(No Model.)

3 Sheets—Sheet 1.

F. E. FISHER.

TROLLEY.

No. 393,749. Patented Dec. 4, 1888.

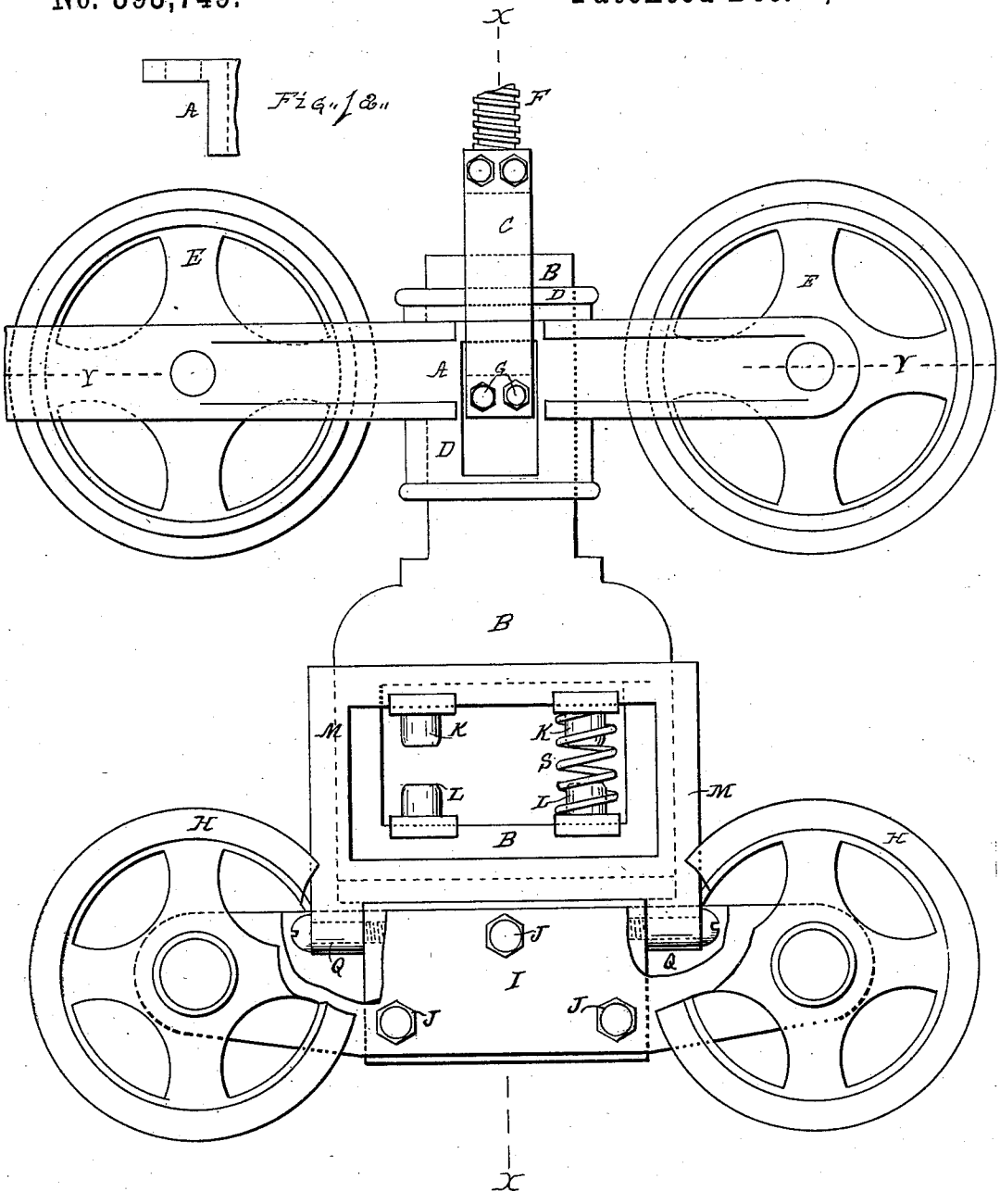


Fig. 1.

Witnesses,
Chas. E. Lothrop
Emma Hesselbacher.

Inventor.
Frank E. Fisher.
By his Attorney
Geo. H. Lothrop.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 2.

F. E. FISHER.

TROLLEY.

No. 393,749. Patented Dec. 4, 1888.

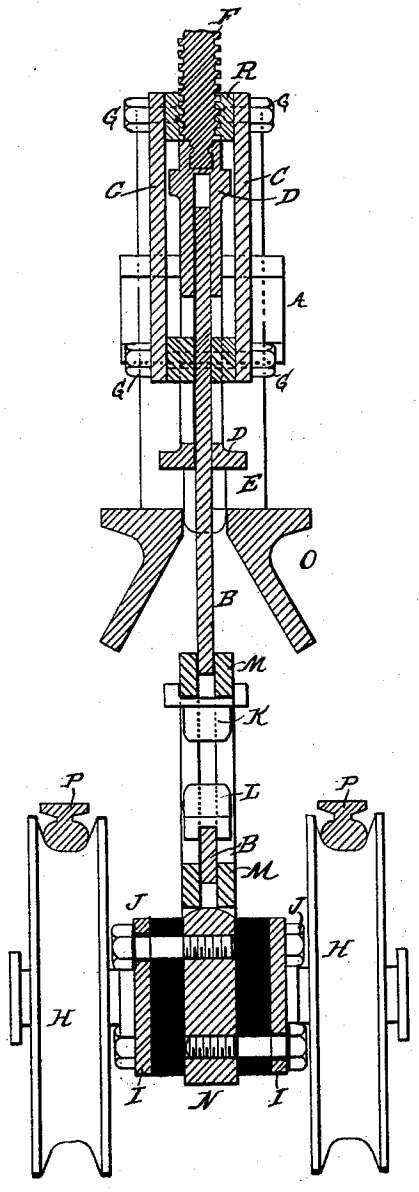


Fig. 2.

Witnesses,
Chas. E. Lothrop.
Emma Hesselbacher.

Inventor,
Frank E. Fisher.
By his Attorney
Geo. H. Lothrop.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 3.

F. E. FISHER.

TROLLEY.

No. 393,749. Patented Dec. 4, 1888.

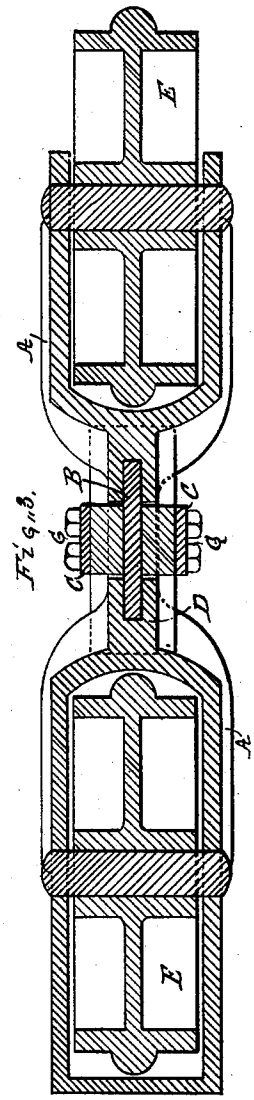


Fig. 3.

Witnesses.
Chas. E. Lothrop.
Emma Hesselbacher.

Inventor,
Frank E. Fisher,
By his Attorney
Geo. H. Lothrop.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

FRANK E. FISHER, OF DETROIT, MICHIGAN.

TROLLEY.

SPECIFICATION forming part of Letters Patent No. 393,749, dated December 4, 1888.

Application filed October 25, 1887. Serial No. 253,358. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. FISHER, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Trolleys, of which the following is a specification.

My invention consists in an improvement in trolleys for use in underground conduits in electrical railways, hereinafter fully described.

Figure 1 is a side elevation, omitting one of the contact-springs. Fig. 1ª is a detail view of a portion of the trolley-frame. Fig. 2 is a section on line *x x;* and Fig. 3, a section on line *y y*, Fig. 1.

O represents the upper portion of two channel-bars, which form the sides and tops of an underground conduit.

E E represent two flat wheels, each having a central flange adapted to enter the conduit-slot, and these wheels run on the top of the conduit, and their axles are journaled in a connecting-frame, A.

B represents a flat metal plate thin enough to pass through the conduit-slot, whose upper end is adjustably secured to the frame A, and whose lower end is attached to a four-wheeled truck having grooved wheels H H. The wheels H H are set on short journals, which are fastened to two plates, I I, and these plates I and the bolt J are insulated, as shown in Fig. 2, so that there is no electrical connection between said plates or between said plates and the central plate, N.

M represents a yoke vertically slotted, which is pivoted at Q Q to the central plate, N, to permit lateral vibration of said plate N, and on the upper side of the opening in said yoke M are two downwardly-projecting lugs, K K.

The lower end of plate B, which lies in the vertical slot in yoke M, is cut out to correspond with the opening of said yoke, and on the under side of this opening are formed two upwardly-projecting lugs, L L, and between the lugs K K L L are two spiral springs, S, only one of which is shown in the drawings, by which said lugs are forced apart, the force of said springs tending to raise the yoke M and plate N, and thereby to force the wheels H H against two electrical conductors, P P, supported within the conduit. For the purpose of increasing the pressure against the conductors when desired, or lowering said wheels away from the conductors, I hang the plate B to the frame by an adjustable connection, as follows:

C represents a yoke whose lower end is bolted to plate B by bolts G, and which has at its upper end a screw-nut, R, secured thereto by screws.

D represents a vertically-slotted plate which is rigidly bolted to frame A, and in the upper end of which is swiveled the end of a hand-screw, F, which engages with screw-nut R.

The upper end of the plate B plays up and down in the slot in the plate D. By this construction, when screw F is turned so as to force nut R away from plate D, the plate B is raised, thus pressing the wheels H against the conductors, and by turning screw F in the contrary direction, so as to bring nut R and plate D together, the wheels H may be lowered so far that springs S will not hold them in contact with conductors P. It will therefore be seen that this trolley is so constructed that slight inequalities in the top of the conduit or in the electrical conductors are compensated for by springs S S, and that variations in the position of the conductors P are compensated by the pivot-joint Q, while by means of the adjustable connection between plate B and frame A the wheels H may be entirely removed from the conductors P when this is necessary.

From the plates I I two insulated flexible conductors (not shown in the drawings) run up through the slot and are to be connected with the poles of the motor in the car.

The frame A of the trolley is to be connected with the car in any suitable manner, so that the car in its motion will draw the trolley along.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an electrical-railway system, the combination of a trolley adapted to run on the surface of the ground, a trolley in an underground conduit adapted to make contact with electrical conductors therein, and laterally and vertically adjustable connections between the two trolleys, substantially as shown and described.

2. In a trolley for an electrical railway,

the combination of the depending plate B, adapted to pass through the slot of an underground conduit, said plate having its lower end cut out and carrying thereon the lugs L L, the slotted yoke M, carrying lugs K K, the springs S S, the plate N pivotally secured to yoke M, and insulated plates I I, carrying the wheels H H, substantially as shown and described.

3. In an electrical-railway system, the combination of the frame A, carried on the centrally-flanged wheels E E, the slotted plate D, secured to said frame, the supporting-plate B, having its upper end within the slot in plate D, the yoke C, bolted to plate B and having in its upper end the screw-nut R, and screw F, meshing with said swiveled end in the top of said plate D, substantially as shown and described.

4. In combination with a conduit having therein two electrical conductors, a four-wheeled trolley having the two wheels on one side insulated from the two wheels on the other side, a truck adapted to run above the conduit, and a supporting-plate vertically adjustable with relation to the truck, and vertically and laterally adjustable with relation to the trolley, substantially as shown and described.

FRANK E. FISHER.

Witnesses:
CYRUS E. LOTHROP,
EMMA HESSELBACHER.