

Dec. 18, 1928.

1,695,848

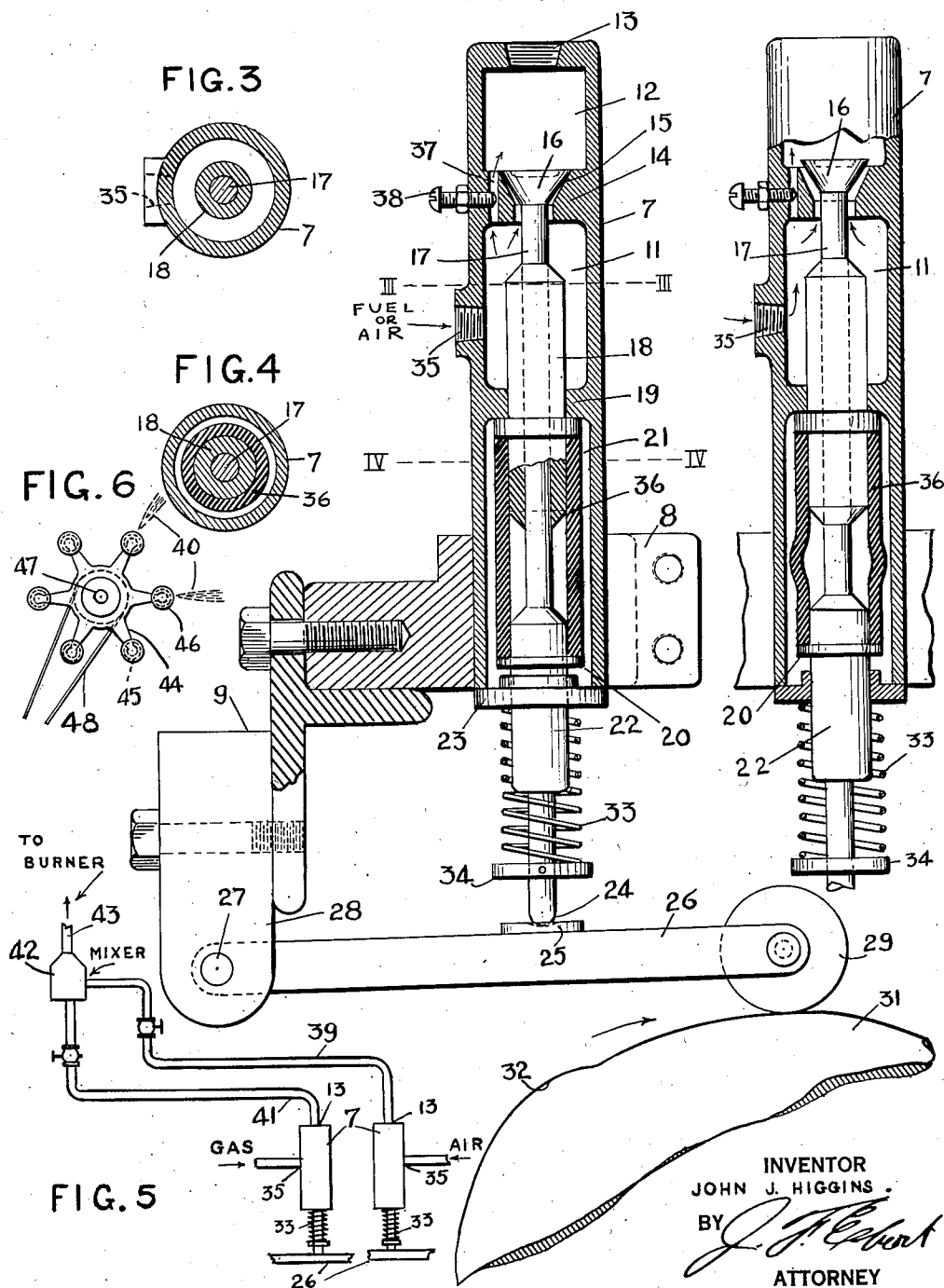
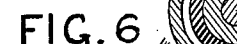
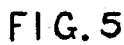
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GAS ECONOMIZER

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FIG. 1

FIG. 2.



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UNITED STATES PATENT OFFICE.

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GAS ECONOMIZER.

Application filed November 1, 1924. Serial No. 747,263.

This invention relates to fluid fuel feeding apparatus as used in connection with the manufacture of incandescent electric lamps and the invention more particularly relates to an economizer for use with such apparatus.

An object of the invention is to provide a device operable to prevent unnecessary consumption of fuel.

Another object of the invention is to provide an automatic mechanism for controlling the discharge of fuel.

A further object of the invention is to provide a fuel control operable in synchronism with a given machine to effect the discharge of fuel at given time intervals.

A still further object of the invention is to provide fuel or air interrupters applicable to fuel or air lines and operable in cooperation with a lamp-making machine to supply ignited fuel intermittently when required.

Other objects and advantages will be apparent as the description proceeds.

In the art of manufacturing incandescent electric lamps, it is necessary to fuse different glass parts together to produce the structure essential to constitute an incandescent electric lamp. During the manufacture of such lamps, certain of the operations require that gas flames be directed against two or more lamp parts to render them plastic for union. Machines for supporting several assembled glass parts to be consolidated generally comprise a conveyor in which the several parts are secured in holders spaced along the periphery of the conveyor. An operator assembles the parts at a loading position and the same are moved from station to station for the various operations, such as the application of heat, mechanical pressure, etc.

It will be appreciated that when several assembled glass parts have been heated at one stage and are moved to another position, there occurs an interim during which no heat is required because there is no object in the path of the fires. Ordinarily, the gas flames which heat the parts continue, and during this period, a relatively large proportion of fuel is consumed unnecessarily.

The present invention provides for the saving of fuel during transportation of lamp parts from one position to another. The invention may be practiced by providing a casing having a receiving chamber and an outlet chamber controlled by a valve. One

such mechanism may be placed in the fuel line and another in the air line and both may be in communication with a mixer chamber. Mechanism may be provided intermediate the valves and a lamp-making machine to cooperate therewith for actuating the valves at predetermined intervals in accordance with the transportation of a lamp part during the process of construction. The valves which may be termed interrupters are, therefore, applicable to fuel and air lines of a lamp-making or other machine where an interrupted ignited fuel jet is desired.

The invention will be more fully understood by reference to the accompanying drawing, in which

Fig. 1 is a vertical sectional view of an embodiment of the present invention;

Fig. 2 is a fragmentary view of the device shown in Fig. 1 and illustrates the valve open;

Fig. 3 is a transverse sectional view taken on line III—III in Fig. 1;

Fig. 4 is a transverse sectional view taken on line IV—IV in Fig. 1;

Fig. 5 is a diagrammatic representation of the valves or interrupters applied for use and shows their connection to a mixer; and

Fig. 6 illustrates diagrammatically, a conveyor of a lamp-making machine and indicates the flames for heating lamp parts at different stages.

As illustrated, an embodiment of the invention may include a casing 7 which may be supported in any suitable manner adjacent or in proper relation to a lamp-making or other machine. As shown, the casing is secured by a split collar 8 fastened to a bracket 9 which may be attached in any desirable manner to the stationary structure of the machine to which the present device is to be applied.

The casing 7 may be provided with an inlet chamber 11 and an outlet chamber 12 having a threaded aperture 13. The chambers may be separated by a partition 14 provided with a valve seat 15 to receive a valve 16, the valve 16 being provided with a stem 17 movable in a guide bearing 18 centrally disposed within the casing 7 and secured thereto in a transverse wall 19. The wall 19 in conjunction with the guide 18, separates the inlet chamber 11 from a compartment 21 at the lower end of the casing 7. The stem 17 which is slidably disposed in the guide

18 extends through the compartment 21 and is provided with an enlargement 22 movable in a guide ring 23 which serves as a closure for and is secured to the lower end of the 5 compartment 21. The stem 17 terminates in a rounded portion 24 which may be disposed in contact with a bearing plate 25 carried on a lever arm 26. The lever arm may, in turn, be pivoted at 27 in a bearing 28 secured to the bracket 9. The free end of the 10 lever 26 may be provided with a roller 29 disposed to engage with a cam wheel 31 having a cam rise 32. The stem is normally urged to engagement with the bearing plate 15 24 under the action of a spring 33 disposed upon the stem between a collar 34 secured thereto and the guide ring 23.

From the foregoing, it will be evident that when the cam wheel 31 is rotated, the roller 20 29 on the lever arm will traverse the cam and engage the rise 32 and a consequent lift of the valve 16 from its seat will result.

Gas or air is permitted to enter the receiving chamber through an inlet 35 and is retained in the chamber until the valve 16 is 25 lifted and in devices of this sort, it is desirable to provide a durable and effective means for preventing any gas leakage.

The present invention, therefore, includes 30 a flexible sleeve 36 of rubber or suitable material which may be slipped over the valve stem so that one end of the sleeve tightly grips the lower end of the guide 18 and the opposite end of the sleeve tightly grips the 35 enlarged portion 22 of the stem and abuts against a flange 20 which may be integral with the portion 22. This sleeve effectively encloses the only communicating passage between the chamber 11 and the atmosphere.

40 Where a movable rod is employed, as in the present invention, it is, of course, impossible to attain a sliding movement and keep a gas tight association between a slide rod and its bearing. The sleeve 36, however, 45 provides a seal and at the same time allows for the necessary movement of the stem as shown in Fig. 2, causing the sleeve to slightly buckle but not disturbing its intimate contact to provide a seal.

50 It is well known that fuel systems employ means for conducting two mediums, such as a gaseous fuel and air. These two elements are passed to a mixing chamber suitably constructed to mix the same for discharge in a 55 highly combustible state. The present device may be used for the interruption of either the gas or the air if desired but is generally placed in both lines. In either case, however, the chamber 11 is provided with a by-pass 37 for the passage of a regulated amount 60 of either gas or air to continually enter the mixer for the maintenance of a pilot light which is necessarily employed. The by-pass 37 may be of a given effective area or a set 65 screw 38 or other adjusting means may be

provided for inward or outward movement to regulate the area.

As an example of the use of the present device, attention is called to Fig. 5 which shows the casings 7 connected by pipe lines 39 and 70 41 to a mixing chamber 42 of any suitable type which in turn, has an outlet 43 from which flame 40 issues to heat work parts.

The present invention is, of course, applicable for use in connection with various styles 75 of machines but is of particular advantage when employed as part of a lamp-making machine, as, for example, one including a rotary carrier 44 (see Fig. 6) having a plurality of heads 45 mounted at the periphery 80 thereof to hold work parts 46 such as a lamp mount and bulb. The conveyor may be movable about a hub 47 and rotatable by suitable mechanism 48 which may include a belt and pulley to effect an intermittent actuation of 85 the conveyor in the manner common to this class of machines.

As indicated, gas flames 40 may be positioned at the various stages, such flames being provided by connections such as 43 (Fig. 90 5) to the mixer 42 and controlled by the check valves as shown in the embodiment of the present invention.

When applied to a machine to control the flow of mixed gases, two devices are employed 95 as shown in Fig. 5 and a lever arm 26 is associated with each device to engage with a cam of suitable width or with individual cams operable in timed relation with the other movable elements of a lamp-making or 100 other machine.

It will be evident from the above that the present invention serves not only to reduce the amount of fuel consumed but also removes 105 the gas flame from the path of movement of certain structural parts carried by the conveyor of the machine, thereby avoiding the disadvantage of heating portions of the machine unnecessarily.

A device of the character such as shown 110 and described herein is of great economic value in connection with machines which run continually since the intermittent action of the flame results in an appreciable saving.

Although a preferred embodiment of the invention is shown and described herein, it is 115 to be understood that modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims. 120

What is claimed is:

1. A fuel control device comprising a tubular member, a partition dividing said member to provide an inlet chamber and an outlet 125 chamber, a valve seat in said partition, a valve stem within said member, a valve head on said stem for engagement with said valve seat, means for normally maintaining said head in contact with said seat, means for 130 automatically lifting said head, a guide for

said stem extending from said inlet chamber means surrounding an end of said guide and a portion of said stem for sealing said inlet chamber from the atmosphere.

5 2. A fuel control device comprising a tubular member, a partition dividing said member to provide an inlet chamber and an outlet chamber, a valve seat in said partition, a valve stem within said member, a valve head
10 on said stem for engagement with said valve seat, means for normally maintaining said head in contact with said seat, means for automatically lifting said head, a guide for said stem extending from said inlet chamber
15 and a flexible member engaging an end of said guide and a portion of said stem to seal said inlet chamber from the atmosphere.

3. A fuel control device comprising a tubular member, a partition dividing said member to provide an inlet chamber and an outlet
20 chamber, a valve seat in said partition, a valve stem within said member, a valve head on said stem for engagement with said valve seat, means for normally maintaining said
25 head in contact with said seat, a guide for

said stem extending from said inlet chamber, flexible means surrounding an end of said guide and a portion of said stem for sealing said inlet chamber from the atmosphere and means for automatically reciprocating said
30 stem.

4. A fuel control device comprising a tubular member, a partition dividing said member to provide an inlet chamber and an outlet chamber, said partition having a passage af-
35 fording communication between said chambers, a valve seat in said partition, a valve stem within said member, a valve head on said stem for engagement with said valve seat, means for normally maintaining said
40 head in contact with said seat, means for automatically lifting said head, a guide for said stem extending from said inlet chamber and a flexible member surrounding an end of said guide and a portion of said stem to seal
45 said inlet chamber from the atmosphere.

In testimony whereof, I have hereunto subscribed my name this 31st day of October, 1924.

JOHN JOSEPH HIGGINS.