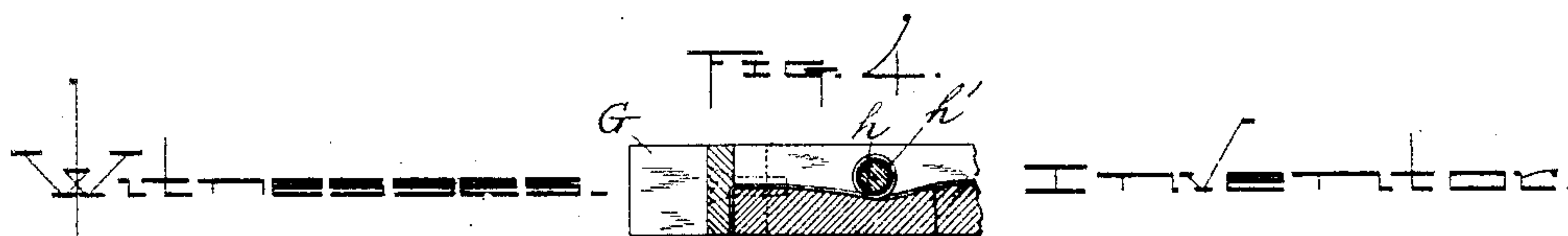
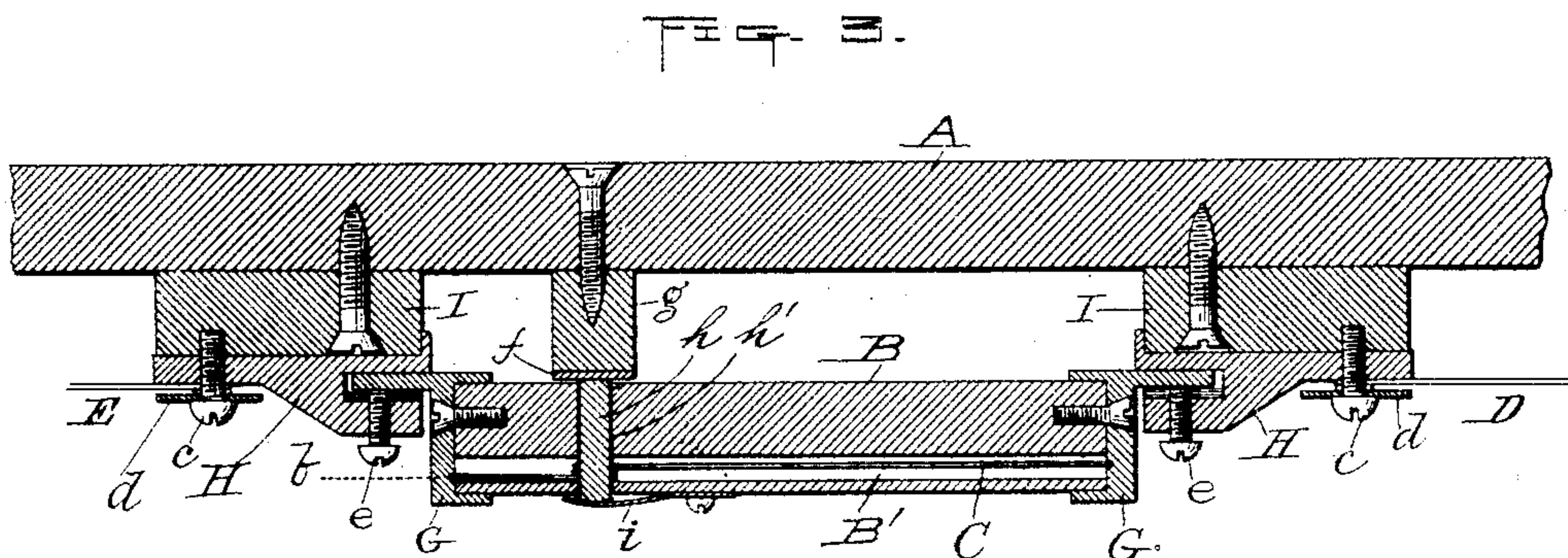
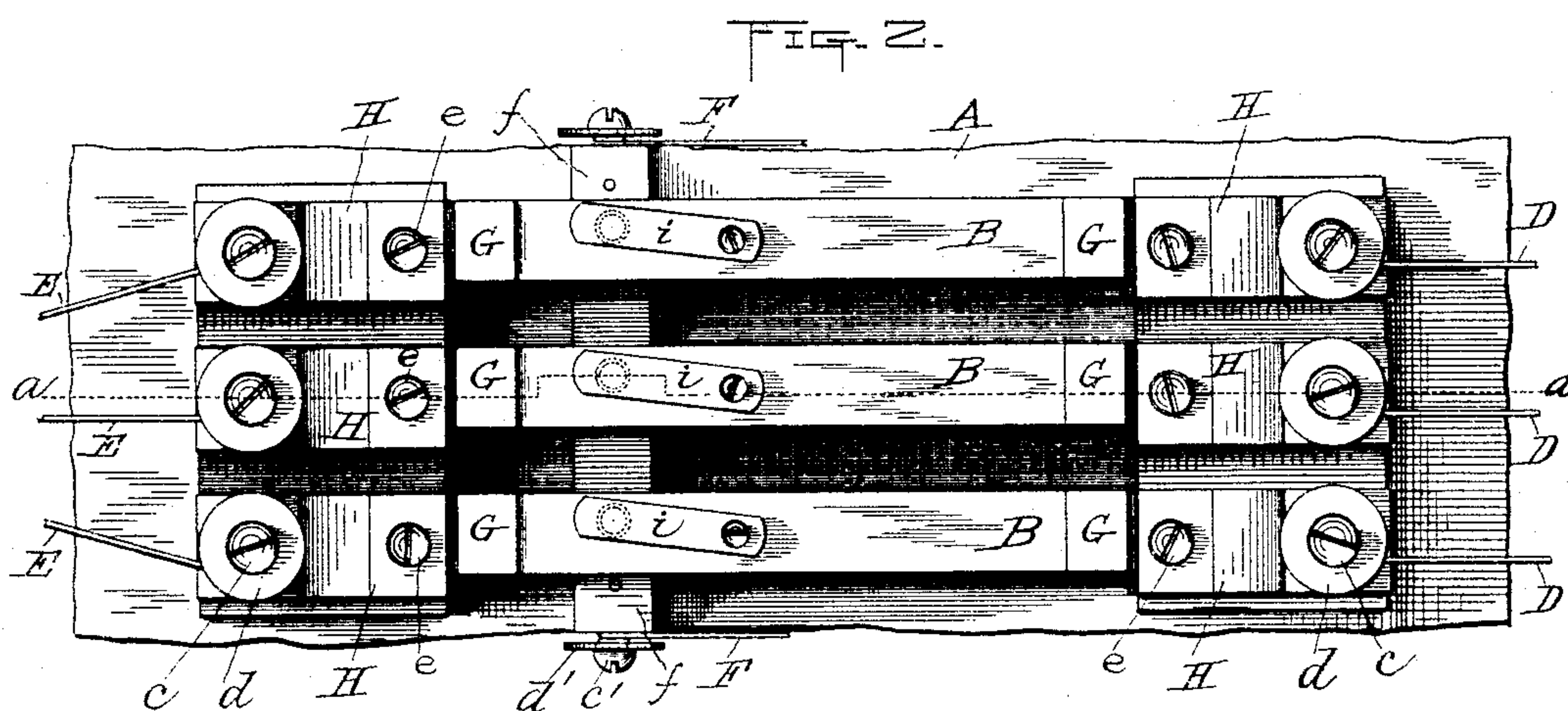
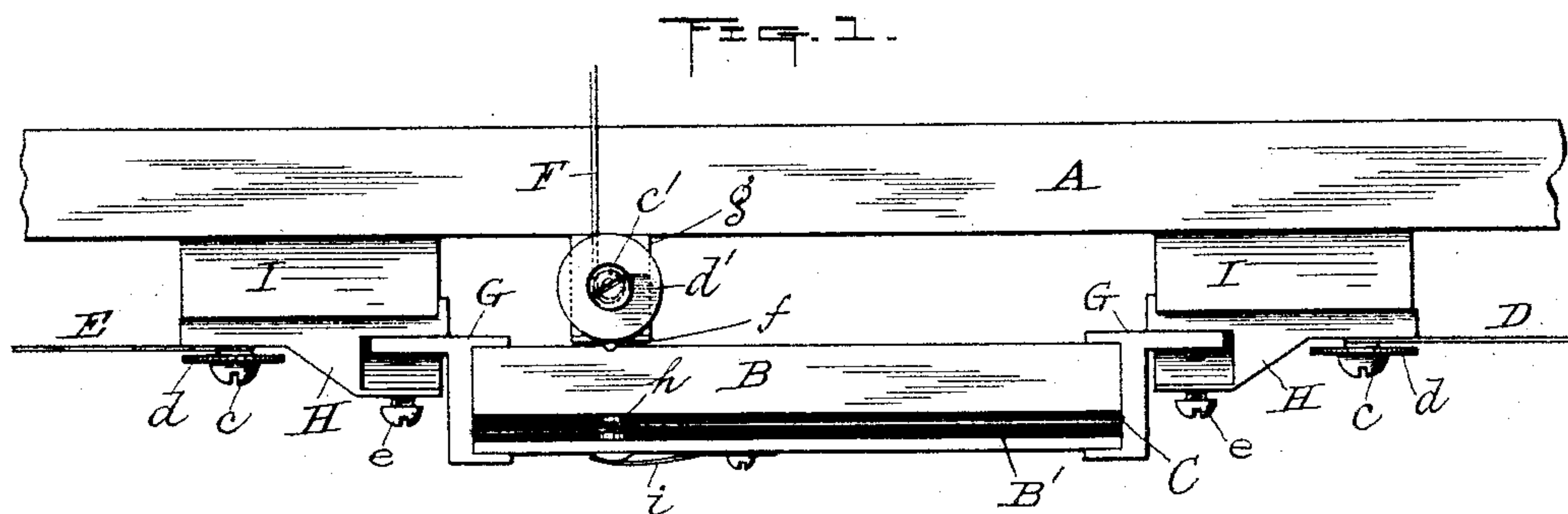


(No Model.)

A. T. ALDRICH.  
COMBINED CUT-OUT AND LIGHTNING ARRESTER.

No. 444,892.

Patented Jan. 20, 1891.



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# UNITED STATES PATENT OFFICE.

ALBERT T. ALDRICH, OF WORCESTER, MASSACHUSETTS.

## COMBINED CUT-OUT AND LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 444,892, dated January 20, 1891.

Application filed June 20, 1890. Serial No. 356,081. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT T. ALDRICH, of the city and county of Worcester, and State of Massachusetts, have invented certain new and  
5 useful Improvements in Protectors for Telephone and Similar Lines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part  
10 of this specification, in which—

Figure 1 represents a top edge view of a protector embodying my improvements, with pieces of the line-wires, cable-wires, and ground-wires connected therewith. Fig. 2 is  
15 a front view thereof. Fig. 3 is a central longitudinal section taken on line *a a*, Fig. 2; and Fig. 4 is a longitudinal section through one end of one of the fuse-wire holders, taken at the point indicated by line *b* in Fig. 3.

20 My invention relates more particularly to protectors for telephone-lines, but may be used on telegraph and electric-light lines, if desired.

It consists of improvements in the construction and mode of supporting the fuse-wire holders and in combining with said holders and the fuse-wire suitable connections  
25 with one or more ground-wires, as and for the purpose hereinafter more fully set forth.

30 To enable others skilled in the art to which said invention appertains to better understand the nature and purpose thereof, I will now proceed to describe it more in detail.

In the drawings, A represents part of the back of the usual box in which the protector  
35 or protectors are arranged and secured.

The parts marked B are the fuse-wire holders; C, the fuse-wires arranged and secured therein; D, the line-wires connecting with  
40 one end of the device; E, the cable-wires connecting with the opposite end of said device, and F the ground-wires connecting with the fuse-wires and their holders, as hereinafter described.

45 The holders B are preferably made of square form in cross-section, but I do not limit myself thereto. They are each provided with a longitudinal slot B' in one side to receive the fuse-wire C, and to both ends are secured the  
50 bearing-pieces G G, which serve not only to connect the holders with the bearings H H, but also to hold the ends of the fuse-wire

between the same and the ends of said holders, as is shown in Fig. 4. The bearings H are preferably fastened to blocks I I, in turn  
55 secured to the back board A. Said blocks and the holders B are in practice made from vulcanized rubber or any other suitable non-conductor of electricity, while the bearing-pieces G and bearings H are made of the  
60 best electric-conducting material, preferably copper or brass.

The line and cable wires D E are attached to the outer ends of bearings H, as is usual in such cases, by means of screws *c* and wash-  
65 ers *d*, said screws in this instance also serving to fasten the bearings in position. The inner ends of the bearings are provided with suitable slots to receive the outer ends of the bearing-pieces G, and the latter are secured  
70 therein by means of set-screws *e*. By the above construction it is obvious that a direct and insulated connection may be made from the line-wires D through the fine fusible wire  
75 C to the usual insulated cable-wires E, which in practice connect with the electrical appliances at the ends thereof. The purpose of thus interposing a fine fusible wire between  
80 the line and cable wires D E is, as is well known, to prevent a strong or unusual current of electricity from passing from said line-wires to and through the cable-wires and  
85 thus causing damage at the end of the line. Said result, as is also well known, is accomplished by said strong electric current quickly  
90 reducing the fusible wire to a molten state and thus breaking the connection between the main wires, the small fusible wire being in practice made of only sufficient capacity to  
95 safely conduct the desired strength of current required without fusing or melting the same. Various devices have been employed for effecting this result, and I therefore limit my invention to the construction shown and described.

The ground-connection is made in the following manner: A metal plate *f* is secured to a block *g* on the back board A and connects  
100 with the ground-wires F through the screws *c'* and washers *d'*. A transverse metal pin *h* is passed through each holder B, whose inner end bears against the surface of said plate *f* and is held endwise against the same by a flat spring *i*, secured to the outside of the



holder. Over said pin is fitted a thin tube *h'*, of suitable non-conducting material, preferably paraffine paper, which is sufficient protection to prevent the electric current being communicated from the fuse-wire (which is wound one or more turns around the same, as shown) to said pin, but not to prevent such connection in case of a current passing over the wires of a greater strength than the fuse-wire is intended to carry. Such a current will at once burn off the tube and thus break the connection with the line and discharge into the surrounding atmosphere or make connection with the ground.

By the usual protectors for telephone-lines which have no ground-connection with the fuse-wire a current of electricity such as produced by lightning if it enters the telephone-line wires will fuse or burn out the protecting-wire C and break the connection with the cable wires; but a current produced by connection with an electric-light wire will pass through said wire C and into the cable wires. I find, however, that by winding the fuse-wire around a transverse pin, as *h*, the current is sufficiently interrupted to cause the same to fly off, and by burning out the thin protecting-tube to pass off to the ground, said interruption necessarily causing the fuse-wire C to also be burned out and the connection thus broken. I have found by practical experiment that with an ordinary fuse-wire such as used by electric-light companies a current of lightning electricity will pass through it without fusing said wire, while if a transverse pin is even pressed against the wire the interruption is sufficient to burn it out, as aforesaid. Although said lateral pressure against the wire has in each practical test proven sufficient, I prefer, in order to positively insure such fusion, to wind the wire one or more times around the pin, as previously described.

By the application of my invention to practice I find that I can melt the fuse-wire and thus break the connection in every instance that a strong current is passed through the same, whether by lightning or by connection with the usual electric-light wires.

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

1. The bearings H, having means for fastening the same to the supports and the line-wires D E, in combination with the detachably-fastened fuse-wire holders B and fuse-wire C, the insulated spring-actuated metal pin *h*, passing through the holder and engaging with the fuse-wire, the metal plate *f*, secured to a suitable support and against which the pin *h* is held, and the ground-wires F, connected with said plate *f*, substantially as and for the purpose set forth.

2. In a protector for telephone and similar lines, the fuse-wire holder B and fuse-wire C, in combination with a transverse insulated metal pin *h*, passed through the holder and engaging with said fuse-wire, the metal plate *f*, secured to a suitable support and engaging with said metal pin, and the ground-wire F, connected with said plate, substantially as and for the purpose set forth.

3. In a protector for telephone and similar lines, the fuse-wire holder B and fuse-wire C, in combination with the metal pin *h* and insulating-tube *h'*, both passed through the holder and engaging with said fuse-wire, the metal plate *f*, secured to a suitable support, means for holding the pin *h* against said plate, and the ground-wires F, connected with plate *f*, substantially as and for the purpose set forth.

ALBERT T. ALDRICH.

Witnesses:

A. A. BARKER,  
W. B. NOURSE.