

March 31, 1959

H. JANSEN ET AL

2,879,799

VALVE

Filed Nov. 30, 1956

2 Sheets-Sheet 1

FIG. 1

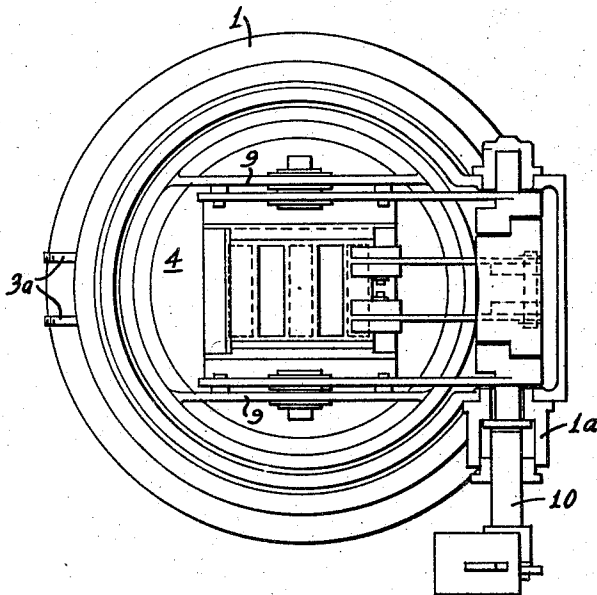
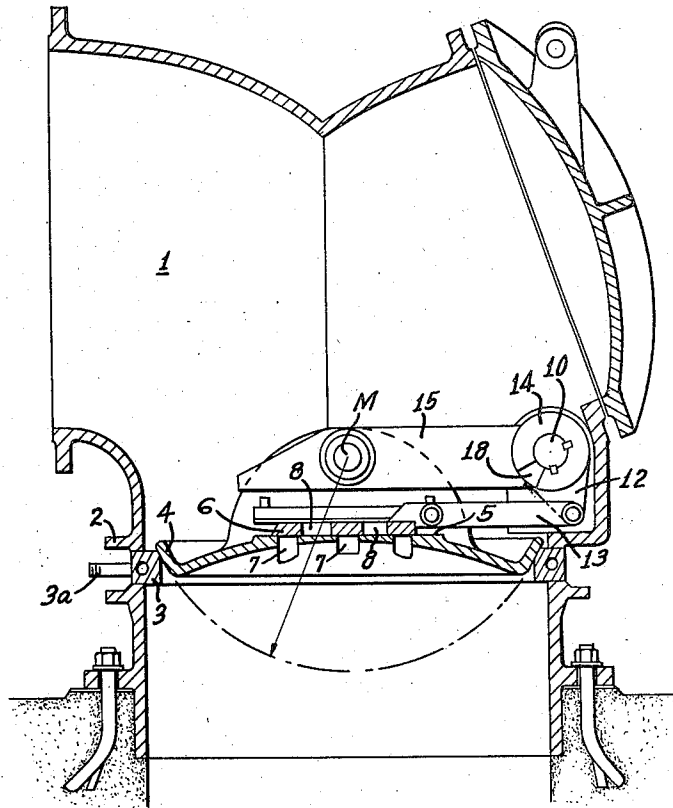


FIG. 2

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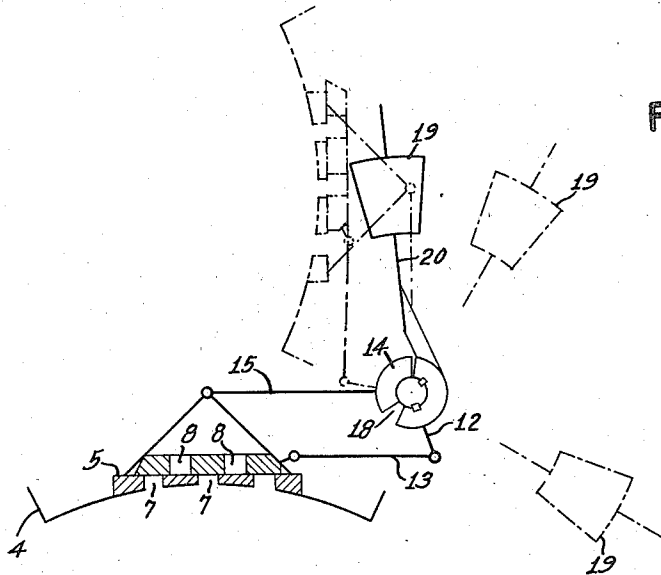


FIG. 3

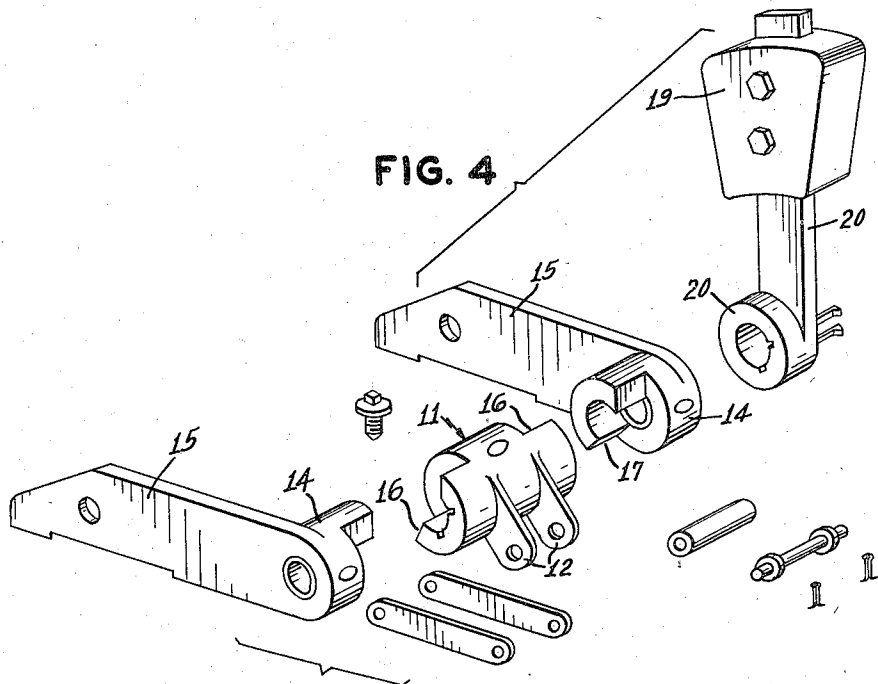


FIG. 4

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VALVE

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3 Claims. (Cl. 137—630.12)

The invention relates to a valve with a cutoff member formed as a flap, which is lifted off by turning movements of its packing seat. The known models have the disadvantage, especially in case of large passages, of requiring a large motive power, since the pressure of the pouring media acts on the flap surface in its entire magnitude.

A simple method of solution has been proposed for the removal of the indicated disadvantage, consisting of the flap member having passages capable of being closed at its discharge. For this purpose, a slide valve plate is removably arranged on the valve flap and has passages which correspond to the passages of the flap members.

The object of the invention has been represented diagrammatically in the sketch in a model form, by way of example, and shows:

Fig. 1 is a longitudinal section through the valve flap, according to the invention;

Fig. 2 is a plan view of the valve assembly according to the invention;

Fig. 3 is a schematic showing of the working position of the valve flap;

Fig. 4 is an exploded view of the driving members for the valve flap, in perspective.

The valve, in the sense of the invention, is especially suitable for rather large passages, as they exist, for example, in lines for flue gases with blast furnaces. The air required for combustion in the blast furnace is heated in hot blast stoves. The escape from the Cowper stove is preferably provided for by an elbow, connected in series to the cutoff slide valve. These cutoff slide valves are expensive, especially in relation to their superstructure. In connection with the elbow, they occupy too great a space. In order to meet these disadvantages, valve flaps were installed in the region of the lower flange of the elbow, and which close during the passage of air to the smoke escape. In the process, the total pressure within the Cowper stove presses on the flap of the closed valve. Large drives must be provided for the opening of this valve flap. In order to confine these motive impulsions to a small extent, the valve flap is provided with passages capable of being closed (locked) in, in the region of the lower flange of an elbow, as may be seen in the diagram.

A pipe elbow is attached to a flue, not represented in the diagram, for the drawing off of smoke. The lower flange 2 of the pipe elbow 1 rests on a joint seat 3, which can preferably be equipped with a cooling appliance 3a. The faying surface is shaped as a spherical concavity with a radius R, whose center M forms at the same time the mounting point for the flap 4. The flap surface 5 is made as a sliding surface, and bears a slide valve 6. The flap 4 and the slide valve plate 6 have one or several passages 7, 8, respectively, which correspond to one another. When the valve is closed, the passages 7, 8 lie displaced with regard to each other. At the beginning of the opening movements of the flap 4, the

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passages 8 slide over the passages 7, so that a release or a pressure build up results on the discharge side of the valve, whereby a simple lifting of the valve flap 4 is made possible.

5 The slide valve 6 is conducted in the rails 9 of the flap 4 with force, so that it cannot lift off its sliding surface 5.

It lies within the framework of the invention that the valve flap 4 and the slide valve plate 6 possess a mutually successive motive power, which is derived from the operation of a shaft 10. A cam 11 is firmly attached to this shaft 10. This cam 11 is provided with arms 12 which are pivotally connected to linkages 13 which are in turn pivotally connected to the slide valve plate 6.

15 If a turning of the shaft 10 takes place, the slide valve 6 is shifted on the gliding surface 5 of the flap 4, whereby the passages 7 are opened or closed.

Hubs 14 are loosely mounted on the shaft 10 and are secured against axial movement. Rocking levers 15 are fixed to the hubs 14. The cam (driver) 11 catches its ends by recesses 16 in the corresponding recesses 17 of the hubs 14. Such a play 18 is allowed between the recesses 16 and 17, that the slide valve plate 6 and the valve flap 4 possess a mutually successive motive power. If the valve flap 4 is to be opened from its closed position, turning of the shaft 10 is first operative to laterally move slide valve plate 6 relative to the flap 4 until the passages 7 and 8 are in registry with each other. Due to the play 18, there is no turning of the hubs 14 until the respective passages have been brought in registry. 25 Upon further turning of the shaft 10, the hubs 14 of the cam (driver) 11 are carried along, so that the flap 4, which is suspended on the levers 15 of the hubs 14, is swung into the open position as shown in Figure 3. For the closing motion of the valve, the reverse cycle of operations takes place, whereby, during the turning back of the shaft 10, the levers 15 set the valve flap 4 up on its joint seat 3. A further turning of the shaft 10 hereupon takes place, which is permitted by the play 18, thereby causing the slide valve 6 to shift on the surface 5 of the flap 4, so that the passages 7 are closed.

A rocking lever 20, provided with a counterweight 19, is set on one end of the shaft 10. Its hub 21 possesses a little play, 5° for example, on the shaft 10. By this means, there is secured the possibility of a rotating motion of the flap in the region of this play. A shutting rotation moment is thereby loaded on the flap 4 in the end position, so that the flap 4 is always pressed into the hollow seat of the joint seat 3 with its ball seat surface.

We claim:

1. A valve adapted for insertion in a flue passage or the like comprising, a hinged closure flap normally disposed across said passage by the pressure of the flue gas in said passage, said flap having a plurality of apertures defined therein and lever arms mounted thereto for rotating said flap, a valve slide having complementary apertures defined therein, said slide being movable laterally cross said flap to bring the respective apertures into registry to relieve the pressure on said flap and out of registry to cause said pressure to develop, and means connected to said slide and said flap for successively actuating said slide to move the apertures therein into registry with said apertures in the flap to relieve said pressure, and then for rotating said flap to open said passage.

2. A valve adapted for insertion in a flue passage or the like comprising, a hinged closure flap normally disposed across said passage by the pressure of the flue gas in said passage, said flap having a plurality of apertures defined therein and lever arms mounted thereto for rotating said flap, a valve slide having linkage means pivotally connected thereto, and further having comple-

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mentary apertures defined therein, said slide being movable laterally across said flap to bring the respective apertures into registry to relieve the pressure on said flap and out of registry to cause said pressure to develop, and means connected to said slide and said flap for successively actuating said slide to move the apertures therein into registry with said apertures in the flap to relieve said pressure, and then for rotating said flap to open said passage, said means comprising a rotatable shaft having cam means fixed thereto, said cam means having arms pivotally connected to said linkage means for moving said slide across said flap, and said cam means also having parts operative to rotate said lever arms subsequent to the actuation of said slide across said flap whereby said flap is rotated to an open disposition after said complementary apertures have been brought into registry to relieve the pressure on said flap.

3. A valve adapted for insertion in a flue passage or the like comprising, a hinged closure flap normally disposed across said passage by the pressure of the flue gas in said passage, said flap having a plurality of apertures defined therein and lever mounted thereto for rotating said flap, a valve slide having linkage means pivotally connected thereto, and further having complementary apertures defined therein, said slide being movable laterally across said flap to bring the respective apertures

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into registry to relieve the pressure on said flap and out of registry to cause said pressure to develop, and means connected to said slide and said flap for successively actuating said slide to move the apertures therein into registry with said apertures in the flap to relieve said pressure, and then for rotating said flap to open said passage, said means comprising a rotatable shaft having cam means fixed thereto, said cam means having arms pivotally connected to said linkage means for moving said slide across said flap, and said cam means also having parts operative to rotate said lever arms subsequent to the actuation of said slide across said flap whereby said flap is rotated to an open disposition after said complementary apertures have been brought into registry to relieve the pressure on said flap, and a counterweight mounted on said shaft, said counterweight being adapted for limited rotation relative to said shaft to develop a rotating movement on said shaft for urging said flap into a closed disposition.

References Cited in the file of this patent

UNITED STATES PATENTS

27,909	Jeffers	Apr. 17, 1860
44,981	Smith	Nov. 8, 1864
1,798,431	McWilliams	Mar. 31, 1931