O. B. LEWIS.

FUSIBLE LINK.

APPLICATION FILED OCT. 18, 1916.

1,248,433. Patented Nov. 27, 1917.

Fig. 1.

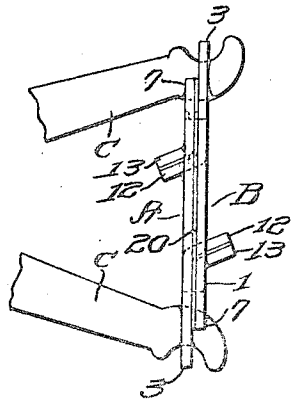


Fig. 2.

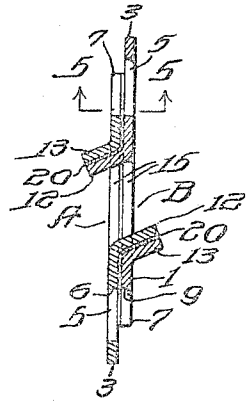


Fig. 3.

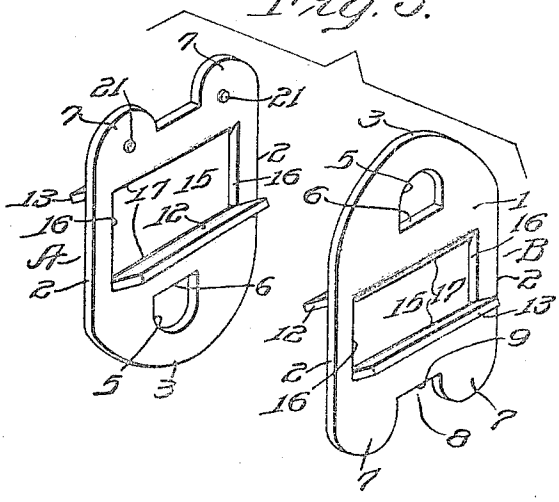


Fig. 5.

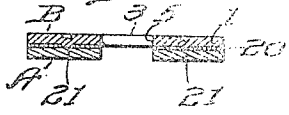
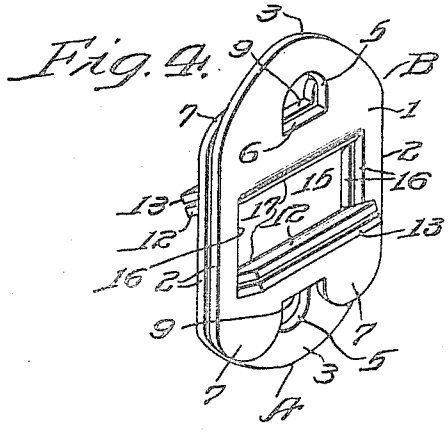


Fig. 4.



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FUSIBLE LINK.

1,248,433. Specification of Letters Patent. Patented Nov. 27, 1917.

Application filed October 18, 1916. Serial No. 126,297.

To all whom it may concern:

Be it known that I, OWEN B. LEWIS, a citizen of the United States, and a resident of the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Fusible Links, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to fusible links suitable for use with automatic sprinkler heads for fire extinguishing apparatus and other devices wherein it is desired to maintain certain elements in positive relation until the temperature in the vicinity of the apparatus reaches a point sufficient to melt a fusible material normally uniting the parts of the link in assembled relation to thereby permit the separation of said parts and consequent release of certain elements of the mechanism with which the link is arranged to coöperate.

Among the principal objects of my invention are to provide a fusible link of this character which shall be positive and efficient in operation, and in which a positive and substantially instantaneous separation of the members of the link will occur when the temperature in the vicinity of the link is raised sufficiently to cause the melting of the fusible material which normally serves to secure said members in assembled relation.

Further objects of my invention are to provide a fusible link having the foregoing characteristics, which may be readily and cheaply constructed, which shall be of great strength, which shall comprise a minimum number of parts which shall be so designed as to minimize the strain upon the fusible material which serves to normally unite the parts of the link and to present a maximum amount of surface for contact therewith, and in which relative movement or "creeping" of the members will not occur even though the link be kept under maximum tension for long periods of time, as when used in connection with automatic sprinkler heads for fire extinguishing systems.

My invention further includes all of the various other novel objects and features of construction and arrangement hereinafter more definitely specified and described.

In the accompanying drawing is illustrated a fusible link constructed in accordance with a preferred embodiment of my invention, Figure 1 showing a side elevation of the link in operative position upon fragmentary portions of the lever arms of an automatic sprinkler head; Fig. 2, a central transverse section of the assembled link removed from the arms; Fig. 3, a perspective view of the two members composing the link and separated from each other; Fig. 4, a similar view of the members in assembled position but without any fusible material between their adjacent surfaces, and Fig. 5 a section through the assembled link taken on line 5, 5 in Fig. 2.

That form or embodiment of my invention illustrated in the drawing comprises a pair of members A and B, said members being in all respects identical with each other and adapted, when united by fusible material, as hereinafter described, to form the completed link. Considering either of the members, for example member B, the same is preferably formed from suitable sheet metal of any desired thickness and may comprise a body 1 having substantially parallel side edges 2, each preferably curved inwardly toward one end of the body so that the latter presents a curved or rounded extremity 3. Adjacent end 3 of the body, is provided a suitable aperture 5, preferably disposed equidistantly from the side edges 2 and adapted for engagement with an arm C of a sprinkler head, or other device with which the link is intended to coöperate, the edge of the aperture toward end 3 being preferably curved in substantial conformity therewith, and the extremity 6 of the aperture toward the opposite end of the body being preferably substantially straight and extending transversely of the member. If desired, however, the aperture may be formed in any other shape suitable for engagement with the lever arms or other elements with which the link is intended to cooperate. The opposite end of the member may preferably be provided with a pair of substantially semicircular outwardly extending projections or lugs situated adjacent the side edges 2 of the body and of such size as to provide a space 8 between and adjacent the bases of the lugs, in width substantially equal to the width of aperture 5, so that when the members of the link are assembled as hereinafter described, the aperture in one member will register with space 8 in the

other member and vice versa, substantially no portion of aperture 5 in either member of the link being covered by any portion of the other member and the lower edge 9 of each member coming into substantial alinement with the edge 6 of the adjacent aperture 5 in the other member.

Projecting outwardly in opposite directions from the opposite faces of each member in angular relation thereto and extending transversely thereof for a relatively considerable distance, are a pair of flanges 12, 13, preferably formed by bending suitable portions of the material of which the member is composed outwardly from the body thereof thus leaving in the body 1 a substantially rectangular opening 15 having longitudinally extending edges 16 and transversely extending edges 17. Preferably one of the flanges, as flange 12, may be of slightly greater width than flange 13, as for example, an amount substantially equal to the thickness of the metal of which the member is composed, so that when the members are assembled to form the completed link, in which position flange 12 on each member projects through the aperture 15 in the other member, the extremity of said flange will come into substantial alinement with the extremity of flange 13 in the other member.

In practice the members may preferably be stamped or otherwise formed by means of a suitable die, the metal of the body being preferably slit or cut transversely and also longitudinally parallel to the side edges 2 thereof prior to the stamping operation, but under some conditions it may be found unnecessary to cut or slit the metal either transversely or longitudinally or in both of these directions, prior to bending out the flanges, the die in such cases being suitably constructed to effect the bending out operation without the preliminary step of cutting or slitting the metal, and while I have for the purposes of description referred herein to this operation, the same forms no part of the invention and the flanges may therefore be punched from the body or otherwise formed without the preliminary cutting or slitting operation, if desired.

The members of the link having been constructed preferably substantially as hereinbefore described, a pair of them may be assembled to form the completed link by inverting and reversing one of them from the position of member B in Fig. 3, to assume the position of member A therein, and then bringing the two members together to assume the position shown in Fig. 4, in which flange 12 of member B will enter aperture 15 of member A and assume a position adjacent, or in contact with flange 13 of that member, and in a similar way flange 12 of member A will extend through aperture 15 of member B and assume a position adjacent, or in contact with, flange 13 of member B, aperture 5 of said member alining with space 8 of member A and in like manner aperture 5 of member A alining with space 8 of member B. The two members of the link may be united in this position by suitable fusible material 20 deposited in any suitable or convenient manner between the adjacent surfaces preferably both of the lugs and also of the bodies of the members. For the purpose of maintaining the adjacent surfaces of the bodies of the members in definitely spaced relation in order to permit the introduction of a suitable substantially definite quantity of fusible metal between them, a plurality of small knobs 21 may be struck from those faces of the members which are normally adjacent in the assembled link at suitable points, as for example, adjacent the bases of the lugs 7, these knobs by contact with the opposing face of the other member in the assembled link serving to maintain two members in slightly spaced relation.

It will be evident that with the members of the link constructed and assembled as hereinbefore described, a relatively large surface will be presented by the body of each member for contact with the fusible material 20 and that the adjacent surfaces of the flanges will also afford space for its reception, so that the parts of the link will be held firmly together under operative conditions without the necessity of forming the link of undue size, and further, that owing to the engagement of the flanges 12 and 13 either directly, or through the medium of the layer of fusible material between their adjacent faces, the longitudinal strain on the fusible material due to the normal tendency of the sprinkler head arms C, C to separate when the link is under operative conditions as shown in Fig. 1, is in great part relieved whereby "creeping" or relative movement of the members when the link is kept under long continued tension is avoided. Moreover, owing to the angular relation of the flanges 12 and 13 with the bodies of the members, as soon as the fusible material melts, the strain exerted in opposite directions on the members of the link by the sprinkler head arms C, C causes the members of the link to relatively separate both longitudinally and in a direction substantially at right angles to the adjacent faces of the members, the members being substantially forced apart by the action of the flanges in riding on each other. This movement of separation is substantially instantaneous and positive under all conditions and once begun cannot be arrested by sudden chilling of the fused solder or other material 20 from contact with water issuing from the partly opened sprinkler head be-

fore the complete separation of the members of the link, and consequent release of the elements which it controls, has occurred.

While I have herein illustrated and described a preferred embodiment of my invention with considerable particularity, I do not thereby desire or intend to limit myself specifically thereto, as various changes and modifications may be made in the form, construction and arrangement of the parts and in the proportions thereof, without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus described my invention I claim and desire to protect by Letters Patent of the United States:—

1. A fusible link comprising a pair of similar members united by fusible material, each of said members comprising a body having a pair of flanges extending in opposite directions therefrom, a closed aperture between said flanges, and means for attaching said member to a sprinkler head, said flanges being operative to coact when said members are assembled to relieve the strain on said fusible material when the link is in operative position.

2. A fusible link comprising a pair of similar members assembled in inverted and reversed relation and united by fusible material, each of said members comprising a body having a pair of flanges extending in opposite directions therefrom and in angular relation therewith and a closed aperture between said flanges adapted to receive one of said flanges on the opposite member when said members are assembled, said flanges being operative to coact when said members are assembled to relieve the strain on said fusible material when said link is in operative position.

3. A fusible link comprising a pair of similar members, each member having an aperture and a pair of flanges extending in opposite directions from the body of said member and adjacent opposite extremities of said aperture, said members being assembled in inverted and reversed relation to form the link with one of the flanges of each member extending through the aperture in the other member and in coöperative relation with one of the flanges thereof, and fusible material uniting the members of the link.

4. In a fusible link, a member comprising a body portion having a substantially rectangular aperture, a flange adjacent each of two opposite extremities of said aperture, said flanges extending in opposite directions from said body, a pair of spaced lugs adjacent one extremity of said body and an aperture adjacent the other extremity of said body adapted to receive the arm of a sprinkler head.

5. In a fusible link, a member comprising a body having a substantially rectangular aperture, a flange adjacent each of two opposite extremities of said aperture extending transversely of said body in angular relation therewith and in opposite directions therefrom and an aperture adjacent the other end of said body adapted for the reception of an arm of a sprinkler head.

6. In a fusible link, a member comprising a body having a substantially rectangular aperture, a flange adjacent each of two opposite extremities of said aperture extending transversely of said body in angular relation therewith and in opposite directions therefrom, a pair of spaced lugs adjacent one end of said body and an aperture adjacent the other end of said body adapted for the reception of an arm of a sprinkler head.

7. In a fusible link, a member comprising a body having a pair of oppositely directed flanges extending in opposite directions from said body and in equiangular relation therewith, an aperture in said body between said flanges, a pair of spaced lugs adjacent one end of said body and an aperture adjacent the other end of said body adapted for the reception of an arm of a sprinkler head.

8. A fusible link comprising a pair of similar members assembled in inverted and reversed relation and united by fusible material, each of said members having a pair of transversely extending flanges bent in opposite directions from the body thereof and in equiangular relation therewith, a pair of spaced lugs adjacent an extremity of each member and an aperture adjacent the other extremity of each member and adapted to register with the space between said lugs on the other member when said members are assembled, said flanges being operative to coact when said members are assembled, to relieve the longitudinal strain on said fusible material when said link is under operative conditions.

In witness whereof, I have hereunto set my hand this 16th day of October, A. D. 1916.

OWEN B. LEWIS.