

No. 750,767.

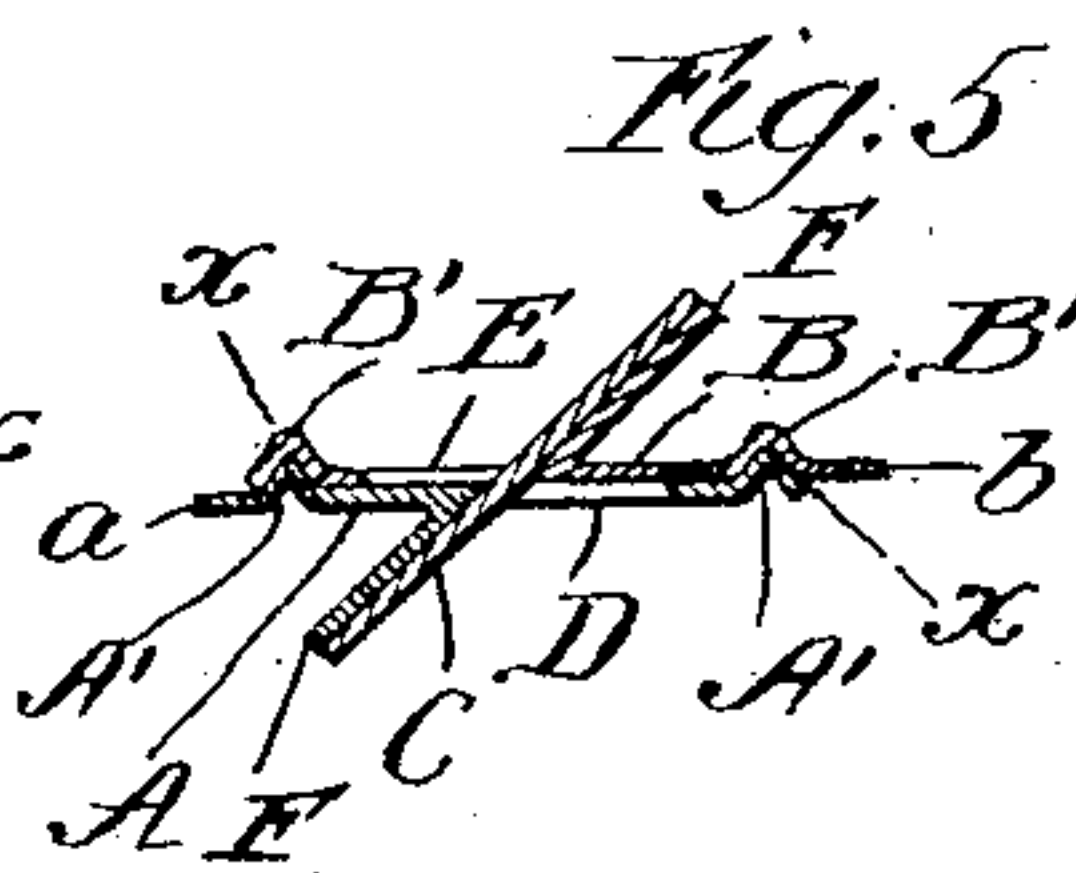
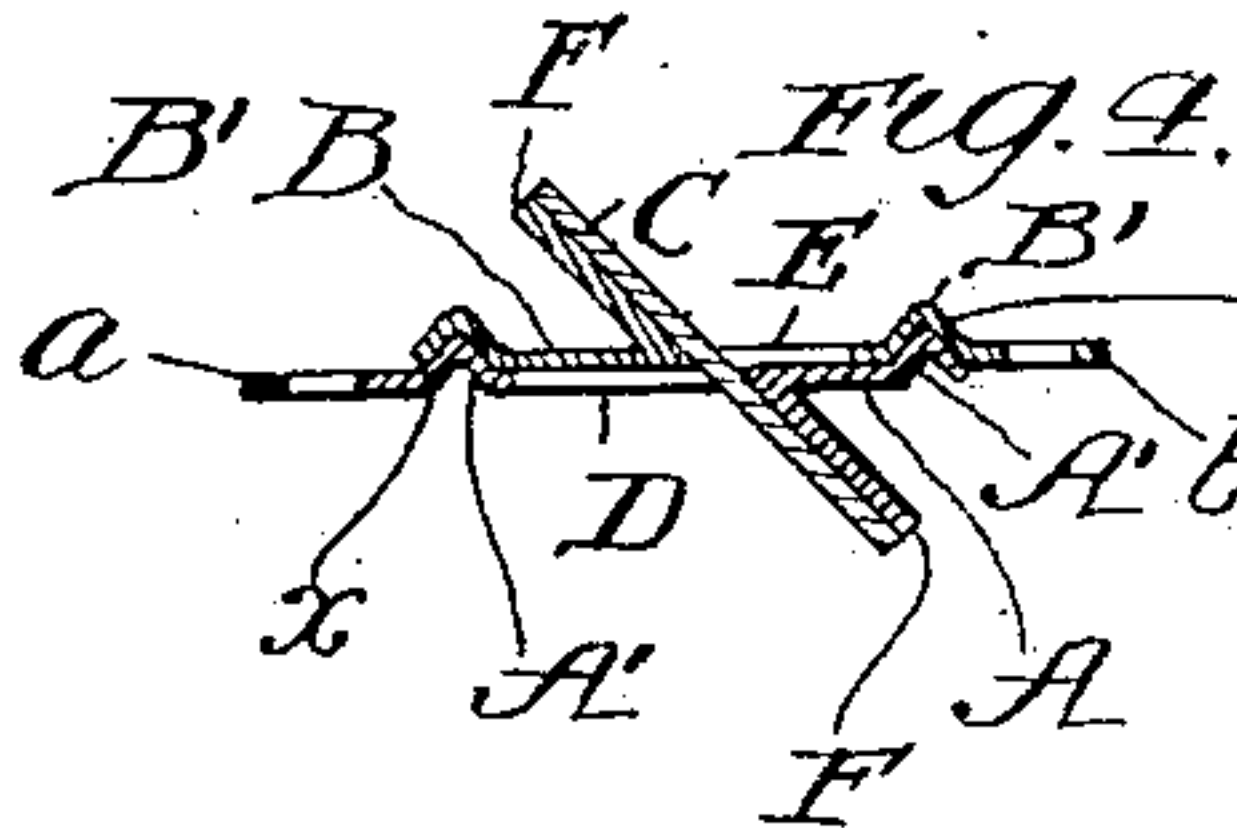
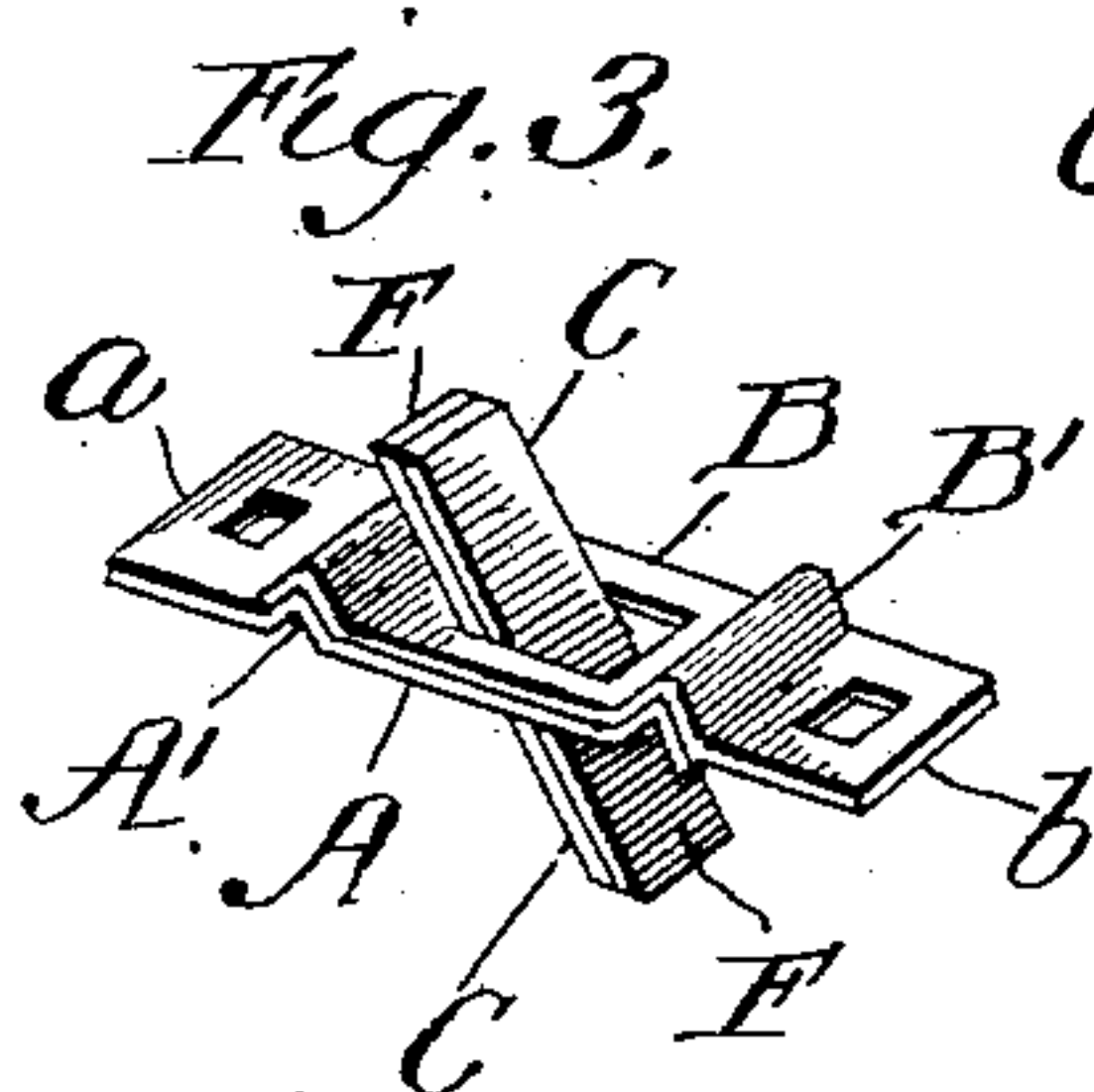
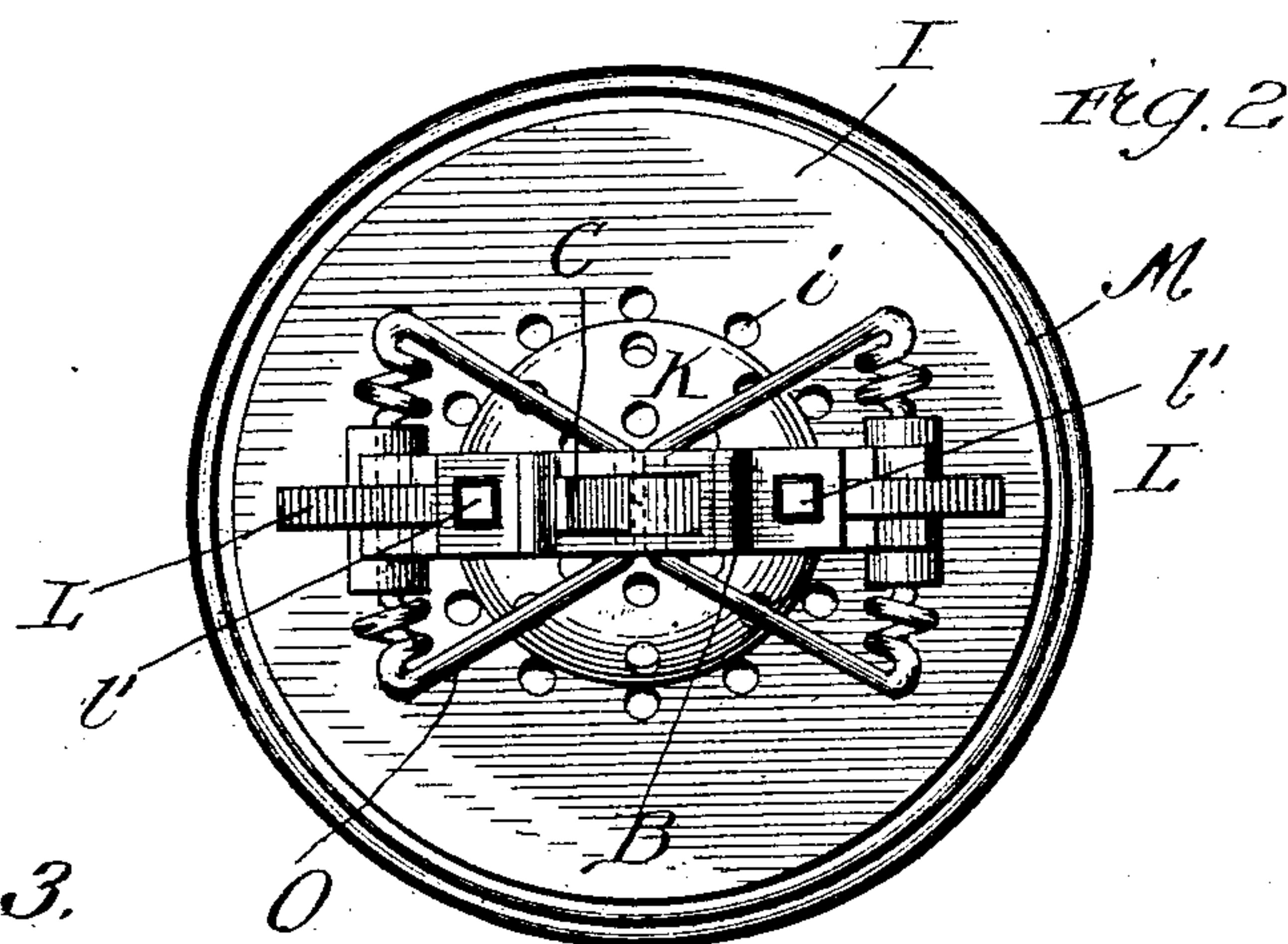
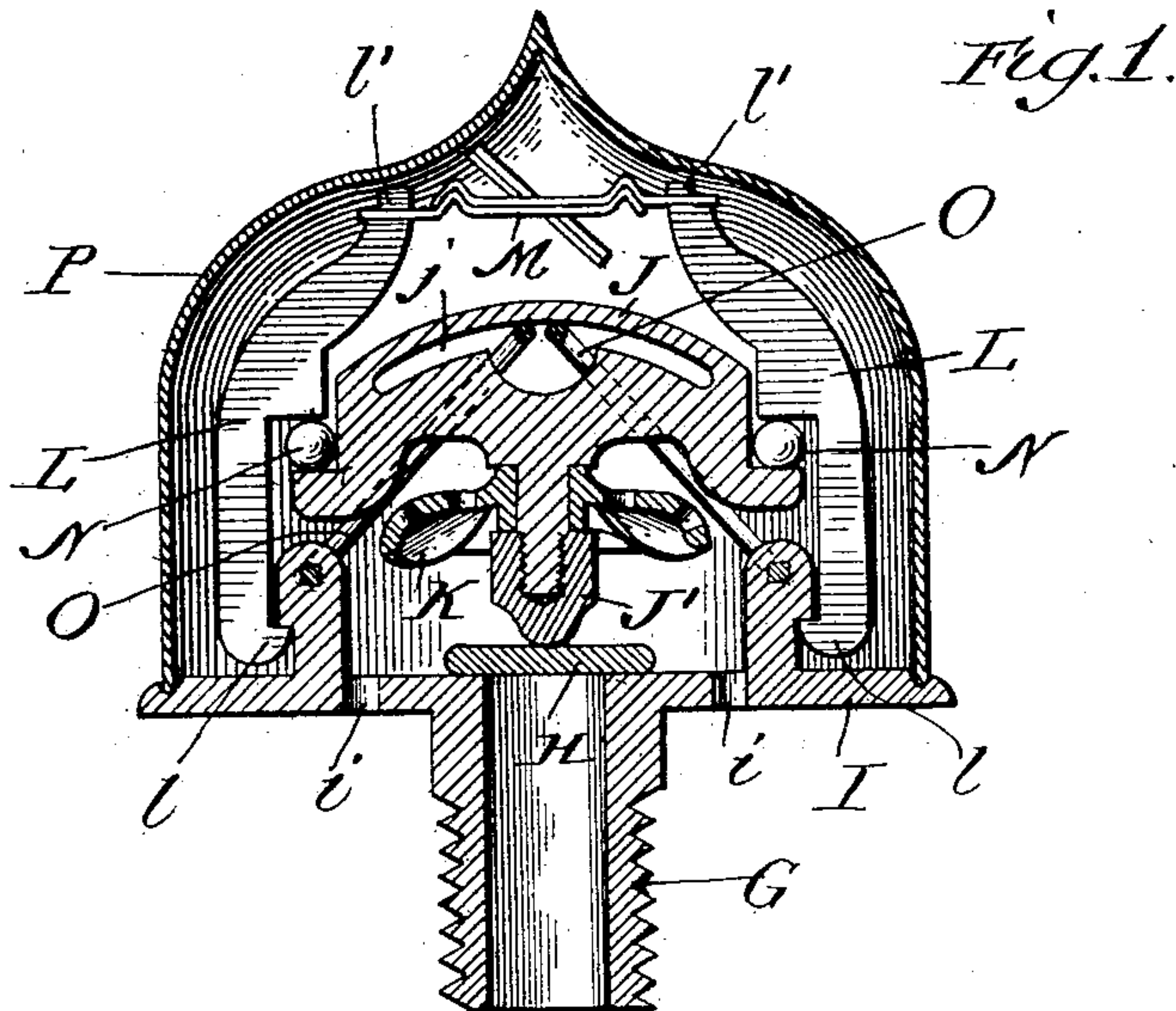
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SPRINKLER HEAD FOR AUTOMATIC FIRE EXTINGUISHERS.

APPLICATION FILED MAY 20, 1901. RENEWED JUNE 23, 1903.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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SPRINKLER-HEAD FOR AUTOMATIC FIRE-EXTINGUISHERS.

SPECIFICATION forming part of Letters Patent No. 750,767, dated January 26, 1904.

Application filed May 20, 1901. Renewed June 23, 1903. Serial No. 162,781. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. HIBBARD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sprinkler-Heads for Automatic Fire-Extinguishers, of which the following is a specification.

In automatic fire-extinguishers of the class at present extensively used there is an element which may be in the nature of a link adapted to resist tensile strains or in the nature of a strut adapted to resist compressive strains, which element is made up of two or more parts united by means of solder fusible at a predetermined temperature, so that when subjected to said temperature the parts going to make up the element aforesaid will be freed one from another and allowed to separate, thus releasing the other parts of the valve-holding mechanism and permitting the valve to be displaced.

The present invention relates in part to an element of this class, and this part of said invention may be embodied either in a link or in a strut, the term "element" as herein used being intended to comprehend both. The object of this part of the invention is to provide for use in sprinkler-heads an improved element of this class.

The invention relates in part also to the general construction of the sprinkler-head; and the object of this part of the invention is to provide a head having certain improved features that are hereinafter fully described.

The invention consists in the features of novelty that are hereinafter described with reference to the accompanying drawings, which are made a part hereof, and in which—
Figure 1 is a sectional elevation of a sprinkler-head embodying the invention. Fig. 2 is a plan view thereof with the cap removed. Fig. 3 is a perspective view of a link embodying the invention. Fig. 4 is a longitudinal section thereof. Fig. 5 is a longitudinal section of a strut.

The link comprises two parts A and B, of similar construction, and a third part C, which will hereinafter be called a "key." The two parts A and B overlap each other, and the

extremity of each projects a short distance beyond the adjacent extremity of the other, as shown at *a* and *b*, respectively, and these projecting portions are provided with openings for admitting the parts that are to be controlled. Each of the parts A and B is provided with one or more hollow ribs or corrugations, and the corrugations of one are complementary to the corrugations of the other, as shown at A' and B', respectively. In the drawings I have shown each as being provided with two corrugations and have shown the corrugations as being of angular cross-section, so as to provide surfaces that are oblique with respect to the length of the element; but I desire to have it understood that in its broadest aspect the invention is not limited to the number of corrugations used or to their shape further than that they should be complementary.

With the parts fitted together as shown in the drawings it is manifest that they will be incapable of any endwise movement relative to each other without a corresponding lateral movement away from each other, so that in order to resist relative endwise movement of the parts it is simply necessary to secure them against lateral movement. This is done partly by soldering together their meeting faces and partly by the key C, which projects through openings D and E in the parts A and B, respectively, and engages said parts upon opposite sides of the general plane of their meeting surfaces.

In order to provide suitable engaging surfaces for the key, each of the parts has a flange F, which is oblique with respect to the length of the element and is the result of reflexing the metal, which is displaced in order to form the openings aforesaid. It will be observed that the relative endwise movement is resisted immediately by oblique surfaces *x*, and it will be observed also that the surfaces of the flanges F are disposed in planes that are transverse to the planes of the surfaces *x*. As a result of this the strain upon the soldered joint between the key and the flanges F is lateral with respect to the key and will tend to rock the key about the bases of the flanges. As shown in the drawings, the plane of the meeting sur-

faces of the key and flanges F is about at right angles to the plane of the surfaces α , and this will give the breaking strain its maximum effect upon the soldered joint between the key
5 and the flanges. The effect of this breaking strain may be regulated by changing the relative angular positions of the flanges and the surfaces α .

It will be manifest to those skilled in the art
10 that the device above described may be used either as a link for resisting tensile strains or as a strut for resisting strains of compression. When used as a strut, its operation will not be
15 precisely as above described, but practically so. In both instances there will be two parts having complementary engaging surfaces that are oblique with respect to the line of strain and adapted to resist the relative endwise
20 movement of said parts, and in both there is a key crossing the general plane of said parts and soldered to them upon opposite sides of said plane.

G is the customary nozzle, having at its extremity a seat for the valve H and having
25 also an annular flange I, which forms the base or foundation of the sprinkler-head. This flange is provided with a circular series of perforations i , which when the sprinkler is in operation admit air to the discharge-point
30 of the nozzle, and thereby prevent the formation of a partial vacuum in the immediate vicinity of the issuing stream of water, said openings being normally closed by solder, wax, or other material fusible at a low temperature.
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The valve H is engaged by a nut J', screwed onto a threaded stud projecting from a cross-bar J, an intermediate part of the stud being cylindrical to form the journal for the rotary
40 distributor K, the nut J' being set tight against a shoulder on the stud, so as to prevent the distributor from falling off, while at the same time allowing it to turn freely on the cylindrical portion of the stud.

L L are a pair of levers, each having at one end a hook l , which engages beneath a shoulder on the base-plate I, and each having a projection l' , which projections are engaged by a link M, preferably constructed as already
50 described. At intermediate points the levers L bear against the cross-bar J, preferably through the medium of antifriction devices N.

O represents springs, both of which pass through a slot j in the cross-bar J and both
55 of which are secured to the base I in such manner that they will have a constant tendency to move away from each other at their free ends and assume positions substantially parallel with each other. In assuming these
60 positions they will carry with them the cross-bar J and the distributor K, and in this way they will serve as the two sides of a yoke supporting the distributor in position to receive the stream of water issuing from the
65 nozzle and distribute it in customary manner.

I am aware that it is not broadly new to provide a sprinkler-head with means for moving the distributor a short distance from the nozzle and there holding it upon the firing of the head, so that it will distribute the water in
70 the manner above described; but so far as I am aware I am the first to do this by means of a yoke having spring sides, which in the normal condition of the sprinkler-head are folded down over the valve and distributor and
75 which upon the firing of the sprinkler-head assume positions approximately parallel with each other in the manner described and in doing so move the distributor into operative position. This arrangement has the advantage of compactness and the further advantage that the sides of the yoke thus formed, being made of wire of comparatively small diameter, do not offer any very material obstruction to the discharge of the water.
80 85

If desired, in order to increase the elasticity of the springs they may be provided with one or more coils, as shown in Fig. 2.

In order to protect the parts from dust, moisture, smoke, and other injurious elements
90 that would tend to corrode them or clog them to such an extent as to interfere with their proper operation, I cover them by means of a hood P, the margin of which is secured to the base I by some suitable means—as, for example, by wax or solder fusible at a low temperature.
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It will be understood that upon the fusing of the soldered joints of the link M the levers L will be freed from restraint, and the pressure against the under side of the valve H, combined with the pressure on the springs O, will dislodge and throw the levers L out of position, and this same movement of the parts, especially the movement due to the lifting of
100 105 the cross-bar J, will tend to dislodge and throw off the cap P.

It will be observed that the portion of the key which crosses the general plane of the two overlapping parts A and B is oblique to that
110 plane, and this is material in that in the initial positions of the parts there is no shearing strain upon the key such as would result if that portion of the key which crosses the general plane of said overlapping parts were perpendicular to said plane and the two parts had contact with opposite sides of the key. With the construction shown the intervening portion of the key does not and cannot prevent the relative movement of the parts toward
115 120 each other. Before it could do so the parts would have to approach each other far enough to bring the key to a position perpendicular to them, and before this takes place the solder joint between the key and said parts will
125 have been torn asunder. This would result even if the corrugations were not used; but with the corrugations there is in addition to the movement of the parts toward each other a relative lateral movement of the parts away
130

from each other, which entirely separates them and avoids the possibility of their becoming locked by the key after the solder fuses.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. An element for sprinkler-heads comprising two parts having oblique engaging surfaces adapted to resist the relative endwise movement of said parts, and a key crossing the general plane of said parts and soldered to them upon opposite sides of said plane, substantially as set forth.

2. An element for sprinkler-heads comprising two parts having complementary corrugations, and a key crossing the general plane of said parts and soldered to them upon opposite sides of said plane, substantially as set forth.

3. An element for sprinkler-heads comprising two parts having complementary corrugations of angular cross-section, and a key crossing the general plane of said parts and soldered to them upon opposite sides of said plane, substantially as set forth.

4. An element for sprinkler-heads, comprising two overlapping parts movable endwise relatively to each other, and means for preventing the relatively endwise movement of said parts, said means including a key crossing the general plane of said parts obliquely and soldered to them on opposite sides of said plane, the meeting faces of said overlapping parts being also soldered together, substantially as set forth.

5. An element for sprinkler-heads comprising two overlapping parts soldered together, and a key crossing the general plane of said parts obliquely, said parts having, upon opposite sides of said plane, oblique surfaces to which the key is soldered, substantially as set forth.

6. An element for sprinkler-heads comprising two overlapping parts movable endwise relatively to each other and means for preventing relatively endwise movement of said parts, said means including a key passing through said parts obliquely and soldered to them on opposite sides of their general plane, said parts themselves being soldered together and provided with openings for the passage of said key, substantially as set forth.

7. An element for sprinkler-heads comprising two overlapping parts soldered together and having openings through them, and a key passing through said openings obliquely, said parts having, adjacent to said openings, oblique surfaces to which said key is soldered, substantially as set forth.

8. An element for sprinkler-heads comprising two overlapping parts soldered together, and a straight key crossing the general plane of said parts obliquely, said parts having oblique surfaces to which the key is soldered, substantially as set forth.

9. An element for sprinkler-heads comprising two parts having engaging surfaces oblique with respect to the length of said parts and having also flanges which are transverse to the plane of said engaging surfaces, and a key crossing the general plane of said parts and soldered to said flanges, substantially as set forth.

10. An element for sprinkler-heads comprising two parts having complementary corrugations of angular cross-section and having also openings through them, and a key passing through said openings and crossing the general plane of said parts, said key being soldered to said parts upon opposite sides of said plane, substantially as set forth.

11. An element of sprinkler-heads comprising two parts having complementary corrugations of angular cross-section, said parts having also openings and flanges adjoining said openings, and a key passing through said openings and soldered to said flanges, substantially as set forth.

12. In a sprinkler-head, the combination with the nozzle and the valve, of a yoke, means to which the sides of the yoke are secured on opposite sides of the nozzle, whence the sides of the yoke proceed outward beyond the nozzle, their outer ends being movable toward and from each other whereby they may be folded inward toward each other, or allowed to move outward from their folded positions, a distributor, means connecting the distributor with the free outer extremities of the sides of the yoke, and means including a fusible joint for holding the sides of the yoke in folded positions, substantially as set forth.

13. In a sprinkler-head, the combination with the nozzle and the valve, of a yoke, means to which the sides of the yoke are secured on opposite sides of the nozzle, whence the sides of the yoke proceed outward beyond the nozzle, their outer ends being movable toward and from each other whereby they may be folded inward toward each other, or moved outward from their folded positions, a cross-bar carried by the free ends of the yoke sides, a distributor carried by the cross-bar, and means including a fusible joint for holding the sides of the yoke in folded positions, substantially as set forth.

14. A sprinkler-head having a nozzle, a valve, a yoke having spring sides, a cross-bar having a slot through which the sides of the yoke pass, a distributor carried by the cross-bar, and means for holding the spring sides of the yoke restrained until subjected to a predetermined temperature substantially as set forth.

15. In a sprinkler-head, the combination of a nozzle, a valve, a distributor, a cross-bar carrying the distributor, a yoke having spring sides engaging the cross-bar, and means for holding the cross-bar in position to hold the

valve seated in opposition to the force of the spring sides of the yoke, substantially as set forth.

16. In a sprinkler-head, the combination of
5 a nozzle, a valve for closing it, a cross-bar, a distributor journaled to the cross-bar, a valve held seated by the cross-bar, a yoke having spring sides engaging the cross-bar, levers fulcrumed to the base of the sprinkler-head
10 and engaging the cross-bar, and a link having a fusible joint engaging the lever, substantially as set forth.

17. In a sprinkler-head, the combination with the nozzle and the valve, of a yoke hav-
15 ing spring sides, means to which said spring

sides are secured on the opposite sides of the nozzle, whence they proceed outward beyond the nozzle whereby they may be folded inward toward each other, or moved outward from their folded positions, a distributor, 20 means connecting the distributor with the free extremities of the spring sides of the yoke, and means including a fusible joint for holding the sides of the yoke in folded positions, substantially as set forth.

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