

947,396.

Fig. 1.

Witnesses:
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Fig. 2.

Fig. 3.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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FLASH-BACK-STOP TESTER.

947,396.

Specification of Letters Patent.

Patented Jan. 25, 1910.

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To all whom it may concern:

Be it known that I, DANIEL O'KEEFE, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Flash-Back-Stop Testers, of which the following is a specification.

My invention relates to means for testing devices adapted to prevent the flame from flashing back from the point of normal combustion through the supply passage to the container. Such a device for arresting the "flashback" is described in my Letters Patent of the United States, No. 879,577, dated Feb. 18, 1908.

All "flashback" stops should be tested in the shop before being sent out for use, and this is the use for which my device is particularly intended; but it may become desirable to test such stop devices on the line, and with my testing device this can readily be done, the supply line being provided with suitable openings and cocks.

My invention is illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of my testing device and the attached "flashback" stop, mostly in vertical axial section. Fig. 2 is a top plan view of the same. Fig. 3 is a detail of the weighted bellows gas holder. Fig. 4 is a detail of the liquid seal gas holder. Fig. 5 is an end elevation of the tester and the outlet end of the stop in position for test.

Referring now to the drawings: A designates a generator of any suitable type, the one shown being a very simple form consisting of a tank a with a water connection a^1 provided with a valve a^2 , a carbid receptacle a^3 fitted with a screw cap, and having a valve a^4 to regulate the feed of the carbid into the tank. A pipe a^5 provided with a cock a^6 forms a vent permitting excess gas to escape into the waste flue C, hereinafter described. An agitator a^7 of any suitable kind is journaled in the ends of the tank a , and is adapted to be rotated or oscillated by the handle a^8 , or in any other suitable manner. A petcock a^9 is adapted to maintain the proper water level in the tank. A drainage plug a^{10} is threaded into the bottom of the tank. A gas outlet pipe a^{11} provided with a cock a^{12} connects the generator A with a pipe B which terminates at one end in a connection adapted to engage the inlet end of the "flash-

back" stop S to be tested, while the other end of said pipe B is fitted with a cap b^1 . Tapped into a convenient point of the pipe B is a safety valve b^2 of any suitable type adapted to discharge gas into a waste flue C or its connection whenever the pressure of gas exceeds a predetermined limit.

Connected with the pipe B at any desired point and in any convenient manner, as by a 6-way cross b^3 are provided one or more receptacles for a limited quantity of gas. In the drawing, three are shown, the middle one a collapsible gas bag D connected to one opening of the cross b^3 ; another E an accordion bellows construction adapted to be placed vertically as shown in Fig. 3 with top weight e , is connected to a tee and pipe threaded into the cross b^3 ; while the third is a liquid seal holder F, of any ordinary type, connected to a tee and pipe threaded into the cross b^3 . The container D is surrounded by a wire net D^1 , or other suitable protection, and its supply is controlled by the cock d . The container E is provided at its inlet end with a cock e^1 to control the supply of gas, and at some convenient point with a cock e^2 to release excess gas into the waste flue. Container F is provided on its inlet pipe f^5 with a cock f to control the supply of gas, and a vent cock f^1 at the top of the inverted bell f^2 , which is partially immersed in liquid contained in the vessel f^3 . The height of liquid in said vessel is controlled by the overflow and draw-off f^4 with its 3 way cock f^6 . The inlet pipe f^5 terminates above the water line, to convey gas to the interior of the bell.

At each end of the cross connection formed by the cross b^3 and its attached pipe and tees is a valve b^4 with provision for suitable connection to a flexible or other pipe, through which air or a foreign gas may be introduced.

A hood C^1 tightly incloses all the gas receptacles, connects with the waste flue C, and is provided with doors c adapted to hermetically seal the hood when closed, and when open to afford free access to the containers.

At a convenient point on the pipe B is a cock b . Tapped into the same pipe is a pipe G for supplying air or elementary gases controlled by the valve g . Also tapped into the same pipe on the top side thereof is receptacle H for highly volatile gas producing

liquids, as gasoline. This receptacle consists of a cup shaped receiver h separated by a contracted neck controlled by the valve h^1 from the reservoir h^2 , at the base of which is another valve h^3 , adapted to control the discharge into the pipe B, while under pressure.

A siphon water gage I adjacent to the stop connection, tapped into the pipe B and provided with the valve i , registers either gas pressure or vacuum.

A frame J of any suitable form serves to connect and support the whole mechanism. At a suitable place on this frame is a pipe K with connections adapted to engage the outlet of the "flash-back" stop.

Adjacent to the connection there is tapped into the upper side of said pipe a gage L similar to the one I, and provided with valve l .

At the outer end of the pipe K is a slide stop k of the ordinary type, adapted to be operated by lateral motion of the handle k^1 , so that a full discharge of gas through the pipe K will be instantly secured.

Tapped into the pipe B is a service gas line M, controlled near said connection by a cock m . Its outer end terminates directly in front of the outlet end of the pipe K in a jet m^1 controlled by a cock m^2 .

The operation of my invention is as follows: If carbid gas is to be made on the spot and supplied, close the cocks a^{12} , a^9 and a^9 and the valve a^4 . Open the valve a^2 letting in a convenient supply of water. Remove the cap and place carbid in the receptacle a^3 , and replace cap. Open the valve a^4 to permit a suitable quantity of carbid to drop down into the water in the tank a .

Close the cocks b and m , open the cock a^{12} , and as many as desired of the cocks d , e or f ;—let us assume but one, and that e^1 ; and close the cock e^2 . Grasp the handle a^8 and agitate the carbid and water mixture until a suitable charge of gas has been formed

and conveyed to the container E. Close the cock a^{12} and open a^6 . Close stop k . Open stop m , allowing gas to flow through pipe M. Open cock m^2 and apply flame to jet m^1 . Set the three way cocks N, N of the "flash-back" stop mechanism S which is open as shown in Fig. 1, so that passage is open through device to the gas container. Open the valve g admitting air to the pipe B and the stop device and pipe K, open the cock b

and allow the gas to flow in until both gages I and L register the desired pressure, then close the cocks i and l of said gages. Then open the stop k and the mixture of air and

gas flowing from outlet of pipe K will come in contact with the flame from jet m^1 , will ignite, "flashback" through pipe K, discharge the fulminate or explosive in the "flash-back" stop S, and if the stop is in proper working order, it will seal the supply passage against the "flashing back" of the flame to the container. If it fails to work properly the flame will "flashback" to the container E and burst it, the gas and fumes escaping into the hood C^1 and waste flue C. As the amount of gas in the container is small, no damage to property or injury to persons can occur.

If a foreign gas is used, the cock a^{12} is closed, the generator A is not used, connection is made at b^4 for the introduction of the gas supply, which is shut off after the container is filled and the operation is otherwise the same.

If the gas is formed within the device from a liquid; cock b is closed, gasoline or other volatile combustible fluid placed in cup h , fed into reservoir h^2 through valve h^1 , and through valve h^3 into pipe B forming an explosive or combustible mixture when air or elementary gases are admitted and the operation is then the same, valve h^3 being closed to prevent "flashing back" into the reservoir h^2 .

Any means of supplying a limited quantity of gas to the stop being tested and of supplying the air or mixture and applying the flame, is within the scope of my invention.

I claim as my invention and desire to secure by Letters Patent of the United States.

In an apparatus for testing flash-back stops, a gas supply pipe provided with means for attaching the inlet end of the flash-back stop; a flame producer adapted to operate approximate to the exit mouth of the flash-back stop; an expansible gas container of limited capacity interposed in the line as a secondary source of gas transmission between the source of supply and the flash-back stop connection, and means for closing the connection between the main and the auxiliary sources of supply.

In testimony whereof I have hereunto set my hand in presence of subscribing witnesses.

DANIEL O'KEEFE

Witnesses:

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