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AUTGENOUS CUTTING BURNER
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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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In some cutting work it is desirable or necessary that the cutting oxygen shall be turned on and off by the hand holding the burner, because the other hand of the person using the burner is occupied either for holding the material or for clinging to a framework or the like.

One hand cutting burners are already known in which the sliding movement of a valve stem for turning on or off the cutting oxygen is produced by the aid of a double thumb piece mounted on a shaft and operated by the hand grasping the handle of the burner.

Hand cutting burners are also known in which the valve stem is projecting outwards through a stuffing box in the valve casing or chest. The disadvantage of this arrangement is that it is difficult of access.

A good grip must however be maintained in freehanded cutting during the guiding of the burner and for this reason the cutting oxygen valve must be capable of being opened and closed by light pressure. Otherwise a jerk is produced whereby the flame or the cutting jet is deflected and the work rendered faulty.

The disadvantages herein mentioned are overcome by the present invention which is characterized by the fact that the valve stem is guided loosely without any lateral packing in a sleeve in the valve casing or chest and at one terminal or extreme position packs the valve seat and at the other terminal or extreme position packs the valve casing or chest against the outside.

Other objects of the invention are a valve actuating mechanism providing for an easy manual operation of the valve, and a spring actuated mechanism preventing the valve from staying in an intermediate position when it is relieved from the pressure exerted by the controlling hand, but keeping the valve in the one extreme position against the action of said spring.

The drawing shows by way of example a constructional form of the handle portion of a cutting burner with means for turning the oxygen on and off by the pressure of the thumb.

Figure 1 is a side elevation,
Figure 2 is a top plan view,
Figure 3 is a view from the hose side with the oxygen valve open,
Figure 4 is the same view with the oxygen valve closed and Figure 5 is a transverse section of the open oxygen valve on a larger scale taken approximately on the line 5—5 of Fig. 1.

The three principal parts of the apparatus are the valve stem a (see Figure 5) the bent lever b and the eccentric or cam c. The stem a is adapted to move easily to and fro in the guide sleeve d. At one terminal or extreme position it closes the valve seat e and at the other terminal or extreme position it bears, when the valve is wide open against the rubber disc or washer f on the one hand by the force of the light spring g and on the other hand by the pressure of the gas as it flows in. An intermediate position is not needed and consequently it is unnecessary to pack the stem gastight in a stuffing box or provide a gastight connection with a diaphragm. The movement from "shut" to "open" and vice versa takes place so quickly that there can be no question of any loss of oxygen provided that the valve is prevented from staying in an intermediate position between "shut" and "open". In accordance with the small cross sectional area of the stem and the slight amount of friction which exists the force required to close the valve is very small. By the aid of the toggle lever b which moves around the rotating bolt h and the use of the eccentric c it is possible to convert the linear movement of the stem a into a rotary motion and then to bring the shaft i with the thumb pieces k, k' (see Figures 1 to 4) into a convenient position for the hand.

When the handle m of the burner is grasped in the hand the thumb can be moved freely. The function of the thumb is to depress the left hand side k of the thumb piece to open the valve and the right hand side thereof to close it, while the eccentric c on the one hand releases the toggle lever b with the pressure screw n which acts on the valve bolt and on the other hand rocks the toggle lever b back into the closing position so as to close the valve stem by means of the pressure screw n.

If the operator should inadvertently release the thumb piece in a position in which the valve assumes an intermediate position and, consequently, a leakage through the guide sleeve d exists, the spring g will move the valve a into the closing position shown in Fig. 5. The cam c is so shaped that it
does not resist the action of the spring in such an intermediate position. When the valve is, however, entirely opened, the cam c locks the lever b against the action of the spring g and the valve will, therefore, stay in the open position after the thumb piece has been released by the operator. In order to still further reduce the friction of the eccentric on the toggle lever it may be provided with an anti-friction ring. Instead of making the thumb piece of the form shown it may also be so constructed that one or both sides are bent at an angle and lie over the handle so that the ball of the hand can be used for operating the valve.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A one hand operated cutting burner comprising a valve casing provided with a valve seat and with a bore in axial registry therewith, a stem passing loosely through said axial bore, a valve within said casing, carried by said stem and resting in an extreme inner position against said seat and resting in an extreme outer position against the inner mouth of said bore thereby sealing the same, a spring tending to move said valve into the one of said extreme positions, and a valve actuating mechanism comprising a pivoted cam and lever to lock said valve against the action of said spring in the other extreme position only, thereby permitting the valve to be controlled by the influence of the spring in all other positions thereof.

2. A one hand operated cutting burner comprising a valve casing provided with a valve seat and with a bore in axial registry therewith, a stem passing loosely through said axial bore, a valve within said casing, carried by said stem and resting in an extreme inner position against said seat and resting in an extreme outer position against the inner mouth of said bore thereby sealing the same, a handle to support the burner, a movable thumb piece located in proximity to said handle, a connection between said valve and said thumb piece, and a spring associated with said valve to force the same into the one extreme position, said connection comprising a pivoted cam and lever locking said valve against the action of said spring in the other extreme position but otherwise permitting said spring to move said valve.

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