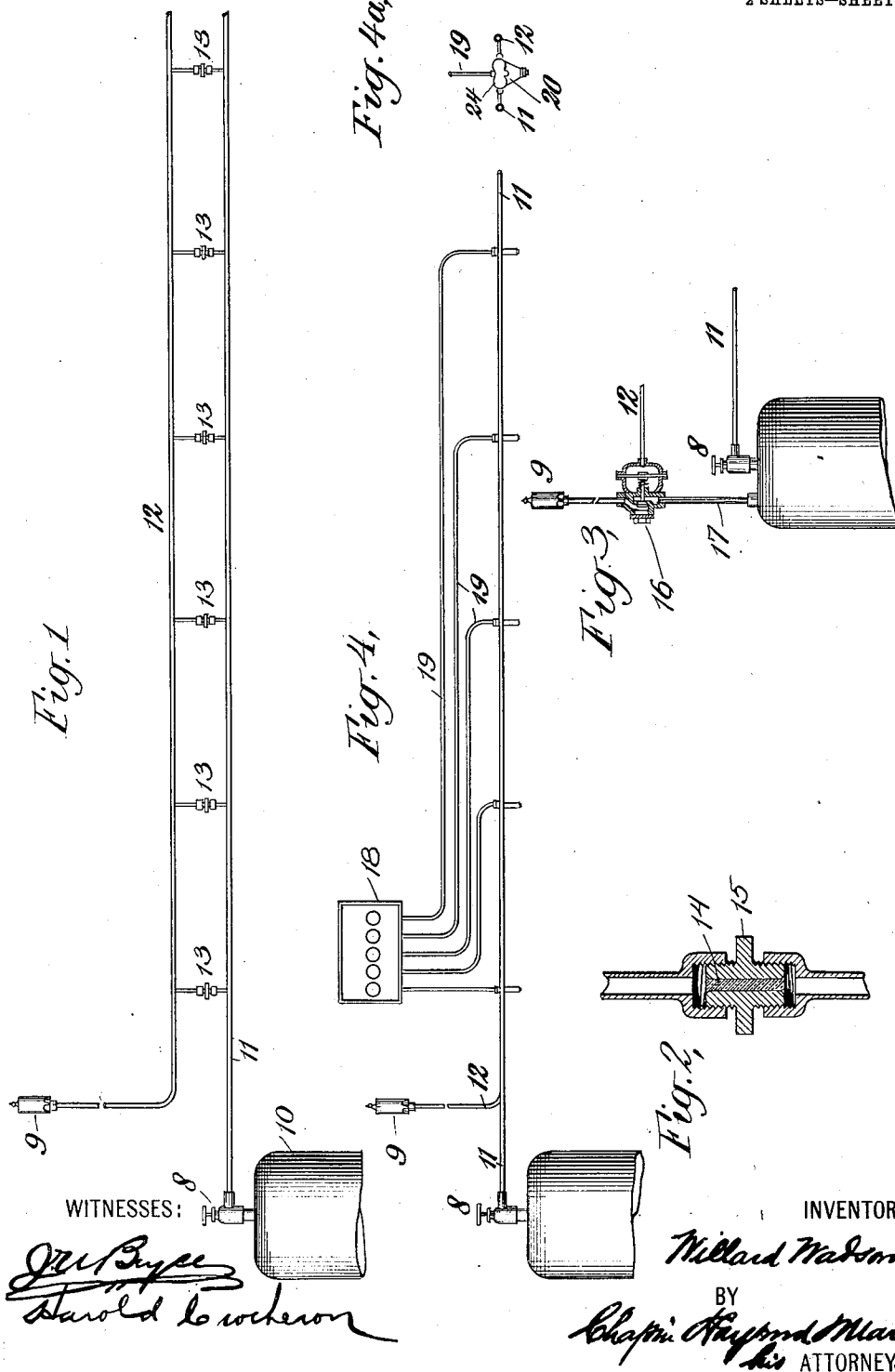


W. WADSWORTH.
PNEUMATIC FIRE ALARM.

APPLICATION FILED AUG. 30, 1905.

2 SHEETS—SHEET 1.



No. 860,842.

PATENTED JULY 23, 1907.

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2 SHEETS—SHEET 2.

Fig. 7,

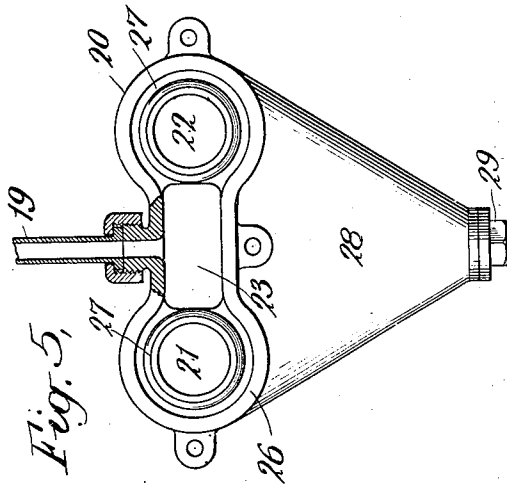
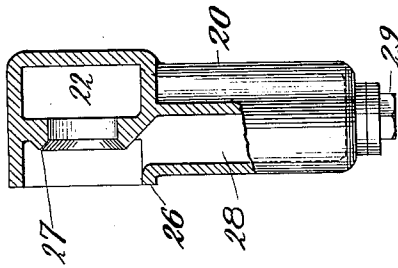
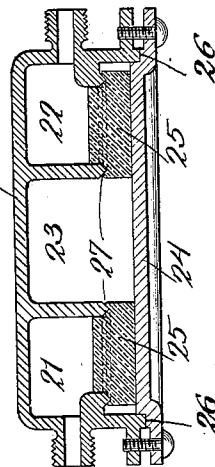


Fig. 6,



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PNEUMATIC FIRE-ALARM.

No. 860,842.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLARD WADSWORTH, a citizen of the United States of America, and a resident of Plainfield, county of Union, State of New Jersey, have invented certain new and useful Improvements in Pneumatic Fire-Alarms, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in pneumatic fire alarms such as are controlled by fusible plugs arranged at the required points.

The main object of my invention is to provide an exceedingly simple fire alarm system of this character which will be positively operated, will take up but little space, which will not readily get out of order, and which is capable of being easily fitted into place.

To these ends my invention consists in certain novel details of construction and combination of parts as will be hereinafter more fully set forth.

I will now describe in detail apparatus embodying my invention, and will then point out the novel features in claims.

In the drawings: Figure 1 is a diagrammatic view of a complete apparatus embodying my invention. Fig. 2 is a detail view in central section showing a form of coupler employed, said coupler including a fusible plug. Fig. 3 is a fragmentary view showing a modified construction. Fig. 4 is a diagrammatic view showing a system in which an annunciator is employed. Fig. 4^a is an end view showing the pipe connection. Figs. 5, 6 and 7 are detail views on an enlarged scale of another form of coupler employed.

I will first refer to Figs. 1 and 2, which show my invention in its simplest form. In Fig. 1 there is illustrated a portion of a tank 10, which is intended to contain air under pressure. The air may be supplied thereto under pressure from any suitable source, not shown. A pipe 11 leads from the top of said tank, being normally in constant open communication therewith, a valve 8 being provided for closing same only after the alarm has operated. A return pipe 12 runs parallel with the pipe 11 and connects with signal means 9. This signal means may be of any desired character, a whistle being herein shown diagrammatically merely as illustrative of signal means generally. Couplings 13 are arranged at suitable points to connect the pipes 11 and 12, said couplings, however, each containing a fusible plug 14 (see Fig. 2), which normally cuts off communication therethrough, whereby pipes 11 and 12 are normally disconnected. The melting of a fusible plug 14 in any coupler 13 will, however, afford direct communication from the pipe 11 to the pipe 12 through said coupling and thence to the signal means. One form of coupling is shown in detail in Fig. 2, the same comprising a nipple 15 having right

and left hand threaded portions which engage with corresponding right and left hand threaded branches of pipe, whereby the said coupling may be readily removed and returned into position when desired. The opening through the nipple 15 is closed by means of the fusible plug 14, the same consisting of any desired alloy, such as will melt at a point of, say 140 or 150 degrees Fahrenheit. Thus, by fusible plug I intend to define an alloy which is solid at ordinary atmospheric temperatures, but readily fusible at temperatures slightly thereabove.

While I have shown the line of piping as arranged to directly convey air under pressure to the whistle 9, it may of course connect with a relay device 16, as shown in Fig. 3, thereby operating a valve or other means to directly open a separate supply 17 of larger capacity, to the said whistle. By this means air may be introduced directly from the receiver to the whistle or other signaling device, instead of first passing all through the line of piping. Where a long line of piping is employed, this is advantageous, especially as I contemplate employing piping of a very small diameter. The pipes 11 and 12 may conveniently be fine copper piping, so that they may be strung around from place to place with but very little more difficulty than is experienced in stringing electric wires. Thus a system of this character may be easily installed without the usual pipe fitting necessary in most pneumatic systems employed at the present day. Such a system as this is particularly applicable for protecting vessels at sea, the pipes leading through the coal bunkers and so forth, such pipes taking up but very little room and readily following the contour of the vessel and compartments thereof.

In Fig. 4 I have shown a somewhat diagrammatic representation of a system in which an annunciator is employed in order to indicate which plug has melted. 18 designates an annunciator to which a series of pipes 19 lead, one from each of the couplers employed. When any individual plug is blown out, air will not only pass to operate the signal means, but will also pass along the individual pipe 19 to the annunciator to operate the same. The annunciator *per se* forms no part of my invention, and I will therefore not go into any further details with regard to it. The form of coupler preferably employed when an annunciator is included in the system, is illustrated in Figs. 5, 6 and 7, and includes two fusible plugs with a chamber between them, the pipes 19 which connect with the annunciator, leading to the said chamber. Referring now to Figs. 5, 6 and 7, the coupling will be seen to comprise a casing 20 having an inlet chamber 21, an outlet chamber 22 and an intermediate chamber 23. The casing is provided with a cover plate 24, which may be removed at will so as to renew the fusible

plugs 25 after they have melted. The plugs 25 are inserted in position when the plate is removed, to control passage from the chamber 21 to the chamber 23, and from the chamber 23 to the chamber 22, respectively, said plugs being retained in position by the cover plate when it is secured in place. The cover plate is fitted accurately to the main portion of the casing, as at 26, such joint being a tight one and preventing the escape of air even after the plugs 25 have melted. The plugs 25 are pressed firmly to seats 27, which seats themselves form tight joints, but the seats are of such a form and construction, that is to say, their edges are so sharp, and the alloy of such relatively soft material, that there will be no difficulty in embedding the plugs upon the said seats 27 so as to permit the parts to come together at 26 to also make a tight joint at this place.

It will be seen that air under pressure is always in the chamber 21, but cannot pass the plug 25 until the same melts. The plugs 25, 25 will both melt in any one coupler at about the same time, so that air, once having passed out of the chamber 21, will pass to the chamber 23, and thence through pipe 19, to operate the annunciator, and to the chamber 22, thence to return pipe 12 to operate the signal means. When a fusible plug has melted, the alloy of which the same is composed may be blown through the piping if desired, the force of compressed air being sufficient to disintegrate the same into small shot, or it may be trapped in the coupler.

In the couplers shown in Figs. 5 and 6, I have shown a chamber 28 which will serve to catch the molten alloy as the plugs blow out, and I have provided a cap 29 to close an opening through which the alloy may be drawn off when the new plugs are inserted into place.

The extreme simplicity of my entire system will be understood when it is realized that I employ no moving parts and no valves throughout, excepting only such valve as may be employed in the relay 16 for directly operating the signal means. Thus there are no parts to get out of order and the action is extremely positive.

What I claim is:

1. In a pneumatic fire alarm, the combination with two lines of piping arranged in parallel, one of said pipes connected with a source of fluid under pressure and the other connected with signal means, of a plurality of connecting branches for said pipes each including a fusible plug which normally cuts off passage therethrough, an annunciator, and individual connections from said branches to said annunciator.

2. In a pneumatic fire alarm, the combination with a pipe for supplying fluid under pressure and a pipe leading to signal means, of a coupler arranged to connect the two said pipes, and provided with fusible material which normally cuts off passage of fluid from one said pipe to the other, said coupler including a chamber for receiving and containing the said material after it has fused and passage through said coupler has thereby been opened, and a normally closed discharge therefrom, for discharging the said fused material at will.

3. In a pneumatic fire alarm, the combination with two pipes, one of which is connected with a source of fluid pressure, and signal means with which the other is connected, of couplers for connecting the two said pipes together at various points, each said coupler containing

fusible material which normally cuts off passage of fluid therethrough from one said pipe to the other, an annunciator, and branch connections from each said coupler to the annunciator.

4. In a pneumatic fire alarm, the combination of a closed conduit for conveying fluid under pressure, an annunciator, individual branches leading from the said conduit to the annunciator, fusible material in each said branch, closing same to passage of fluid from said conduit therethrough, and a signal means with which all said branches are connected.

5. In a pneumatic fire alarm, the combination of a closed circuit for conveying fluid under pressure, a signal means, a plurality of bridge connections connecting said conduit in multiple with said signal means, an annunciator, individual branches from each said bridge connection to the annunciator, fusible material for each said bridge connection controlling passage thereto from said conduit, and means for preventing passage from one said branch to another when passage from the conduit to any one said branch is permitted.

6. In a pneumatic fire alarm the combination of a closed conduit for conveying fluid under pressure, a signal means, a plurality of bridge connections connecting said conduit in multiple with said signal means, an annunciator, individual branches from each said bridge connection to the annunciator, and fusible material for each said bridge connection controlling passage thereto from said conduit and also passage from one said branch to another when passage from the conduit to any one said branch is permitted.

7. In a pneumatic fire alarm, the combination with two lines of piping arranged in parallel, one of said pipes connected with a source of fluid under pressure, and the other connected with signal means, of a plurality of connecting branches for said pipes, each including a fusible plug which normally cuts off passage therethrough, an annunciator, individual connections from said branches to said annunciator connecting with the branches at points between the said fusible plug and the said signal means, and means normally closing the said branches from communication with the pipe leading to said signal means.

8. In a pneumatic fire alarm, the combination with two lines of piping arranged in parallel, one of said pipes connected with a source of fluid under pressure, and the other connected with signal means, of a plurality of connecting branches for said pipes, each including two fusible plugs which normally cut off passage therethrough, an annunciator, and individual connections from points in said branches between the two plugs therein to said annunciator.

9. In a pneumatic fire alarm, the combination with two lines of piping arranged in parallel, one of said pipes connected with a source of fluid under pressure, and the other connected with signal means, of a plurality of couplers each comprising three chambers in series, the first said chamber connected with one said pipe, and the last said chamber connected with the other said pipe, fusible material contained in said couplers for closing connection between said chambers, an annunciator, and individual connections from said annunciator to the central chamber of each said coupler.

10. In a pneumatic fire alarm, the combination with a closed conduit for conveying fluid under pressure, a signal means, a conduit leading thereto, an annunciator, and individual connections for said annunciator, of couplers for the two said conduits and the branch connections, each comprising a casing having an inlet chamber, an outlet chamber and an intermediate chamber, a cover for all three said chambers, fusible plugs arranged between the inlet and outlet chambers and said cover, and a chamber for receiving and containing the said plugs after they have been fused, substantially as set forth.

WILLARD WADSWORTH.

Witnesses:

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C. L. HALL.