R. E. BRUCKNER.

SAFETY MEANS FOR GAS TANKS.

APPLICATION FILED MAY 4, 1917.

1,250,552. Patented Dec. 18, 1917.

Fig 1

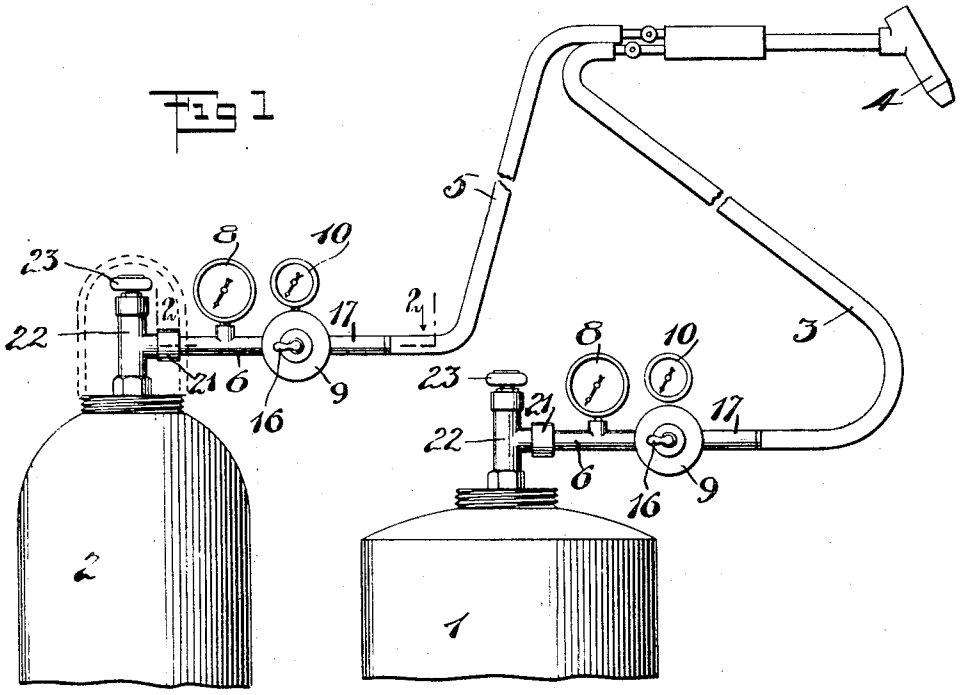
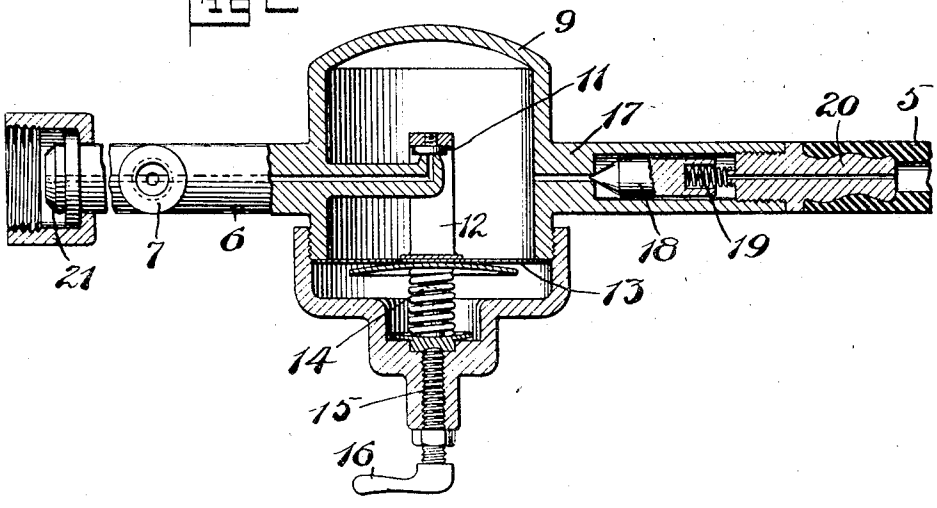


Fig 2



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UNITED STATES PATENT OFFICE.

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SAFETY MEANS FOR GAS-TANKS.

1,250,552. Specification of Letters Patent. Patented Dec. 18, 1917.

Application filed May 4, 1917. Serial No. 166,506.

To all whom it may concern:

Be it known that I, RUDOLPH E. BRUCKNER, a citizen of the United States of America, residing at New York city, county and State of New York, have invented a new and useful Safety Means for Gas-Tanks and the like, of which the following is a specification.

My invention relates to a safety means for gas tanks and pressure regulators and is particularly useful in connection with gas welding and cutting apparatus wherein two tanks containing different gases under pressure are distributed therefrom at a reduced pressure and lead to a torch where said gases mingle and produce a flame of intense heat. Sometimes in the use of such apparatuses, a flash-back occurs which is liable to cause great damage either by exploding the tank or by injury or destruction to the pressure regulating means. By my invention this is guarded against. Again, it sometimes happens that in the event of stoppage at the outlet of the torch, gas from one of the tanks if being discharged at a higher pressure than the other, is liable to force its way back into the other tank creating what is recognized as a dangerous condition. This likewise is guarded against. My present invention is a distinct improvement in many ways over prior existing devices, in that it associates the safety means with the regulator unit whereby it is effectively protected and whereby danger of injury or unsatisfactory operation is guarded against in the above and other respects which will be apparent to the mechanic skilled in the art. My improved device will be found to contain many advantages, for example, by the employment of my invention the particular construction of the tool or torch employed is immaterial.

In the accompanying drawing:

Figure 1 is a view conventionally illustrating the upper part of two gas tanks operatively connected and associated with a torch.

Fig. 2 is a section on the plane of the line 2—2 of Fig. 1 and relatively enlarged.

It will be understood that I have shown and described my invention only in its preferred embodiment, and that modifications and changes can be made without departing from the spirit or scope thereof.

1 conventionally represents the upper part of a gas tank containing say acetylene. 2 conventionally represents the upper part of a tank containing say oxygen. 3 is a pipe leading from tank 1 to a torch 4. 5 is a pipe leading from the tank 2 to the torch 4. Arranged intermediate the pipes 3—5 and their respective tanks, are gas pressure regulating devices usually built as a unit and including a high pressure and a low pressure gage. One of these units is shown chiefly in section in Fig. 2, and will be seen to comprise a main pipe 6 having a mounting 7 for a high pressure gage 8 and having a low pressure chamber 9 upon which is mounted a low pressure gage 10. The pipe 6 has a nozzle projecting into the chamber 9 controlled by a valve 11 which is mounted on a carrier 12 connected with a diaphragm 13. The diaphragm 13 is pressed in the valve opening direction by a spring 14, and the compression of said spring may be increased or diminished by means of a screw 15 controlled by a handle 16 whereby the diaphragm 13 will resist to a greater or less capacity the pressure of gas within chamber 9 and will correspondingly control the operation of the valve 11. 17 is a pipe leading from the chamber 9 toward the torch. 18 is a check valve carried by the regulator unit and preferably located in a chamber in the outlet end 17 whereby said check valve will not only prevent flow of gas toward the tank with which the regulator is connected, but will also prevent a flash-back into the regulator. In the particular form shown, the valve 18 is self-closing under the action of a spring 19. 20 is an outlet nipple to which one of the pipes 3 or 5 which lead to the torch 4 is connected. In this instance we have shown the pipe 5 as connected therewith. The opposite end of the regulator unit is provided with a suitable coupling 21 whereby the regulator unit may be connected to the tank. 22 represents the usual so-called stud valve with which such tanks are equipped, this valve being provided with the usual controlling handle 23. In this particular instance the coupling 21 is connected to the outlet of the stud valve, as shown in Fig. 1. When the parts are all assembled, as shown, it will be observed that the high pressure gages 8—8 will register the actual tank pressure when the stud valves are opened. To reduce this pressure the handles 16 may be turned to the

desired degree so that the gages 10—10 will indicate the pressure of gas within the pipes 3—5, that is to say, the pressure of gas in each pipe as delivered to the torch 4. In the event the outlet end of the torch 4 should become clogged, it is obvious that if the pressure in one tank and its connecting pipe should be greater than the pressure in the other tank, gas would flow from the former into the latter in the absence of the check valve aforesaid, but my improvement absolutely prevents this and thereby removes a source of great danger. In the preferred construction also, the check valve safeguards the gage units as well as the tanks from any possible accident due to a flash-back. By the particular arrangement shown, the danger of any disconnecting of the check valve or uncertainty of its operation is minimized because the same is mounted in a solid part of the regulating unit which is always so located that there is very little danger of its being subjected to rough treatment or undue strain.

It is obvious that my improvement makes it possible to use a tool or torch of any description without sacrifice of safety.

I claim:

1. In a gas welding and cutting apparatus wherein different gases, contained under pressure in two tanks, are distributed therefrom at a reduced pressure and lead to a torch wherein said gases mingle and are ignited to produce a flame of intense heat, a self-contained safety device comprising a casing, a pressure reducing valve therein, said casing having an inlet pipe at one side with means for connecting the same to a gas tank, an outlet pipe projecting from said casing and having a valve chamber therein, and a passage connecting said valve chamber with said pressure reducing valve, means having a passage therethrough and having one end adapted for connection to said valve chamber, and the other end adapted to receive a tubing suitable for connection to a torch, and a self-closing valve within said valve chamber arranged to close the passage-way leading to said casing to permit the flow of gas in an outward direction only.

2. In a self-contained safety apparatus of the character described for gas tanks, a pressure regulating device arranged to be rigidly attached to a tank and including a pipe coupling means at one end thereof, a housing, the other end of said pipe projecting into said housing, a diaphragm controlled pressure reducing valve in said housing associated with that part of said pipe projecting into the same, a rigid outlet pipe projecting from said housing and arranged to be connected with a flexible pipe extension, valve mechanism within said outlet pipe comprising a spring seated valve arranged to prevent the flow of gas toward the tank with which it is connected but permitting the flow of gas in an opposite direction whereby the back flow of gas and the collection of explosive mixtures in the pressure reducing valve and tank is prevented.

RUDOLPH E. BRUCKNER.