C. ADAMS.

FUSIBLE LINK.

APPLICATION FILED AUG. 30, 1917.

1,283,612.

Patented Nov. 5, 1918.

Fig. 1.

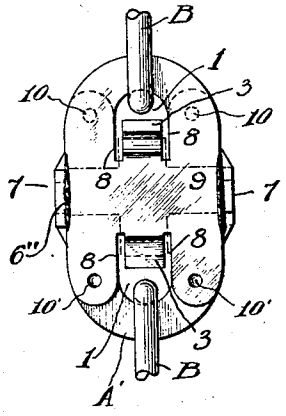


Fig. 2.

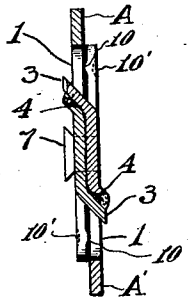


Fig. 3.

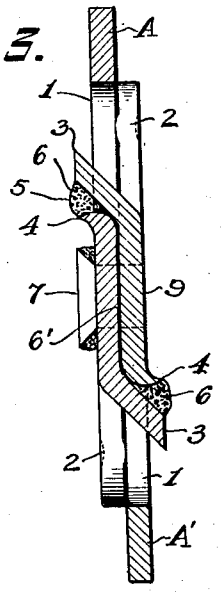
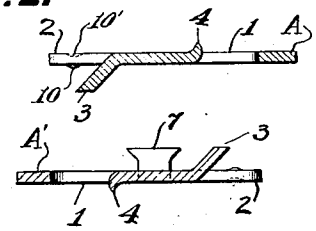


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FUSIBLE LINK.

1,283,612. Specification of Letters Patent. Patented Nov. 5, 1918.

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To all whom it may concern:

Be it known that I, CHARLES ADAMS, a citizen of the United States, residing in Union Hill, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Fusible Links, of which the following is a specification.

My invention relates to fusible-links, which will automatically release and break apart when the temperature reaches a predetermined abnormally high point, usually about 155 degrees F.; used in many devices such as automatic sprinkler-nozzles in fire extinguisher systems for delivering fire-extinguishing fluids upon a fire-zone; and for closures for fire-doors and shutters; and the like.

One object of my invention is to form an efficient, strong and effective fusible-link, of simple and cheap construction, of little weight but great holding strength, until released by fusion; and in which the amount of the extremely costly fusible-solder necessarily used, will be reduced to a minimum.

Another object is to provide a link that may be used in many varied positions, and for many separate uses; such as sprinkler-heads; fire-doors and shutters, etc., without change in such links or in the apparatus to which it is to be applied; none of which I have deemed it essential to show herein.

Other objects and capabilities of my said invention will at once be seen by those skilled in the art, upon examination of the specification, etc., and I do not intend to limit myself to the exact construction shown.

My said invention is fully shown, described and claimed in the following specification, of which the accompanying drawing forms a part; wherein similar letters or numerals of reference designate like or equivalent parts wherever found throughout the several views, and in which:—

Figure 1 is a face-view of a complete fusible-link, of my improved form; secured in place by end securing-links, but with the main-supports to which such end-links are secured, not being shown.

Fig. 2 is a side view of such link taken in central vertical section of Fig. 1, looking from the right.

Fig. 3 is a view similar to Fig. 2, on an enlarged scale of the link, as shown in Figs. 1 and 2, being of about the actual size of link used in sprinkler-heads, and Fig. 3, being of about the actual size of the links used for securing fire-doors, fire-shutters, etc., where greater strength is required;—and

Fig. 4 is a view in central longitudinal section of the two parts of such link separated, and released one from the other.

Referring to the drawing:—

The reference letters A and A′ designate two flat metallic-plates or link-members formed in any desired manner, from any suitable metal, but which for cheapness of construction and lightness, are usually struck up into the form shown, by means of suitable-dies, from some non-oxidizable or non-corrodible metal; such as sheet-brass of the proper thickness; which in the case of links to be used in automatic fire-extinguisher nozzles is usually between one and two millimeters (or about 3/64 of an inch) in thickness. These two link members are of the same identical shape, size and contour, being struck in the same die; and each having the closed securing-orifice 1, and the open ended-like trip-orifice 2, which when such two plates A and A′, are reversely superposed one upon the other will register one with the other, (Figs. 1, 2 and 3) and when soldered together form a two-part thermally releasable link, of the form shown in Figs. 1 and 2.

As shown, each of such links is provided at the inner central end of the open ended trip-orifice 2, with a backwardly bent securing-lug 3, which when the parts are in the locking position (Figs. 1, 2 and 3) extends into and through the closed securing-orifice 1, of its sister-plate, and abuts against the inner end surface of such securing-orifice 1, which end is usually swaged outward in the same direction as 3 into a point 4, so as to leave an enlarged space 5, between 3 and 4, adapted to be filled with a body of fusible-solder 6; and adjacent to the center of each of such link-members A and A′, so as to be in line, when such members are soldered together, on the central line of the double-plate-link so formed is a side-lug 7, one extending in one direction and one in the other; whereby the strain upon the two link members until fully released upon fusion, will be along and in line with the longitudinal axis of each of such plates; whereby liability of accidental displacement (as well as the amount of solder required) will be reduced to a minimum, while at the same time the outer end, bent portion of the lugs will

upon melting of the solder, tend to throw the plates A and A′ apart.

In order to facilitate quick release of the link-members A and A′ upon thermal fusion, the securing-lugs 3 are separated from the main body portion of the link-members by the side-slots 8 (Fig. 1); and while in some cases, where great strength is desired, a central film of fusible-solder 6′ (Fig. 1) may be interposed between the abutting faces of the central portions 9 of the link-members which may also extend horizontally across such member, and secure the side-lugs 7 to the abutting edges of the adjacent link-member as indicated at 6″ of Fig. 1, the securing film of solder being then in the form of a central cross, as indicated by the dotted lines in Fig. 2; but in the smaller sizes of links only the end bodies 6 of solder are used, whereby the cost of construction is much reduced. Such composite two-plate fusible-links are secured in place according to the use to which they are to be put, such as the securing-links or members B (Fig. 1), one of which is passed through the securing closed end orifices 1, as shown in such figure; but other suitable means may of course be used.

While the cross-like form of the body of fusible solder indicated by the dotted lines in Fig. 1, in the form of a thin film, is one very good and efficient form thereof for securing the two separate link portions together, in some cases; and for certain purposes, I prefer to solder the links together with a very much thicker body of solder, located between and covering their entire abutting surfaces; the thickness assisting in the quick melting of such solder, and to provide for same, a boss 10 is formed in each of the two end members at the open end of each of the links, usually by swaging by suitable punchers or dies, from the outside of the links toward the inner side or face, as indicated by the outer depressions 10′ opposite the projection or boss so formed in Figs. 1 and 4. These bosses are of sufficient length, (usually about one or two millimeters, or say approximately $\frac{1}{16}$ of an inch) as clearly indicated in Figs. 1 and 4, as to space the links apart from one another, as indicated in Fig. 1, the length of the projection of the bosses from the opposing plate at either end. In soldering the same together the double link so formed is clamped or wired in position; whereupon the entire space between the abutting faces is completely filled with a suitable easily fusible solder; and upon cooling the two part link so formed, is ready for use.

It is evident that many changes and modifications in the construction arrangements of the various parts of my improved thermally automatically releasable link, may be made without departing from the scope of my invention, and I do not intend to limit myself to the exact construction or arrangement shown.

I claim:

1. An automatically thermally releasable link comprising two flat-members superposed one upon the other with their flat-faces in contact, so as to form a two-part composite link, each part having at one end a closed-orifice or slot, and at the other a like orifice or slot open at the outer end; a central securing-lug at the inner end of each open-slot extending into the closed-slot of the adjacent member; and fusible-solder securing the superposed members together adjacent to the center.

2. An automatically thermally releasable link comprising two flat-members superposed one upon the other with their flat-faces in contact, so as to form a two-part composite-link, each part having at one end a closed-orifice or slot, and at the other a like orifice or slot open at the outer end; a central securing-lug at the inner end of each open-slot extending into the closed-slot of the adjacent member; and bodies of fusible-solder securing each of the central securing-lugs to the central end-wall of the closed slot of its sister link-members.

3. An automatically thermally releasable link comprising two flat-members superposed one upon the other with their flat-faces in contact, so as to form a two-part composite-link, each part having at one end a closed-orifice or slot, and at the other a like orifice slot open at the outer end; a central securing-lug at the inner end of each open-slot extending into the closed-slot of the adjacent member; and bodies of fusible-solder securing each of the central securing-lugs to the central end-wall of the closed slot of its sister link-members; such end-walls of the slots flaring outwardly in the direction of the outer ends of the coacting securing flanges, so as to leave an enlarged chamber between them for holding the body of securing fusible-solder.

4. An automatically thermally releasable link comprising two flat-members superposed one upon the other with their flat-faces in contact, so as to form a two-part composite-link, each part having at one end a closed-orifice or slot, and at the other a like orifice or slot open at the outer end; a central securing-lug at the inner end of each open-slot extending into the closed-slot of the adjacent member; and bodies of fusible-solder securing each of the central securing-lugs to the central end-wall of the closed slot of its sister link-members; such end-walls of the slots flaring outwardly in the direction of the outer ends of the coacting securing flanges, so as to leave an enlarged chamber between them for holding the body of securing fusible-solder; the further solder

body having the form of a cross located at substantially the centers of the two link-members.

5. An automatically thermally releasable link comprising two flat-members superposed one upon the other with their flat-faces in contact, so as to form a two-part composite-link, each part having at one end a closed-orifice or slot, and at the other a like orifice slot open at the outer end; a central securing-lug at the inner end of each open-slot extending into the closed-slot of the adjacent member; and bodies of fusible-solder securing each of the central securing-lugs to the central end-wall of the closed slot of its sister link-members; such end-walls of the slots flaring outwardly in the direction of the outer ends of the coacting securing flanges, so as to leave an enlarged chamber between them for holding the body of securing fusible-solder; the further solder body having the form of a cross located at substantially the centers of the two link-members and a side-lug on one side of each link-member extending at substantially a right-angle to the plane thereof for holding the two members in line against side displacement.

6. An automatically thermally releasable link comprising two flat-members superposed one upon the other with their flat-faces in contact, so as to form a two-part composite-link, each part having at one end a closed-orifice or slot, and at the other a like orifice or slot open at the outer end; a central securing-lug at the inner end of each open-slot extending into the closed-slot of the adjacent member; and bodies of fusible-solder securing each of the central securing-lugs to the central end-wall of the closed slot of its sister link-members; such end-walls of the slots flaring outwardly in the direction of the outer ends of the coacting securing flanges, so as to leave an enlarged chamber between them for holding the body of securing fusible-solder; the further solder body having the form of a cross located at substantially the centers of the two link-members; and a side-lug on one side of each link-member extending at substantially a right-angle to the plane thereof for holding the two members in line against side displacement; the central-securing-lugs being of less width than either of the slots and out of contact with the side-walls thereof.

7. An automatically thermally releasable link comprising two flat-members superposed one upon the other with their flat-faces in contact, so as to form a two-part composite-link, each part having at one end a closed-orifice or slot, and at the other a like orifice or slot open at the outer end; a central securing-lug at the inner end of each open-slot extending into the closed-slot of the adjacent member of less width than either of such slots; and a body of fusible-solder securing the link-members together.

8. An automatically thermally releasable link comprising two flat-members superposed one upon the other, supported slightly apart by suitable bosses upon the adjacent faces, the two together forming a two part composite link, each part having at one end a closed slot, and at the other a slot open at the end, the separating bosses of each of the links being two for each link part and located at the open end thereof, a central securing lug at the inner end of each open slot, extending into the closed slot of the adjacent member; and a fusible solder filling the space between the two parts of the link and securing the same firmly together.

CHARLES ADAMS.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."