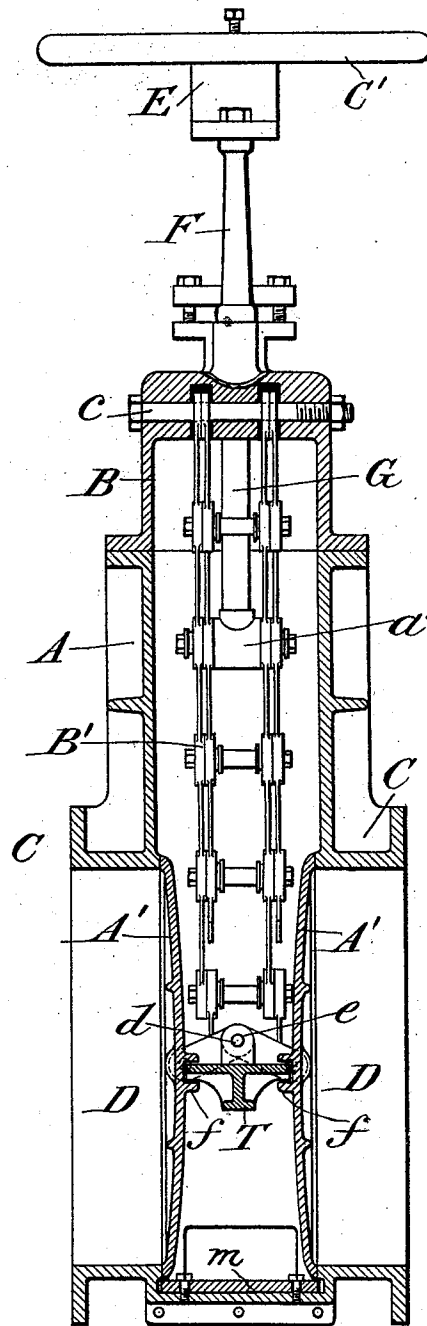


2 Sheets—Sheet 1.

No. 498,690.

Patented May 30, 1893.

Fig. 2.



Inventors

Frank J. Parish.

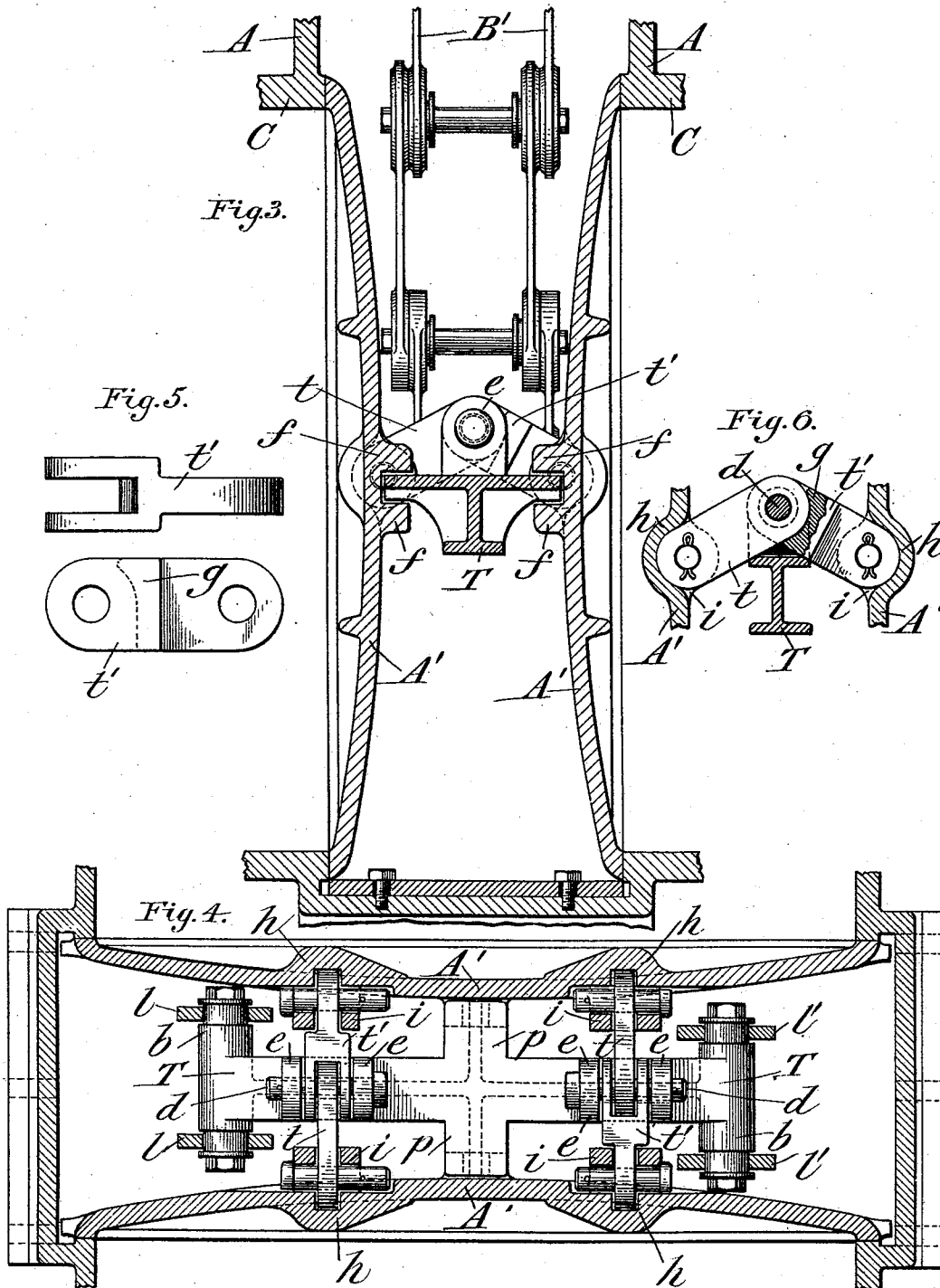
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F. J. PARISH & H. H. B. MEYER.
VALVE OPERATING MECHANISM.

No. 498,690.

Patented May 30, 1893.



Witnesses,
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UNITED STATES PATENT OFFICE.

FRANK J. PARISH, OF NEW YORK, AND HERMANN H. B. MEYER, OF BROOKLYN, ASSIGNORS OF ONE-HALF TO JAMES R. FLOYD, FREDERICK W. FLOYD, AND HENRY E. FLOYD, OF NEW YORK, N. Y.

VALVE-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 498,690, dated May 30, 1893.

Application filed December 27, 1892. Serial No. 456,431. (No model.)

To all whom it may concern:

Be it known that we, FRANK J. PARISH, a subject of the Queen of Great Britain, residing at New York, in the county of New York, State of New York, and HERMANN H. B. MEYER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Valve-Operating Mechanism; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to certain new and useful improvements in means or mechanism for operating the valves of hydraulic and gas mains, and has reference more especially to what are known as sliding gate valves. In this class of devices it is a desideratum to have a quick and easy movement of the valve or gate across the valve opening, and also to have the valves firmly and securely tightened upon their seats when closed; and it is to the accomplishment of these objects that our invention is more particularly directed.

In the accompanying drawings forming part of this specification Figure 1 is a vertical central longitudinal section through the valve casing. Fig. 2 is a similar transverse section. Fig. 3 is a vertical sectional detail of the valves and their immediate connections. Fig. 4 is a horizontal section of the valves showing the connections in plan. Fig. 5 shows details of the toggles, and Fig. 6 is a detail of the connection between the toggle levers and the valve.

Referring to the drawings, the same letters of reference indicate corresponding parts in the different views.

A denotes the body or barrel of the usual oblong valve casing, B the hood or dome, C the cylindrical projections to which the adjacent ends of the main-pipe sections are coupled, and D the circular valve openings.

E indicates the wheel stand erected as usual upon the dome, and supported by columns or pillars F, and G denotes the screw stem of the valve.

A' denotes circular valves or gates corresponding in shape and size to the valve openings D, and adapted to slide across the openings into the barrel of the casing.

B' indicates lazy tongs, the lower end levers of the tongs being connected to the valve, and the upper end levers being pivoted in the upper part or dome of the casing, a connection being made between the screw stem G and the lazy tongs preferably at a point intermediate the length of the tongs, as at a'.

C' denotes a hand wheel mounted in the wheel stand and key-connected to an interiorly threaded sleeve D' through which the threaded upper end of the valve stem G works.

As thus far described, the invention is not new with us, but is substantially the same as that illustrated and described in the patents granted November 15, 1892, to J. W. Ogden, No. 489,263, and C. L. Rowland, No. 489,219, whereon our present invention is designed as an improvement.

In the inventions covered by the patents above referred to, the lower end levers of the lazy tongs are straddled apart and separately connected by means of short links to each of the valves, and the toggles for seating the valves are carried and supported by the valves themselves.

In our improvement, instead of connecting the end levers of the tongs directly to the valves at different points we connect them to opposite ends of a tie-bar T interposed between the valves and lying parallel with and extending across the face of the same. This tie-bar is preferably constructed substantially as illustrated in Figs. 1, 3 and 4. It is a plain narrow bar of T-iron provided at its ends with laterally projecting bosses b to which the lower ends of the short links l attached to the end levers of the tongs are pivotally connected in any preferred manner. About midway of its length we provide the bar with lateral extensions or projections p which fit loosely in between the horizontal lugs or flanges f formed on the back sides of the valves, thus forming a connection between the tie-bar and valves by means of which the valves are bod-

ily raised and lowered. The space between the lugs or flanges on each of the valves is somewhat in excess of the thickness of the extensions of the bar, as clearly shown in Figs. 2 and 3, the object of this clearance being to allow of a slight initial movement of the tie-bar in the operations of opening and closing the valves independent of the valves themselves, as will presently be more fully described.

Instead of connecting the upper arms of the tongs to a cross-head as in the Ogden patent, or bringing the arms together and pivoting them on a fixed axis common to both as in the patent to Rowland, we separate the arms at this end and pivot each independently to a separate through bolt *c* passing through the hood or dome on opposite sides of the screw stem of the valve. As shown in Fig. 1, the arms are preferably slotted at their upper ends, so as to permit them to accommodate their movement to that of the adjacent tongs levers, and to allow them to fold more compactly and readily within the dome of the casing as the valves are raised. Among other advantages, this construction permits the use of ordinary bolts passing entirely through the hood without interfering with the free working of the valve stem which plays between them.

For the purpose of firmly closing the valves upon their seats we employ toggles as heretofore, but we construct and mount and operate them in a novel manner, as follows: Near the opposite ends of the tie-bar we provide pairs of short vertical posts or lugs *e* into which pins or pintles *d* are secured. The two short levers *t*, *t'* constituting the toggles are pivoted upon these pintles, so that they are carried and supported by the tie-bar, and are operated entirely by the movements of the bar. These levers are constructed as shown in Figs. 4, 5 and 6 of the drawings, wherein the lever *t'* is shown forked at its inner end so as to embrace the lever *t*. The inner end of lever *t* is rounded, as clearly shown in Fig. 6, and the fork of the lever *t'* is provided with the curved bearing surface *g* against which the curved end of the companion lever bears during the end-thrust of the toggles in seating the valves. The object of this arrangement is to take all strain off the pintles, and thereby to increase the strength of the joint and incidentally to permit the use of smaller pins. It will be understood that the pins have sufficient clearance in the eyes in the levers to permit the ends to bear solidly together during the straightening out of the toggles.

The outer ends of the toggle levers are connected with the valves by means of ears *i* cast on the back side of the valves and pins passing through the ears and levers, as represented in Fig. 4. It is not intended that these pins shall bear any strain during the end thrust of the toggles in seating the valves, and as shown in Figs. 4 and 6, bearings *h* are provided for this purpose in the walls of the

valves. These bearings are formed by casting depressions in the valves, and forming rounded bearing surfaces therein between the ears *i*. The outer ends of both the levers *t* and *t'* are also curved or rounded so as to fit these bearing surfaces. As in the case of the connection between the toggle levers, the pin joints between the levers and the ears on the valves have sufficient clearance to permit all the strain to be taken by the bearings *h*.

Assuming the valves to be closed, the initial movement of the tongs raises the tie-bar slightly independently of the valves, the clearance between the side extensions of the bar and the flanges *f* on the valves permitting this, as before described. The toggles being mounted on the tie-bar, the movement of the latter draws the levers together and loosens or disengages the valves from their seats. It is desirable, however, that the valves should not be drawn away too far, and to provide for this we extend the projections *p* farther than is necessary to form a mere connection between the tie-bar and the valves, so that they act as spreaders and hold the valves apart against the tendency of the toggles to bring them together in opening the valves. As shown in Fig. 3 the spreaders *p* extend in between the flanges on the gates nearly to the back side of the valves when in closed position, leaving only sufficient space for the toggles to cause the valves to clear their seats.

In reversing the operation, it will be understood that the valves descend of their own weight and do not require to be forced down. Therefore the tie-bar does not contact with the lower flange *f* till the valves reach the limit of their sliding movement. When this occurs, however, the further slight movement of the tie-bar tends to straighten out the toggles, thus jamming the valves tight against their seats and holding them practically locked in closed position.

In order to limit the downward movement of the valves, and cause them to stop at the right point to accurately fit their seats, we prefer to use the form of stop shown in Figs. 1 and 2, consisting of a plain bar or plate *m* secured by screws or otherwise to the flooring of the valve casing. This form of stop is preferable to that shown in the Ogden and Rowland patents, for the reason that it does not in any way interfere with the accurate grinding of the valve, not being put in position until the fitting of the valves to their seats has been completed.

Instead of forming the pillars *F*, which support the wheel stand *E*, solid as heretofore, we prefer to construct them as shown in Fig. 1 of the drawings, wherein *n* indicates a hollow shell of a size and shape to conform to the old style of pillar, and *o* denotes a screw bolt which is tapped into the dome and passes through the hollow shell and the base of the wheel stand, nuts being fitted upon the upper threaded ends of the rods, whereby when the parts are screwed up tightly the

whole structure is as strong and rigid as though the pillars F were solid and reduced at the ends.

We would have it understood that we do not intend to be limited to the specific construction of parts herein illustrated, as many modifications of the same may be made without departing from the spirit or scope of the invention.

Having thus described our invention, what we claim is—

1. The combination, substantially as hereinbefore set forth, of lazy-tongs, a tie-bar to which the end levers of the tongs are connected at the valve end, a valve, and a connection between the tie-bar and valve whereby the valve is opened and closed.

2. The combination, substantially as hereinbefore set forth, of lazy-tongs, a tie-bar to which the end levers of the tongs are connected at the valve end, a pair of valves, and a toggle lever connection between the tie-bar and the valves for seating and unseating said valves.

3. The combination, substantially as hereinbefore set forth, of lazy-tongs, a tie-bar to which the end levers of the tongs are connected at the valve end, a pair of valves, a connection between the valves and the tie-bar for opening and closing the valves, and a toggle connection between the tie-bar and valves for seating and unseating said valves.

4. The combination, substantially as hereinbefore set forth, of lazy-tongs, a tie-bar to and near the ends of which the end levers of the tongs are connected at the valve end, a pair of valves, a connection between the tie-bar and valves for opening and closing the valves, a toggle lever connection between the bar and valves for seating and unseating the valves, and intermediate projections or spreaders on the bar to prevent the toggles from pulling the valves too far from their seats.

5. The combination, substantially as hereinbefore set forth, of lazy-tongs, tie-bar, valve, and valve stem, the end levers of the tongs being connected at the valve end with the tie-

bar by pivoted links, the opposite end levers of said tongs being connected to separate fixed pivots, and the valve stem having a connection with the tongs at a point between the ends and playing between the pivots of the end levers at the power end of the tongs and a connection between the tie-bar and valves for opening and closing the latter.

6. The combination, substantially as hereinbefore set forth, of lazy-tongs, a tie-bar connected with the end-levers of the tongs at the valve-end, a pair of valves, lugs on said valves engaging lateral extensions midway of the length of the tie-bar, and toggles mounted on said bar near its ends and pivotally connected with the valves.

7. The combination, substantially as hereinbefore set forth, of lazy-tongs, a pair of valves, a tie-bar to which the end levers of the tongs are connected at the valve end, and a connection between the tie-bar and valves for opening and closing the latter, said connection consisting of lugs on the valves and lateral projections or extensions on the tie-bar working between the projections.

8. The combination, substantially as hereinbefore set forth, of lazy-tongs, a tie-bar to which the end levers of the tongs are connected at the valve end, a pair of valves, a connection between the tie bar and valves for opening and closing the valves, a toggle connection between the tie bar and valves for seating and unseating the valves, and lateral extensions or spreaders on the tie bar to prevent the toggles from pulling the valves too far from their seats, the connection for opening and closing the valves being such that the tie-bar has a limited play independently of the valves.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK J. PARISH.
HERMANN H. B. MEYER.

Witnesses:

MANUEL R. MONTENEGRO,
ROBERT DOUGLAS.