

No. 709,996.

Patented Sept. 30, 1902.

F. R. McBERTY & F. H. LOVERIDGE.  
SIGNAL LAMP FOR TELEPHONE SWITCHBOARDS.

(Application filed May 14, 1900.)

(No Model.)

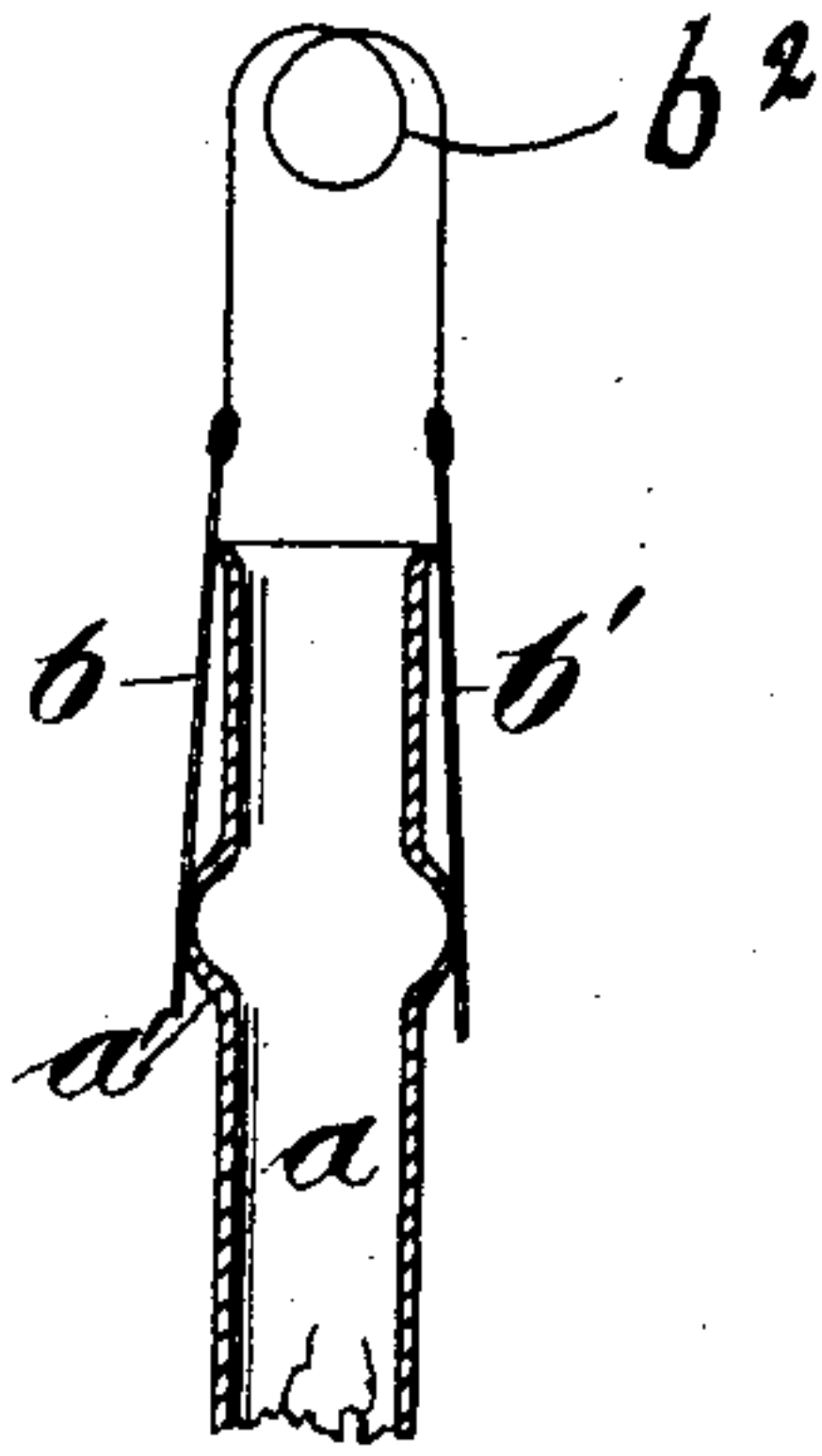


Fig. 1.

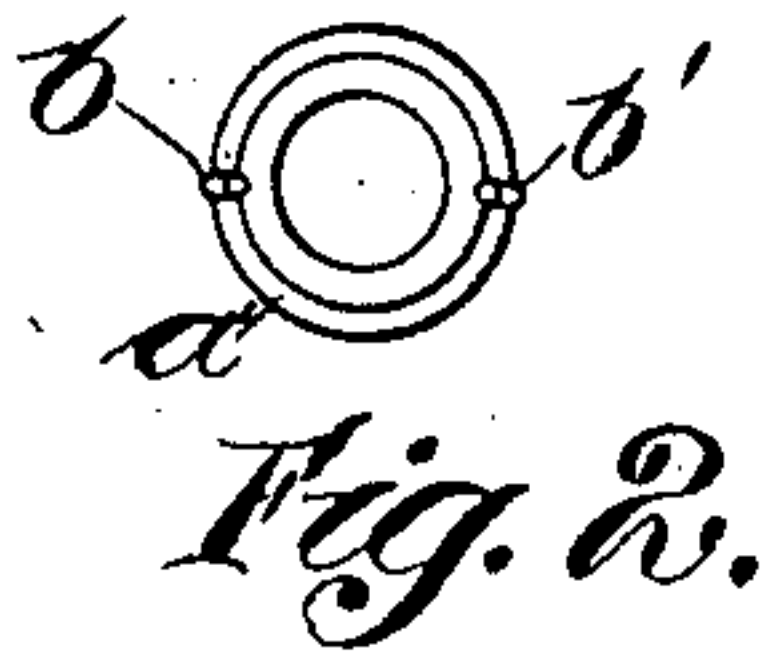


Fig. 2.

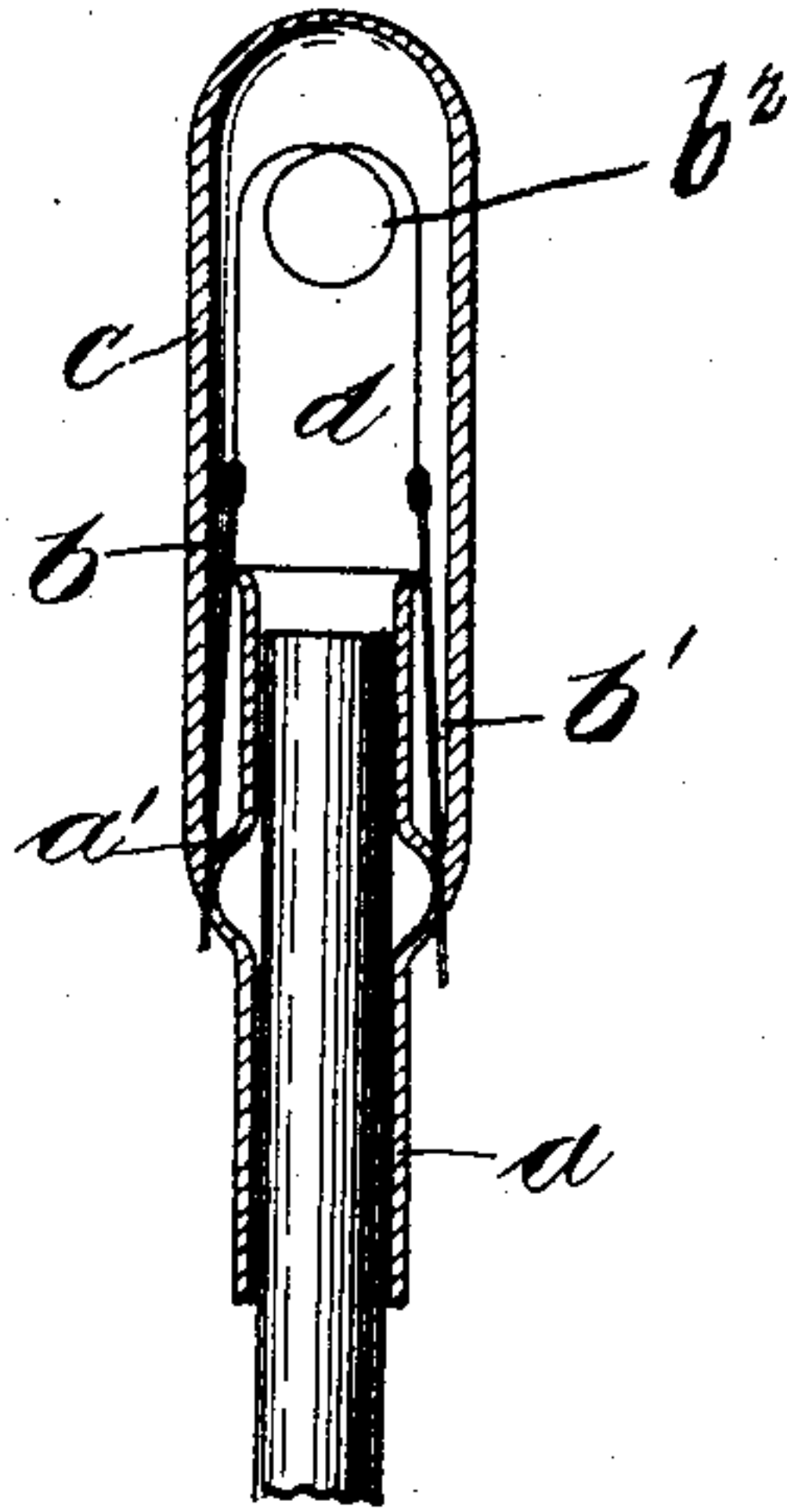


Fig. 4.

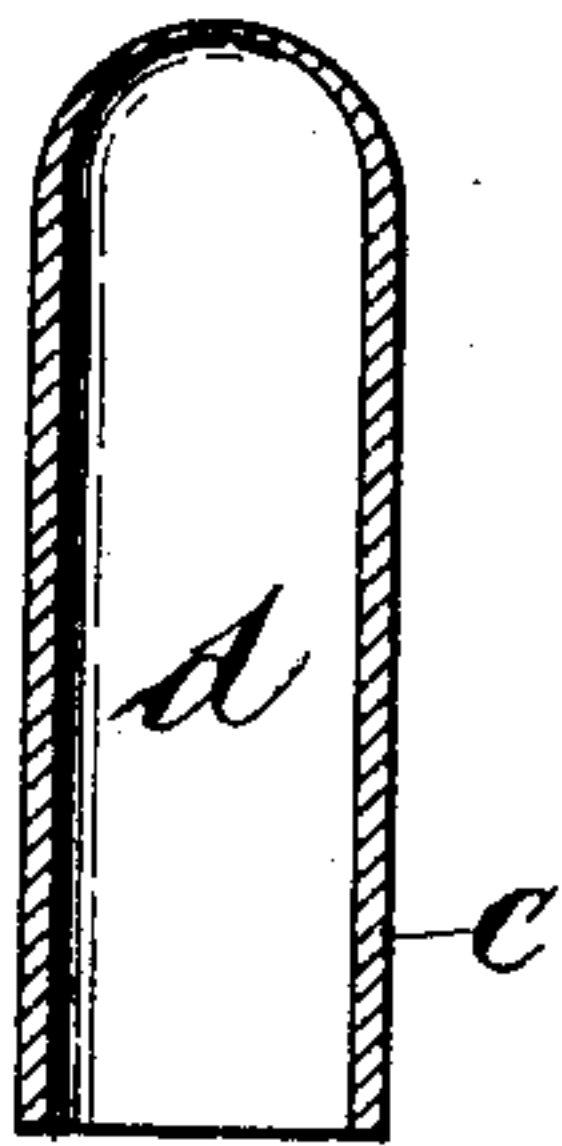


Fig. 3.

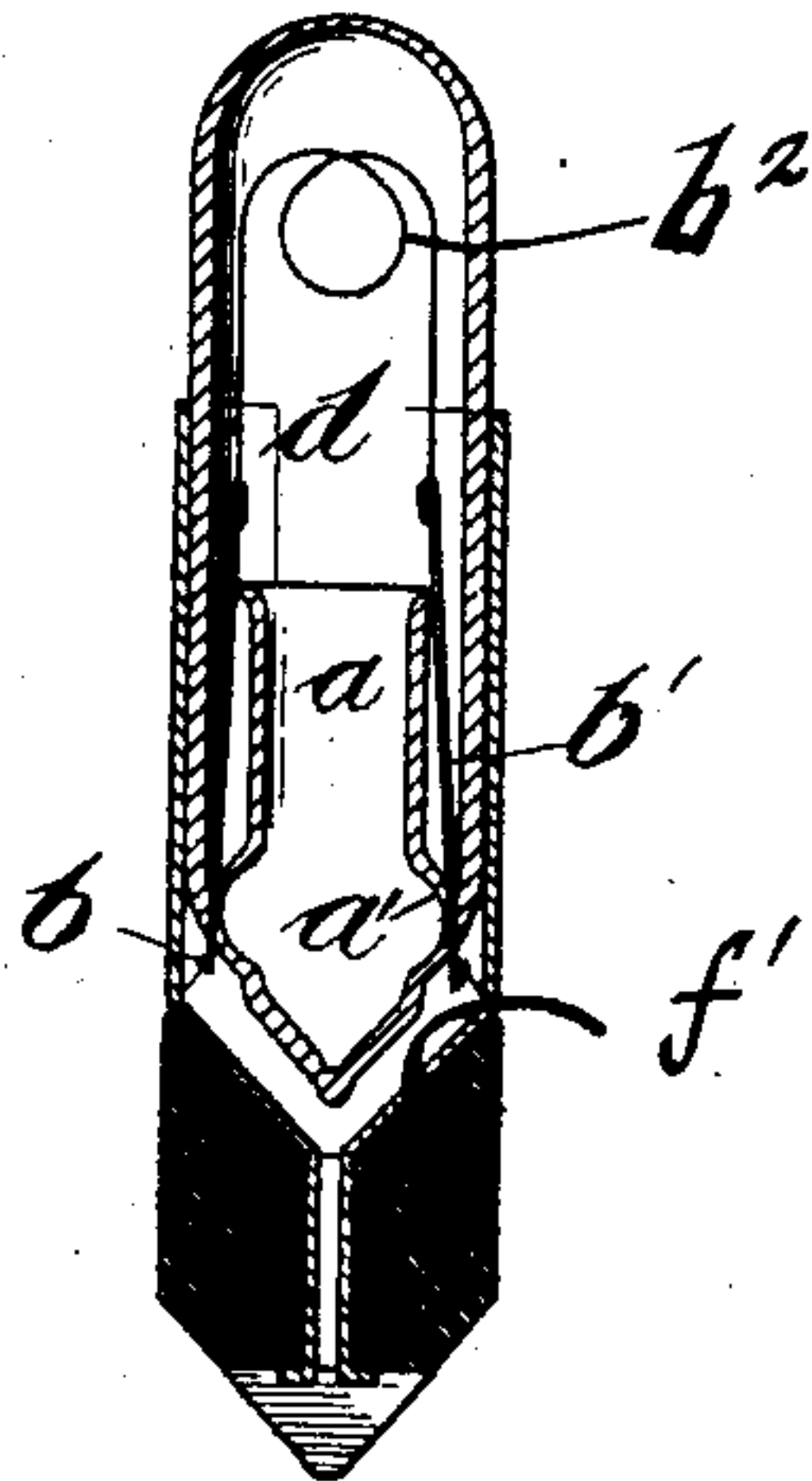


Fig. 5.

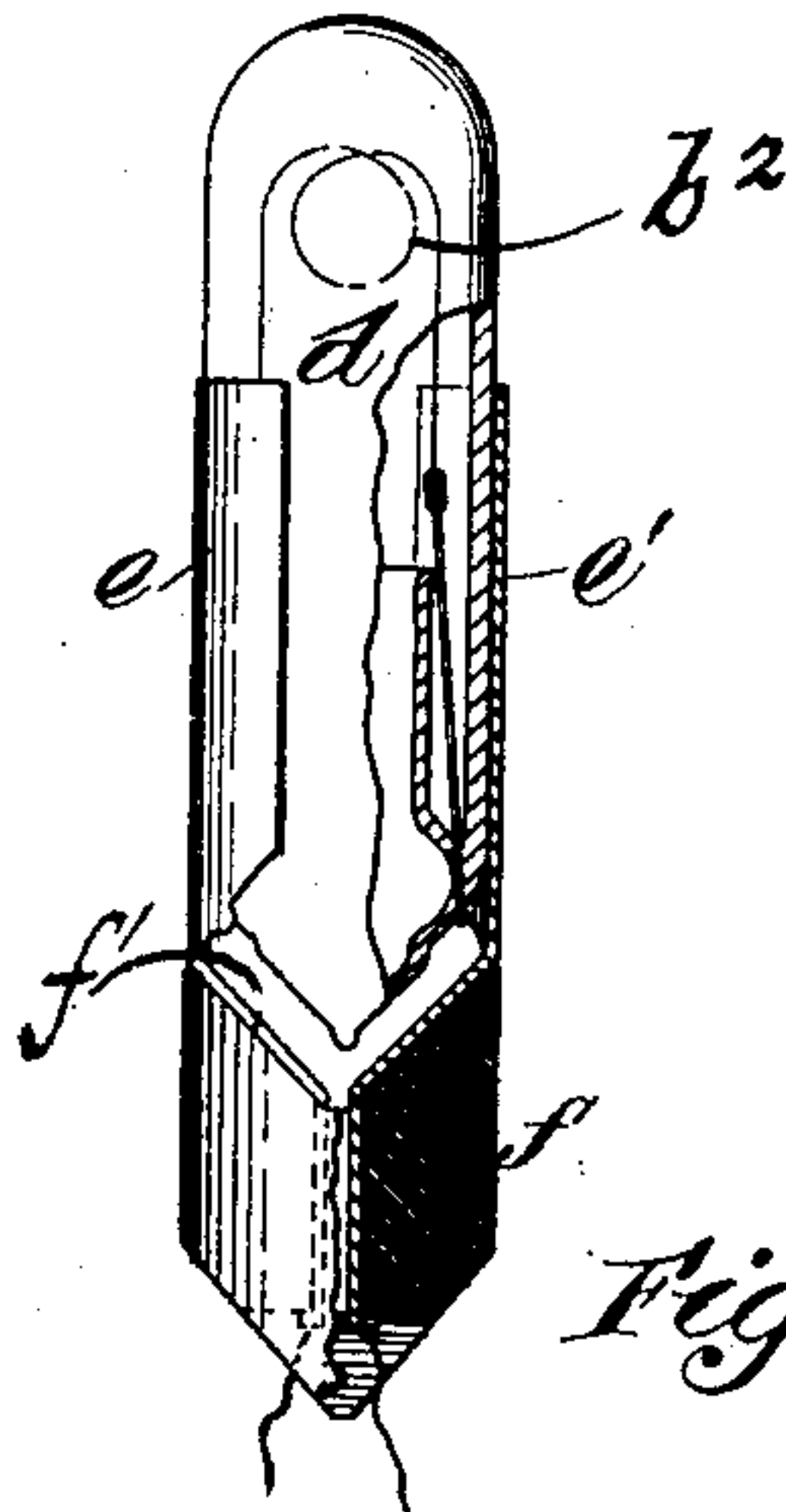


Fig. 6.

Witnesses:  
J. M. Skinkler  
W. H. Leach

Inventors:  
Frank R. McBerty,  
Frederick H. Loveridge.  
By Guy P. Barton,  
Attorney.

# UNITED STATES PATENT OFFICE.

FRANK R. McBERTY AND FREDERICK H. LOVERIDGE, OF EVANSTON, ILLINOIS, ASSIGNORS TO THE WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## SIGNAL-LAMP FOR TELEPHONE-SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 709,996, dated September 30, 1902.

Application filed May 14, 1900. Serial No. 16,553. (No model.)

*To all whom it may concern:*

Be it known that we, FRANK R. McBERTY and FREDERICK H. LOVERIDGE, citizens of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Signal-Lamps for Telephone-Switchboards, (Cases Nos. 89 and 18,) of which the following is a full, clear, concise, and exact description.

Our invention concerns signal-lamps for use in telephone-switchboards, in which the lamps are sunk in recesses in position to illuminate translucent lenses placed in the orifices of the recesses and constituting signal-indicators in the switchboard.

The object of our invention is to produce a small cylindrical signal-lamp of cheap construction especially adapted for illuminating with maximum efficiency such a translucent lens placed opposite one end of the lamp, and also to produce a suitable terminal connection for the lamp, adapted to register with contact-springs in the recess in the switchboard.

To this end the novel features of our invention consist in details of construction permitting the cheap construction of a strong lamp adapted for sealing off or hermetic closure at the end of the lamp distant from the lens.

Our improved lamp is illustrated in the attached drawings.

Of these drawings, Figure 1 represents the filament-supporting stem, of special form and arrangement. Fig. 2 is a plan view of the stem. Fig. 3 is a view of the capsule or bulb of the lamp, adapted to be sealed upon said stem. Fig. 4 is a sectional view of the capsule and stem sealed together, the lamp being then adapted for exhaustion. Fig. 5 is a sectional view of the exhausted and sealed lamp with the lamp-terminals secured thereto, and Fig. 6 is a side elevation of such lamp complete with the terminals.

The lamp is adapted for formation from two pieces of glass tubing of different sizes with a minimum of labor in forming them.

The stem *a* of the lamp, which is illustrated in Figs. 1 and 2, is a length of narrow tubing,

wherein, near one extremity, a small bulb or enlargement *a'* is formed by blowing. This bulb should be especially thin, as the seal between the tubes constituting the lamp is to be made at this point and should be of small mass in order to avoid liability to cracking.

The platinum terminal wires *b b'* of the lamp lie substantially parallel with the axis of the stem and are sealed to the stem, preferably to the edges of a narrow flange at the upper extremity of the stem. They carry the filament *b<sup>2</sup>*, secured upon them in any suitable way. The bulb *a'* is formed with longitudinal grooves, in which the wires *b* and *b'* lie loosely.

The inclosing bulb of the lamp is made from a short section of tubing *c* of larger diameter, of which the upper extremity is closed. This closed extremity is formed by blowing, so that it may be hemispherical in form, thin, and free from inequalities, in order that it may be perfectly transparent. The exterior of the enlargement *a'* is of very slightly less diameter than the interior of the inclosing bulb or cap. The cap is of such length as to barely contain the filament, the lower edge of the capsule reaching to the equatorial line of the enlargement *a'*.

With this construction the illuminated filament is presented as near the extremity of the lamp as possible, and the lens to be illuminated may be placed very near the filament, so as to receive the largest possible proportion of the light emitted thereby.

In the process of sealing together the parts thus described to form a lamp a mandrel, loosely fitting the stem *a*, is placed within the stem. The cap *d* is placed over the lamp, the axes of the two tubes being in coincidence and the lower edge of the cap *d* extending to the equator of the bulb *a'*, and by means of a pointed flame the edge of the cap is melted upon the enlargement of the stem, a slight air-pressure being maintained within the stem to prevent the collapse of the same. The glass in melting flows about the wires *b* and *b'* and seals them in place. The enlarged portion of the stem *a'* being very thin, only a small mass of glass is formed at the seal, and liability to cracking of the glass in cooling is



avoided. After the parts thus sealed together have cooled the mandrel is withdrawn from the stem *a*, and the lamp is exhausted. After exhaustion the lamp is finished by hermetically sealing off the stem *a* just beneath the seal. Thus a lamp is produced which is free from the point or tip ordinarily formed at the front end of the lamp in sealing the lamp off and which is strong and cheap of construction.

The terminal which we provide for this lamp consists of two plates *e* and *e'*, adapted to embrace or partly inclose the lamp, lying upon its opposite sides and secured together at their rear ends in a block of insulating material *f*. This block *f* is of cylindrical form, with a small central longitudinal perforation of H cross-section. The terminals *e* and *e'* are narrow throughout a part of their lengths. A transverse V-shaped groove *f'* is formed in one end of the block *f*, and the terminals *e* and *e'* are formed with offsets in them joined by inclined faces conforming to the incline of the sides of the groove. The contracted portions of the terminals *e* and *e'* are thrust through grooves formed in the block *f* until the inclined faces of the terminals bear against the correspondingly-inclined faces of the block. Then the ends of the terminals where they emerge from the perforation of block *f* at the other extremity are bent outward, whereby the terminals are secured in place in the block.

The cylindrical lamp, conforming to the cylindrical space between the broad portions of terminal plates *e* and *e'*, is thrust between the terminals, and the leading-in wires of the lamp are soldered to the terminals.

A considerable advantage is secured in providing the enlarged portion *a'* of the stem, to which the cap is sealed at a distance from the tip of said stem, in that the stem thus extends up into the cap and forms a firm support for the leading-in wires, which are sealed to the tip of the stem and also sealed in at the lower edge of the cap. The filament is thus supported near the tip of the lamp, which is desired where the lamp is to be used as a signal in telephone-switchboards.

We claim as new, and desire to secure by Letters Patent, the following:

1. An incandescent lamp comprising the

open tubular stem *a* having the enlargement *a'* a short distance below its tip, terminal wires *b b'* sealed to the upper edge of the stem and extending down outside the stem past the enlargement *a'*, a filament *b<sup>2</sup>* carried by the terminal wires, and a cylindrical cap *d* rounded at the upper end, with its lower end fitting over the stem, inclosing the filament and sealed to the enlarged portion of the stem in an annular seal, the terminal wires passing through and sealed in the annular seal, substantially as set forth.

2. In combination, in an electric lamp, the cylindrical cap *d* having the rounded extremity, the tubular stem *a* having the enlargement *a'* formed thereon, the said enlargement being sealed at its equator to the lower edge of the said cap *d*, the leading-in wires passing through said seal and secured to the stem near its end within the bulb, said stem being open within the bulb, the filament carried upon the leading-in wires, the stem being sealed off after exhaustion outside the said seal, as described.

3. In a base for cylindrical incandescent lamps, the combination with the block *f* having the central perforation, of the terminal pieces *e* and *e'* formed to partially embrace the lamp-bulb, and having contracted portions extending through and secured in the central perforation of said block *f*, as described.

4. In combination with a cylindrical incandescent lamp-bulb, terminals therefor, consisting of the plates *e* and *e'* partially embracing the bulb, situated on opposite sides thereof, having contracted extensions, the cylindrical block *f* having a central perforation through which said extensions pass, said block having the wedge-shaped transverse groove therein, against which the terminal plates bear, and the extensions being bent outward at the rear of the block to hold them in place, as described.

In witness whereof we hereunto subscribe our names this 10th day of April, A. D. 1900.

FRANK R. McBERTY.

FREDERICK H. LOVERIDGE.

Witnesses:

FLORENCE E. SUMMERS,  
EDITH DIBBLE.