

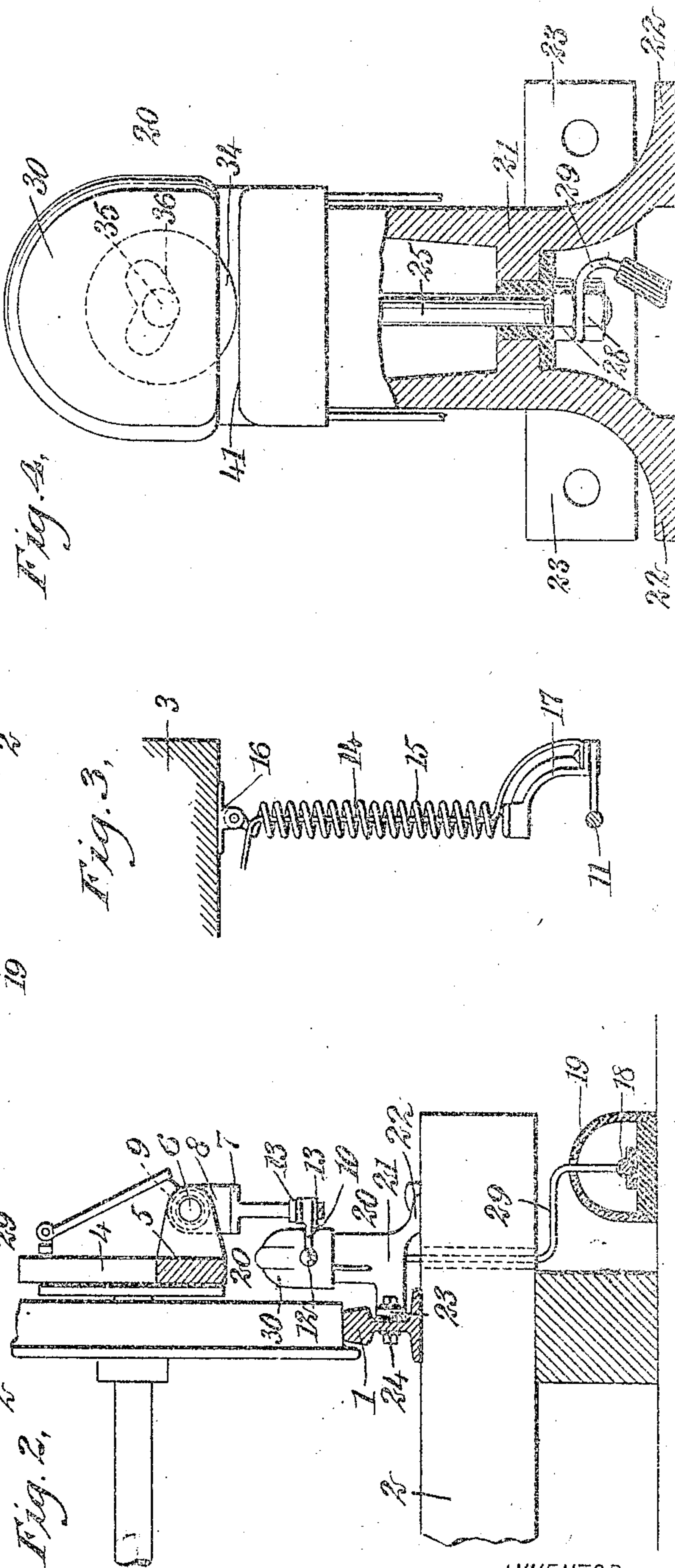
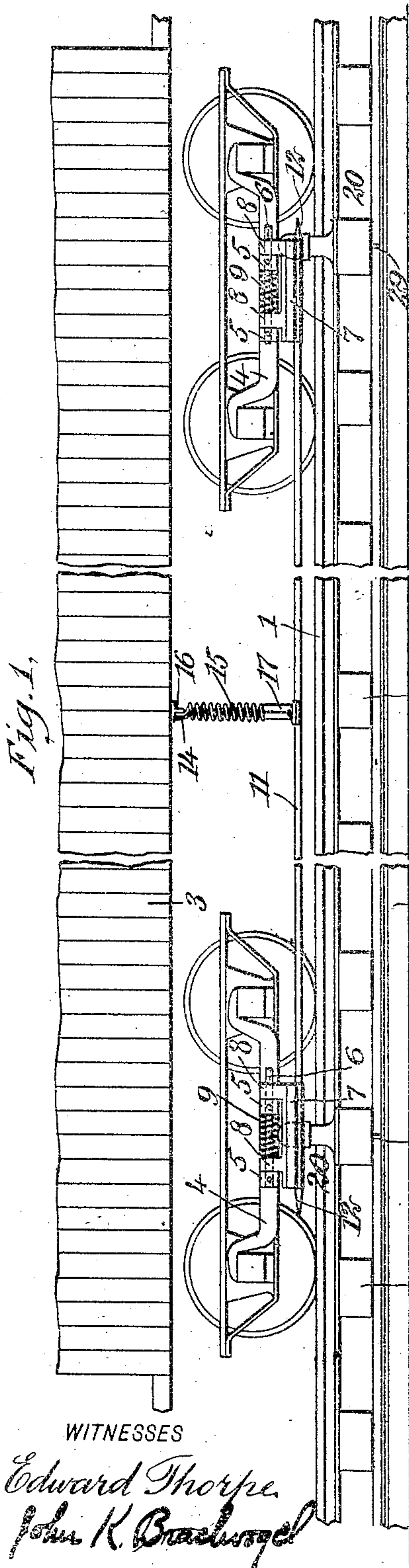
No. 891,619.

PATENTED JUNE 23, 1908.

S. H. HOOPES, JR.
SYSTEM OF ELECTRIC TRACTION.

APPLICATION FILED AUG. 10, 1907.

2 SHEETS—SHEET 1.



INVENTOR
Samuel H. Hoopes, Jr.
BY *Mum & Co.*
ATTORNEYS

No. 891,619.

PATENTED JUNE 23, 1908.

S. H. HOOPES, JR.
SYSTEM OF ELECTRIC TRACTION.
APPLICATION FILED AUG. 10, 1907.

2 SHEETS—SHEET 2.

Fig. 5,

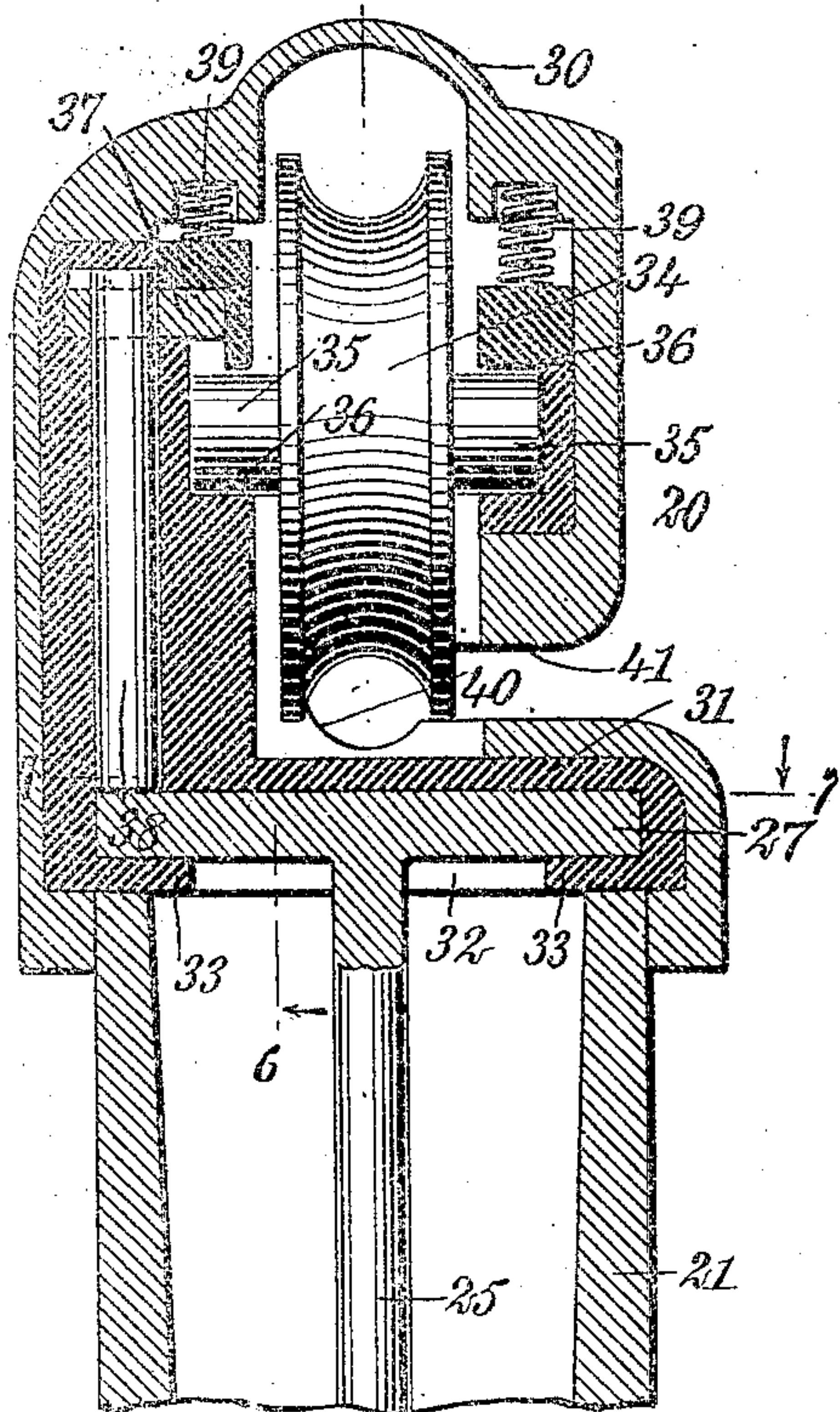


Fig. 6,

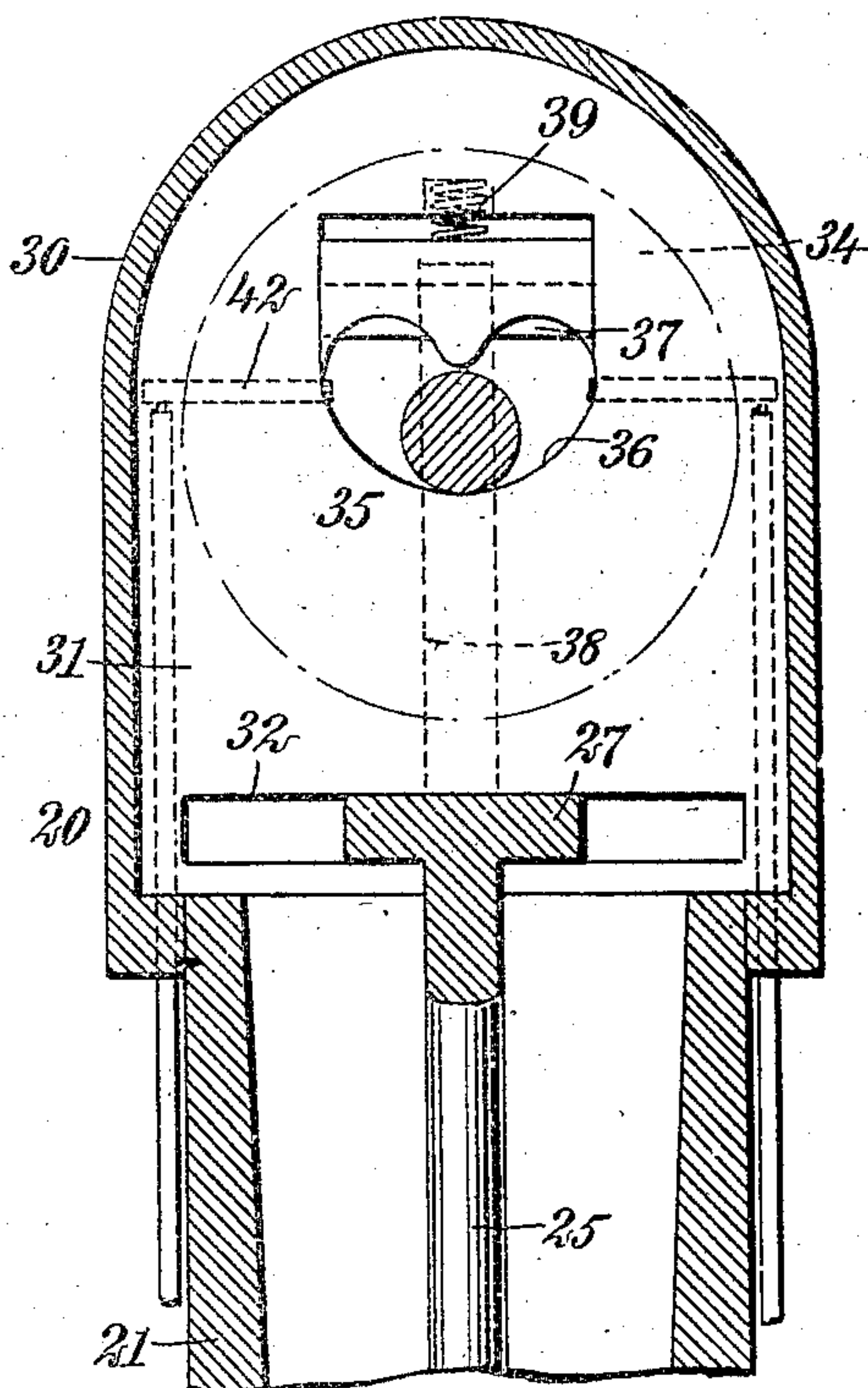
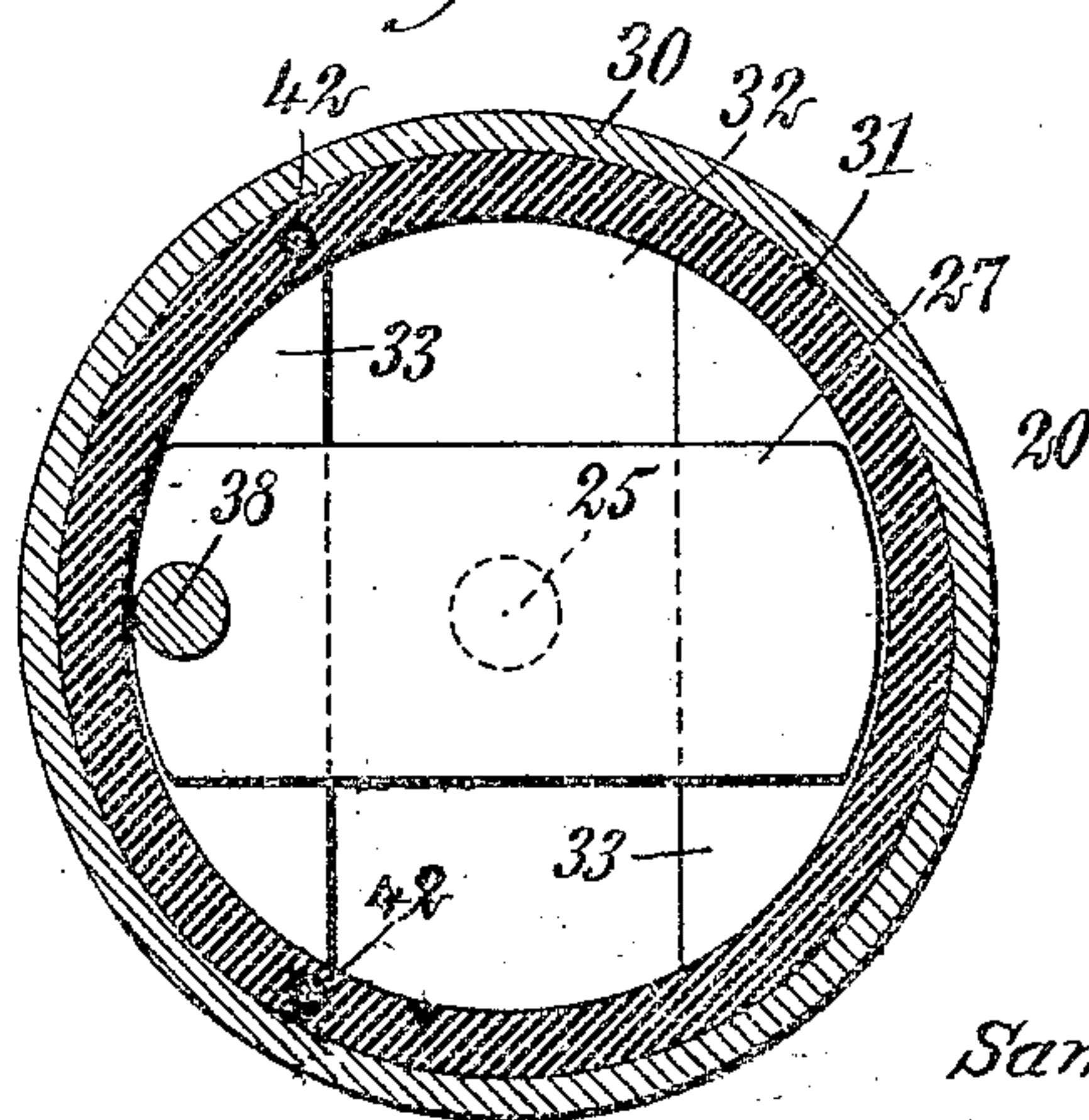


Fig. 7.



WITNESSES:

Edward Thorpe.
John K. Brachvogel

INVENTOR

Samuel H. Hoopes Jr.

BY *Mum & Co*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

SAMUEL H. HOOPES, JR., OF WEST CHESTER, PENNSYLVANIA.

SYSTEM OF ELECTRIC TRACTION

No. 891,619.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed August 10, 1907. Serial No. 388,011.

To all whom it may concern:

Be it known that I, SAMUEL H. HOOPES, Jr., a citizen of the United States, and a resident of West Chester, in the county of Chester and State of Pennsylvania, have invented a new and Improved System of Electric Traction, of which the following is a full, clear, and exact description.

This invention relates to improvements in electric traction.

An object of the invention is to provide a system of electric traction for railroads, tramways and the like, comprising a series of independent sections constituting an electric circuit, and means for conducting the current from the circuit at the sections, successively to a car, in such a manner that the car is in electrical connection with at least one section all the time.

A further object of the invention is to provide a system of the class described, comprising a series of sections forming an electric circuit, one line of which is insulated so that there is no danger of electric shock due to the coming in contact of a foreign body with the circuit.

A still further object of the invention is to provide a system of electric traction which comprises a series of independent sections constituting sub-divisions of an electric circuit, and contacts arranged to be engaged by a collecting member carried by a car to conduct the current from the insulated line to the car, whence it returns to the uninsulated line of the circuit, the construction of each of the contacts being such that no current flows therethrough when it is not in engagement with the collecting member.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

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 views, and in which

Figure 1 shows in elevation a portion of a system of electric traction of my design, having a car arranged to travel upon the track rails; Fig. 2 is a transverse section showing a portion of the track and the car upon the track; Fig. 3 is a side elevation of a detail which comprises a resilient support for the collecting member; Fig. 4 is a partially

longitudinal section of one of the contacts; Fig. 5 is an enlarged vertical section showing the contact in detail and with a part broken away; Fig. 6 is a similar view on the line 6—6 of Fig. 5; and Fig. 7 is a transverse section on the line 7—7 of Fig. 5.

Before proceeding to a more detailed explanation of my invention it should be understood that the same is applicable to various systems of electric traction in which electric current is conducted by means of a moving collecting member to the motors and other current requiring devices of the cars or trains of cars. I employ a series of sections, each of which is a sub-division of an electric circuit drawing current from a suitable source of supply. The circuit comprises an insulated, and an uninsulated or return line, the latter preferably being a track rail or independent third rail. The insulated line may consist of a conductor of preferred or common type arranged in a suitable conduit or supported on insulators in any conventional manner. As one of the lines of each circuit is insulated it is impossible accidentally to short-circuit this system by effecting electrical communication between the lines, for instance by the contact of a foreign body with both lines of the circuit. This construction obviates the danger of accidental electric shocks to travelers or others who might accidentally come in contact with the rails of the traction system. To permit, however, the flow of the current from the insulated line to the collecting member of the car, I provide a plurality of contacts each of which is so constructed that when it is engaged by the collecting member a movable part is actuated to effect electric communication between the insulated line and the contact, the current flowing from the latter through the collecting member to the car and returning from the latter through the wheels or a contact shoe to the uninsulated line formed by the track rail or the third rail. I further provide means for operating a signal system such as a block-light system, by means of the contacts. When the latter are actuated by the collecting member, conductors leading to the signal system are connected electrically with the insulated line, and the current thus flows from the insulated line to the signal system and thence to the uninsulated line of the circuit, when the car is drawing current from a section which is part of the signal

block. The collecting member is preferably in the form of an elongated contacting shoe arranged longitudinally of the car, and of greater length than the length of the sections. Consequently, the collecting member is always in electrical connection with at least one section. As it passes from engagement with the contact of one section it comes into contact with the next adjacent contact of the succeeding section. It will be understood that the distance between any two contacts is less than the length of the collecting member. The circuit is divided into sections by the contacts, each section comprising the portion of the circuit between two adjacent contacts. The sub-division of the line into blocks for signal purposes and the like can also be effected by means of the contacts, though in practical use each block would probably comprise a number of sections, for each section is shorter in length than the length of an ordinary car.

Referring more particularly to the drawings, 1 represents a rail of a track such as is commonly employed in electric and other traction systems. The rails of the system are supported upon ties 2 or are carried in any other suitable manner upon the roadbed. The cars 3 may be of any suitable or preferred form and are mounted upon the usual wheeled trucks 4 which travel upon the track rails. Needless to say, all the cars used in the system are not necessarily motor cars or otherwise adapted for use as such in connection with my system. As is customary, certain of the cars may be motor cars, while others may be trailers, which are propelled by the motor cars. Each of the trucks 4 of the motor cars has projections 5 which carry a rod 6. A bracket 7 is mounted by means of laterally disposed wings 8, upon the rod 6, and is slidably supported by the latter. A spring 9 is arranged upon each of the rods 6 between one of the projections 5 and a wing 8, this resiliently holding the bracket 7 in position upon the rod. Near the lower extremities, the brackets have arms 10 disposed inwardly toward the car wheels, and carrying an elongated collecting member 11 having pointed end 12. The collecting member 11 can be fashioned from any suitable conducting material such as copper, and is insulated from the brackets 7 by means of plates 13 of di-electric material. The current which flows from the collecting member 11 passes to the car from the latter along a conductor 14 secured to the collecting member near the center thereof and passing through a coiled spring 15 which is secured respectively to the car and the collecting member by means of brackets 16 and 17. The spring 15 is of sufficient stiffness to support the collecting member near the center for a purpose which will appear hereinafter. The electric circuit comprises a conductor

18 arranged in an insulating conduit 19, and an uninsulated line formed by a track or other rail. The insulated and uninsulated lines are of course in electric communication and draw current from a suitable source of supply. The circuit is provided with contacts 20 adapted to be engaged by the collecting member 11 which draws current from the contacts as the cars travel along the sections.

The contact 20 comprises a support or standard 21 having laterally disposed feet 22 by means of which it can be rigidly mounted adjacent to the track. The standard is hollow and can be formed from any material suitable for the purpose, such as cast-iron, porcelain and the like. I prefer to provide the standard with a laterally extending arm having flanges 23 which can be bolted to the adjacent track rail and insulated therefrom by means of plates of di-electric material held in position by the holding bolts 24. A bolt rod 25 of conducting material such as copper, is arranged within the standard, longitudinally thereof, and has the shank mounted in an insulating sleeve 26 carried by the standard. The bolt rod 25 has a laterally elongated head 27 which is of considerably greater length than width. By means of nuts 28 arranged upon a suitable threaded portion of the bolt rod 25, a conductor 29 which is electrically connected with the conductor 18 is secured to the bolt rod and permits the flow of current from the conductor 18 to the latter. A hood 30 is mounted upon the standard 21 and may be formed from any suitable material. The hood is hollow and has an insulating lining 31 of any material suitable for the purpose. The lining 31 has a recess 32 having inwardly disposed flanges 33 at opposite sides. The construction is such that in one position the head 27 passes freely into the recess and when the head is turned the flanges 33 engage at the under side of the head to hold the hood firmly in position upon the standard. As the latter, as well as the hood, is preferably of substantially circular transverse section, the hood can be easily rotated upon the standard to be locked in position by this movement of rotation through the co-acting of the head of the bolt rod with the flanged recess of the lining.

A peripherally grooved wheel 34 of conducting material such as copper is loosely mounted by means of journals 35 in lateral recesses 36 of the insulating lining 31. The recesses 36 have the ends upwardly disposed and have the lower edges curved as is shown most clearly in Fig. 6. The form of the recesses is such that in the normal position the journals 35, owing to the gravitational action of the wheels, rest against the lower edges of the recesses and out of engagement with a block 37 of conducting material embedded in the insulating lining and project-

ing into one of the recesses 36 at the upwardly disposed extremities thereof.

It will be understood that if the wheel 34 is swung in one direction or the other to bring the journal at one side into position within either of the upwardly disposed extremities of the recesses 36 at the corresponding side, the journal will come into contact with the conducting block 37. As the latter is electrically connected by means of a conducting rod 38 with the head of the bolt rod 25, when the hood is locked in position upon the standard, current will flow through the bolt rod 25, the conducting rod 38, and the conducting block 37, to the wheel 34. Helical springs 39 seating in suitable recesses of the hood and engaging the insulating lining 31, hold the latter resiliently in position within the hood. The latter has a rounded opening 40 therethrough communicating with a slot 41. The rounded opening 41 is adapted to receive the collecting member 11, the arms 10 passing freely through the slot 41, as the collecting member passes through the contact. The arrangement of the parts of the contact is such that when the collecting member 11 passes into the opening of the contact the pointed end 12 of the collecting member slides smoothly under the grooved wheel 34 and lifts the latter into engagement with one or the other of the upwardly disposed extremities of the recesses 36, depending upon the direction of movement of the car. As the wheel is raised, one of the journals 35 comes into contact with the conducting block 37 and electrical communication is thereby established between the conductor 18 in the conduit 19, and the collecting member 11, the current flowing from the latter to the car and returning from the car to the uninsulated line of the circuit. The spring 14 which supports the collecting member 11 near the middle, is of sufficient stiffness to hold the latter against the imposed weight of the wheel 34 as the collecting member passes through the contact. At the same time, the spring is resilient and allows the member to move within certain limits thereby obviating the danger of fracturing or injuring the contacts or collecting member when a train is traveling at high speed.

The extremities of signal circuit conductors 42 project into the extremities of the recesses 36, so that when the wheel is raised the current flows from the journal through the conductors 42 and thereby operates the signal system, which may be of any preferred or common type.

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

1. In improvements in electric traction, a system of sections comprising an electric circuit, a current collecting member resiliently secured upon a car and resiliently held against

movement longitudinally of the car, and means adapted to be engaged by and controllable by said member for conducting current from one of said sections to the car, said means being inoperative when not engaged by said member.

2. In improvements in electric traction, a system of sections comprising an electric circuit having an insulated and an uninsulated line, an elongated current collecting member mounted upon a car and held at the ends resiliently against movement longitudinally of the car, said member being further resiliently connected with the car intermediate of the ends of said member, and a contact for each section, said contact being adapted to be engaged by said member and to be operated by the same to establish an electrical connection between said contact and said insulated line, whereby the current is led from said insulated line through said contact and said member to the car.

3. In improvements in electric traction, a system of sections comprising an electric circuit, one line of which is insulated, an elongated current collecting member adapted to be carried by a car and greater in length than any one of said sections, whereby said member is always in contact with one or more of said sections, said member having brackets near the ends adapted to be mounted upon the car and holding said member resiliently against movement longitudinally of the car, said member being further resiliently connected with the car at a point intermediate of the ends of said member, and a contact for each of said sections, said contacts being adapted to be engaged by said member and to be operated thereby to establish electrical connection between said contacts and said insulated line.

4. In improvements in electric traction, an electric circuit having a plurality of contacts dividing said circuit into sections, said circuit comprising an insulated and an uninsulated line, a current collecting member adapted to be carried by a car and greater in length than the distance between any two adjacent contacts, said member having tapered extremities and being resiliently held upon said car against movement longitudinally of said car, said member having a further resilient connection with said car, said contacts being normally electrically independent of said circuit and having means for forming an electric connection with said circuit when engaged by said collecting member.

5. In improvements in electric traction, in combination with a car and electric contacts, a collecting member adapted to engage said contacts and resiliently supported upon said car said member being resiliently held against movement longitudinally of said car.

6. In improvements in electric traction, in

combination with a car and electric contacts, a collecting member adapted to engage said contacts and having an elongated body, said collecting member being resiliently supported
 5 upon said car at a point intermediate of the ends and being resiliently held against movement longitudinally of said car, said member having the ends tapered.

7. In improvements in electric traction, in
 10 combination with a car and electric contacts, a collecting member adapted to engage said contacts and having an elongated body presenting tapered ends, said member having brackets near the ends adapted to be mount-
 15 ed upon the car and resiliently holding said member against movement longitudinally of said car, said member being further resiliently supported at a point intermediate of the ends.

20 8. In improvements in electric traction, in combination with an electric circuit and a collecting member, a contact having a standard, a hood removably carried by said standard, and a movable member within said
 25 hood and adapted to be actuated by said collecting member, said movable member communicating electrically with said circuit in one position, said hood having means operable by a movement of said hood for locking
 30 the same in position upon said standard.

9. In improvements in electric traction, in combination with an electric circuit and a collecting member, a contact having a stand-
 35 ard, a hood removably mounted upon said standard and having means for locking it in position thereupon by a movement with respect to said standard, and a movable member within said hood and adapted to be engaged by said collecting member, said con-
 40 tact having conducting means connected with said circuit and adapted to be engaged by said movable member when the same is displaced by engagement with the collecting member.

45 10. In improvements in electric traction, in combination with an electric circuit and a collecting member, a contact having a standard, a hood removably mounted upon said standard and having means for locking it in
 50 position thereupon by a movement of said hood with respect to said standard, a revoluble member movably arranged within said hood and adapted to be engaged by said collecting member, said hood presenting an open-
 55 ing for the passage of the collecting member, and means for electrically connecting said circuit and said movable member when the

latter is displaced by engagement with the collecting member.

11. In improvements in electric traction 60 in combination with an electric circuit and a collecting member, a contact having a hollow standard, a conductor within said standard having a head and electrically connected with said circuit, a hood removably carried 65 by said standard and having a flange adapted to engage said head to hold said hood in position when the latter is moved with respect to said standard, and a revoluble member removably arranged within said hood and adapt- 70 ed to be engaged by said collecting member, said hood presenting an opening for the passage of the collecting member said hood having a conductor in contact with said first conductor when said hood is locked in position upon 75 said standard, said revoluble member engaging said second conductor when said revoluble member is displaced by the collecting member.

12. In improvements in electric traction, 80 in combination with an electric circuit and a collecting member, a contact having a hollow standard, a conductor within said standard and insulated therefrom, said conductor having a laterally extended head and com- 85 municating electrically with said circuit, a hood having an insulated lining presenting flanges, said hood being adapted to be removably mounted upon said standard, said flanges engaging said head to lock said hood 90 in position when the latter is rotated with respect to said standard, a conductor within said lining and engaging said first conductor when said hood is locked in position, said lining having recesses presenting upwardly 95 disposed extremities, a revoluble member having journals arranged in said recesses and adapted to be engaged by said collecting member, said revoluble member being operable by said collecting member, said second 100 conductor having a conducting block projecting into one of said recesses whereby the same is engaged by one of said journals when said revoluble member is displaced, said hood presenting an opening for the passage of the 105 collecting member and having resilient means for holding said lining in position.

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

SAMUEL H. HOOPES, JR.

Witnesses:

EDWARD CROSSON,
 H. J. STILL.