICE.

BYRON E. OSBORN, OF AUBURN, NEW YORK.

## ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 625,796, dated May 30, 1899.

Application filed April 12, 1898. Serial No. 677,324. (No model.)

*To all whom it may concern:*

Be it known that I, BYRON E. OSBORN, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Electric-Railway Systems; and I do 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.

My invention relates to improvements in electric-railway systems, and more particularly to a subway system in which the prime conductor is insulated and free from all exterior connections and the electric energy carried by said prime conductor is mechanically brought to the surface, as required, to energize a normally dead contact-stand; and the object is to provide a simple, safe, and effective system of this character.

To this end the invention consists in a conductor-shoe carried by the car which automatically releases a locking device in the contact-stand and operates a switch-lever, whereby electrical communication is established between the prime conductor and the car-motor.

The invention further consists in the construction, combination, and arrangement of the separate parts of the device, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

Figure 1 is a diagrammatic view of a section of an electric railway embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical transverse section. Fig. 4 is an enlarged longitudinal section through one of the contact-stands. Fig. 5 is an enlarged transverse section through the same. Fig. 6 is a perspective view of a section of the roadway.

1 1 denote the ordinary track-rails, secured to the ties 2 2 in the usual manner.

3 denotes a tube which may be laid in the usual manner in a suitable cement or other protecting medium.

4 5 denote the prime conductor and the feed-wire, respectively, which are of course independently insulated and incased within the tube 3.

6 denotes a conduit-chamber, of which there is a continuous series maintained at regular intervals along the road between the tracks, and they are connected by a series of the tubes 3, that portion of the prime conductor and the feed-wire passing through these chambers being bared at these points to permit proper connections to be made therewith.

13 denotes the contact-stand, one of which surmounts each conduit-chamber, and it is preferably sectional, being secured together by the bolts 38.

Antifriction bearing-rollers 39 39 are transversely mounted in the top plate 37, which projects laterally beyond the walls of the stand to protect the projecting end of the switch-locking device.

The conduit-chambers are each provided with a drain-pipe 63, preferably communicating with the sewer to carry off any water which may find its way into the conduit-chamber through the contact-stand.

The reference character A denotes the dynamo or prime motor, the (—) negative pole of which is connected by conductors *a* to the rails 1 1, and the (+) positive pole is connected to the prime conductor 4 and the feed-wire 5, which, as before stated, are housed within the tube 3.

41 represents a lever fulcrumed on a bolt 42, fixed in the stand, and its upper end or arm 43 projects through a longitudinal slot in the top plate 37 into the path of the shoe 22, carried by the motor-car, while the lower segmental face of said lever is toothed to engage the correspondingly-toothed face of a vertical lever 44, which is fulcrumed on a rod 45, fixed in the stand. The lower end of the lever 44 terminates in an enlarged head 9, which projects between and into the path of the free ends of the curved arms 8 8 of the rocking cams 47 and 48, and each cam is formed with a concentric slot to coact with a fixed pin 7 to limit the play of the cam in one direction.

The lower end of the cam 47 is provided with a projecting arm 10, which projects into the path of a collar 12, having a sliding engagement with a fixed rod 14; a similar collar 15 being mounted on the opposite end of the rod 14 and resting against a correspond-



ing arm of the cam 48, the two collars being held apart by an intermediate spiral spring 18, mounted on the rod.

52 and 53 denote vertical parallel conductor-springs, having their upper ends curved outward and in electrical communication with the contact-stand 13. The lower or free ends of these conductor-springs project into the paths of the collars 12 and 15 and are also aligned with the contact-arms 54 54, fixed to the prime conductor 4, and from this construction it will be seen that when the projecting free end 43 of the lever 41 is moved to the right its lower end will move to the left and carry with it the contiguous end of the lever 44, the head 9 of which is moved to the right, turning the cam 48 on its axis, which in turn causes the collar 12 to press the lower end of the conductor-spring 52 into contact with the near conductor-arm 54, fixed on the prime conductor, and thereby place the stand 13 in electrical communication with the prime conductor 4. Of course a reverse movement of the lever 41 will connect the conductor-spring 53 with the prime conductor in the same manner, and when the lever 41 has been moved in either direction and then released the spring 18 restores it to its normal position, and thereby disconnects the stand and prime conductor, the two being only connected during the time the lever 41 is out of its normal position.

16 denotes a transverse locking-bolt, the free end of which is arranged to be projected between the teeth on the lever 44, and thus lock it and the lever 41 against movement in either direction. The opposite end of this bolt is pivoted to the lower end of a vertical lever fulcrumed in a lateral arm 19, fixed to the inner face of a bracket 20, which forms a part of the contact-stand 13, and the upper end of said lever is pivoted to a rod 21, fixed in a bearing-frame 22', in which is journaled a vertical roller 23, the projecting journals 24 24 of which have a sliding movement in the guide-recesses 25 25 in the bracket 20. A spiral spring 26 encompasses the rod 21 between the frame 22' and the bracket 20, and it serves to press the roller-frame to its outward limit, and consequently project the locking-bolt between the teeth and the lever 44, as hereinbefore set forth. If, however, the roller-frame 22' be forced inwardly against the tension of the spring 26, the bolt will be withdrawn from the path of the teeth on the lever 44, and thus release the lever 41, which can thus be moved in either direction to connect the stand with the prime conductor.

It will be noted that the upper and lower flanges on the contact-stand project beyond the outside limit of movement of the roller-frame to protect it from passing vehicles, and the tension of the spring 26 is preferably such as to prevent the possibility of mischievous tampering with the locking device.

The car-truck is provided with the usual

motor or motors, rheostats, and controllers, (which are conventionally shown in Fig. 3,) one end of the circuit terminating with the car-wheels and the other in an insulated conductor-shoe 22, which is of sufficient length to bridge two of the contact-stands 13, so that contact will be made with the preceding stand before it is broken with the succeeding one. The outer ends of the shoe are flared upwardly to facilitate its engagement with the friction-rollers on the stand and also with the switch-lever 41, which when depressed by the passage of the car over it in either direction connects the prime conductor with the stand, which in turn connects with the shoe, and thus energizes the car-motor through the usual controlling devices. To one side of the shoe is fixed a depending plate 27, the ends of which extend in advance of the contiguous ends of the shoe to coact with the roller 23 on the contact-stand before the ends of the shoe come in contact with the lever 41, the operation being such that the plate 27 presses the roller and its bracket 20 inwardly to withdraw the bolt 16 and release the levers 41 46, and thereby permit the shoe to depress the lever 41 and, as heretofore explained, connect the prime conductor with the stand. After the rear end of the shoe has released the lever 41 the parts are restored to their normal positions, and the bolt relocks the switch-levers after the plate 27 has released the roller 23, thus leaving the stand dead or disconnected from the prime conductor.

While it is not absolutely essential to the practical working of the system, I prefer to employ the feed-wire 5 independent of the prime conductor 4, which leads from the plus pole of the generator and extends through the contact-chambers to be used in an emergency in the event of a defect in the prime conductor.

The accompanying drawings show my invention in the best form now known to me; but many changes in the details might be made within the skill of a good mechanic without departing from the spirit or sacrificing any of the advantages of this invention.

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

1. In an electric-railway system, the combination with a trackway, of a series of chambers arranged at intervals intermediate the rails of the trackway, contact-pieces within each chamber, a prime conductor in electrical connection with said pieces, a contact-stand above each chamber, a lever pivoted within the stand for engaging the contact-pieces, means for locking said lever normally against operation, and means for releasing the lock and for operating the lever to close the stand upon the prime conductor, as and for the purpose set forth.

2. In an electric-railway system, the combination with a trackway, of a series of chambers and contact-pieces arranged at intervals



adjacent to the trackway, contact-pieces arranged within each chamber, a prime conductor, in electrical connection with the contact-pieces, a spring-pressed circuit-closer adapted to engage the contact-pieces alternately, a contact-stand above each chamber in electrical connection with said circuit-closer, a lever pivoted within each stand and having connections with the circuit-closer to operate it, means for locking said lever normally against motion, and a vehicle adapted to the trackway, said vehicle having means for releasing the locking-lever, means for operating the lever and for collecting and transmitting current from the stand, as and for the purpose set forth.

3. In an electric-railway system, the combination with a trackway, of a series of segmentary conduits with chambers arranged at intervals adjacent to the trackway, contact-pieces within each chamber, a prime conductor in electrical connection with the contact-pieces, a circuit-closer adapted to engage the contact-pieces alternately, contact-stands normally out of electrical contact with the prime conductor, and situated above each chamber, a lever pivoted within each stand and adapted to reciprocate the circuit-closer to operate it, a vehicle adapted to the trackway, said vehicle having means for releasing the locking means, for operating the lever, and for collecting and transmitting current from the stand, a drainage-pipe and means

for freeing the chambers from foreign matter, as and for the purpose set forth.

4. In an electric-railway system, the combination with a trackway, of a series of segmentary conduits with chambers, and arranged at intervals adjacent the trackway, contact-pieces within each chamber, a prime conductor in electrical connection with the contact-pieces, a circuit-closer adapted to engage the contact-pieces alternately, contact-stands normally out of circuit with the prime conductor, and situated above each chamber, a lever pivoted within each stand and adapted to reciprocate the circuit-closer to operate it, a vehicle adapted to the trackway, said vehicle having means for releasing the locking means for operating the lever and for collecting and transmitting current from the stand, the oscillating lever and its antifriction-roller, drainage-pipes, and means for freeing the chambers from foreign substances, antifriction-rollers in electrical contact with the stand and said oscillatory lever, said rollers supporting the current-collectors, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

BYRON E. OSBORN.

Witnesses:

GEORGE P. HEALY,  
C. J. WARNE.