Oct. 24, 1939. J. F. KYES ET AL 2,177,301

VALVE

Filed Nov. 20, 1936

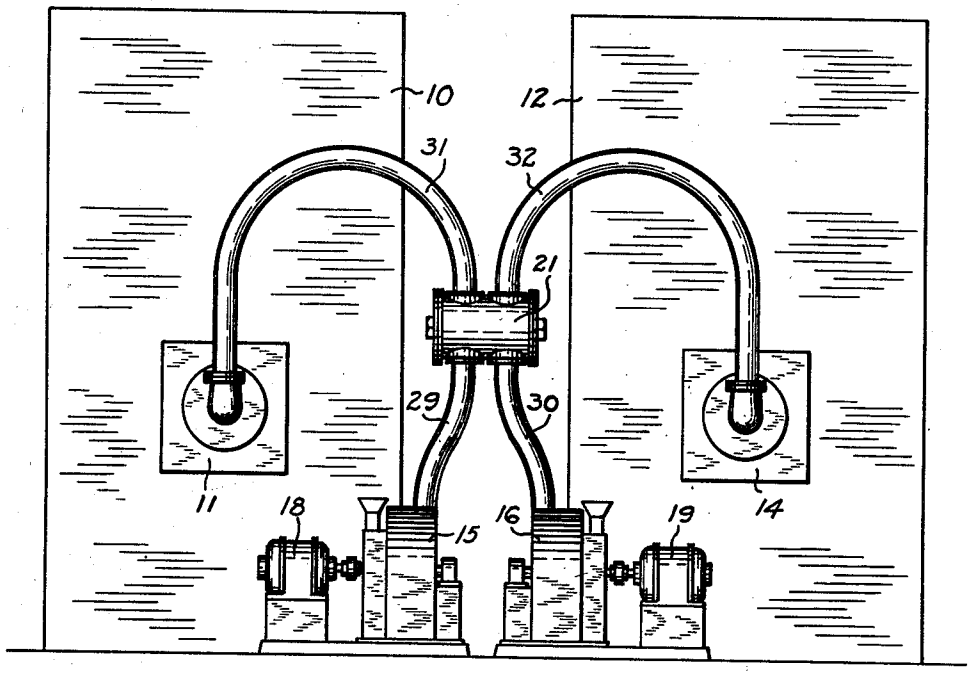


Fig. 1

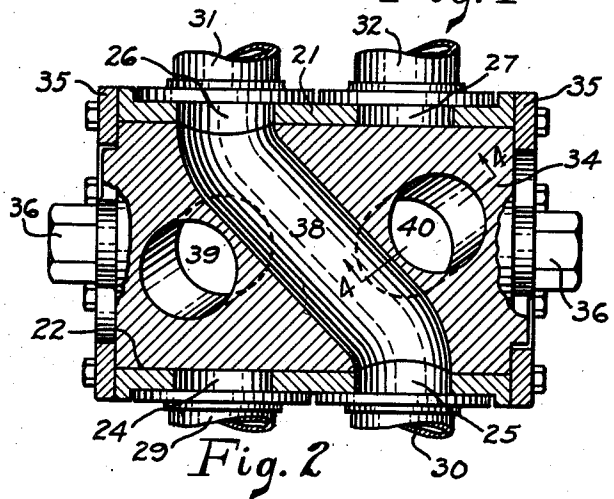


Fig. 2

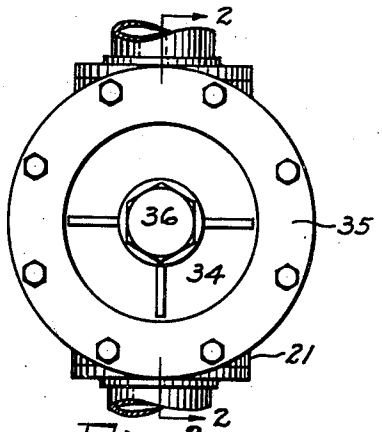


Fig. 3

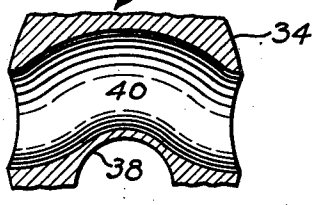


Fig. 4

Inventors
JOHN F. KYES
HERBERT J. HASTEDT

By Albert G. Blodgett
Attorney

Patented Oct. 24, 1939

2,177,301

UNITED STATES PATENT OFFICE

2,177,301

VALVE

John F. Kyes, West Boylston, and Herbert J. Hastedt, Worcester, Mass., assignors to Riley Stoker Corporation, Worcester, Mass., a corporation of Massachusetts

Application November 20, 1936, Serial No. 111,900

2 Claims. (Cl. 251—104)

This invention relates to valves, and more particularly to a valve of the rotary plug type adapted to control the distribution of pulverized fuel to a pair of combustion furnaces.

In supplying pulverized fuel by the well known "direct-fired" system, it is a common practice to utilize a separate pulverizer for each furnace and to provide a separate and independent connection between each pulverizer and its particular furnace. This arrangement makes it possible to control the rate of combustion in each furnace independently by regulation of the feed of fuel to the corresponding pulverizer. If however a plant has two furnaces fired in this manner, and one of the furnaces has to be shut down for repairs at the same time as the pulverizer associated with the other furnace, it will be apparent that neither furnace can be maintained in operation.

It is accordingly the main object of the invention to overcome this difficulty and to provide a simple and convenient valve whereby each pulverizer may be independently connected to its respective furnace, or either of the pulverizers may be connected to the furnace normally corresponding to the other pulverizer.

It is a further object of the invention to provide a comparatively simple and inexpensive valve which will normally serve to direct the discharge from the pulverizers to their respective furnaces independently but which can be readily adjusted to direct the discharge from either pulverizer to the furnace normally fired by the other pulverizer.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claims appended hereto.

Referring to the drawing illustrating one embodiment of the invention, and in which like reference numerals indicate like parts,

Fig. 1 is a front elevation of a pair of furnaces and the associated fuel feeding apparatus;

Fig. 2 is a longitudinal section through a valve, the section being taken on the line 2—2 of Fig. 3;

Fig. 3 is an end elevation of the valve; and

Fig. 4 is a fragmentary section taken on the line 4—4 of Fig. 2.

The embodiment illustrated comprises a steam boiler furnace 10 having a burner 11 mounted on its front wall, and a second steam boiler furnace 12 having a burner 14 mounted on its front wall. The two furnaces are laterally adjacent, and in front of them there is provided a pair of fuel pulverizers 15 and 16 driven by electric motors 18 and 19 respectively.

A casing 21 is mounted above the pulverizers, and this casing is provided with a cylindrical bore 22. The casing walls are provided with two inlet ports 24 and 25, and two outlet ports 26 and 27, all communicating radially with the bore 22 and all located in a common plane which passes through the axis of the bore. The inlet ports 24 and 25 are located diametrically opposite the outlet ports 26 and 27 respectively. Pipes 29 and 30 connect the inlet ports 24 and 25 with the pulverizers 15 and 16 respectively, and pipes 31 and 32 connect the outlet ports 26 and 27 with the burners 11 and 14 respectively.

A cylindrical plug 34 fits closely within the bore 22 and is held in place against axial movement by means of annular plates 35 secured to the ends of the casing 21 and overlapping the ends of the plug. A hexagonal boss 36 is formed on each end of the plug so that the plug may be rotatably adjusted by means of a suitable wrench.

The plug 34 is provided with passages so arranged that each pulverizer may be connected with its respective furnace, or either pulverizer may be connected with the opposite furnace, depending upon the position of the plug. For this purpose there is shown a central passage 38 extending transversely through the plug, and two passages 39 and 40 located on opposite sides of the passage 38 and likewise extending transversely through the plug. The central passage 38 is inclined with respect to the axis of the plug, and its opposite ends are located in a common axial plane and they may be brought into register either with the ports 26 and 25 (as shown in Fig. 2) or with the ports 24 and 27 (by rotating the plug 180 degrees from the position shown). One end of the passage 38 is located in a plane extending through the ports 24 and 26 and perpendicular to the axis of the plug, and the other end of the passage is located in a plane extending through the ports 25 and 27 and perpendicular to the axis of the plug. The passage 39 is arranged with its ends diametrically opposite each other and located in the first of said planes, and the passage 40 is arranged with its ends diametrically opposite each other and located in the second of said planes. The ends of the passages 39 and 40 are located in a common plane extending through the axis of the plug and at right angles with the axial plane which contains the central passage 38. In order to make possible a more compact construction, with a plug of comparatively small diameter, the passages 39 and 40 are

offset intermediate their ends in directions perpendicular to the adjacent portions of the central passage 38.

The operation of the invention will now be apparent from the above disclosure. By rotating the plug 34 through 90 degrees from the position shown in Fig. 2, the ends of the passage 39 may be brought into register with the ports 24 and 26, while the ends of the passage 40 are at the same time brought into register with the ports 25 and 27. In this manner the pulverizers 15 and 16 will be independently connected to the furnaces 10 and 12 respectively, and the rate of combustion in the separate furnaces can be controlled as desired. If now it becomes necessary to shut down the furnace 12, and at the same time the pulverizer 15 requires repair or is otherwise inoperative, the plug 34 can be turned to the position shown in Fig. 2, and the pulverizer 16 can be used to supply fuel through the passage 38 to the furnace 10. Similarly, by turning the plug through 180 degrees from the position shown in Fig. 2, the pulverizer 15 can be used to supply fuel through the passage 38 to the furnace 12. It will thus be seen that so long as one of the furnaces is available for use, it may be kept in operation by utilizing, if necessary or desirable, the pulverizer which normally supplies fuel to the other furnace. The change-over can be made very quickly and easily, since it merely requires the adjustment of a single member. The apparatus is comparatively simple and inexpensive to manufacture and install.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A valve comprising a casing having a bore with two ports communicating with the bore at one side and two ports communicating with the bore at the other side, all the ports being located in a common plane which passes through the axis of the bore, and the ports on one side being diametrically opposite the respective ports on the other side, and a plug rotatably supported in the bore and provided with two transverse passages having their ends located in a common plane which passes through the axis of the plug, each passage having a cross-section which is substantially uniform in size and shape throughout the length of the passage, the said passages being arranged to connect the ports at one side to the diametrically opposite ports when the plug is in one position, the plug having a third transverse passage located in a plane which passes through the axis of the plug and is substantially perpendicular to the last-mentioned plane, the third transverse passage being positioned between the first-mentioned passages and arranged to connect one of said ports to a diagonally opposite port when the plug is rotated to a different position.

2. A valve comprising a casing having a bore with two ports communicating with the bore at one side and two ports communicating with the bore at the other side, all the ports being located in a common plane which passes through the axis of the bore, and the ports on one side being diametrically opposite the respective ports on the other side, and a plug rotatably supported in the bore and provided with two transverse passages having their ends located in a common plane which passes through the axis of the plug, the said passages being arranged to connect the ports at one side to the diametrically opposite ports when the plug is in one position, the plug having a third transverse passage positioned between said passages and located in a plane which passes through the axis of the plug and is substantially perpendicular to the last-mentioned plane, the third transverse passage being arranged to connect one of said ports to a diagonally opposite port when the plug is rotated to a different position, the intermediate portions of the two first-mentioned passages being offset away from the adjacent portion of the said third passage.

JOHN F. KYES.
HERBERT J. HASTEDT.