B. CHRISTIANSEN.

ELECTRIC SAFETY LAMP.

APPLICATION FILED APR. 4, 1911.

999,298.

Patented Aug. 1, 1911.

3 SHEETS—SHEET 1.

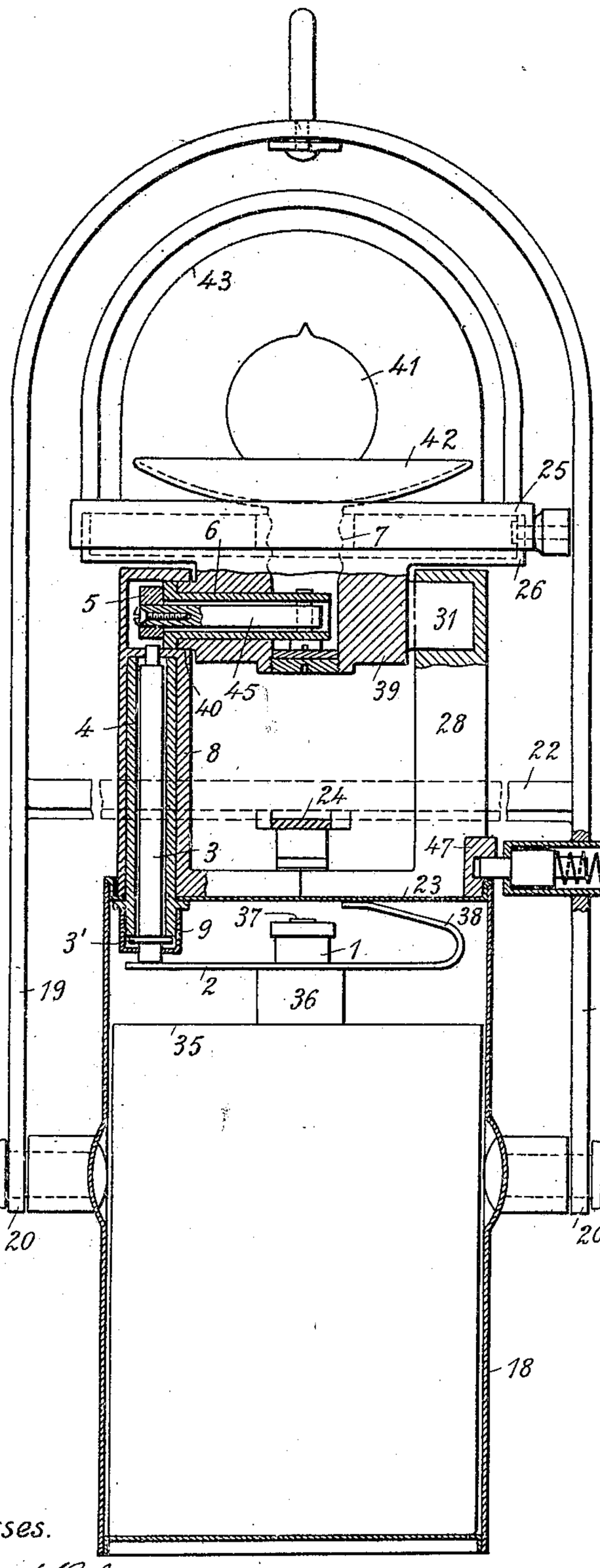

Fig. 1.

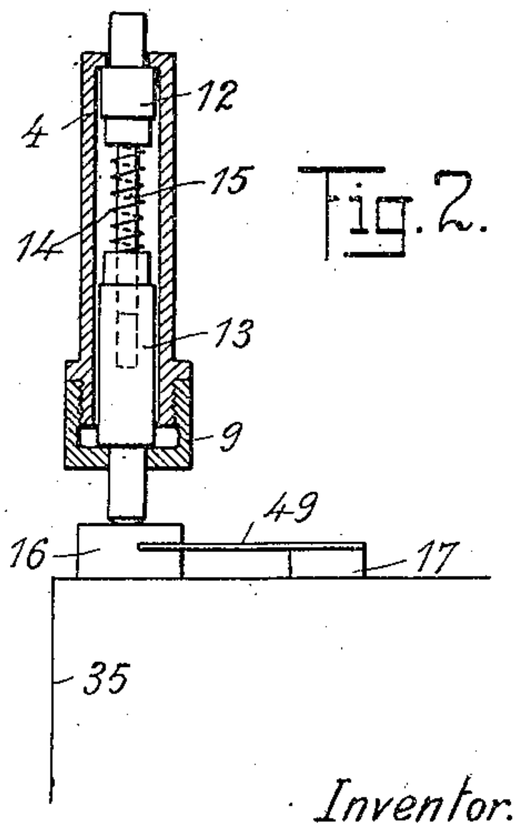

Fig. 2.

Witnesses.

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3 SHEETS—SHEET 2.

Fig. 3.

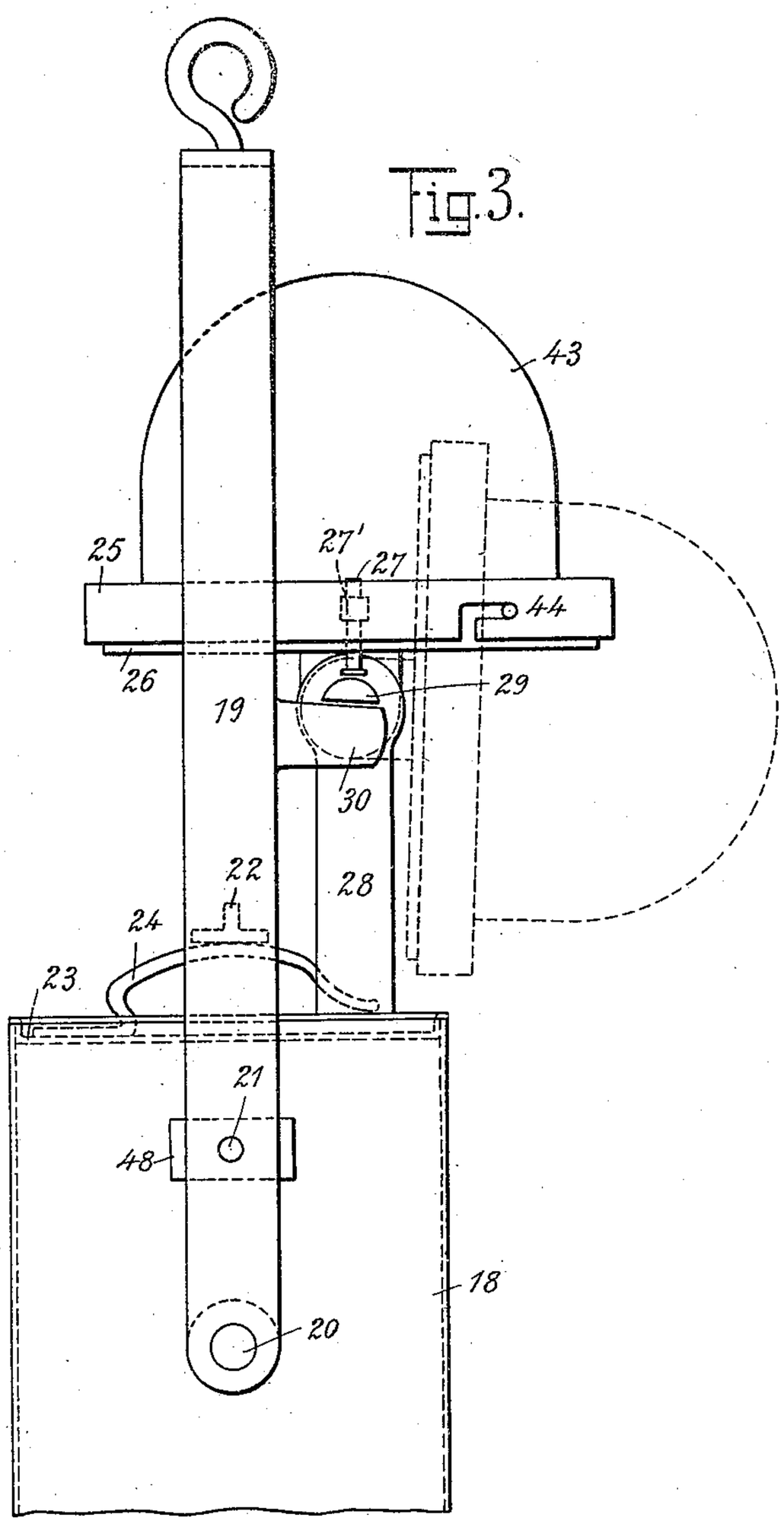
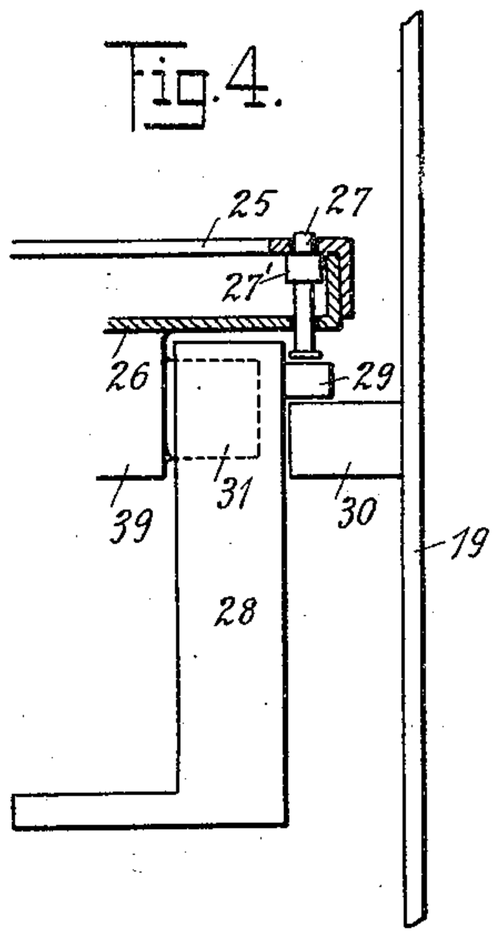


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

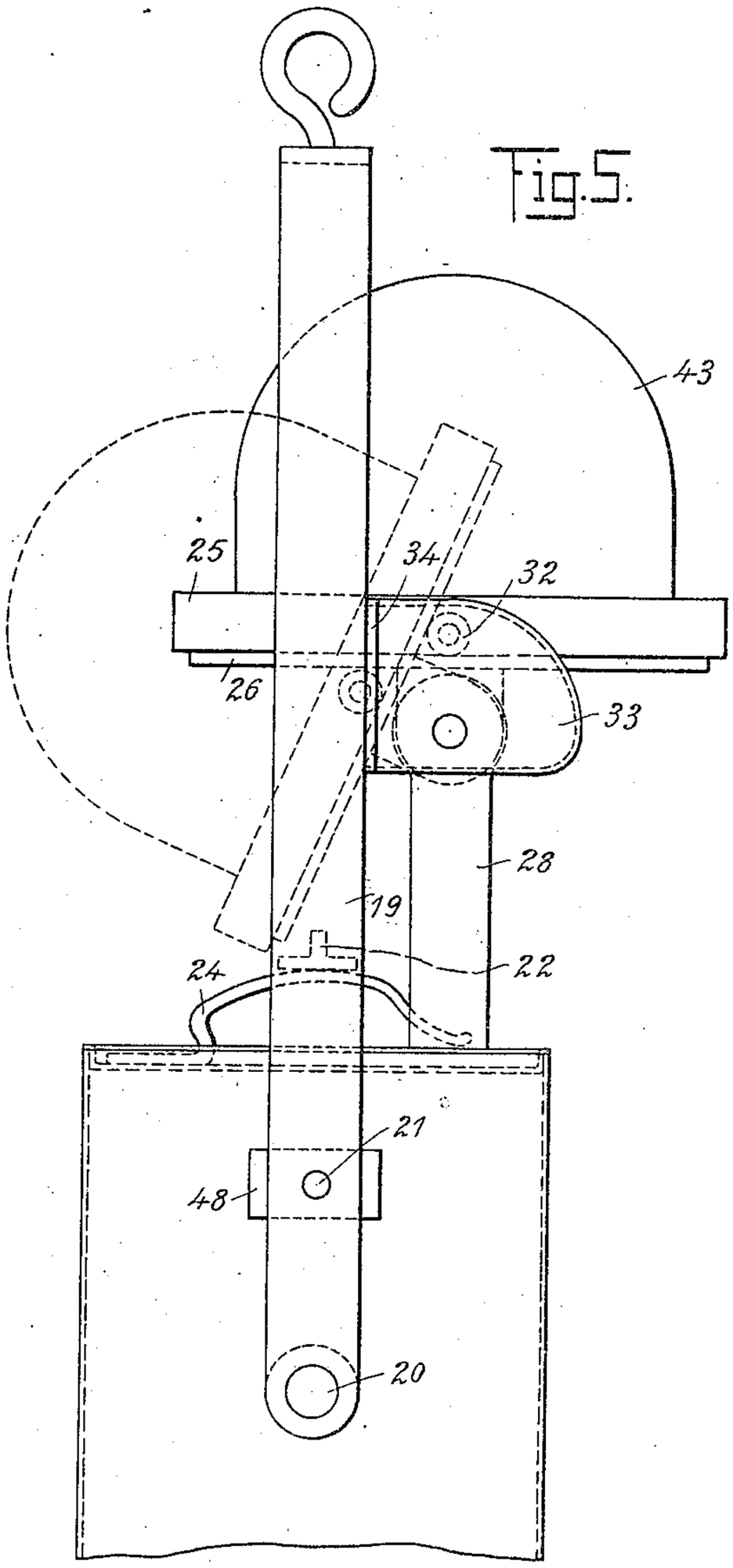
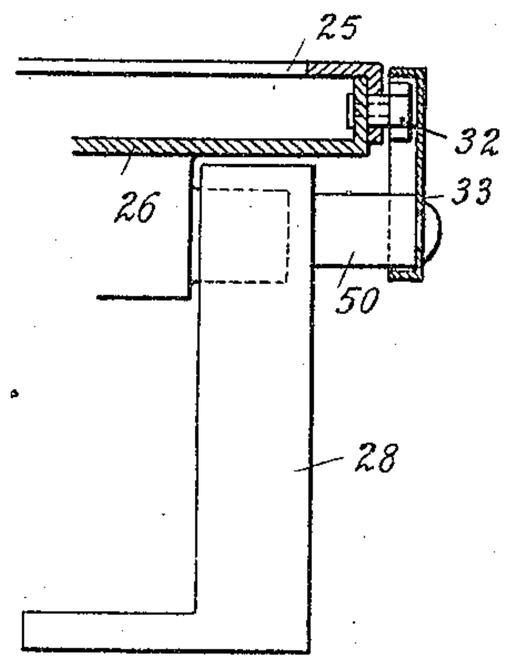


Fig. 6.



Witnesses.
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UNITED STATES PATENT OFFICE.

BRUNO CHRISTIANSEN, OF COLOGNE-SÜLZ, GERMANY.

ELECTRIC SAFETY-LAMP.

999,298. Specification of Letters Patent. Patented Aug. 1, 1911.

Application filed April 4, 1911. Serial No. 618,796.

To all whom it may concern:

Be it known that I, BRUNO CHRISTIANSEN, a subject of the King of Prussia, residing at Zülpicherstrasse 199, Cologne-Sülz, in the Empire of Germany, have invented a new and useful Electric Safety-Lamp, of which the following is a specification.

My invention relates to improvements in electric safety-lamps to be carried in rooms which under circumstances may be filled up with an explosible mixture of gases, and the improvements have for their object to protect the lamp from short-circuits or sparking due to defects in the current conductors or in consequence of any carelessness of the carrier.

One improvement consists in disposing all the current conductors within the casing and frame of the lamp, so as to protect the insulation of conductors from damages which otherwise might produce short-circuits.

Another improvement consists in so arranging the handle, that in its vertical position during use it prevents the removal of the protecting glass-bell covering the incandescent lamp, while in its turned-down position the handle permits to take off the protecting glass-bell.

A further improvement consists in providing the handle with a cross bar by means of which it on being turned up into the vertical position can press the cover with the frame on the upper edge of the box, where the storage battery is located.

I will now proceed to describe my invention with reference to the accompanying drawings, in which—

Figure 1 is an elevation of the improved electric safety-lamp, parts being shown in section, Fig. 2 shows a modification of a part in Fig. 1, Fig. 3 is a side view of the electric safety-lamp shown at Fig. 1, Fig. 4 is a part out of Fig. 1 and shows means for preventing the removal of the protecting glass-bell, Fig. 5 corresponds to Fig. 3 and shows a modification of the means for preventing the removal of the protecting glass-bell, and Fig. 6 corresponds to Fig. 4 and shows the modified securing means.

Similar characters of reference refer to similar parts throughout the several views.

The electric safety-lamp comprises a box 18 with two opposite pins 20, 20, on which a U-shaped handle 19 can be turned upward into the vertical position shown, if the lamp is to be carried about. In the box 18 a storage battery 35 of any known construction can be disposed, which is shown to have one pole 36 in the center above. A contact spring 2 (Fig. 1) may be fastened on the pole 36 by means of a screw 37 and a nut 1. A cover 23 provided with a leaf spring 24 (Fig. 3) can be put on the edge of the box 18 for closing the latter. The handle 19 is provided with a cross bar 22, which is adapted to depress the leaf spring 24 on the handle being turned upward into the vertical position, whereby the cover 23 is secured on the box 18. When the handle 19 is turned to a side downward, its cross bar 22 will release the spring 24, which can be seized for taking off the cover 23. The contact spring 2 is shown to have a bent rear arm 38, which is adapted to bear from below against the cover 23 for preventing the storage battery 35 from shaking during the transport. However, this is immaterial to my invention.

On the cover 23 are fastened two parallel supports 8 and 28 (Fig. 1), the upper ends of which form bearings for the pivots 31 and 40 of a crosshead 39. This crosshead is made in one with a circular flanged disk 26 and with a socket 7 for the incandescent lamp 41, which latter may be provided with a reflector 42. A flanged ring 25 (Fig. 4) carrying a protecting glass-bell 43 of any known construction fits the flange of the disk 26 and the two parts 25 and 26 are connected together by means of several bayonet-catches 44. A vertical bolt 27 is guided in two opposite holes in the ring 25 and in the disk 26 (Fig. 4) and may be provided with a collar 27′ or the like for preventing it from getting lost. A lug 29 is provided on the support 28 and as long as the head of the bolt 27 below bears on the lug 29, the bolt 27 will engage both the disk 26 and the ring 25 and prevent their relative displacement, so that the protecting glass-bell 43 in its upper position shown at Fig. 3 can not be taken off. One side part of the handle 19 is provided with a lug 30, which for the vertical position shown of the handle 19 engages beneath the lug 29. From an examination of Fig. 3 it will be evident that in the vertical position of the handle 19 its lug 30 will also prevent the bolt 27 from longitudinal motion, if the protecting glass-bell 43 with the incandescent lamp 41 is turned downward into a position indicated by the dotted lines. The incandescent lamp 41 is

to be inserted in circuit by turning it from the upper position shown in full lines to the other extreme position indicated by dotted lines and in the following manner.

One support 8 is made hollow and in this hole a tube 4 of insulating material is secured. A metallic bolt 3 is longitudinally guided in the tube 4 and has a collar 3', which can bear on the one hand against the lower end face of the tube 4 and on the other hand against the shoulder of a cap 9 (Fig. 2) screwed on the lower projecting end of the tube 4. The contact spring 2 already mentioned above is adapted to bear from below against the lower end face of the bolt 3. The upper end of the bolt 3 may be reduced in diameter, as is shown at Fig. 1, although this is not absolutely necessary. For the left part in Fig. 1 the crosshead 39 is bored in its axis, and in this bore a tube 6 of insulating material is secured. In the tube 6 is fastened a shaft 45 which carries a cam 5. The shaft 45 is to be placed in permanent electric connection with one terminal of the incandescent lamp 41 in any known manner (not shown). The cam 5 is adapted to come in contact with the upper end face of the bolt 3 and thereby to depress the latter on the electric lamp 41 with the protecting glass-bell 43 being turned downward, whereby the respective terminal of the incandescent lamp 41 is electrically connected with the pole 36 of the storage battery 35. The other terminal of the electric lamp 41 is put in permanent electric connection with the other pole of the storage battery 35 by means of the support 28 in any known manner, which I do not describe here, as it is immaterial to my invention.

Where so preferred, a spring-pressed bolt 46 (Fig. 1) may be provided in either side part of the handle 19 and be adapted to engage in some part 47 on the cover 23 for securing the handle 19 in its vertical position. The part 47 may be provided with an inclined face or the like for forcibly pushing the bolt 46 back and thus releasing the handle 19 on the latter being forced downward in one direction. Or the handle 19 may be secured in its vertical position by a pin passed through a hole 21 (Fig. 3) and the corresponding hole of a lug 48 on the box 18 or in any other known manner.

If so preferred, the bolt 3 in Fig. 3 may be replaced by two parts 12 and 13 (Fig. 2) guided in the tube 4 and pressed apart by means of a helical spring 14 inserted between them and surrounding a bolt 15 made in one with the part 12 and guided in a snugly fitting hole of the other part 13. By the bolt 15 the two parts 12 and 13 are kept in permanent electric connection. The contact spring 2 in Fig. 1 may be replaced by a contact piece 16 disposed on the storage battery and insulated therefrom, while it is electrically connected by a spring 49 or the like with one pole 17 which corresponds to 36 in Fig. 1. The bolt 27 in Fig. 4 serving for preventing the relative displacement of the parts 25 and 26 may be replaced by a device illustrated at Figs. 5 and 6. Here the support 28 is provided with a lug 50, on which a cap 33 is fastened. This cap is provided with a vertical flange 34, against which the handle 19 in its vertical position may lean. In the ring 25 a screw 32 is made to engage, which has a reduced portion at its end for engaging in a hole in the disk 26. The cap normally covers the screw 32 for any position of the incandescent lamp 41 and the protecting glass-bell 43, so that it is not possible to get at the screw 32 as long as the handle 19 remains in its vertical position. When, however, the handle 19 is turned to the left in Fig. 5 and downward, it will be possible to so turn the protecting glass-bell 43 in the same direction, that the screw 32 leaves the cap 33 and can be longitudinally moved for withdrawing its reduced end from the hole in the disk 26, or it may be taken off altogether. Then it will be possible to displace the ring 25 with regard to the disk 26 and to take off the protecting glass-bell 43.

The electric safety-lamp described and shown can be varied in many respects without departing from the spirit of my invention.

I claim:

1. In an electric safety-lamp, the combination with a box, of a storage battery in said box, two supports on said box, one hollow and the other solid and electrically connected with one pole of said storage battery, a crosshead turnable in said two supports, an incandescent lamp in said crosshead and having its one terminal electrically connected by said crosshead with said solid support, a conductor longitudinally movable in and insulated from said hollow support and electrically connected with the other pole of said storage battery, a second conductor in said crosshead insulated therefrom and electrically connected with the other terminal of said incandescent lamp, and a cam on said second conductor adapted to depress and release said conductor on said crosshead with said incandescent lamp being turned in either direction.

2. In an electric safety-lamp, the combination with a box, of a storage battery in said box, two supports on said box, one hollow and the other solid and electrically connected with one pole of said storage battery, a crosshead turnable in said two supports, an incandescent lamp in said crosshead and having its one terminal electrically connected by said crosshead with said solid support, a first conductor in said hollow support in-

sulated therefrom and electrically connected with the other pole of said storage battery, a second conductor longitudinally movable in said hollow support and insulated therefrom and having a part guided in said first conductor, a spring inserted between said first and second conductors, a third conductor in said crosshead insulated therefrom and electrically connected with the other terminal of said incandescent lamp, and a cam on said third conductor adapted to depress and release said second conductor on said crosshead with said incandescent lamp being turned in either direction.

3. In an electric safety-lamp, the combination with a box, of a handle turnable on said box, a storage battery in said box, two supports on said box, one hollow and the other solid and electrically connected with one pole of said storage battery, a crosshead turnable in said two supports, an incandescent lamp in said crosshead and having its one terminal electrically connected by said crosshead with said solid support, a conductor longitudinally movable in and insulated from said hollow support and electrically connected with the other pole of said storage battery, a second conductor in said crosshead insulated therefrom and electrically connected with the other terminal of said incandescent lamp, a cam on said second conductor adapted to depress and release said conductor on said crosshead with said incandescent lamp being turned in either direction, a protecting glass-bell on said crosshead covering said incandescent lamp, and a device on said crosshead for connecting therewith and disconnecting said protecting glass-bell, said handle being adapted to lock in its vertical position said device.

4. In an electric safety-lamp, the combination with a box, of a cover for said box, a spring on said cover, a handle turnable on said box and having a cross bar adapted to depress said spring for the vertical position of the handle, a storage battery in said box, two supports on said box, one hollow and the other solid and electrically connected with one pole of said storage battery, a crosshead turnable in said two supports, an incandescent lamp in said crosshead and having its one terminal electrically connected by said crosshead with said solid support, a conductor longitudinally movable in and insulated from said hollow support and electrically connected with the other pole of said storage battery, a second conductor in said crosshead insulated therefrom and electrically connected with the other terminal of said incandescent lamp, a cam on said second conductor adapted to depress and release said conductor on said crosshead with said incandescent lamp being turned in either direction, a protecting glass-bell on said crosshead covering said incandescent lamp, and a device on said crosshead for connecting therewith and disconnecting said protecting glass-bell, said handle being adapted to lock in its vertical position said device.

BRUNO CHRISTIANSEN.

Witnesses:
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BESSIE T. DUNLAP.