No. 848,085. PATENTED MAR. 26, 1907.

H. J. BREWER.

SPRING CLAMP FOR ELECTRIC TERMINAL WIRES.

APPLICATION FILED AUG. 7, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

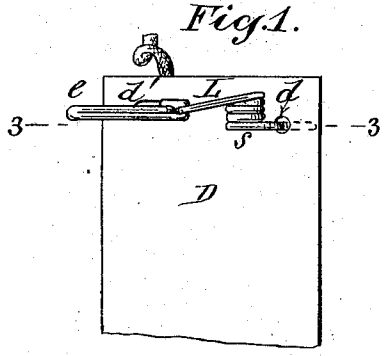


Fig. 2.

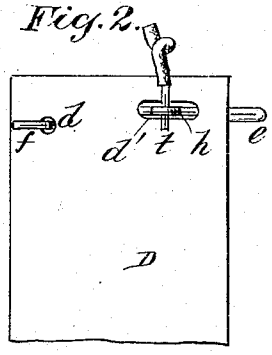


Fig. 5.

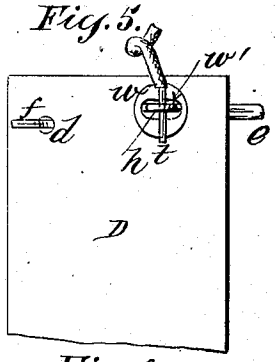


Fig. 3.

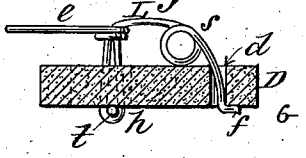


Fig. 4.

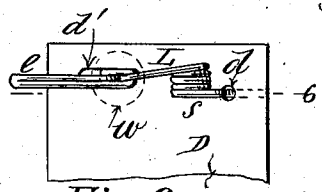


Fig. 6.

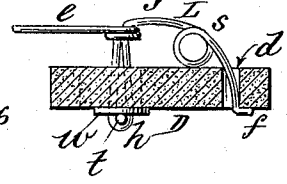


Fig. 7.

Fig. 8.

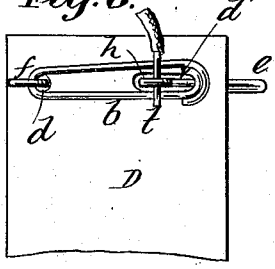
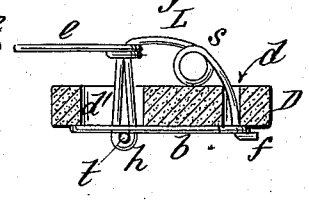


Fig. 9.



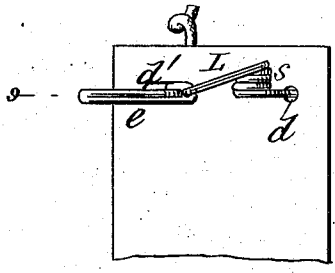
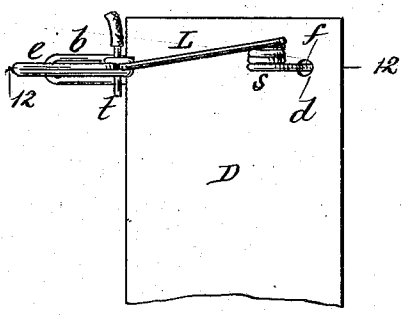


Fig. 10.

Fig. 11.



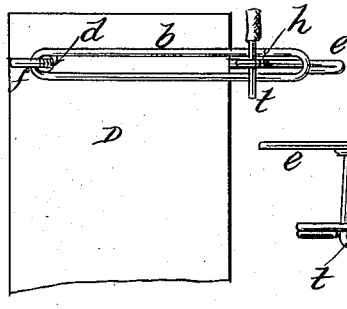
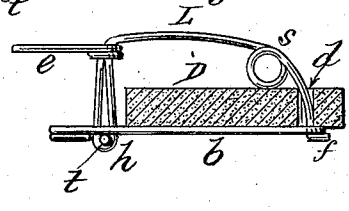


Fig. 12.



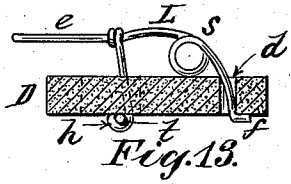


Fig. 13.

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2 SHEETS—SHEET 2.

Fig. 14.

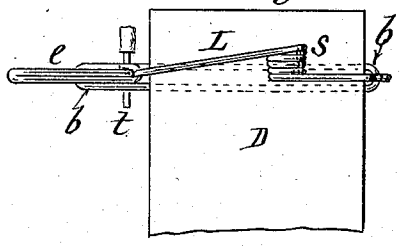


Fig. 15.

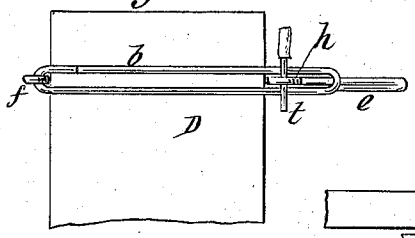


Fig. 16.

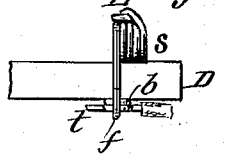


Fig. 17.

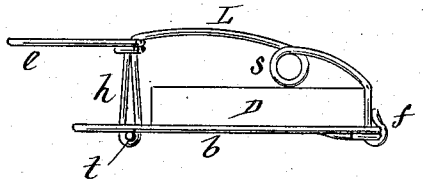


Fig. 18.

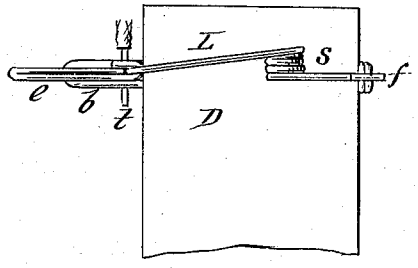


Fig. 19.

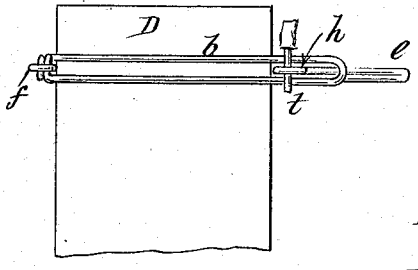


Fig. 20.

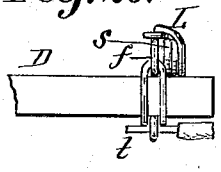


Fig. 21.

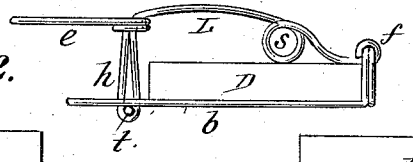


Fig. 22.

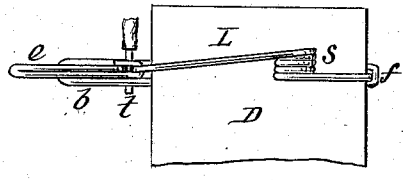


Fig. 23.

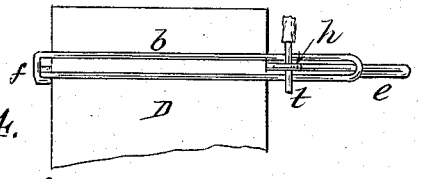
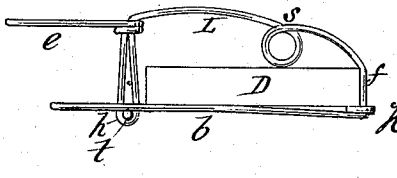


Fig. 24.



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UNITED STATES PATENT OFFICE.

HORATIO J. BREWER, OF NEW YORK, N. Y.

SPRING-CLAMP FOR ELECTRIC TERMINAL WIRES.

No. 848,085. Specification of Letters Patent. Patented March 26, 1907.

Application filed August 7, 1906. Serial No. 329,551.

To all whom it may concern:

Be it known that I, HORATIO J. BREWER, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Spring-Clamps for Electric Terminal Wires, of which the following is a specification.

My invention relates to means for clamping a terminal wire to an electrode or other object with which it is desired to establish electrical connection, the object being to afford a simple, inexpensive, but effective device which may be quickly and conveniently applied or detached, and by means of which the terminal wire is held in intimate electrical contact by spring-pressure.

The invention consists, primarily, in a clamp of resilient metal constituting, essentially, a spring-lever, formed with a hook and with a holder for engaging with the terminal wire, said lever being also preferably formed with intermediate spring-coils which afford the requisite degree of elasticity and resilience to hold the terminal wire in positive electrical contact between said terminal-holder and an opposed surface, and, secondarily, my invention consists in the combination with said spring-lever of an auxiliary bearing-piece adapted to engage with its hook and with a terminal wire inserted between it and said holder, as hereinafter set forth.

In the accompanying drawings I have illustrated the use of my improved terminal-wire clamp in connection with a flat carbon electrode plate, it being understood that I do not limit myself in this respect, since my spring-clamp may be utilized in effecting electrical connection with various other objects, as metal plates and the like, the distinguishing feature being that the elasticity and resilience of my spring-lever performs the double function of attaching the clamp to the electrode or other object as well as of holding the terminal wire in close electrical connection.

Figure 1 is an elevation of one side of the upper end of a carbon plate or other object to which the simpler form of my terminal-clamp is applied. Fig. 2 is an elevation of the opposite side of the plate and clamp; Fig. 3, a section upon plane of line 3 3, Fig. 1. Figs. 4 and 5 are elevations of opposite sides of the plate, showing the use of a washer in connection with my terminal-clamp. Fig. 6 is a section upon plane of line 6 6, Fig. 4. Figs. 7 and 8 are elevations of opposite sides of the plate, showing the use of an auxiliary bearing-piece in conjunction with the spring-lever; Fig. 9, a section taken upon plane of line 9 9, Fig. 7. Figs. 10 and 11 are elevations of opposite sides of the plate, showing a modification. Fig. 12 is a section taken upon plane of line 12 12, Fig. 10. Fig. 13 is a view of the spring-lever, showing a modification in the formation of the terminal-jaw. Figs. 14 and 15 are elevations of opposite sides of the plate, showing another modification. Fig. 16 is a view of a portion of one of the longitudinal edges of the plate giving a rear view of the clamp shown in Figs. 14 and 15. Fig. 17 is an end view of the plate, &c., shown in Figs. 14 and 15. Figs. 18 and 19 are elevations of opposite sides of a plate, showing still another modification; Fig. 20, an edge view, and Fig. 21 an end view, of said plate. Figs. 22 and 23 are elevations of opposite sides of a plate, showing a modification in which the spring-lever and the bearing are made of a single piece of metal; Fig. 24, an end view of the plate, showing said last-named modification.

The essentials of the spring-lever L are the hook or catch *f* at one extremity, the terminal jaw or holder *h* at or near the other extremity, and the intervening spring-coils *s*, all formed, preferably, of a single piece of metallic wire of suitable temper and resilience.

An extension *e* at the forward or terminal end of the lever L is preferably provided to constitute a handle or finger-piece, by means of which the lever may be conveniently manipulated. The terminal-holding jaw *h* may be made in the form of a loop, as shown in all but Fig. 13 of the drawings, the extension *e* consisting of the end of the wire bent over upon itself and about the upper portion of said loop, or said jaw *h* may consist of a hook or catch formed in the extreme forward end of the wire, as shown in said Fig. 13, in which case the extension *e* is made by doubling and returning the wire upon itself above said jaw *h*. This spring L may be used either alone or in conjunction with a bearing-piece *b*, which is preferably, though not necessarily, formed of an elongated loop of wire, one end of the loop forming a bearing for engagement with

the catch *f* and the other extremity admitting of the passage between its side members of the end of the terminal jaw or holder *h*.

In the first three figures of the drawings the catch *f* is shown as passed through a hole *d* in the plate D and engages with and bears against one side of said plate, while the coils *s* bear against the other, the terminal jaw *h* passing through another (elongated) hole *d'* in the plate and engaging with the terminal wire *t*, which is inserted between it and said first-mentioned side of the plate, so that the resilience of the lever L when the latter is released is exerted constantly to press the said terminal wire against the electrode D.

Figs. 4 to 6, inclusive, show the same conditions as in Figs. 1 to 3, except that a metallic washer *w* with an elongated hole *w'* is interposed between the terminal *t* and the side of the plate D for the purpose of increasing surface contact, as where the plate D is a carbon electrode, in which case the washer also protects the edges of the slot *d'* by relieving them from direct contact with the terminal wire *t* and distributing the strain exerted thereon by the spring-lever L.

In Figs. 7, 8, and 9 the washer *w* is replaced by the bearing-loop *b*. In Figs. 10, 11, and 12 both the bearing-loop *b* and the lever L are made of sufficient length to extend beyond the edges of the plate D, so as to dispense with the elongated hole *d'* in said plate D, otherwise the functional relations of both parts are the same. In the remaining figures of the drawings both the holes *d d'* in the plate D are dispensed with and the lever L and bearing-link *b* are made long enough to straddle the plate D. In Figs. 14, 15, 16, and 17 the lever extends across the end of the plate D to the link *b*, which is clasped by the hook *f* of the lever L. In Figs. 18, 19, 20, and 21 the conditions are the same, except that the loop *b* extends across the end of the plate D and engages with the hook *f* on the other side thereof. Finally, in the modification shown in Figs. 22, 23, and 24 the spring-lever L and bearing *b* are made out of a single piece of metal, the hook *f* being merged into said bearing-piece as it were, but the parts performing the same functions, as before set forth.

The coil *s* is essential in that it affords a direct bearing against one side of the plate and takes up and distributes the strain throughout its several convolutions.

It is to be understood that the term "wire" is herein used to designate any suitable metallic strip however formed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A clamp for electric terminal wires, consisting of spring metal formed with a hook and a terminal-wire holder, in combination with the article to which the terminal wire is clamped, said article being formed with a perforation for the reception of said hook and with a perforation for the reception of the terminal-wire holder.

2. A clamp for electric terminal wires, consisting of spring metal formed with a hook, a coiled portion, and a terminal-wire holder, in combination with the article to which the terminal wire is clamped, said article being formed with a perforation for the reception of said hook, and with a perforation for the reception of the terminal-wire holder.

3. A clamp for electric terminal wires consisting of spring metal formed with a hook and a terminal-wire holder, in combination with the article to which the terminal wire is clamped, said article being formed with a perforation for the reception of the said hook, and with a perforation for the reception of the terminal-wire holder, and a washer interposed between the article and the terminal wire.

4. A clamp for electric terminal wires consisting of a single spring-wire formed with a hook, a coiled portion and a terminal-wire holder, in combination with the article to which the terminal wire is clamped, said article being formed with a perforation for the reception of the said hook, and with a perforation for the reception of the terminal-wire holder, and a washer interposed between the article and the terminal wire.

5. A clamp for electric terminal wires, consisting of a spring-wire formed with a hook, and a terminal-wire holder, in combination with the article to which the terminal wire is clamped, said article being formed with a perforation for the reception of the said hook, and with a perforation for the reception of the terminal-wire holder, and a bearing-piece engaging the said hook and formed to admit the terminal-wire holder.

6. A clamp for electric terminal wires, consisting of a spring-wire formed with a hook, a coiled portion, and a terminal-wire holder, in combination with the article to which the terminal wire is clamped, said article being formed with a perforation for the reception of the said hook, and with a perforation for the reception of the terminal-wire holder, and a bearing-piece engaging the said hook and formed to admit the terminal-wire holder.

7. A clamp for electric terminal wires, consisting of spring metal formed with a hook, a coiled portion, and a terminal-wire holder, in combination with the article to which the terminal wire is clamped, said article being formed with a perforation for the reception of the said hook, and a bearing-piece engaging said hook and formed to receive the terminal-wire holder.

8. A clamp for electric terminal wires, consisting of a spring-lever having a coiled portion, a terminal-wire holder, and a bearing-piece formed with a loop for the reception of

the terminal-wire holder, together with the article to which the terminal wire is clamped.

9. A clamp for electric terminal wires, consisting of a spring-lever having a terminal-wire holder and a finger extension, and a bearing-piece formed with a loop for the reception of the terminal-wire holder, together with the article to which said terminal wire is clamped.

10. A clamp for electric terminal wires, consisting of a spring-lever having a coiled portion, a terminal-wire holder and a finger-extension, and a bearing-piece formed with a loop for the reception of the terminal-wire holder, together with the article to which the terminal wire is clamped.

11. In a clamp for electrical terminals, the combination of a spring-lever consisting of a spring-wire formed with a hook and a terminal-wire holder, the latter being formed by doubling the wire upon itself and bending it about the shank of the loop thus formed, together with the article to which the terminal wire is clamped.

12. In a clamp for electrical terminals, the combination of a spring-lever consisting of a spring-wire formed with a hook, a coiled portion, and a terminal-wire holder, the latter being formed by doubling the wire upon itself and bending it about the shank of the loop thus formed, together with the article to which the terminal wire is clamped.

13. In a clamp for electric wire terminals the combination of a spring-lever consisting of a single piece of wire formed with a hook, a coiled portion, a loop for the terminal wire and a finger extension formed by doubling the wire upon itself and bending the end of the wire around the shank of the terminal-wire loop, together with the article to which the terminal wire is clamped.

14. In a clamp for electric terminal wires, a spring-lever consisting of a single piece of wire formed with a hook, a coiled portion, a loop for the terminal wire, the latter being formed by doubling the wire upon itself and bending it about the shank of the loop thus formed, in combination with a bearing-piece engaging with said hook and adapted to receive the terminal-wire holder, together with the article to which the terminal wire is clamped.

15. In a clamp for electric wire terminals, a spring-lever consisting of a single piece of wire formed with a hook, a coiled portion, a loop for the terminal wire, and a finger extension formed by doubling the wire upon itself and bending the end of the wire around the shank of the terminal-wire loop, in combination with a bearing-piece engaging with said hook and adapted to receive the terminal-wire loop, together with the article to which the terminal wire is clamped.

16. In a clamp for electric terminal wires, a spring lever consisting of a single piece of wire formed with a hook, a coiled portion, and a terminal-wire holder, in combination with a bearing-piece consisting of an elongated loop of wire engaging with the hook and adapted to receive the terminal-wire holder, together with the article to which the terminal wire is clamped.

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Witnesses:
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