

1,297,996.

Patented Mar. 25, 1919.

2 SHEETS—SHEET 1.

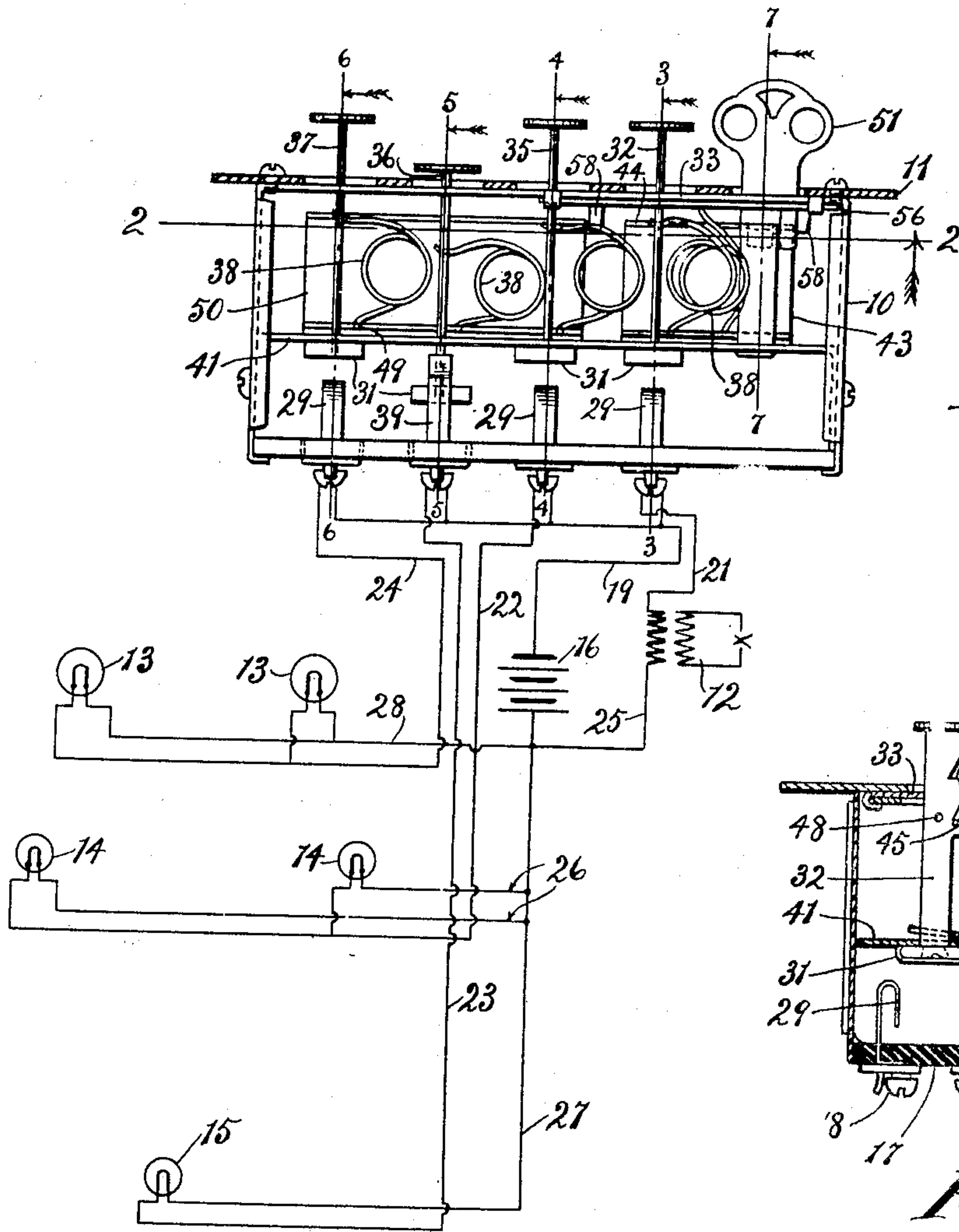


Fig. 1.

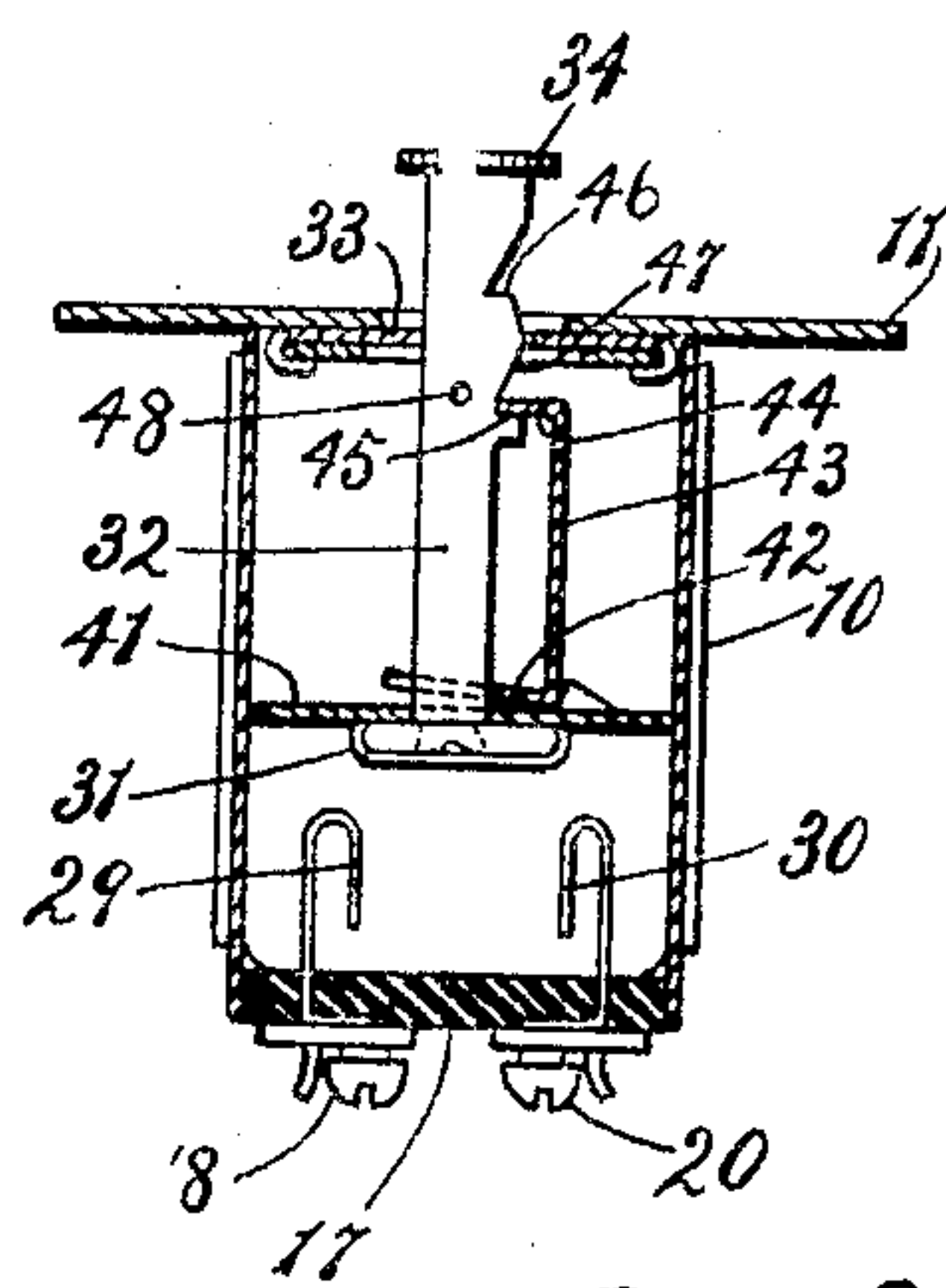


Fig. 3.

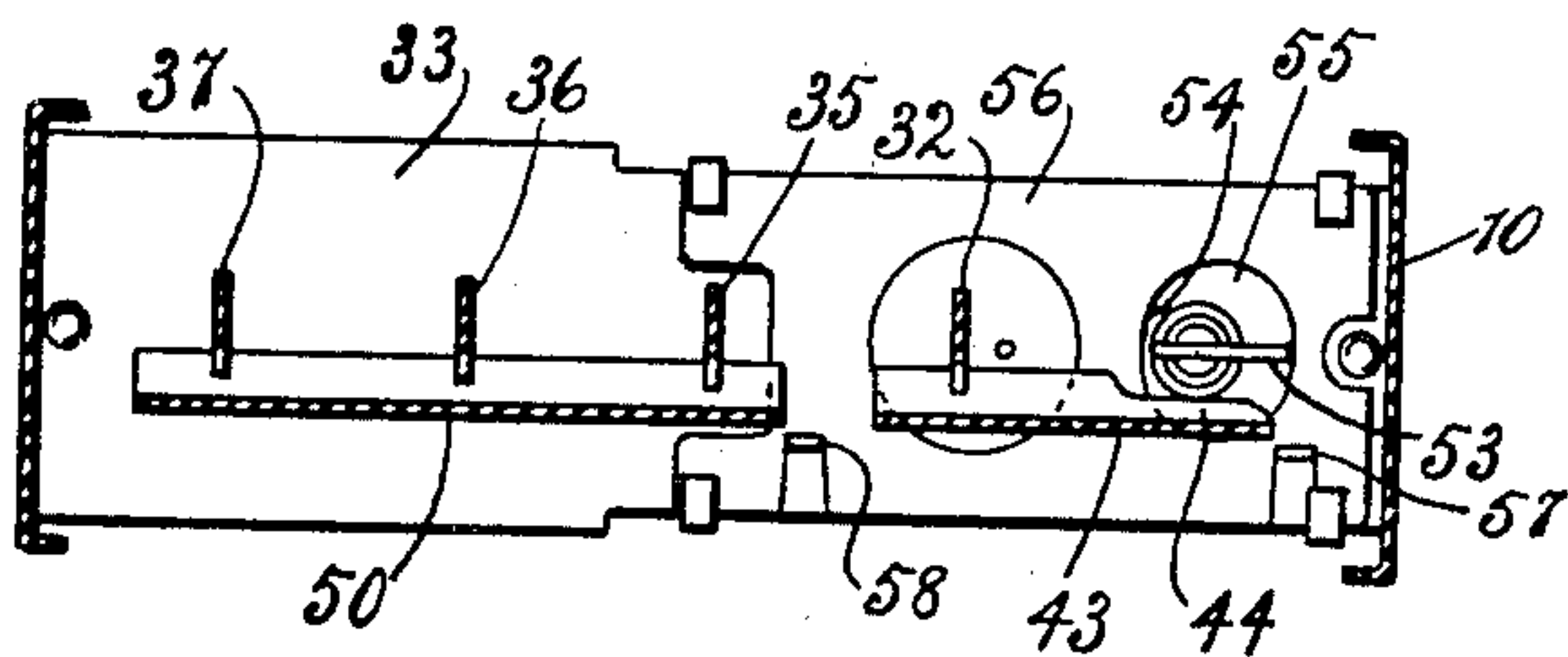


Fig. 2.

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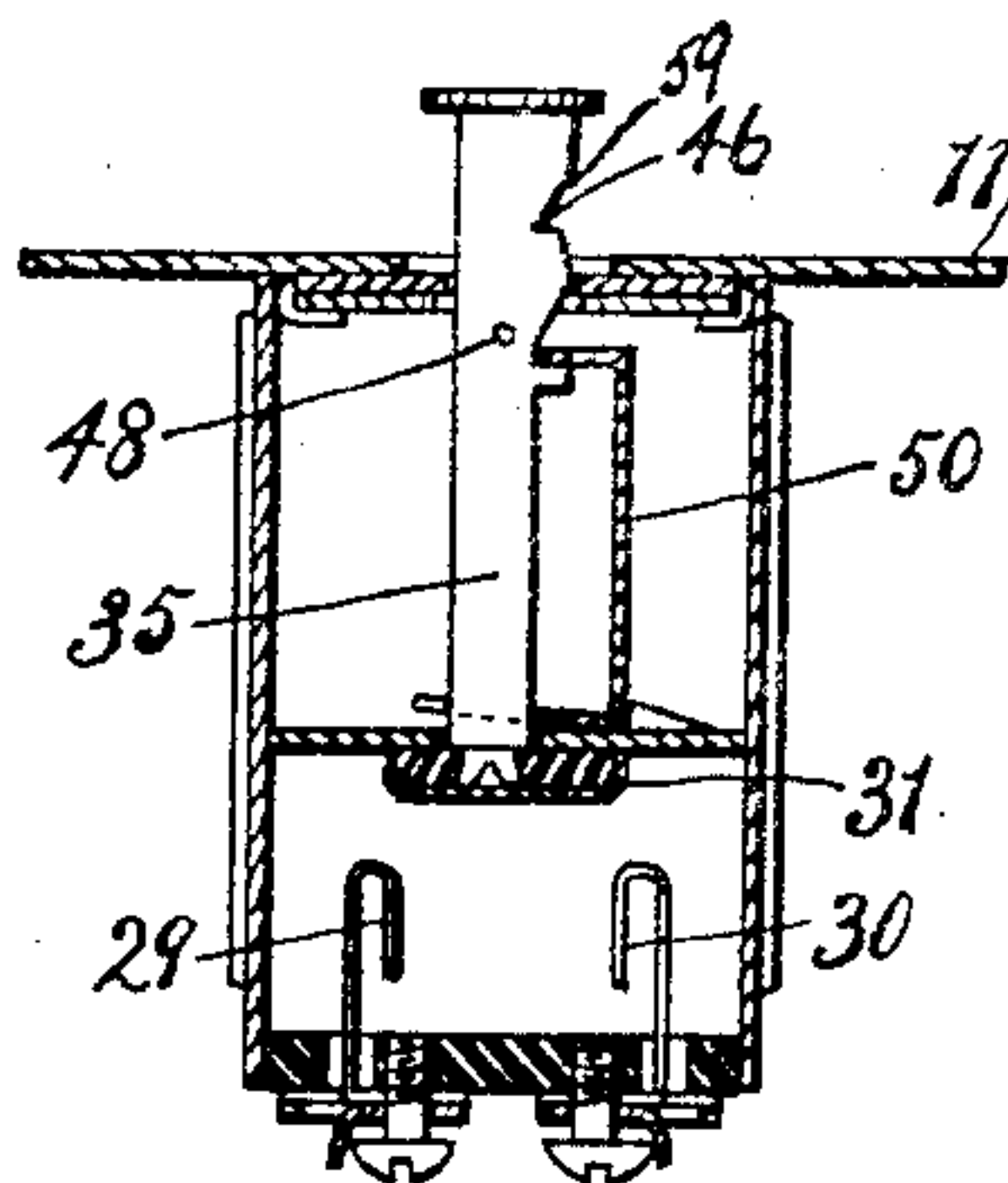


Fig. 4.

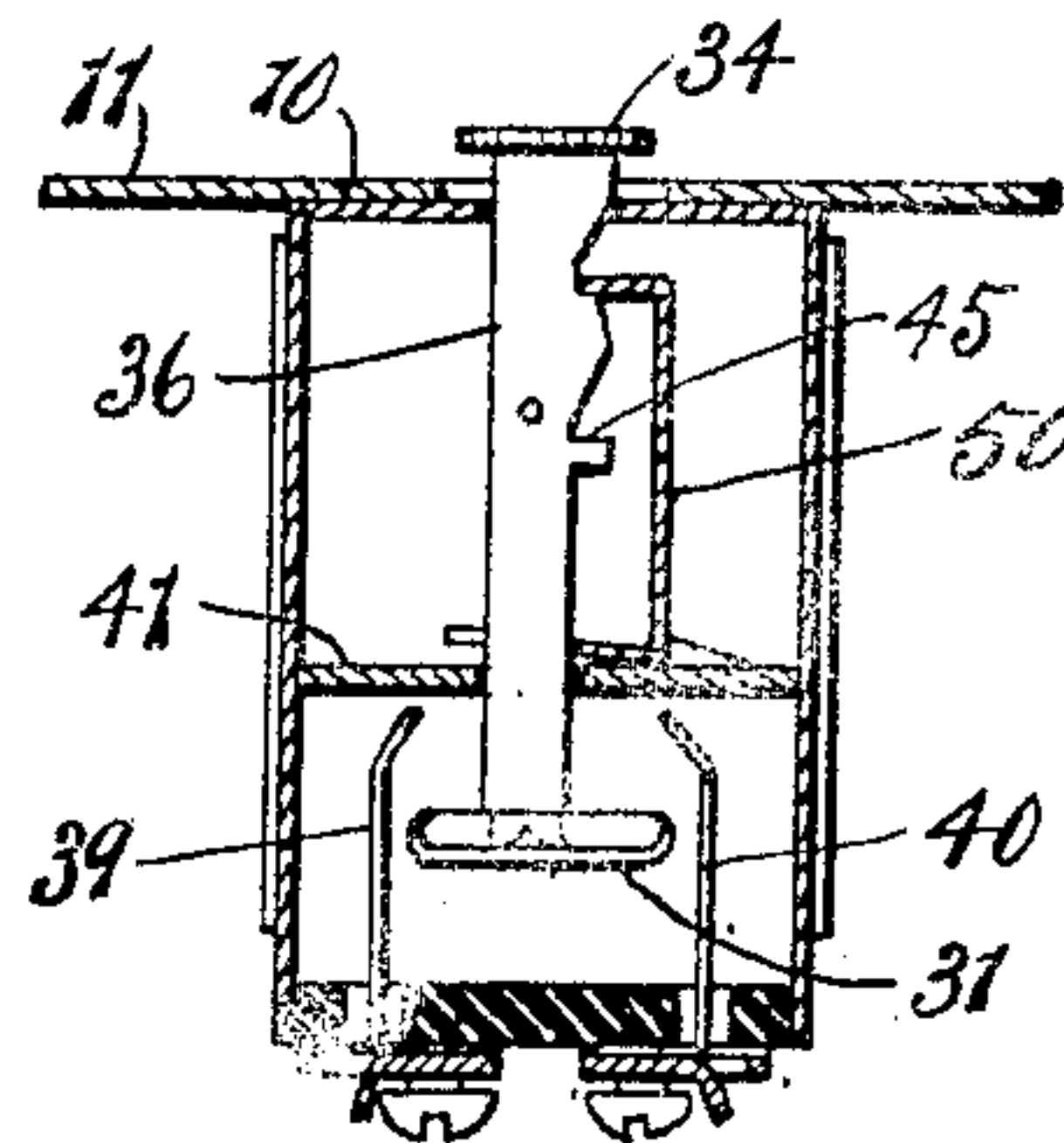


Fig. 5.

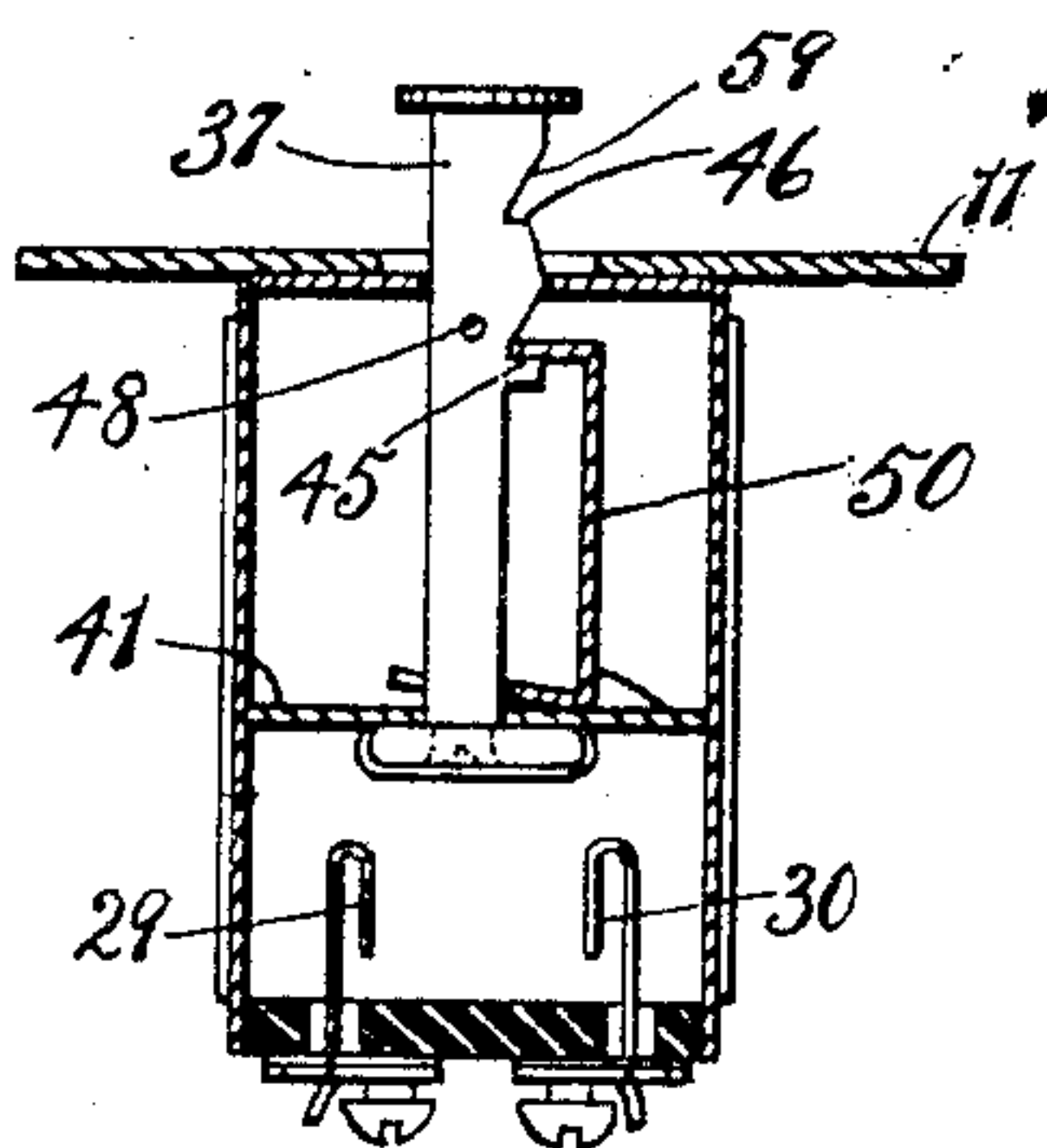


Fig. 6.

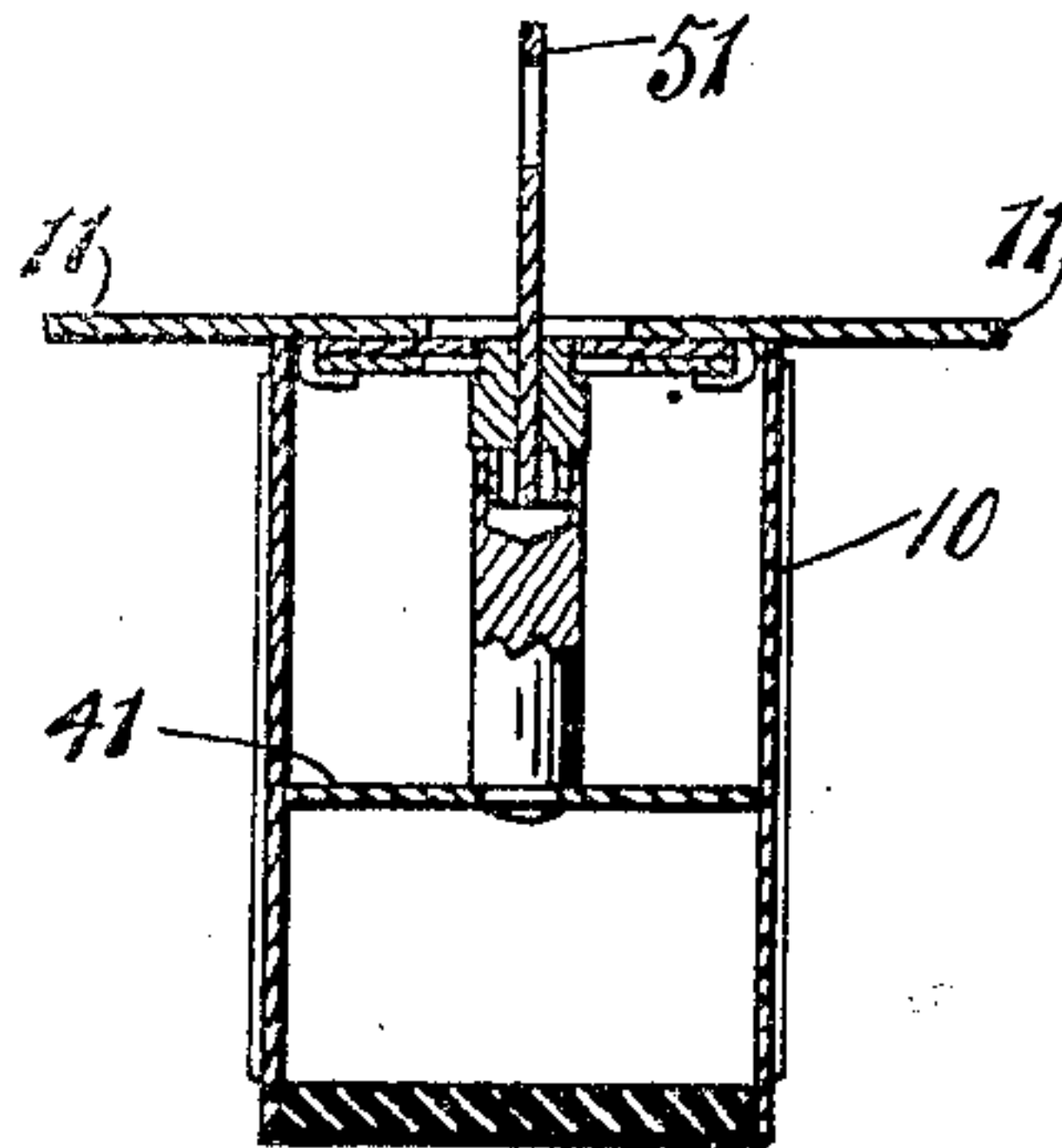


Fig. 7.

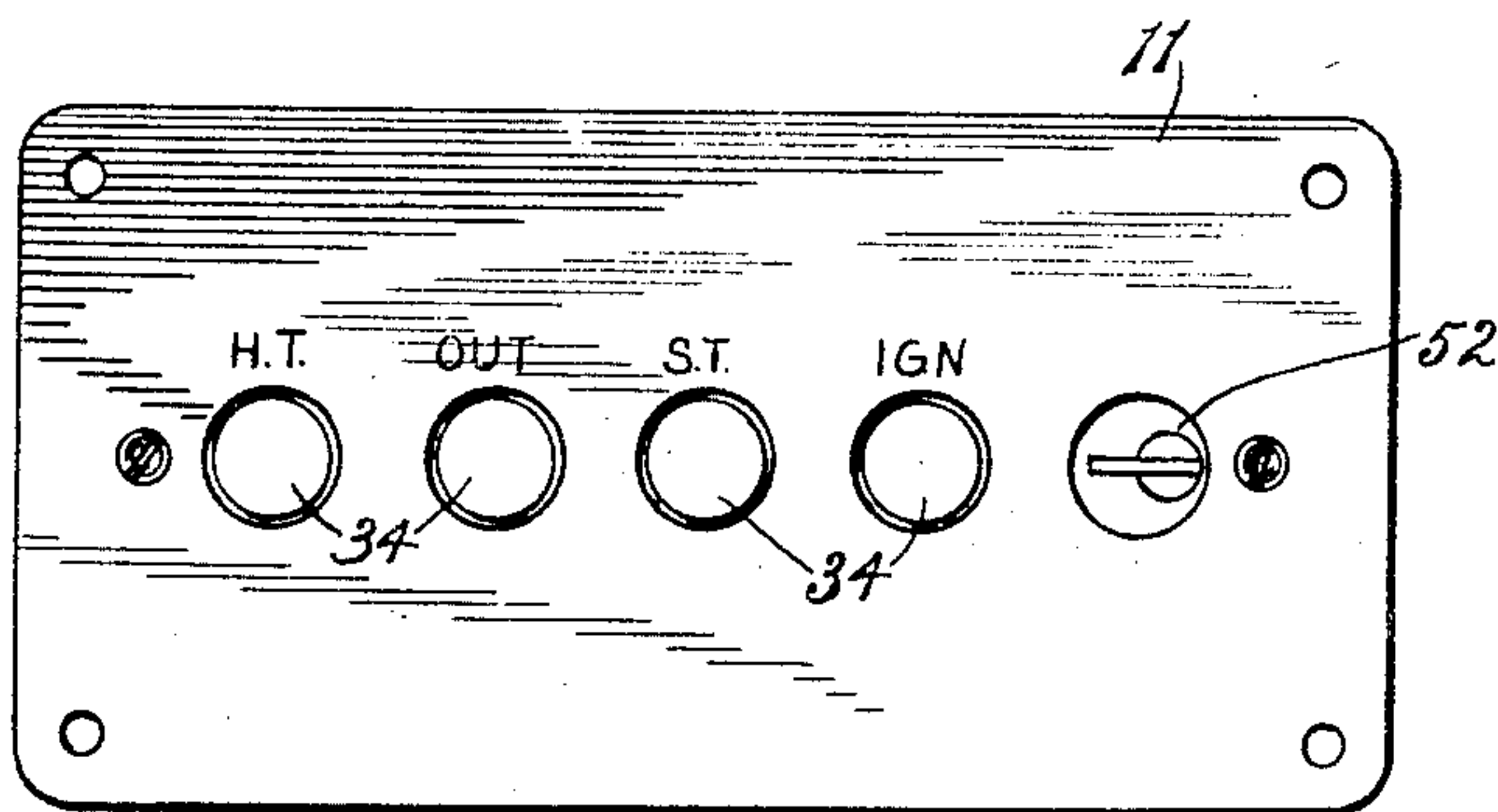


Fig. 8.

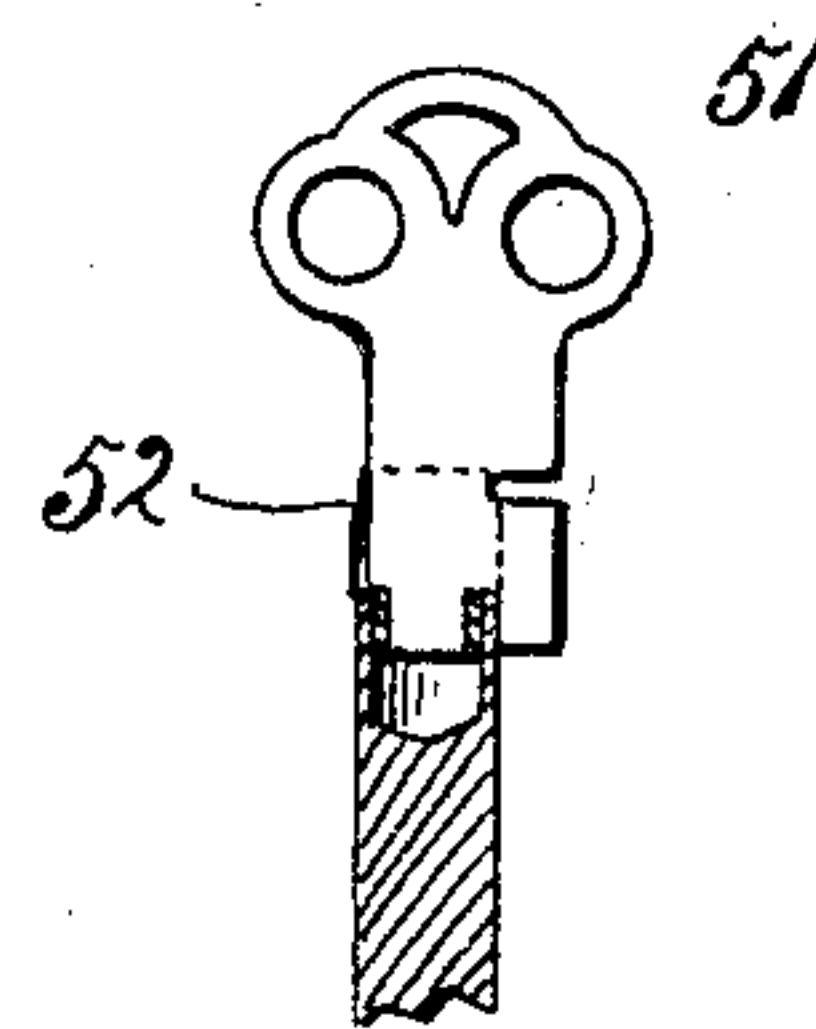


Fig. 9.

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UNITED STATES PATENT OFFICE.

CARL BRAMMING, OF CHICAGO, ILLINOIS, ASSIGNOR TO ACCESSORIES MANUFACTURING COMPANY, A CORPORATION OF ILLINOIS.

SWITCH FOR ELECTRIC CIRCUITS.

1,297,996.

Specification of Letters Patent.

Patented Mar. 25, 1919.

Application filed October 16, 1917. Serial No. 196,885.

To all whom it may concern:

Be it known that I, CARL BRAMMING, a citizen of the United States, and resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Switches for Electric Circuits, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

10 The invention relates to switch mechanism for controlling electric circuits and is especially adapted for use on automobiles in connection with the ignition and lighting circuits.

15 The object of the invention is to provide a key control switch whereby unauthorized operation of the car and of its lighting system may be prevented. It consists in the structure such as is hereinafter described and illustrated in the accompanying drawings in which—

25 Figure 1 is a diagrammatic view of the electric circuits and a longitudinal sectional view through the casing of the switch mechanism,

Figs. 2 to 7 are sectional views of the switch mechanism taken respectively on the lines 2—2, 3—3, 4—4, 5—5, 6—6 and 7—7, and

30 Fig. 8 is a view of the face plate and the switch keys,

Fig. 9 is a detail view of the key and socket.

35 The switch mechanism is inclosed within a casing 10 which, as shown, is oblong rectangular in form and may be entered into an aperture in a wall of the vehicle or other structure in connection with which it is to be used, the casing preferably being covered

40 by a face plate 11 through which the controlling key and the plungers of the various switches enter, as shown in Figs. 1 and 9. As illustrated the device is intended to control the circuit of ignition mechanism

45 conventionally represented at 12, of a pair of head lights 13, a pair of side lights 14 and tail lamp 15. The battery for providing electric energy is represented at 16. To the inner wall 17 of the casing 10 is attached

50 a series of binding posts as 18, to which one of the battery lines 19 is connected, there being one of such posts for each of the circuits to be controlled. To the same wall there is attached a second series of binding

55 posts, as 20, one for each circuit, to which are

attached respectively the lines 21 leading to the ignition device, 22 leading to the side lamps, 23 leading to the tail lamp and 24 leading to the head lights. The return lines of these several circuits leading to the battery are represented respectively at 25, 26, 27 and 28.

A pair of spring contact elements, as 29—30 is associated with each pair of binding posts 18—20, the members of each pair of contacts 65 coöperating with the bridging switch element 31 carried by a plunger 32 reciprocating through the outer wall 33 of the casing 10 and through the face plate 11, each plunger being provided with a head or 70 finger key 34. The switch plunger or key of the ignition circuit is designated 32, that of the side lights 35, that of the tail lamp 36 and that of the head lights 37. Each of the several plungers is normally extended or 75 moved backwardly by a spring, as 38, and is advanced or moved forwardly by pressure upon its outer end. The spring contact elements, as 29—30, of the ignition, side and head lamps are so disposed that the circuit 80 is closed when the plungers are forced inwardly. The contact elements, as 39—40 of the tail lamp are of greater length and so shaped, as shown in Fig. 5, that the circuit is closed when the plunger is in its outer 85 position and open when the plunger is in its inner position. The inner ends of the plungers reciprocate through a guide plate or partition 41 located across the casing 10. Upon this partition 41 there is seated one of 90 the flanges 42 of the U-shaped plate 43. The upper flange 44 of this plate coöperates with a pair of backwardly facing shoulders 45—46 formed on the side of the plunger, the former engaging the flange to limit the out- 95 ward movement of the plunger and the latter engaging the flange to hold the plunger in its inner position. Between the two shoulders the edge of the plunger is inclined to form a forwardly facing cam 47 for forcing 100 the plate 43 backwardly out of the path of the shoulders as the plunger advances. The springs 38, of the several plungers are attached at one end to the plunger, as indicated at 48, and at the other end to the 105 flange 42 adjacent its margin, as indicated at 49. This arrangement of the springs therefore not only causes it to urge the plunger outwardly but also tilts the plate 43 forwardly to hold its upper flange in en- 110

gagement with the shouldered edge of the plunger.

When the plunger 32 is forced inwardly it cams backwardly the plate 43 until the shoulder 46 passes the flange 44, whereupon, under the influence of the spring associated with the plunger, the flange 44 is forced into engagement with the shoulder 46 and the circuit remains closed until the plunger is released. This release is effected by means of a key 51 entering through the face plate 11 at 52. The key 51 is provided with a shoulder 53 adapted to engage the flange 44 and force it backwardly, thus releasing the plunger. By the same movement the shoulder 53 of the key engages a margin 54 of an aperture 55 in a reciprocating locking plate 56 in sliding engagement with the inner surface of the outer wall 33 of the casing 10 and carrying a dog 57, which by the movement of the plate 56 under the influence of the key, is forced back of the plate 43 thereby preventing inward movement of the plunger 32 until the key is again turned. When the plunger is thus locked the key is in position for removal and the ignition switch is therefore inoperative except when released by the same or a similar key. The key and the key opening may of course be suitably configured to render it impossible to insert a key of different shape.

The controlling plate 43 is associated only with the plunger of the ignition circuit. A similar plate 50 is associated with the several plungers of the light circuits which are provided with shoulders and an intermediate cam the same as the plunger 32. The plate 56 is also provided with a dog 58 adapted to cooperate with the plate 50, locking it against movement when the key is withdrawn or turned to the withdrawing position thereby retaining the switches of the several circuits in the position they then occupy.

The inward movement of any one of the plungers of the light circuits will release any of the other plungers of such circuits which may at the time occupy their inner positions. In Fig. 1 these several circuits are shown as being open. The intrust of either or both of the plungers 35—37 will close the circuit or circuits with which they are associated and release the plunger 36 thereby closing the tail light circuit. Each of the plungers 35—37 is provided with a cam face 59 back of its retaining shoulder 46. Further advance of either of these plungers from the closed position will tilt the plate 50 backwardly thereby releasing the other plunger should it be in circuit closing position.

It follows therefore that with the light circuit switches in the positions of Fig. 1 all three of these circuits will be closed by pushing in the plungers 35—37, or by advancing one only thereof the circuit which it con-

trols as well as the tail light circuit will be closed. The advance of the plunger 36 effects the opening of all of the circuits. With all of the light circuits closed pressure upon the plunger 35 will cut out the head lights. To again close the head light circuits without cutting out the side lights pressure will be applied to both plungers 35—37.

While the lights 14 have been referred to as side lights it is obvious that they may be dim lights for use in alternation with the head lights. In this case the plungers 35 and 37 will be actuated in alternation and it is obvious that these two switches may be so used either for controlling separate circuits or for connecting up the head lights either serially, for the purpose of securing a dim light, or in multiple for the purpose of securing a bright light.

While the switch mechanism is shown as arranged to control all of the light circuits and also the ignition circuit it is obvious that the switches of the light circuits and that of the ignition circuit may be mounted in separate casings and be wholly independent each of the other.

While it is desirable to employ locking means for preventing meddlesome persons from tampering with the lights, the switch mechanism described for controlling the light circuit is simple and of economical construction and convenient in use, one of its advantages being that all of the movements are secured by pressure.

The face plate 11 may be designed to give a suitable finish to the switch mechanism and may carry suitable characters for designating the various circuits controlled by the plungers. As shown the letters "H T" are applied to the head light circuit and indicate that the manipulation of that plunger will close both the head light and tail light circuit; in like manner the letters "S T" are employed to indicate that the plunger with which they are associated will close the side light and tail light circuits. The word "Out" is applied to the plunger associated with the tail light circuit and indicates that pressure thereon will extinguish all of the lights. The letters "I G N" are applied to the plunger associated with the ignition circuit.

While a preferred embodiment of the invention is shown and described, various changes of detail may be made without departing from its scope.

I claim as my invention:

1. In combination, an electric circuit, a plunger switch therefor, the stem of the switch having a backwardly facing shoulder and a forwardly and inwardly inclined cam face in advance of the shoulder, a U-shaped element facing the stem and arranged to rock on one of its side arms and to engage the shoulder and cam by its other arm, and

a spring reacting between the first named arm and the stem to urge the stem backwardly and the U-shaped element toward the stem.

5 2. In combination, an electric circuit, a plunger switch therefor, the stem of the switch having a backwardly facing shoulder and a forwardly and inwardly inclined cam
10 element facing the stem and arranged to rock on one of its side arms and to engage the shoulder and cam by its other arm, a spring reacting between the first named arm and the stem to urge the stem backwardly
15 and the U-shaped element toward the stem, and a key controlled dog for preventing movement of the U-shaped element by the cam.

3. In combination, an electric circuit, a
20 plunger switch therefor, the stem of the switch having a backwardly facing shoulder and a forwardly and inwardly inclined cam face in advance of the shoulder, a U-shaped element facing the stem and arranged to rock on one of its side arms and to engage
25 the shoulder and cam by its other arm, a spring reacting between the first named arm and the stem to urge the stem backwardly and the U-shaped element toward the stem,
30 a dog slidable back of the U-shaped element, a key socket, a key fitting the socket and adapted to move the dog into engagement with the named element when turned to withdrawing position.

35 4. In combination, an electric circuit, a plunger switch therefor, the stem of the switch having a backwardly facing shoulder and a forwardly and inwardly inclined cam face in advance of the shoulder, a U-shaped
40 element facing the stem and arranged to rock on one of its side arms and to engage the shoulder and cam by its other arm, a spring reacting between the first named arm and the stem to urge the stem backwardly

and the U-shaped element toward the stem, 45 a dog for engaging the rear face of the U-shaped element, a key socket, and a key fitting the socket and adapted to move the dog to engaging position when turned to a position to permit its withdrawal from the
50 socket.

5. In combination, an electric circuit, a plunger switch therefor, the stem of the switch having a backwardly facing shoulder and a forwardly and inwardly inclined cam
55 face in advance of the shoulder, a movable detent coöperating with the cam and shoulder, and a spring re-acting between the stem and the detent to urge the stem backwardly and to urge the detent toward the stem. 60

6. In combination, a plurality of light circuits, a spring retracted plunger switch for each circuit, one of such switches being adapted to close its circuit when advanced and the other being adapted to close its circuit when retracted, means for holding the plungers in advanced position, such holding means being releasable by the inward movement of each plunger. 65

7. In combination, two light circuits, a
70 spring retracted plunger cut-out switch in each circuit, one of such switches closing and the other opening the circuit with which it is associated when advanced, a detent for holding each plunger in advanced position,
75 and means on each of said plungers to release said detent.

8. In combination, three light circuits, a spring retracted plunger cut-out switch in each circuit, one of said switches being
80 adapted to open and the other two switches being adapted to close the circuit with which each is associated, by advance movement, a detent for holding the several switches in advanced position, and means on each of
85 said plungers to release said detent.

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