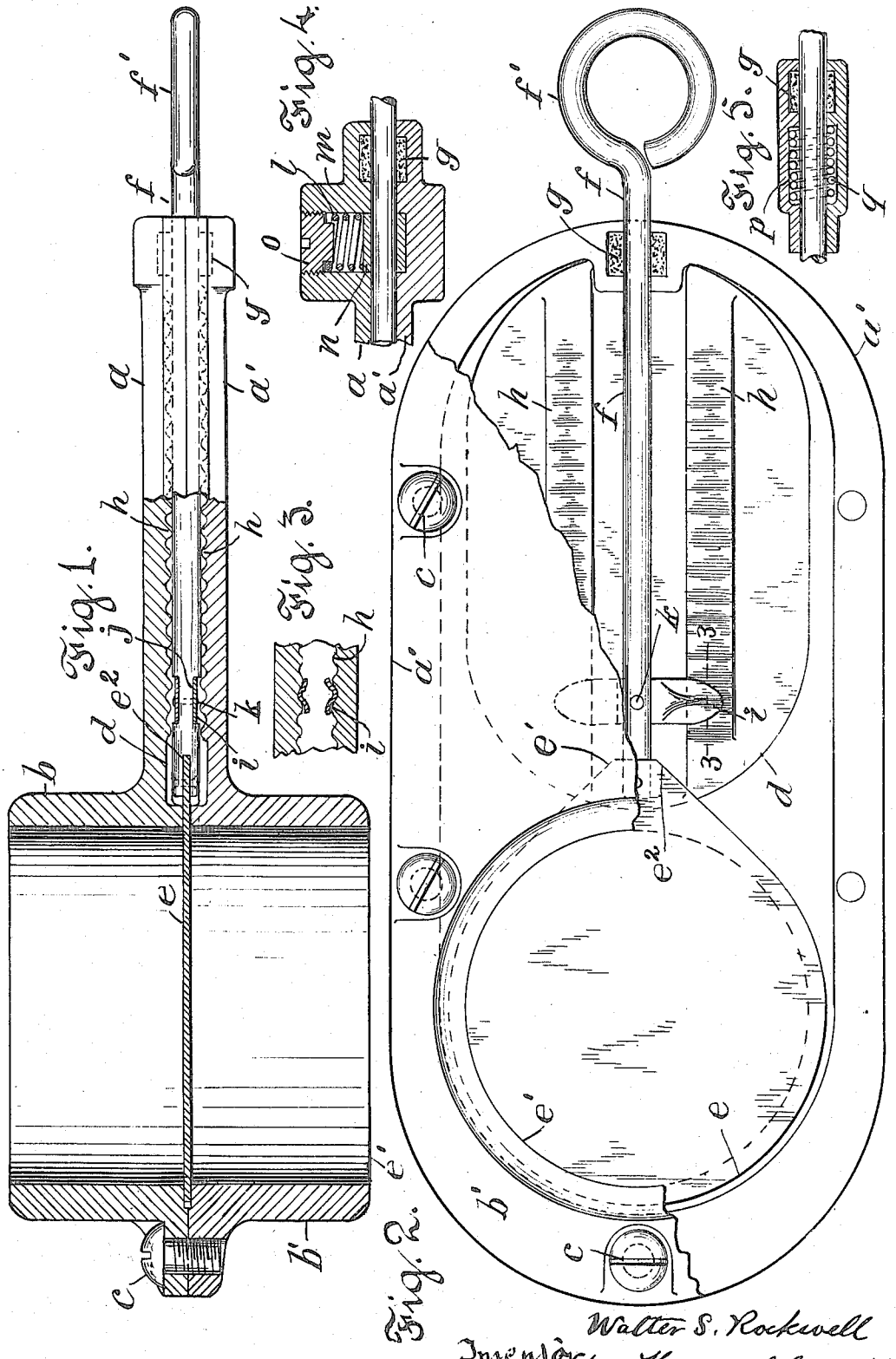
W. S. ROCKWELL.

BLAST GATE.

APPLICATION FILED DEC. 10, 1915.

1,206,469.

Patented Nov. 28, 1916.



UNITED STATES PATENT OFFICE.

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BLAST-GATE.

1,206,469. Specification of Letters Patent. Patented Nov. 28, 1916.

Application filed December 10, 1915. Serial No. 66,152.

To all whom it may concern:

Be it known that I, WALTER S. ROCKWELL, a citizen of the United States, residing at 300 West One Hundred and Sixth street, New York, county of New York, and State of New York, have invented certain new and useful Improvements in Blast-Gates, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to a blast-gate constructed with nozzles upon opposite sides for insertion in a pipe-line, and employed in connection with forges and furnaces to regulate the supply of air to the fire. In such blast-gates the sliding-plate or valve requires occasional adjustment to vary the opening of the air-passage to suit the requirements of the fire, but it has been found in practice that such adjustment is seldom maintained, as the vibrations of the blast in the pipe or arising from other causes which affect the blast-gate, are liable to jar the valve-plate and shift it from its adjusted position.

The present invention is applicable to blast-gates having a casing made in two longitudinal sections upon which the inlet and outlet-nozzles are respectively formed, with a wholly closed chamber between the sections into which the valve-plate can be retracted from the passage which connects the nozzles. In such a blast-gate the valve-plate is wholly concealed and requires a rod extended through the chamber and outside of the same to adjust the plate when required. To prevent the accidental displacement of the valve-plate, the present invention provides a spring operating in connection with the rod for holding the plate from accidental displacement, and the means for applying the spring are shown in the annexed drawing, in which—

Figure 1 is a longitudinal section of the blast-gate on the middle line of Fig. 2. Figs. 1, 2 and 3 show a holding device of the same form. Fig. 2 is a side elevation of the gate with a portion of the casing broken to expose a part of the chamber containing the holding device; Fig. 3 is a section of the holding device on line 3—3 in Fig. 2; Fig. 4 is a section of a second holding device of modified construction; and Fig. 5 is a section of a third holding device showing still another modification. The section in each of Figs. 4 and 5, is shown lengthwise of the rod, which is not itself in section.

In Figs. 1 and 2, a, a' designate the opposite longitudinal sections of the casing, having respectively the nozzles b and b' to receive pipe-connections. The sections are connected by bolts c. A chamber d is formed in the casing at one side of the two nozzles to receive the valve-plate e when retracted from the passage e' through the gate. This chamber is formed to tightly inclose the valve-plate; and to further this object the rod f is extended through a packing g into the chamber d and is secured to an ear e^2 upon the nearer edge of the valve-plate. Where the rod projects outside of the casing it is furnished with a handle f' to adjust the valve-plate. By this construction the casing is maintained in a wholly closed condition, and air is excluded from it by the packing around the rod.

In Figs. 1, 2 and 3, the opposite sections of the casing are provided upon the inner wall of the chamber with transverse ridges h adapted to engage leaf-springs i extended transversely of the rod f.

In Fig. 1 the sections a, a' of the casing are hatched at the center line, and the middle portion of the springs i is shown seated in notches j cut transversely in opposite sides of the rod f and secured in such notches by a rivet k.

The ridges h are formed upon each section of the casing at opposite sides of the rod f, as shown in Fig. 2, and the ends of the leaf-springs i are indented, as shown in Figs. 2 and 3, to fit elastically between the ridges h, and thus retain the rod yieldingly in any operative position to which it may be moved with the valve-plate e. The firmness with which the rod and valve-plate are held is determined in the construction of the device, by the stiffness of the springs i. Figs. 4 and 5 show constructions for utilizing a spring pressure upon the smooth surface of the rod, to hold the valve-plate in place. Fig. 4 shows a spiral spring l fitted to a socket m at one side of the rod, and arranged to bear upon a friction-block n which is fitted to the side of the rod. A screw-plug o is fitted to the outer end of the socket m to press the spring adjustably against the block n, and thus vary the holding power of this device, as may be required. Such spring-block is adapted to yield when

the rod is moved with force to adjust the valve.

In Fig. 5, a socket *p* is shown formed in the casing adjacent to the packing *g* of suitable size to receive a spiral-spring *q*, the coils of which are wound to embrace the rod snugly or with sufficient force to hold it from accidental longitudinal movement; the ends of the spring contacting with the ends of the socket *p*.

I have in my co-pending application No. 98264 filed May 18, 1916 for patent on "gate for air-blast" claimed leaf-springs projected from the edge of the valve-plate and movable therewith; and I do not in the present application make any claim to a spring or springs attached to the valve-plate, but only to springs which operate directly upon the rod to produce a yielding or frictional resistance to the movement of the rod, while leaving it free to be moved by hand in either direction.

I am aware that ratchets and clutches have been applied directly to the rod or stem of a valve-plate to positively prevent movement in one direction, but exerting no resistance to motion in the opposite direction, and such devices do not therefore leave the valve-plate free to be moved in either direction without manipulation of the locking device. They do not permit the free movement of the valve in both directions, and do not exert a yielding resistance like mine to the movement of the valve, but a positive unyielding lock. I therefore disclaim any positive locking device operating upon the valve-rod of a blast-gate.

The leaf-spring *i* and the spiral-springs *l* and *q* operate alike in offering a certain yielding resistance directly to any movement of the rod *f*, which resistance is proportioned in the construction of the gate to resist any tendency which arises in practice to jar the valve-plate from its adjusted position. The accidental derangement of blast-gate valves often causes, in practice, a serious difficulty in the operation of the furnace supplied with air from such gate, as any accidental movement of the valve changes the force of the blast, and thus causes unknown and uncontrolled variations in the temperature thus created.

My invention furnishes a very cheap and wholly effective means of preventing such derangement of the valve-plate.

Having thus set forth the nature of the invention what is claimed herein is:

1. A blast-gate, for insertion in a pipe-line, having a wholly closed casing with a valve-plate movable wholly within the said casing, a rod attached to the valve-plate and extended outside the casing for adjusting the valve-plate in various operative positions, and a spring acting directly upon the rod and exerting a yielding frictional resistance to any accidental derangement of such adjustment, while permitting a manual adjustment of the plate in either direction without any manipulation of the spring.

2. A blast-gate having an inlet and outlet, a chamber at one side of the passage between such inlet and outlet, a plate adapted to close the passage and movable into the chamber, a rod attached to the plate and movable within the chamber and extended outside of the same for adjusting the plate, transverse ridges upon the wall of the chamber adjacent to the sides of the rod, and a leaf-spring carried by the rod and adapted to elastically engage the ridges to retain the rod and valve-plate yieldingly in their adjusted position.

In testimony whereof I have hereunto set my hand.

WALTER S. ROCKWELL.