Oct. 24, 1939. J. I. HILL ET AL 2,177,278

AUTOMATIC VALVE

Filed May 8, 1939

Fig. 1.

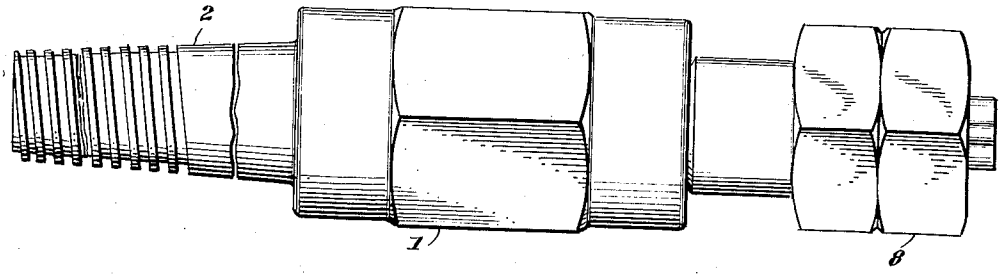


Fig. 2.

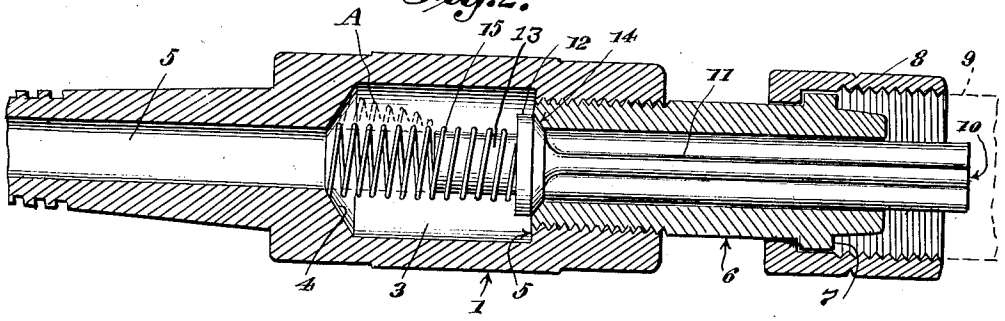


Fig. 3.

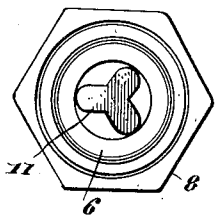
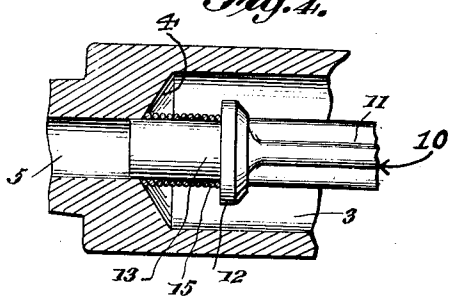


Fig. 4.



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Patented Oct. 24, 1939

2,177,278

UNITED STATES PATENT OFFICE

2,177,278

AUTOMATIC VALVE

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Application May 8, 1939, Serial No. 272,502

1 Claim. (Cl. 284—18)

This invention relates to an automatic valve.

An object of the invention is to provide a novel and efficient valve, whereby interchanging working tools on the end of an oxygen, acetylene, or air line can be easily accomplished without going to or operating the control valve on the line.

Another object of the invention is the production of an automatic valve which comprises a very few parts, and involves among its novel features an efficient spring seat, as well as a novel primary casing in which said seat is formed.

A still further object of the invention is the construction of a simple, efficient, and comparatively inexpensive automatic valve for automatically closing the tool end of a line when a tool is removed from the line and for automatically opening the line when a tool is connected with the line.

With the foregoing and other objects in view the invention comprises certain other novel constructions, combinations and arrangements of parts as will be hereinafter fully described, illustrated in the accompanying drawing, and more particularly pointed out in the appended claim.

In the drawing:

Figure 1 is a view in side elevation of an automatic valve constructed in accordance with this invention, while

Figure 2 is a vertical longitudinal sectional view of the same.

Figure 3 is a view in elevation of the tool attaching end.

Figure 4 is a fragmentary, vertical, longitudinal sectional view, showing the valve unit in its extreme depressed position.

Referring to the drawing by numerals, 1 designates a comparatively long primary casing having at one end an outwardly-extending reduced threaded extension 2. The primary casing 1 is provided with a comparatively long spring compartment 3 that has, at one end, a conical spring guide and seat 4; this conical seat extends entirely across the end of compartment 3, and opens into the central bore 5 of the threaded extension 2. The end of compartment 3 opposite to that having the spring guide and seat 4 is provided with an annular shoulder 5', for the purpose hereinafter specified. Threaded into the inner end of the long casing 1 is an auxiliary casing 6; the inner end of auxiliary casing 6 is flush with shoulder 5 (Fig. 2). Near the outer end of auxiliary casing 6 is an annular, integral collar 7, which prevents displacement of the slidable sleeve 8.

The sleeve 8 is internally threaded, and is provided for attachment to a torch, or the like, designated by dotted line 9.

The valve unit 10 of our automatic valve comprises a valve stem 11, at integral valve head 12, and an integral spring support 13. It is to be noted that the valve stem is considerably longer than the auxiliary casing 6, so as to be acted upon regularly by the tool or attachment, when fastened to the device in the place designated by 9.

On the inner end of the auxiliary casing 6 is a valve seat 14, which is normally engaged by the valve head 12. The shoulder 5 and a portion of the inner end of the auxiliary casing 6 provide an excellent clearance for the air, or the like, to quickly and freely pass by the valve head when said valve head is in an open position.

The integral spring support 13 of valve unit 10 is cylindrical shape and is of the same diameter as the central bore 5, whereby, in extreme cases, the spring support 13 can enter the central bore 5 (Fig. 4) without injuring the conical spring seat 4; further, the conical spring seat 4 will act to direct the spring support 13 positively into bore 5, when it is necessary. Therefore, when a tool is screwed into the coupling 8 and engages the outer end of the valve stem 17, the valve may be shifted inwardly until the spring carrier 13 enters the inner end of the bore 5 and closes the same. By loosening the tool the valve may move forwardly and allow fluid to flow through the compartment 3 and the auxiliary casing 6 to the tool. It will thus be seen that flow of fluid into the compartment from the bore 5 may be controlled as well as flow of fluid from the compartment through the auxiliary casing. A coil spring 15 is mounted on the spring support 13, and is therefore greater in diameter than the central bore 5, whereby, when the spring comes to rest, as per Fig. 2, the outer end of the spring will be in engagement with the conical guide and seat 4, around the edge of the inner end of central bore 5. When assembling the parts of our valve, the spring may engage to one side of the bore 5, the conical seat 4, but if the spring is temporarily in an off position, as shown by dotted line A in Fig. 2, by reason of the conical structure, the spring will positively be slid or directed towards the center, assuming its true and correct position, as hereinbefore specified, and as shown in full lines in Figure 2. This "floating" of the spring 15 into its correct position is of importance by reason of the desire to quickly and correctly assemble the parts of our valve.

It is to be understood that we have invented a special automatic valve, used more particularly in a specific manner, and that this valve comprises a relatively few parts, arranged in a novel and efficient manner. That is to say, this invention can be used on connections between the supply tanks and torches, riveting machines, and the like. In the ordinary process of the use of a cutting or welding torch, the operator finds numerous occasions when he must switch from one to the other of these machines, which are essentially different in design. In working on a job, the operator may have his welding hose connected up and find that it is necessary to cut a piece of steel or the reverse condition may happen. Similarly, if he be using a riveting machine, he may find it essential to unlock his riveting machine to attach a caulking machine. In any of which cases, it is essential that he have two separate units with all attachments, which, obviously is impractical, or he must change from one machine to the other by connections at the end of the hose which is the accepted practice. Now to do this, the operator must either go back to the beginning of his hose to a cut-off valve to close it and release the pressure, thus losing the material in the line when the machine on the end is removed or he must crimp the hose with one hand while making the changes with the other hand, a very unsatisfactory working arrangement, accompanied by damage to the crimp hose. This undesirable method of operation is entirely eliminated by means of our improved automatic valve.

While we have described the preferred embodiment of our invention and illustrated same in the accompanying drawing, certain changes or alterations may appear to one skilled in the art to which this invention relates during extensive manufacture of same, and we, therefore, reserve the right to make such alterations or changes as shall fairly fall within the scope of the appended claim.

What we claim is:

A valve adapted to be unseated by the act of coupling together two conduits comprising a single piece primary valve casing provided with a spring receiving compartment, a spring directing cone-like seat across the entire compartment at one end, said body being also provided with a bore opening into the compartment centrally of the spring seat, the other end of the casing having a socket opening into the compartment and provided at its inner end with a valve seat, a valve unit having a stem extending through said auxiliary casing and a head in said compartment, a spring support extending from said valve head towards the first-mentioned end of the chamber, said valve head being adapted to engage said valve seat, a coil spring fitting about said spring support and projecting therefrom and adapted to engage the cone-like seat and be moved to the center thereof about the inner end of said bore, and said spring support being of a diameter adapting it to be snugly received in the bore when the valve unit is forced inwardly its full extent by pressure applied to the other end of the valve stem.

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