D. P. WITMAN.

SAFETY AIR VALVE.

APPLICATION FILED JULY 5, 1919.

1,356,580. Patented Oct. 26, 1920.

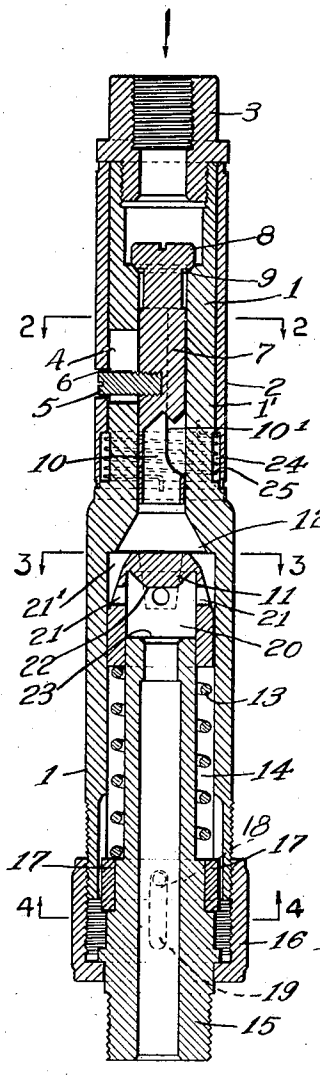


FIG. 1

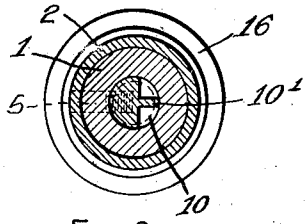


FIG. 2

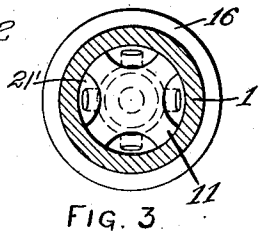


FIG. 3

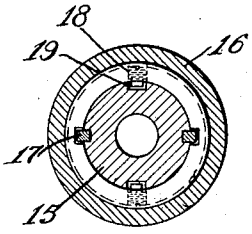


FIG. 4

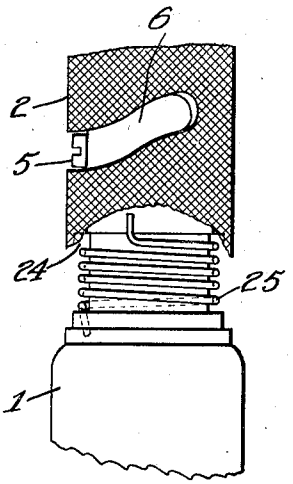


FIG. 5

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SAFETY AIR-VALVE.

1,356,580. Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed July 5, 1919. Serial No. 308,750.

To all whom it may concern:

Be it known that I, DANIEL P. WITMAN, a citizen of the United States, residing at East Somerville, county of Middlesex, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Safety Air-Valves, of which the following is a specification.

This invention relates to safety air valve handles for pneumatic drilling machines and the like, and particularly to a self-closing valve handle for such a machine as set forth in my prior application, Serial No. 282,598, filed March 14, 1919. The necessity for an automatic cut-off on such machines is well recognized as eliminating accidents heretofore all too common with the ordinary live air handle usually furnished as standard equipment for such machines. In addition to the automatic cut-off such as I have disclosed in said application positively operable handles are employed and while my automatic valve has great promptness and certainty of action I have devised a simple and convenient shut-off for the positive valve which is of advantage whether employed with an automatic valve or alone.

In my present invention I provide such an automatic closing positive control for a handle which in the embodiment shown is capable of being combined with the automatic shut-off and all in simple and efficient form affording both convenient operation and a high degree of safety.

In the drawings illustrative of my invention, I have shown as an embodiment my improved form of handle in its entirety as illustrating the manner in which it combines with my automatic cut-off and as it is actually used in practice.

In the drawings:

Figure 1 is a central vertical section through the handle.

Figs. 2, 3 and 4 sections on the lines 2—2, 3—3 and 4—4, Fig. 1, and

Fig. 5 an enlarged detail in partial section.

The body 1 of my handle is longitudinally bored from end to end affording a direct air passage therethrough.

Adjacent to one end the handle 1 is reduced as indicated at 1^1, and surrounded by a rotatable sleeve 2 held in place by the shoulder of a connection 3 which is tapped into the end of the handle. The bore of the sleeve 2 is enlarged adjacent its inner end to provide between its inner face end and its bearing on the body 1 an annular chamber 24 in which is located a spring 25.

This spring 25 is coiled about the body 1 and is attached at one end to said body and at the other end to said sleeve 2 so as to hold said sleeve normally rotated to its closed or closing position. To admit air under positive control the sleeve is turned against the action of the spring 25.

The reduced portion 1^1 is slotted longitudinally at 4, to receive a pin 5 which projects into a cam slot 6 in the sleeve 2. The pin 5 is tapped into a valve stem 7 which slidingly fits within the reduced bore of the portion 1^1. The stem 7 is headed at 8 and seats on a beveled seat 9 opposite to the intake through the connection 3. The valve stem 7 has a double longitudinal channel as at 10 with an intermedial fin 10^1 so that the air has practically a direct and straight line admission through the handle of the tool. The slot 4 is covered at all times by the main body of the stem 7 and the tubular portion 10 which also acts as a guide on the lower end of the stem in its reduced bore. Within the handle portion 1 the longitudinal bore is enlarged for the reception of the safety valve piece indicated at 11. This piece is slidable in the enlarged bore of the handle 1 below the shouldered entry 12 against which it is held by the action of a spring 13. This spring surrounds a hollow stem 14 formed on the connecting nipple 15, and normally maintains the valve 11 in the open position shown in Fig. 1 against the seating tendency of the incoming air through connection 3, but which is overcome under certain conditions to permit the valve 11 to close, as will be explained more fully hereinafter. The nipple 15 has a union connection 16 by which the stem and nipple may be adjustably moved within the handle portion 1 to adjust the compression of the spring 13. The stem 14 is keyed at 17 to the handle against any rotative tendency and is locked by screws 18 seated in slots 19.

The valve 11 is hollow, as indicated at 20 having lateral ports 21 and cut away areas 21^1 and is slidably mounted on the end of the stem 14. Within the valve block 11 is the valve 22 and on the end of the stem 14 is a seat 23. The pressure of the spring 13 having been suitably adjusted by the rota-

tion of the connection 19, the machine may be controlled by the rotation of the sleeve 2, raising the valve 8 and admitting air to the machine.

If the machine be suddenly checked by reason of any stoppage or breakage of a cutting tool, a back pressure is immediately built up behind valve 11 and the incoming air delivers a direct thrust on the large face of the valve block 11 sufficient to overcome the resistance of the spring and close the valve 22 firmly on its seat 23. This immediately shuts off the air in time to avoid the jam of the machine with the consequent danger to the workmen.

In such emergency where the abnormality occurs in the tool the shut-off is complete but in case of accident to the operator or carelessness on his part, I provide for additional and supplemental safety by the self-closing feature of the positive control through the spring return of the operating sleeve 2 of the handle. If the handle be released or otherwise loss of positive control occurs in the hands of the operator the sleeve immediately turns back closing the supply.

These and various other modifications may be made in the structure and operation of my safety handle, all without departing from the spirit of my invention if within the limits of the appended claim.

What I therefore claim and desire to secure by Letters Patent is:

A safety handle of the class described comprising a tubular body member having a central bore and externally provided with an enlarged hand hold and a reduced sleeve bearing, a rotatable control sleeve on said bearing, a spring coiled about said bearing within said sleeve and attached to the sleeve and bearing at opposite ends, a flanged nipple in the end of said bore and retaining said sleeve, a valve in said bore and controlled by said sleeve, a plug member adjustably guided in the opposite end of said bore and having a reduced tubular extension projecting within said bore, a valve seat on the inner end of said extension, a hollow valve head slidably mounted on the end of said extension, an internal valve on said head and a spring surrounding said stem and resiliently supporting said valve head against pressure.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL P. WITMAN.

Witnesses:

CAROLYN LOWDEN,

MARION F. WEISS.