

No. 692,926.

Patented Feb. 11, 1902.

H. W. SMITH.  
ELECTRIC CIRCUIT CLOSER FOR LOOMS.

(Application filed Feb. 6, 1899.)

(No Model.)

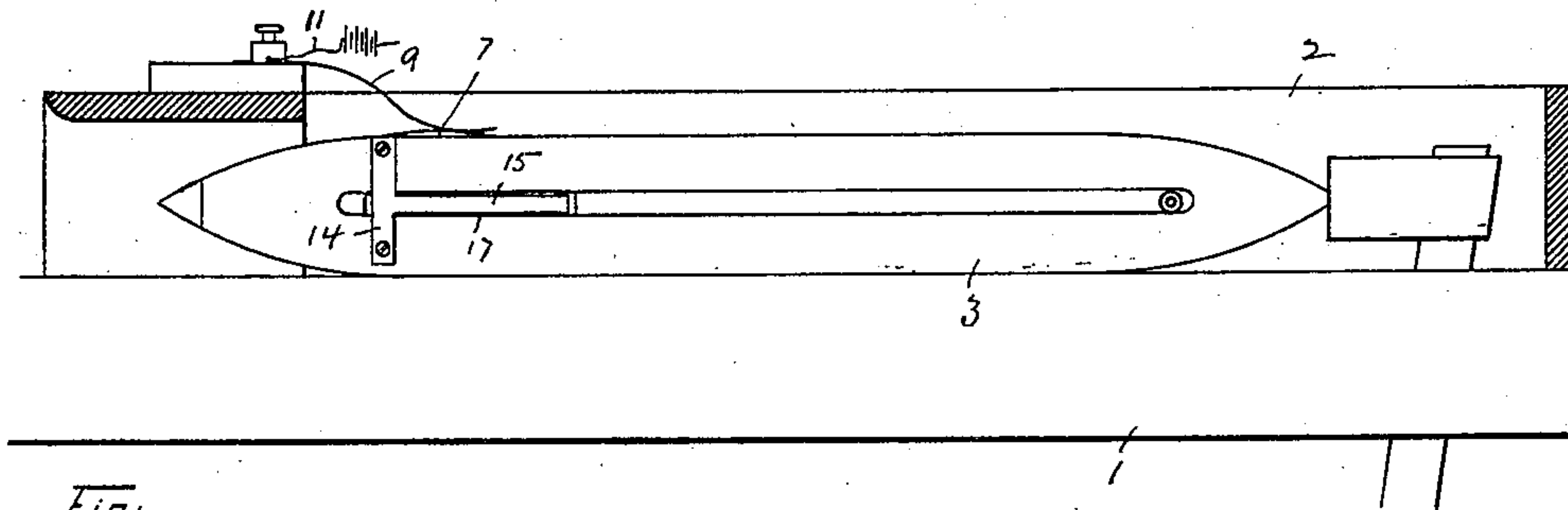


FIG. 1.

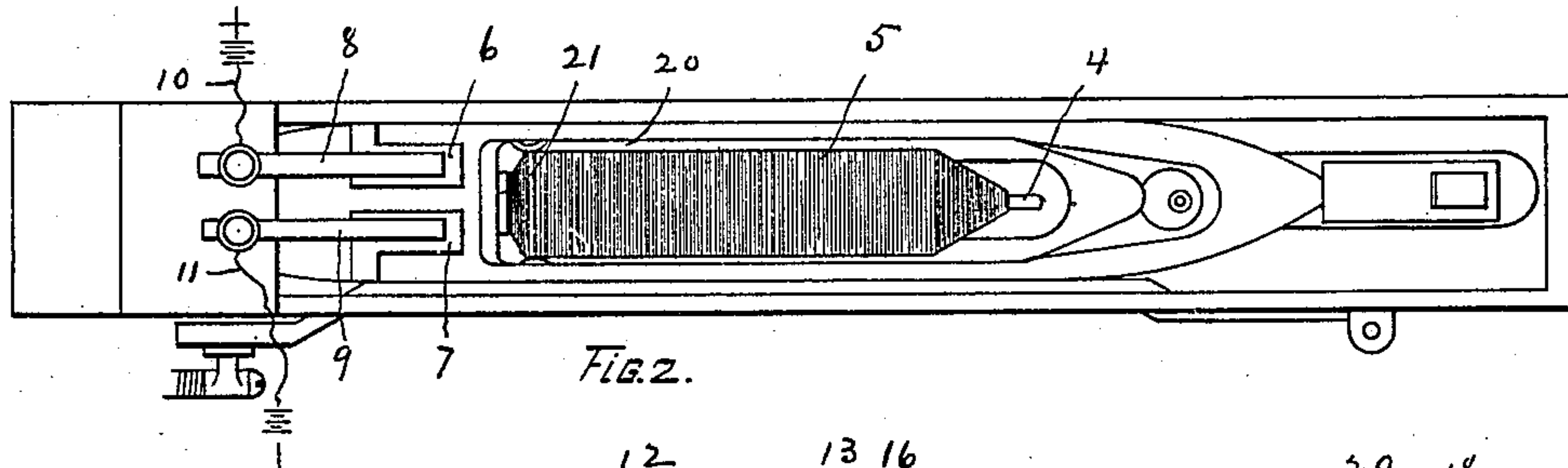


FIG. 2.

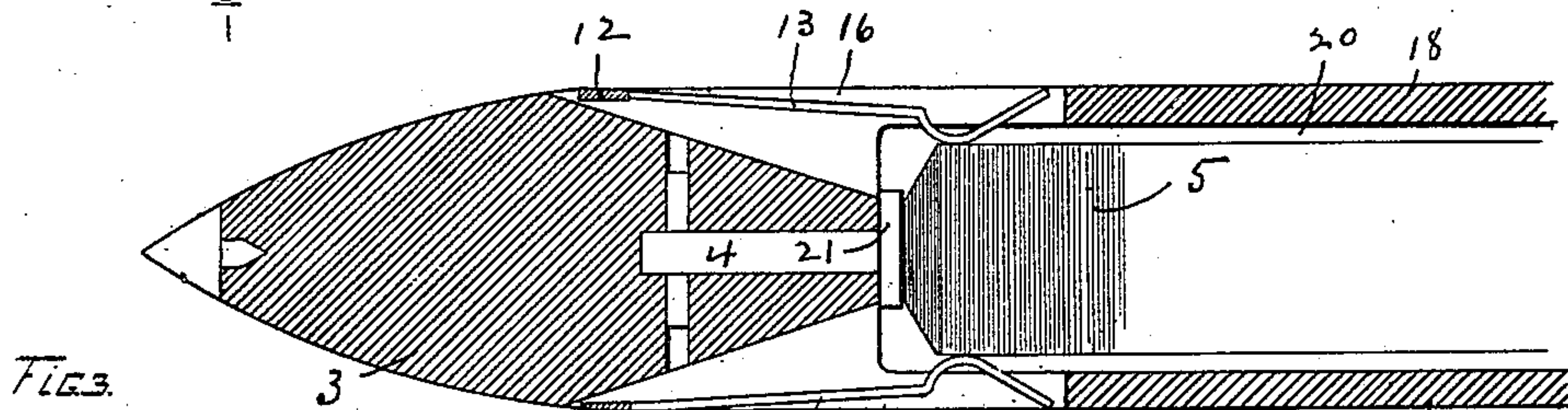


FIG. 3.

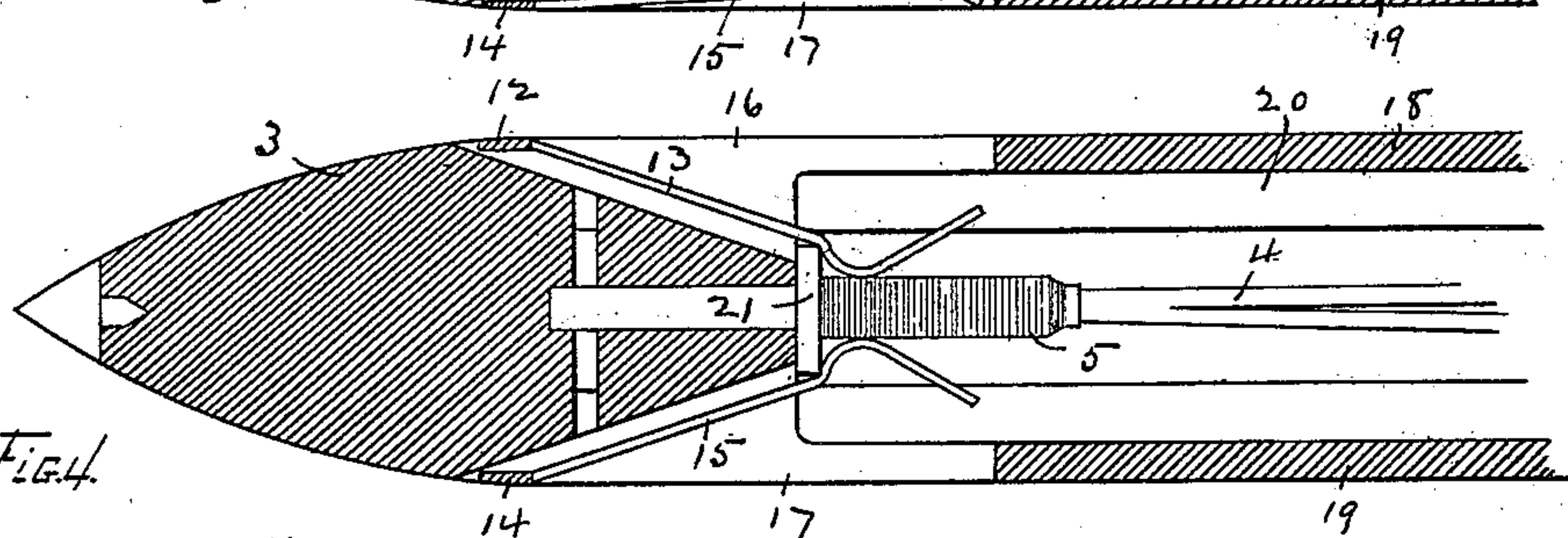


FIG. 4.

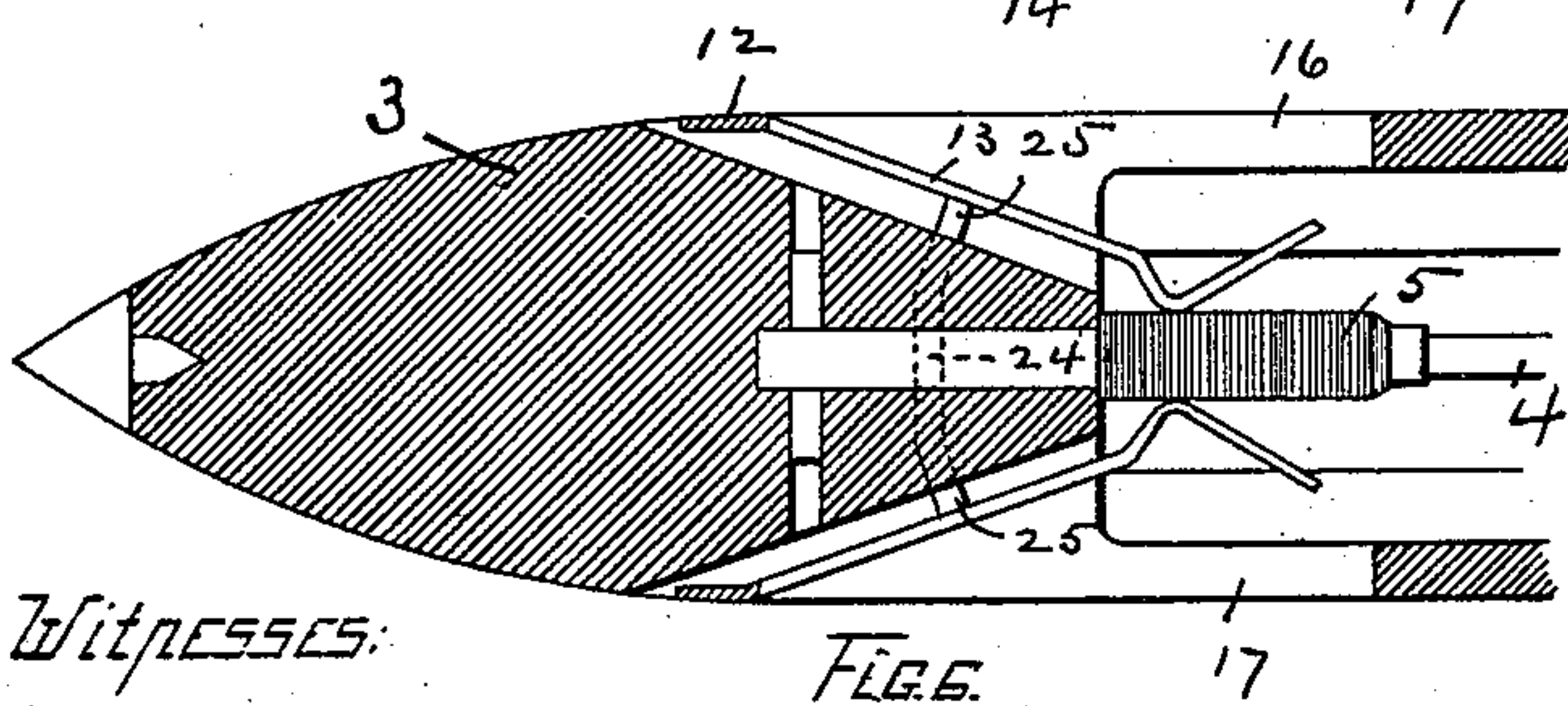


FIG. 5.

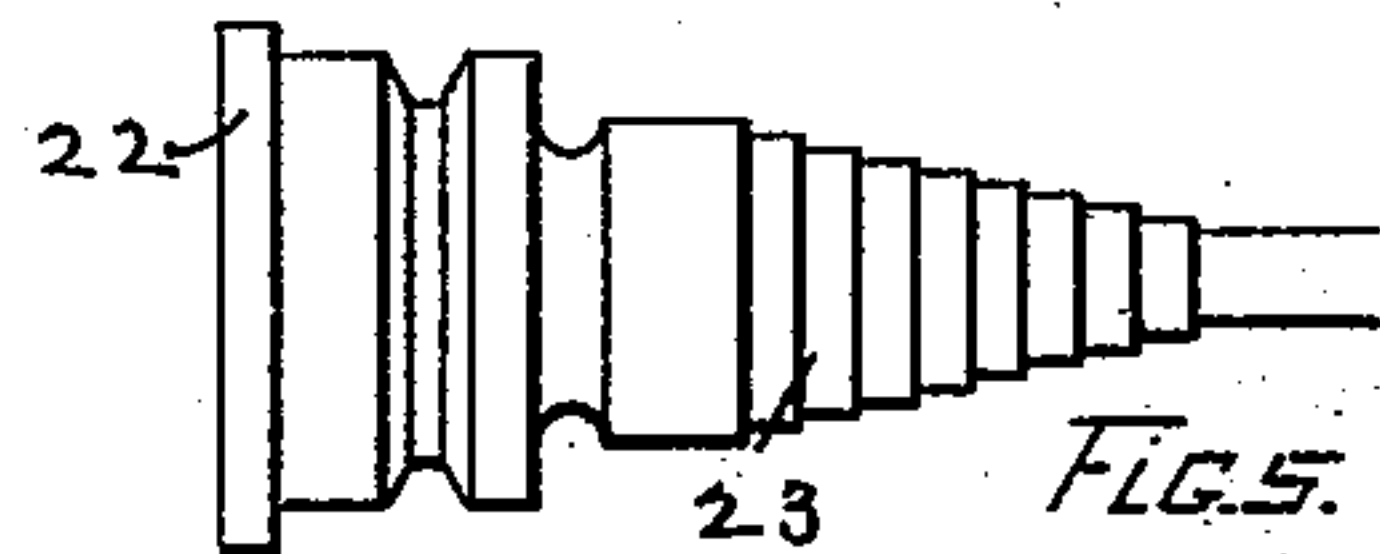


FIG. 5.

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# UNITED STATES PATENT OFFICE.

HARRY W. SMITH, OF WORCESTER, MASSACHUSETTS.

## ELECTRIC-CIRCUIT CLOSER FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 692,926, dated February 11, 1902.

Application filed February 6, 1899. Serial No. 704,763. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY W. SMITH, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Electric-Circuit Closers for Looms, of which the following is a specification, accompanied by drawings forming a part of the same, and in which—

10 Figure 1 represents a front elevation of a portion of a loom-lathe, with the shuttle-box mounted thereon, having the front of the box removed in order to disclose the shuttle in position in the shuttle-box. Fig. 2 is a top  
15 view of the shuttle-box and shuttle contained therein. Fig. 3 is a central vertical sectional view, on a larger scale, of a portion of the shuttle, showing the elastic blades or feelers supported by the weft upon the cop. Fig. 4 represents the same view as Fig. 3, but with the elastic blades or feelers electrically connected by their contact with a metallic washer carried  
20 upon the cop-spindle, showing the position of the feelers when the circuit is closed by the withdrawal of the weft from the cop. Fig. 5 represents a portion of a conical wooden bobbin commonly used in weaving-loom with a metallic disk attached thereto; and Fig. 6 represents a portion of a shuttle shown in central vertical sectional view with a metallic  
30 wire, with its ends in the paths of the elastic blades or feelers.

Similar reference-figures refer to similar parts in the different views.

35 My invention relates to a device for closing an electric circuit, which is determined by the partial withdrawal of the weft from the shuttle in the operation of weaving, whereby an electromagnet may be energized for the purpose of controlling the operation of an auxiliary mechanism—such, for example, as mechanism for automatically stopping the loom or furnishing a fresh supply of filling. Such auxiliary mechanism controlled by an elec-  
45 tromagnet is now in common use, and its construction and operation will be well understood by those conversant with this class of machinery. Therefore I have not deemed it necessary to describe or show the same,  
50 but have confined myself to the description

and illustration of the device which embodies my invention, whereby the electric circuit is closed at the proper period and before the entire exhaustion of the weft from the shuttle.

Referring to the accompanying drawings, 55 which represent one embodiment of my invention, 1 denotes one end of a loom-lathe, upon which is mounted a shuttle-box 2, containing a shuttle 3, in which is a spindle 4, adapted to receive a weft-cop 5, said cop being shown as full in Figs. 2 and 3 and as  
60 nearly empty in Fig. 4.

Placed upon the outer surface of the shuttle, and preferably, as in the present instance, upon the top side, are two metallic contact-  
65 strips 6 and 7, and attached to the shuttle-box or fixed portion of the lathe are brushes 8 and 9, projecting into the path of the contact-strips 6 and 7 during the reciprocating motion of the shuttle. The brush 8 is con-  
70 nected by the wire 10 with one pole of a battery or other source of an electric current, and the brush 9 is connected by the wire 11 with the opposite pole. The contact-strip 6 passes down one of the vertical sides of the  
75 shuttle, as at 12, and integral therewith or electrically attached thereto is a yielding feeler 13, preferably consisting of an elastic blade. The contact-strip 7 similarly passes  
80 down the opposite vertical side of the shuttle, as at 14, and integral therewith or electrically attached thereto is a yielding feeler 15, similar to the feeler 13. The opposite sides of the shuttle are preferably slotted, as at 16 and  
85 17, to receive the feelers 13 and 15.

The slots 16 and 17 preferably extend through the vertical side walls 18 and 19 of the cop-chamber 20, and the free ends of the feelers 13 and 15 are arranged to enter the  
90 cop-chamber 20 and rest in their normal position upon a metallic disk 21, carried by the hinged spindle 4. The feelers 13 and 15 are bent so their free ends will diverge to facilitate the insertion of a cop upon the spindle 4.

When a cop is placed upon the spindle 4, 95 the feelers are pressed apart and out of contact with the disk 21, as represented in Fig. 3. As the weft is withdrawn in the operation of weaving the elasticity of the feelers 13 and 15 cause them to approach each other, and  
100



when a sufficient amount of weft has been withdrawn from the cop the feelers 13 and 15 come in contact with the metallic disk 21, thereby electrically connecting the feelers 13 and 15 and the contact-strips 6 and 7, so that the movement of the shuttle into the box by bringing the contact-strips 6 and 7 into contact with the brushes 8 and 9 will complete the electric circuit.

10 I have shown and described a disks 21 held upon the spindle 4 and in the path of the feelers 13 and 15; but the means for electrically connecting the feelers might obviously be carried by a bobbin or other weft carrier, as shown in Fig. 5, in which a disk or ring 22 is attached to the end of a bobbin 23 of the form in common use and brought into the position of the disk or ring 21 when the bobbin is placed upon the spindle 4. Instead  
20 of a disk 21 held by the spindle 4 a wire 24 may be inserted in the body of the shuttle, with its ends 25 25 projecting into the slots 16 and 17 and into the paths of the feelers 13 and 15 as they approach each other, as shown in Fig. 6.

25 The feelers lie parallel with the axis of the spindle, so that the weft-thread as it is unwound from the weft-carrier is drawn off the end in a line parallel with the feelers, and  
30 the coils of thread upon the weft-carrier are not liable to become caught against the edges of the feelers, as each coil as it is stripped from the weft-carrier moves parallel with the edges of the feelers instead of against them,  
35 as is the case when the feelers are located at right angles to the axis of the weft-carrier.

The feelers in my present construction are preferably supported on one end by the shuttle, so that their free ends will extend over the  
40 base of the weft-carrier and contact with a member placed in the path of the feelers at the base of the weft-carrier and outside the weft-supporting surface of the weft-carrier.

I claim—

45 1. The combination with a shuttle-body provided with a bobbin-chamber, of a pair of contact-strips on the outside of said shuttle-body, a pair of brushes forming part of an electric circuit and projecting into the paths  
50 of said contact-strips, yielding feelers electrically connected with said contact-strips and extending through slots in said shuttle-body into the bobbin-chamber with their free ends arranged to rest upon the weft carried  
55 by the shuttle, and means for electrically connecting said feelers as the weft is removed from between them, substantially as described.

60 2. The combination with a shuttle-body and a weft-carrier carried therein, of a pair of yielding feelers forming the terminals of an electric circuit, and arranged on opposite sides of the weft-carrier, whereby they are held apart by the weft, and an intervening  
65 member lying in the path of said feelers as

they approach each other, by which they are electrically connected as the weft is withdrawn, substantially as described.

3. The combination with a shuttle-body and a weft-carrier carried therein, of a pair of  
70 yielding feelers supported at one end by the shuttle-body beyond the base of the weft-carrier and having their free ends overlapping the end of the weft-carrier and on opposite sides thereof, whereby said feelers are separated by the weft, said feelers forming the  
75 terminals of an electric circuit, and an intervening member in the paths of said feelers as they approach each other, whereby they are electrically connected as the weft is withdrawn, substantially as described. 80

4. The combination of a shuttle-body having a bobbin-chamber and a bobbin or cop carried therein, of a pair of yielding feelers lying parallel with the axis of said bobbin or  
85 cop, a metallic contact between said feelers and at the end of the bobbin or cop, said contact lying in the path of said feelers as they approach each other, by the withdrawal of the weft and means whereby said feelers are  
90 brought into an electric circuit by the movement of the shuttle, substantially as described.

5. In an electric-circuit closer for looms, the combination with a shuttle-body having  
95 a chamber for a weft-carrier and a weft-carrier held therein, of a pair of yielding feelers arranged to press against the weft on the weft-carrier, said feelers being substantially parallel with the axis of the weft-carrier and  
100 forming the terminals of an electric circuit, and an intervening member lying in the path of said feelers as they approach each other by the removal of the weft, by which said feelers are electrically connected, substantially as described. 105

6. In an electric-circuit closer for looms the combination with a shuttle-body and a weft-carrier held therein to deliver thread from the end thereof, of a yielding feeler held near one  
110 end by the shuttle-body, with its free end parallel with the axis of the weft-carrier and arranged to normally press against the weft in the path of said feeler, as the weft is removed, substantially as described. 115

7. In an electric-circuit closer for looms, the combination with a shuttle-body and a weft-carrier held therein, of a yielding feeler held near one end in the shuttle-body with its  
120 free end parallel with the axis of the weft-carrier and overlapping its base and arranged to normally press against the weft held thereon and a contacting member lying between the supported end of the feeler and the weft-supporting surface of the carrier, substantially as described. 125

8. In a circuit-closer for looms, the combination of the shuttle-body and a weft-carrier held therein at one end or base to deliver  
130 yarn from the other end thereof, a contact-



band on a portion only of the weft-support-  
ing surface of the carrier to be covered by the  
weft only after the same has been wound a  
number of turns on the weft-supporting sur-  
5 face to one side of said band, and a yielding  
feeler held at one end near the base of the  
carrier and extending parallel to the axis  
thereof, said feeler arranged to normally press

against the weft and to contact with the said  
band as the weft approaches exhaustion and 10  
prior to complete exhaustion thereof.

Dated this 25th day of January, 1899.

HARRY W. SMITH.

Witnesses:

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