No. 647,748.

Patented Apr. 17, 1900.

J. B. GOTTSBERGER.

PLOW FOR CONDUIT ELECTRIC CARS.

(Application filed Jan. 4, 1900.)

(No Model.)

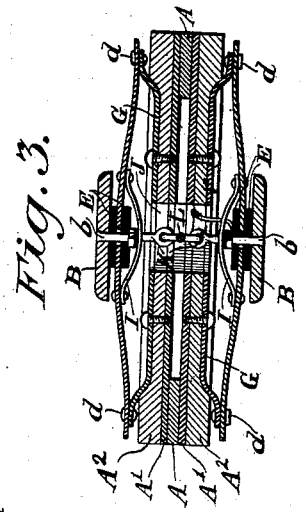

Fig. 3.

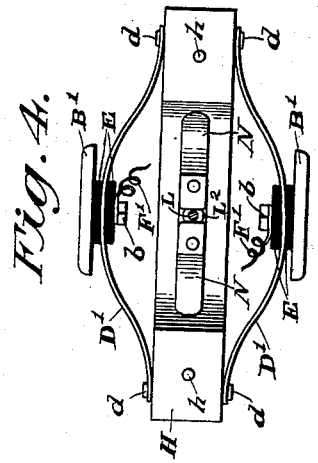

Fig. 4.

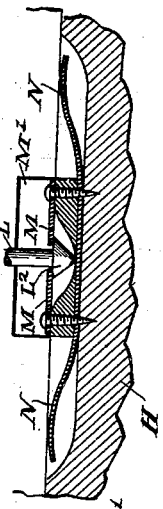

Fig. 5.

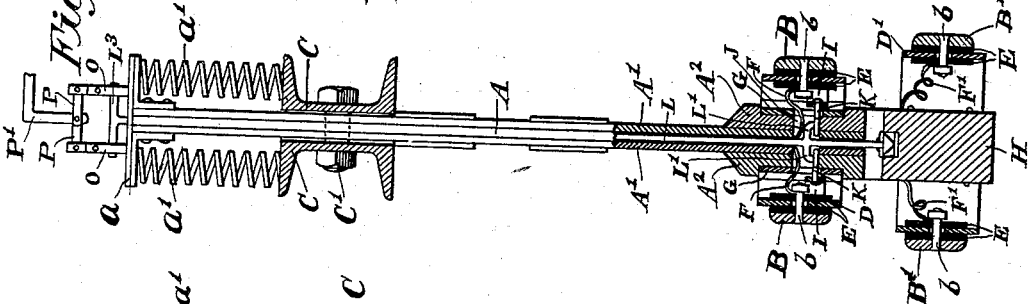

Fig. 2.

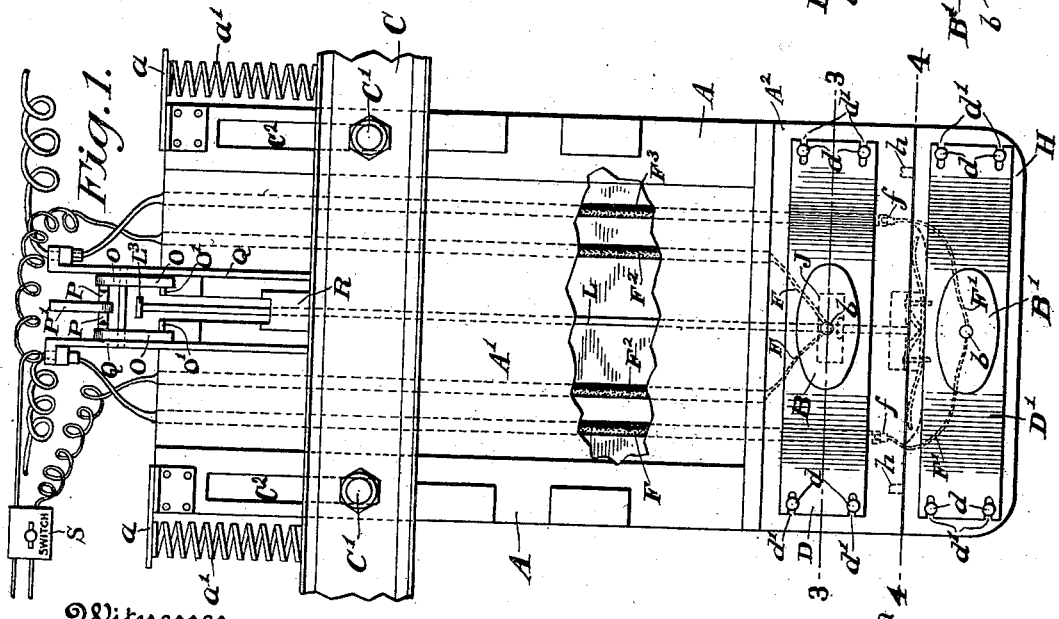

Fig. 1.

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PLOW FOR CONDUIT ELECTRIC CARS.

SPECIFICATION forming part of Letters Patent No. 647,748, dated April 17, 1900.

Application filed January 4, 1900. Serial No. 307. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. GOTTSBERGER, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county of New York and State of New York, have invented a new and Improved Plow for Conduit Electric Cars, of which the following is a full, clear, and exact description.

My invention relates to an improvement in the construction of plows for conduit electric cars; and it consists of making the plow adjustable vertically and providing it with two sets of shoes, so that when one set of shoes is incapacitated from any cause the shoe may be shifted so as to bring the other set of shoes into action, and thus enable the car to proceed without assistance.

My invention further comprises means by which a section of the plow carrying one set of shoes may be released and left in the conduit at the time the plow is shifted to bring the new set of shoes into operation.

My invention comprises other features which will be hereinafter claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my plow having a portion broken out to clearly show its interior construction. Fig. 2 is an edge view and partial section of the plow. Fig. 3 is a sectional plan taken upon the line 3 3 of Fig. 1. Fig. 4 is a plan of the lower detachable plow-section and the lower shoes, and Fig. 5 is a sectional detail showing in elevation the means by which the detachable plow-section is secured in place.

In the operation of conduit electric railways much trouble is caused by accidents to the plow by which it is incapacitated from performing its proper function. At times this results in a positive danger, as when a short circuit occurs and arcing occurs, which will rapidly burn up the mechanism of the car or line, or both. When the latter happens, it is necessary in order to prevent damage that the old shoes be gotten out of the way where they cannot do any damage, and the quicker this can be done the better. It may also be necessary that the car be returned to the barn by other power than its own, which results in delay and interruption of traffic.

The object of my invention is chiefly to provide the plow with two sets of current collecting and delivering means, a regular and a reserve set, the reserve set being normally out of use and the regular set being quickly detachable from the plow whenever desired and the reserve set brought into use when the regular set is released, thus preventing damage to car or line and enabling the car to return to the barn under its own power and, in fact, to continue in service until a convenient opportunity for repairing the damage occurs.

The framework of the plow may be constructed in the main like any of the present approved forms. The construction herein illustrated consists of the longitudinal or vertical bars A and the plates A′, which are suitably secured together and provide a central space for the reception of the leads F^2 and F^3 and the rod L, by which the shoe-detaching mechanism is operated.

My plow differs from the ordinary plow in not being fixedly secured to the framework of the car, but being vertically adjustable. In its upper part it has vertical slots C^2, through which pass pins or bolts C′, which are supported by bars C, secured to or forming a part of the car. Extending upwardly from the bars C are posts Q, (shown in Fig. 1,) which have dogs or catches O pivoted thereto and engaging projections O′ upon the plow to keep it raised. These dogs or catches form levers which are connected by links P with an operating link or lever P′, by which means when the link P′ is raised or lowered the upper ends of the catches O are drawn together and their lower ends separated to release the plow and permit it to fall. The dropping of the plow is assisted by the springs *a′*, which in their normal position, as shown in Fig. 1, are under tension, acting upon the plow to pull it downward. The ends of these springs are secured to the bars C and to arms or brackets *a* upon the plow.

The plow is provided with two sets of shoes, one carried directly by the lower end of the body of the plow and the other by a remov-

able section which is carried by the body of the plow and below the same. The division between the body of the plow and said removable section is upon the line 4 4 of Fig. 1. The body of the lower removable section consists of a block H, preferably of wood, which is of the same sectional plan as the lower end of the plow. This block has two shoes B′ secured thereto and adapted to engage the conductor-rails within the conduit. Any suitable form of shoe may be used with my plow. The shoe shown consists of a block or plate B′, which is secured by means of a bolt *b* to a plate-spring D′, which in turn is secured to the block H by means of bolts or screws *d*, which pass through slots *d′* in the spring to permit slight longitudinal play. The shoe B′ is insulated from the supporting-spring D′ by the interposition of two insulating plates or washers E. The current is carried through the bolt *b*, which, however, is not in contact with the spring, as the hole in the spring through which the bolt passes is larger than the bolt. The fuse-wire F′ extends from the bolt *b* to a connection with the leads F^3, extending upward within the central space in the body of the plow. The connection of these fuse-wires with the leads at *f* is by a plug which will pull out readily when the block H and the lower set of shoes is detached. At S a switch is shown by means of which the leads for the upper set of shoes may be cut out whenever desired. The lower set of shoes is the one which is relied upon ordinarily or when the plow is in perfect working conditions. The upper set is not to be brought into use except when something happens to throw the lower set out of operation.

The block H, carrying the lower set of shoes, is provided with dowel-pins *h*, which enter holes in the bottom of the main body of the plow and hold the block in its proper position upon the plow. At the same time these pins are easily freed when the block is to be released. The block is held against the plow by means of a head L^2 upon a rod L, which passes centrally through the plow, said head passing beneath the ends of two plates M M, which are secured by one end to the top of the block H. These plates are strong enough to support the block and the lower shoes against ordinary strains, but will yield to release the head L^2, and thus free the block, when sufficient force is brought to bear upon the rod L. The removal of the block after the head L^2 has been released is further secured by a spring N, which is interposed between the plow and block. The lower end of the shoe is provided with a recess M′ above the plates M, so that these plates may bend upwardly when necessary.

The rod L extends to the upper end of the plow and terminates in a T-head L^3, which when the shoe drops will be detained by striking blocks R before the plow reaches its lowermost position. As the plow is thrown down by the influence of gravity assisted by the springs *a′* and is quite heavy, the rod L will be checked with sufficient force to bend upward the plates M, and thus to free the head L^2 and the block H.

The upper set of shoes B and supporting-springs D are similar to the lower set. The blocks A^2 of the plow are, however, recessed, as clearly shown in Figs. 2 and 3, the recesses receiving bars G, to which the ends of the spring-plates D are attached. To the inside of the spring-plates D are secured plates or bars I, each carrying an eyebolt K, extending inwardly and adapted to enter a recess J in the plow. The rod L passes centrally through this recess and has lateral arms L′, terminating in short downward extensions adapted to enter the eyes in the eyebolts K, so as to hold the shoes B close against the sides of the plow. In this position the shoes are not separated sufficiently to engage the conductor-rails. When the plow is dropped, the rod L will be raised, so as to free the eyebolts K and permit the spring-plates D to hold the shoes outward against the conductor-rails. This will not occur until the plow has dropped to a position where the shoes are between the conductor-rails. Holding the upper set of shoes drawn inward toward the plow enables said shoes to drop into place without danger of catching upon the rails. Fuses F connect the shoes B with the leads F^2.

It is to be understood that the particular construction shown and above described is only one way of carrying out my invention and that I do not wish to limit myself to the particular form shown to the exclusion of others, as my invention does not consist so much of the particular construction shown as it does of the general feature of a plow having plural sets of shoes adjustable to bring the reserve shoes into operation when the ordinary set has been thrown out of use and also of the feature of discarding the shoes which are thrown out of use.

With my invention applied to a car when a fuse or lead on the plow burns out or from any cause the shoes which have been in use are thrown out of use the old shoes may be dropped and the plow lowered to bring the reserve set of shoes into use, and the car may proceed without interruption, and no injury will be caused either to the car or line.

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

1. A plow for conduit electric railways, having two sets of shoes, and means for detaching one set of shoes from the plow while in use, substantially as described.

2. A plow for conduit electric railways having an upper and a lower set of shoes, and means for detaching the lower set of shoes while the plow is in use, substantially as described.

3. A plow for conduit electric railways, hav-

ing two sets of shoes, and means for detaching one set of shoes, operated from outside the conduit, substantially as described.

4. A plow for conduit electric railways having two sets of shoes, means for holding one set of shoes out of action, means for bringing said set of shoes into action when desired, and means for detaching the other set of shoes, substantially as described.

5. A plow for conduit electric railways, having an upper and a lower set of shoes, the lower set of shoes being normally operated, and the upper set being normally held out of action, means for detaching the lower set of shoes, and for lowering the upper set into action, substantially as described.

6. A plow for conduit electric railways, having an upper and a lower set of shoes, and means for shifting the plow vertically to bring either set of shoes into operation with the same feeder, and means for detaching the lower set of shoes by the dropping of the plow, substantially as described.

7. A plow for conduit electric railways, having an upper and a lower set of shoes, the plow having a detachable section carrying the lower set of shoes, and means for shifting the plow vertically to bring either set of shoes into operation, with the same feeding-rail, and means for releasing said detachable section with its shoes when desired, substantially as described.

8. A plow for conduit electric railways, having an upper and a lower set of shoes, the plow having a detachable section carrying the lower set of shoes, and means for shifting the plow vertically to bring either set of shoes into operation with the same feeding-rail, and means for releasing said detachable section with its shoes actuated by the dropping of the plow, substantially as described.

9. A plow for conduit electric railways, having an upper and a lower set of shoes and mounted to be moved vertically to bring either set into contact with the same feeding-rails, springs connected with the plow to shift it from one position to the other, and a catch for restraining the action of said springs, substantially as described.

10. A plow for conduit electric railways, having an upper and a lower set of shoes, and mounted to be moved vertically to bring either set into contact with the same feeders, springs connected with the plow to shift it from one position to the other, means for automatically releasing the set of shoes which are thrown out of use, and a catch for restraining the action of said springs, substantially as described.

11. A plow for conduit electric railways, having an upper and a lower set of shoes, and mounted to be moved vertically to bring either set in contact with the same feeders, the plow having a detachable section carrying the lower set of shoes, springs connected with the plow to shift it from one position to the other, and a catch for restraining the action of said springs, substantially as described.

In testimony whereof I have signed my name to this specification before the two subscribing witnesses.

JAMES B. GOTTSBERGER.

Witnesses:
H. L. REYNOLDS,
CHARLES J. RATHJEN.