R. W. NEWTON.

AUTOMATIC SPRINKLER.

APPLICATION FILED SEPT. 26, 1919.

1,345,217. Patented June 29, 1920.

Fig. 1.

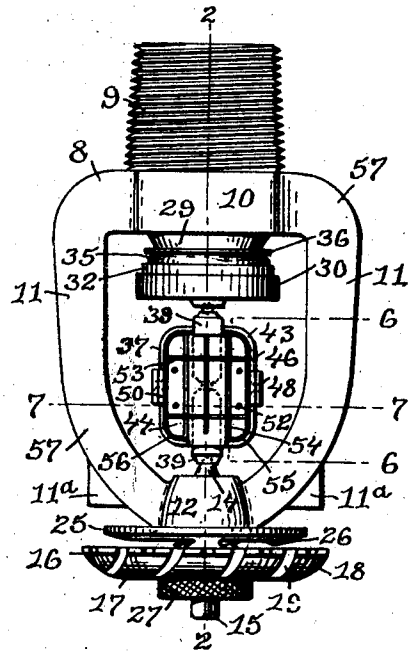


Fig. 2

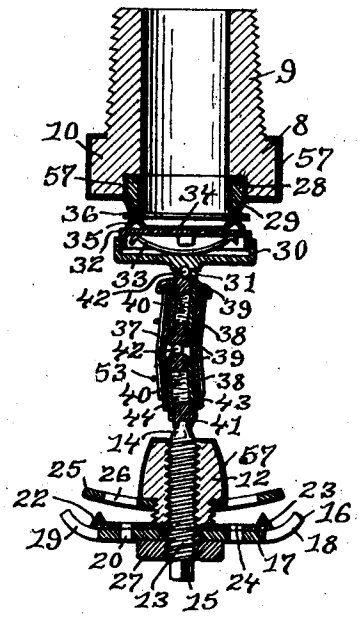


Fig. 3.

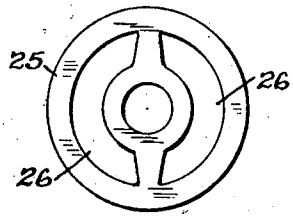


Fig. 6.

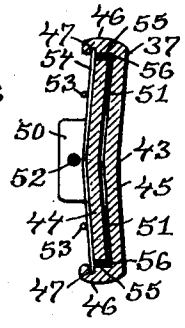


Fig. 5.

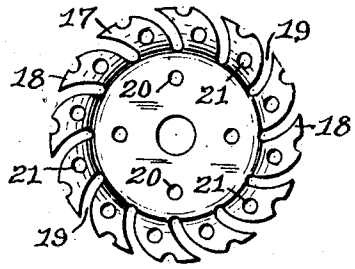


Fig. 4

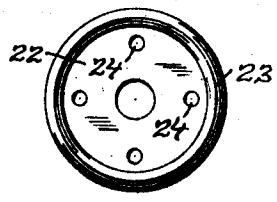
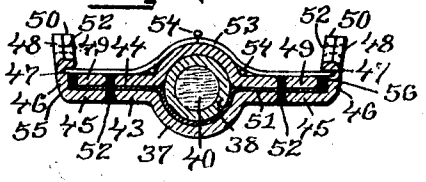


Fig. 7.



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AUTOMATIC SPRINKLER.

1,345,217. Specification of Letters Patent. Patented June 29, 1920.

Application filed September 26, 1919. Serial No. 326,441.

To all whom it may concern:

Be it known that I, ROBERT WILKINSON NEWTON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Automatic Sprinklers, of which the following is a specification.

My invention has reference to means for extinguishing fires, and more particularly to an improvement in automatic sprinklers as used in automatic sprinkler systems.

The object of my invention is to improve the construction of automatic sprinklers, whereby corrosion of the surface of the sprinkler, corrosion in the valve seat, and sticking or cohesion of the releasing element, when in operation, are wholly eliminated.

Further objects of my invention are to improve the construction, and the operation of automatic sprinklers, thereby more positively locking the sprinkler under normal inoperative conditions, and more positively unlocking or releasing the sprinkler under fire conditions.

My invention consists in the peculiar and novel construction of an automatic sprinkler, having details of construction, as will be more fully set forth hereinafter and claimed.

Figure 1 is a side view of my improved automatic sprinkler.

Fig. 2 is a longitudinal sectional view through the sprinkler taken on line 2.2 of Fig. 1.

Figs. 3, 4, and 5 are top plan views of the deflector parts.

Fig. 6 is an enlarged detail sectional view taken on line 6.6 of Fig. 1, through the bent valve support and releasing device, and

Fig. 7 is an enlarged detail transverse sectional view taken on line 7.7 of Fig. 1, through the bent valve support and releasing device.

In the drawings 8 indicates the body of an automatic sprinkler having the screw-threaded tubular shank 9, the yoke 10 and the arms 11.11 curving to the hub 12. A screw 13 is screw-threaded through the hub 12 and has the usual cone-shaped inner end 14 and square outer end 15. A circular three part deflector 16 has an outer member 17 with curved peripheral fingers 18.18, curved peripheral slits 19.19, holes 20.20 and 21.21, an intermediate member 22 having a circular cone-shaped rib 23 and holes 24.24, adapted to coincide with the holes 20.20, in the outer member 17 and an inner disked member 25 having the semi-circular openings 26.26 and which screws adjustably on to a screw-threaded portion of the hub 12. The members 17 and 22 are secured in place by a nut 27 on the screw 13, between the hub and nut, as shown in Fig. 2.

The inner end of the tubular shank 9 has a circular recess 28 in which is a detachable valve seat 29, covered with a non-corrosive material. A round box shaped valve head 30 is constructed to have a bottom in which is a depression 31, a cover 32, an intermediate spring 33, a plate 34 with a raised edge 35 and a washer 36 against the valve seat 29, as shown in Fig. 2. The plate 34 and washer 36 are covered with a non-corrosive material 57.

Interposed between the inner end 14 of the screw 13 and the valve head 30 is a bent valve head support and releasing device 37, consisting of two hollow thrust rods 38.38, each thrust rod 38 having a cap 39 on each end closing the ends of the hollow rods. Each hollow rod 38 is filled with an expansible fluid 40. The caps 39.39 each have a central depression 41, a depression 41 on one of the outer caps fitting on to the end of the screw 13, a ball 42 interposed between the center caps in the depressions 41.41 in the caps and a ball 42 interposed between the depression in the other end cap, and the depression 31 in the valve head 30. The hollow thrust rods 38.38 and center ball 42 are held in place by a shoe 43 and a plate 44 shaped to hold the thrust rods and ball in place. The shoe 43 has the flat side extensions 45.45 each having a lip 46 with an inner undercut portion 47 and angular projecting portion 48. The plate 44 has flat side extensions 49.49 shaped to fit over the side extensions 45.45 of the shoe, it also has angular projecting portions 50.50 corresponding to and in contact with the projecting portions 48.48 on the shoe. Flat springs 51.51 are interposed between the shoe and plate which are riveted together by fusible rivets 52.52 through the shoe and plate and also through the angular projecting portions 48.48 and 50.50 on the shoe and plate. Wires 53.53 extend transversely across the plate 44 as shown in Fig. 1 and the ends hook under the undercut portion 47 in the shoe, as shown in Fig. 7 and wires 54.54 extend lengthwise of the plate 44 as shown in Fig. 1 and the ends hook under the undercut portion 47 of the

shoe, as shown in Fig. 6. The plate 44 is smaller than the shoe, thereby forming an edge trough 55 which is filled with a fusible metal 56 as shown in Figs. 6 and 7, thereby fusibly securing the plate to the shoe.

The entire surface of the sprinkler frame and valve seat is covered with a non-corrosive material 57, as shown in Fig. 2, and all of the other parts may be covered with the same non-corrosive material.

By this construction the shoe 43 and plate 44 holds the hollow thrust rods in place, the fusible metal 56 secures the shoe and plate together, at their outer edges, thereby leaving the hollow thrust rods 38.38 free from fusible metal, also the fusible rivets 52.52 assist in securing the plate to the shoe, assisted by the wires 53.53 and 54.54; the expansible fluid 40 in the tubular thrust rods 38.38, when expanded by heat, assists in disintegrating the several parts of the valve releasing device 37, the springs 51.51 assisting; the separate valve seat 29 may be plated with or formed from a non-corrosive material; the peculiar and novel construction of the deflector 16 is such that by adjusting the inner member 25 on the hub 12 and turning the intermediate member 22 on the screw 13, the spray from the sprinkler may be made fine or coarse, and after adjustment the parts may be secured in the adjusted position by tightening the nut 27, and corrosion of the frame is prevented by coating the frame with a non-corrosive material.

When in use under fire conditions the expansible fluid 40.40 in the hollow thrust rods expands under heat, the fusible metal 56 and fusible rivets 52.52 melt and the pressure of the water on the valve head 30, assisted by the expansion of the fluid in the hollow thrust rods and the springs 51.51, will cause the valve head and all of the parts of the valve releasing device 37 to separate and fall out of the sprinkler and the water will pass unobstructed to the deflector 16 from which it is distributed in the form of a fine or coarse spray as required. In practice I find that this sprinkler will stand a heavy water pressure without leaking, it is extremely sensitive in operation, and the sprinkler will stand for a long time without corrosion of the frame or parts.

Having thus described my invention I claim as new.

1. In an automatic sprinkler, a valve supporting and releasing device consisting of a shoe, a plate over the shoe, hollow thrust rods in the shoe and held in place by the plate, an expansible material in the hollow thrust rods, and fusible means for securing the plate to the shoe.

2. In an automatic sprinkler, a valve supporting and releasing device consisting of a shoe having undercut edge lips, a plate over the shoe, hollow thrust rods in the shoe and held in place by the plate, wires extending across the plate under the lips on the shoe, an expansible material in the hollow thrust rods and fusible means between the edge of the plate and the lip on the shoe for securing the plate to the shoe.

3. In an automatic sprinker, a valve supporting and releasing device consisting of a shoe having undercut edge lips, a plate over the shoe, hollow thrust rods in the shoe and held in place by the plate, wires extending lengthwise and transversely across the plate under the lips on the shoe, an expansible material in the hollow thrust rods and fusible rivets securing the plate to the shoe.

4. In an automatic sprinkler, a valve supporting and releasing device consisting of a shoe having undercut edge lips, a plate over the shoe and having edge lips, hollow thrust rods in the shoe and held in place by the plate, an expansible fluid in the hollow thrust rods and fusible rivets through the lips on the shoe and plate for fusibly securing the plate to the shoe.

5. In an automatic sprinkler, a valve supporting and releasing device consisting of a shoe having undercut edge lips, a plate over the shoe, thrust rods in the shoe and held in place by the plate, said plate being smaller than the shoe, and fusible means between the undercut edge lips of the shoe and the edges of the plate for fusibly securing the plate to the shoe.

In testimony whereof I have signed my name to this specification.

ROBERT WILKINSON NEWTON.