

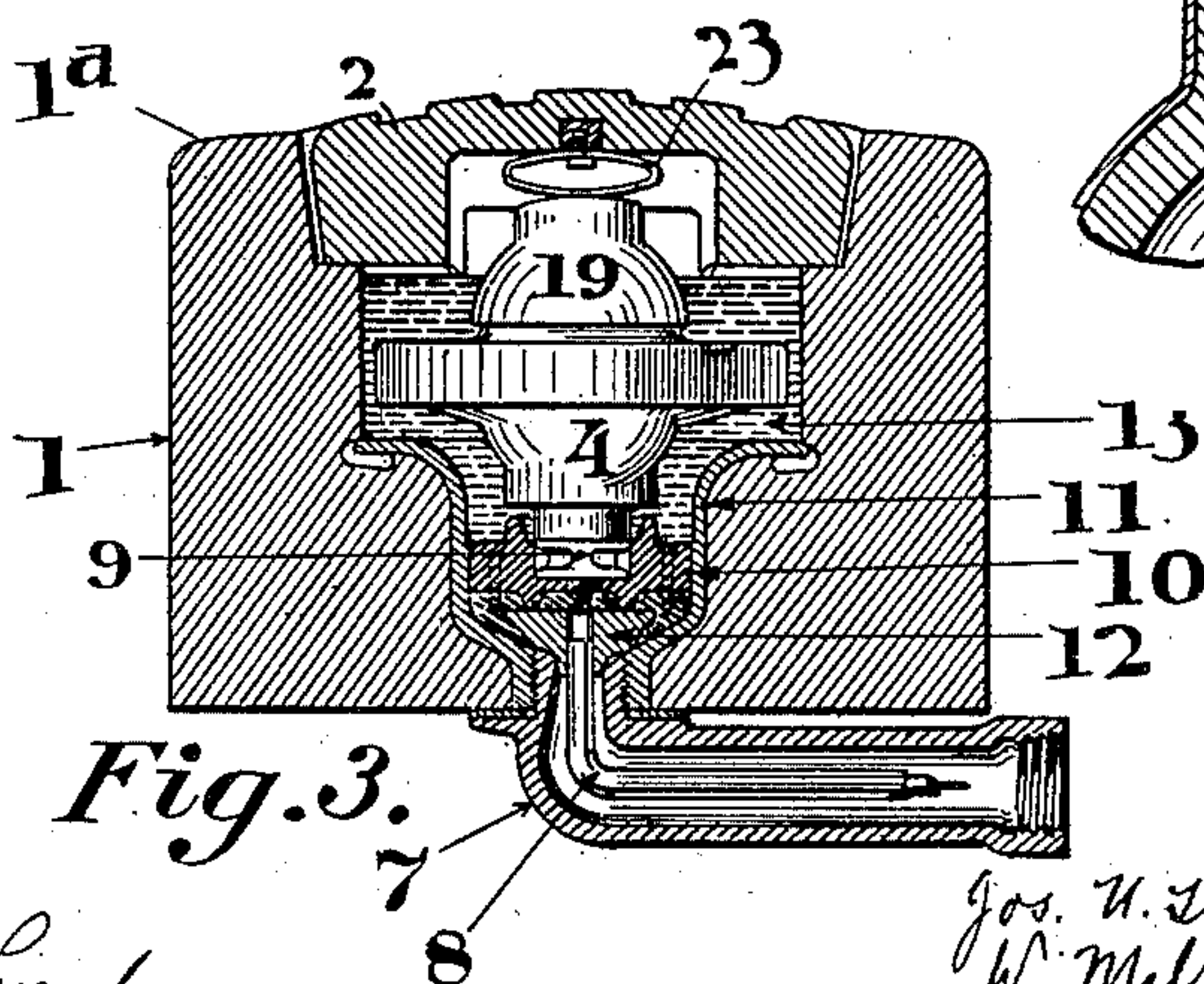
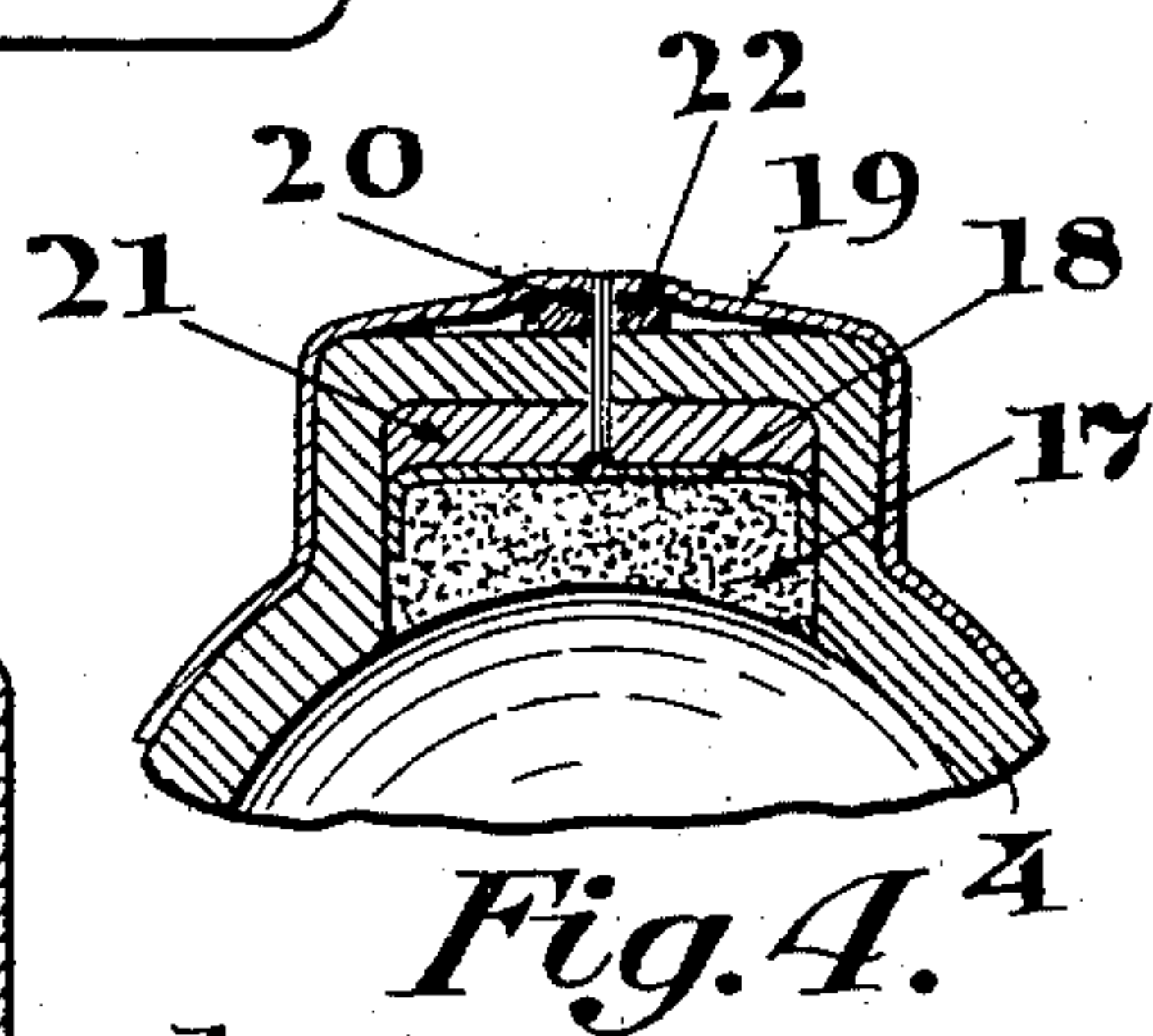
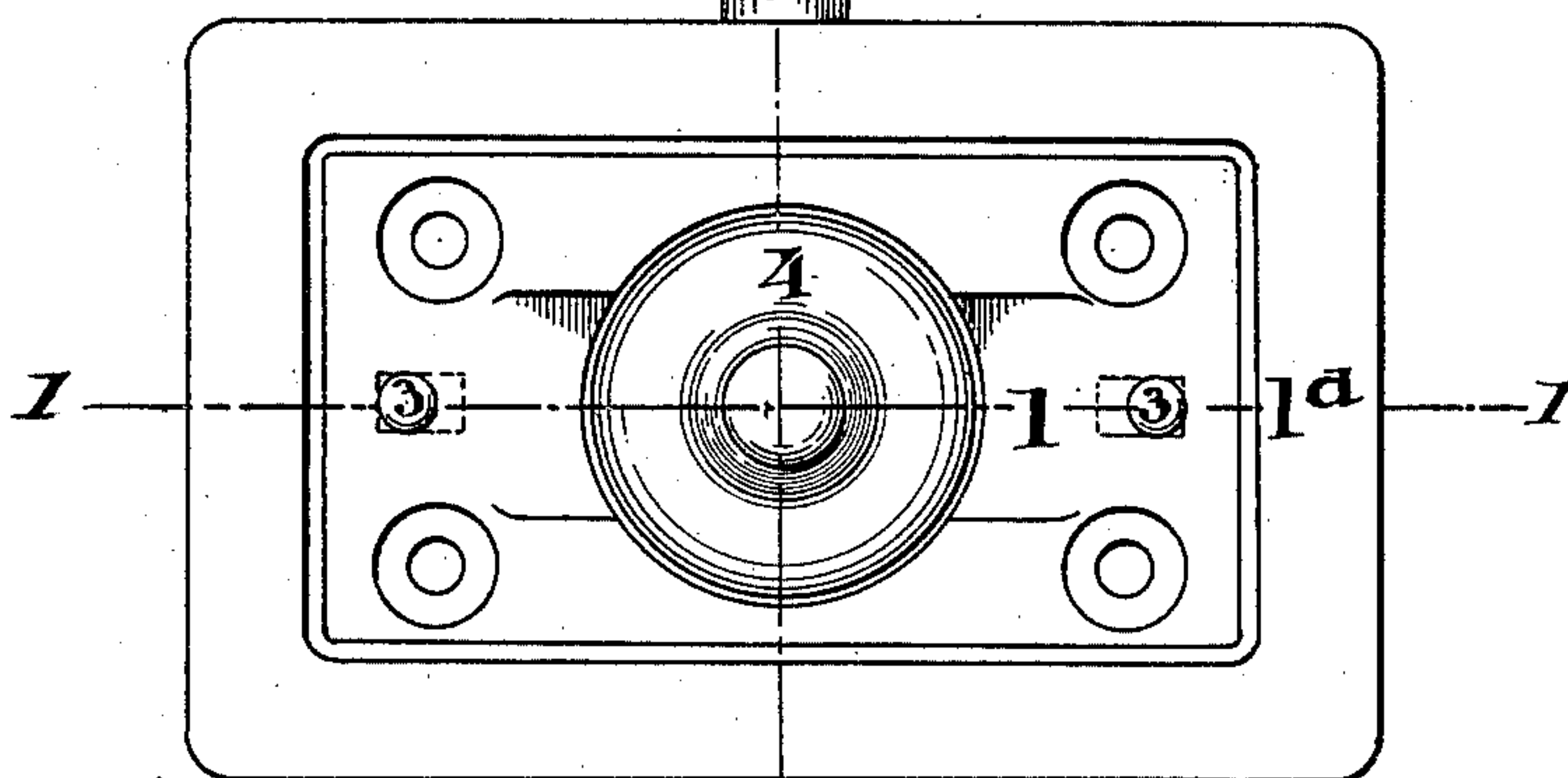
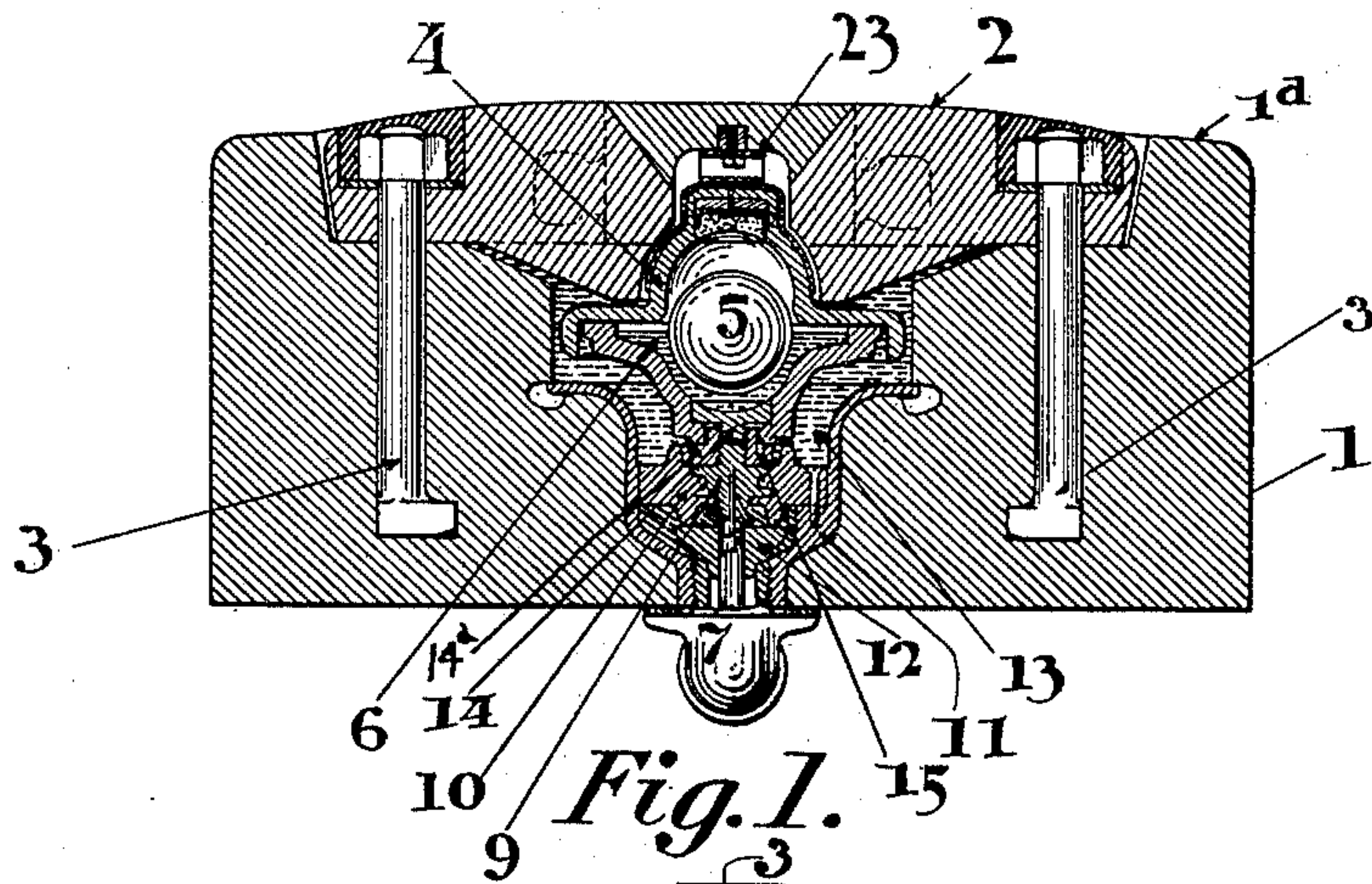
No. 612,880.

Patented Oct. 25, 1898.

J. N. THOMAS & W. M. BROWN.
ELECTRIC CONTACT BOX.

(Application filed Mar. 22, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JOSEPH N. THOMAS AND WILLIAM MILTON BROWN, OF JOHNSTOWN,
PENNSYLVANIA, ASSIGNORS TO THE JOHNSON COMPANY, OF OHIO.

ELECTRIC CONTACT-BOX.

SPECIFICATION forming part of Letters Patent No. 612,880, dated October 25, 1898.

Application filed March 22, 1898. Serial No. 674,729. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH N. THOMAS and WILLIAM MILTON BROWN, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented new and useful Improvements in Electric Contact-Boxes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to contact-boxes employed with that class of electric railways which employ disconnected contact-sections to act as terminals for one side of the circuit, a switching mechanism operated by the presence of the car being interposed between the feeders connected with the said side of the circuit and the said terminal. Such a system has been described in a patent issued April 14, 1896, No. 558,151, to W. Milton Brown, and our present invention is particularly applicable to the general system therein described. The improvements, however, in which our invention consists are also applicable to distinctly different electric systems of propulsion.

Our present invention consists, in part, of improvements upon the electric contact-box shown and described in the patent of Joseph N. Thomas, issued March 22, 1898, No. 600,937.

The various objects of the invention and the means by which these objects are achieved will be made to appear more fully hereinafter in describing the construction, combination, and arrangement of the various parts.

Referring to the drawings, Figure 1 is a vertical section on the line 1 1 of Fig. 2. Fig. 2 is a plan view of the same with the top or cover removed. Fig. 3 is a vertical section on the line 3 3 of Fig. 2. Fig. 4 is an enlarged sectional view of the upper portion of the switch-containing vessel.

The box proper is formed of two principal parts—a non-conducting base 1, preferably of asphaltum, and a metallic cover 2. The top 2 is secured to the base 1 by means of hook-bolts 3, which are preferably molded into the asphaltum base.

The detailed construction of the cover 2 is not material to our present invention. We

have shown it as composed of two sides of iron cast about a center of brass or other non-magnetic material. This construction is one which is adapted for use in systems in which an electromagnet having parallel longitudinal poles is carried by the traveling vehicle, so that the poles may be over opposite sides of the top, the armature of the switching mechanism being placed under the center of the top, so as to complete the magnetic circuit.

We form the base 1 of the box with an upward projection 1^a, which is continuous around the top of the base and forms a recess in which the metallic cover 2 rests. By this construction the danger of ground-leaks from the metallic top to the return-circuit, which usually comprises the track-rails, is minimized. At the same time it is not necessary that asphalt or other material be poured around the box after it is in place. We are therefore enabled to construct the system more cheaply and with greater celerity and certainty. Another advantage of this arrangement is that the asphalt projection 1^a, where contiguous to the ordinary pavement of the street, may be at the same level as the same and then gradually inclined upward, thus making the necessary crown of the metallic cover rise less suddenly from the general level of the paving. The advantage of this is obvious.

The contact-box incloses a vessel 4, which we prefer to construct of porcelain. This vessel contains the mercury 6, which is in connection with the supply-feeders by improved means, which we will hereinafter describe. In this mercury floats an iron ball 5, which is the armature or movable member of the switch.

7 is preferably a brass tube which surrounds the lead-covered cable 8, the latter being connected in any suitable manner to the supply-feeders. The end of this cable is secured to a brass pedestal 9, which is molded into a circular insulator 10. This insulator rests upon and is secured to a shelf on a brass vessel 11, fastened upon the end of the tube 7.

12 is a rubber ring which surrounds the lead-covered cable and rests upon the end of

the tube 7. The ring 9 also forms a further support, as shown, for the insulator 10.

Some of the functions of the foregoing parts will appear more fully hereinafter. The pedestal 9, insulator 10, and ring 12 are secured to the end of the cable 7 before the same is placed in position, so that when a cable proves defective and a new section must replace it the top of the box and the vessel, with its switching mechanism, are first removed, when the defective cable may be drawn upward through the open base and a new cable with the foregoing parts already attached inserted. The same vessel may now be put back again into the box.

13 is a liquid insulating compound which surrounds vessel 4, pedestal 9, &c. This liquid insulating compound we prefer to form of a mixture of asphalt and oil, as set forth in a pending application of Bruce Ford, filed January 12, 1898, Serial No. 666,468, in such proportions as to make a liquid heavier than water, so that any moisture which may enter the bottom of the box will rise through this compound, and floating on its top be removed from a position of danger.

In the bottom of the vessel 4 is an opening. In this opening rests a steel terminal 14, which is intended to retain the mercury and close the circuit thereto. The lower part of this terminal is provided with a thread which screws into the brass nut 14^a. This brass nut is keyed to the vessel 4 by means of the pin 15 and has a female thread which secures it to the pedestal 9. The brass nut 14 therefore forms the medium for securing the vessel 4 to the pedestal 9. This arrangement has specific advantages in that the mercury cannot escape from the vessel without leaking through several points. It is also a very strong and permanent construction.

In Fig. 4 is shown the improved means which we employ in connection with the passage of the current from the ball 5 (when the ball is raised to its operative position) to the metallic top 2, from which the current is gathered by a traveling collecting device.

According to our present invention we make the porcelain top of the vessel 4 completely closed, except for a small opening through the center. Inside the vessel is dovetailed a concave electrode 17, preferably of carbon. This electrode has an annular recess about its top, into which fits a metallic cap 18, the two being soldered together. Outside the cap is a metallic sheath 19, which bears closely against the upper sides of the vessel, but stands off somewhat from the top, as shown. To the top of the cap 18 is soldered a short conductor 20, which conductor passes through the before-mentioned hole on the top of the vessel and also through the sheath 19 and is soldered to the outside thereof. Between the inner top of the vessel and the cap 18 is placed a rubber bushing 21, which acts as a cushion to protect the porcelain vessel from shock when the ball 5 is raised by magnetic attraction into

contact with the electrode 17. Between the sheath and the outside top of the vessel is a small rubber bushing 22, which acts as a cushion to protect the porcelain vessel from shocks due to traffic over the top of the contact-box. The spring 23, secured to the metallic top 2, bears against the top of the sheath 19 and completes the circuit between the electrode 17 and the metallic top 2. Porcelain or similar material is very useful for a vessel of this kind, because of its excellent insulating character, its imperviousness to moisture, its ability to withstand deterioration, and because of the fact that it will not be softened by heat. It is, however, more or less brittle and is therefore apt to break from any sudden shock imparted to it by the rapid movement of the ball 5 or by blows which the top 2 is sure to receive from the hoofs of horses, wheels of vehicles, &c. The arrangement which we have provided, however, is very effective in preventing any breakage of this vessel. We have, first, the highest inherent strength which a given-sized porcelain vessel can have, for the top of the vessel is without any substantial perforation to weaken it, and, second, the bushings 21 and 22 effectually prevent any sudden shock being transmitted to the vessel.

The whole arrangement of our contact-box, as must be obvious from the foregoing description, is such as to reduce the time and expense required for repairs and renewals to the lowest possible point.

We desire to be clearly understood as not limiting ourselves to such specific details of construction and arrangement as might be modified without departing outside the scope of our invention. Such modifications of these details will readily suggest themselves to those skilled in the art.

Having thus described our invention, what we claim, and desire to protect by Letters Patent, is—

1. The combination of the closed insulating vessel containing a switching mechanism, an electrode on each side of the top wall of the same, a conductor connecting said electrodes, and cushions between each electrode and the top of the said vessel.

2. In an electric contact-box, the combination of a sealed vessel of insulating material containing the switching mechanism, a fixed electrode inside the top thereof, a metallic sheath for the top walls of the said vessel, and an electric conductor passing through the vessel and connecting the sheath and the said electrode.

3. In an electric contact-box, the combination of a sealed vessel of insulating material containing the switching mechanism, an electrode fixed inside the top thereof, a metallic cap covering the same, a metallic sheath for the top walls of the said vessel, and an electric conductor passing through the top of the vessel and secured to the sheath and to the cap.

4. The combination of a closed vessel of in-

5 sulating material, a fixed electrode inside the top thereof, a metallic sheath for the top walls of the vessel, cushions between the electrode and the vessel, and between the sheath and the vessel, and an electric conductor passing through the top of the vessel and through the cushions, and electrically connecting the sheath and electrode.

10 5. The combination of the sealed vessel 4, the electrode 17, cap 18 therefor, sheath 19, conductor 20, and cushions 21 and 22.

15 6. The combination of the cable 8, the pedestal 9 secured to the end of the same, the insulator 10 in which the said terminal is embedded, and the rubber ring 16 surrounding the said cable.

20 7. The combination of the non-conducting vessel having a bottom opening, the terminal 14 partially filling said opening, the nut 14^a extending upwardly into said opening and secured to the terminal, and the pedestal 9

secured to said nut and in connection with the source of electric supply.

8. The combination with the vessel 4 and terminal 14 therein, of the pedestal 9 connected to one side of the circuit, the nut 14^a connecting the said terminal and pedestal, and the locking-pin 15.

9. The tube 7 inclosing feeder 8 and rubber ring 12 surrounding said feeder and closing the end of said tube, in combination with open vessel 11 containing liquid insulator 13, and the switch containing vessel surrounded by said insulator.

In testimony whereof we have affixed our signatures in presence of two witnesses.

JOSEPH N. THOMAS.

WILLIAM MILTON BROWN.

Witnesses:

RICHARD EYRE,

MYRTLE E. SHARPE.