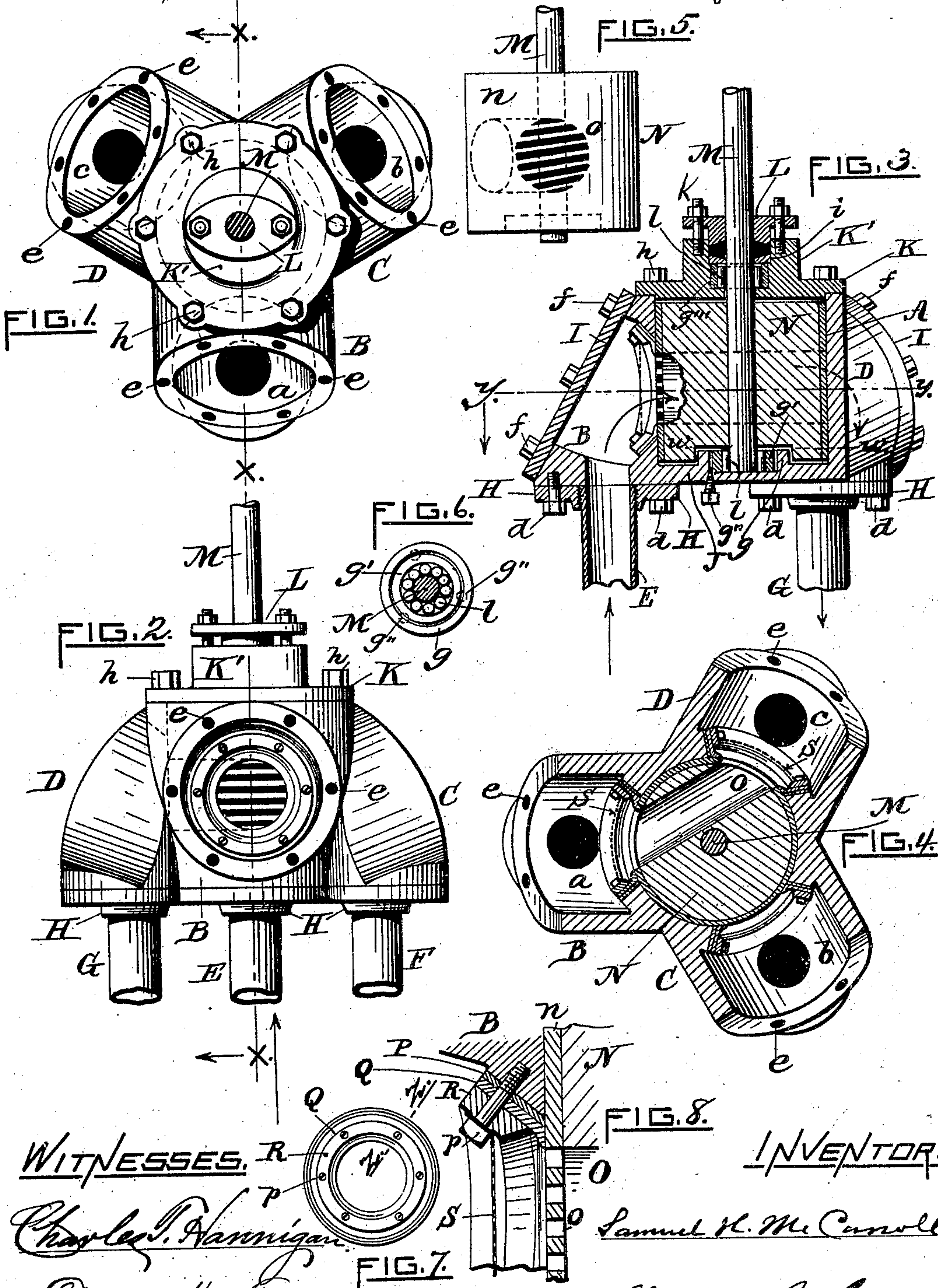


(No Model.)

S. H. McCARROLL.
VALVE.

No. 604,835.

Patented May 31, 1898.



WITNESSES.

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VALVE.

SPECIFICATION forming part of Letters Patent No. 604,835, dated May 31, 1898.

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To all whom it may concern:

Be it known that I, SAMUEL H. MCCARROLL, of the city and county of Providence, in the State of Rhode Island, have invented a certain new and useful Improvement in Valves; and I declare the following to be a specification thereof, reference being had to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a top plan of my improved valve. Fig. 2 is a front elevation of the same. Fig. 3 is a sectional view as seen on line *xx* of Figs. 1 and 2. Fig. 4 is a sectional view as seen on line *yy* of Fig. 3. Fig. 5 is a side elevation of the movable portion of the valve. Fig. 6 illustrates in top plan, as seen on line *ww* of Fig. 3, the roller-bearings in position within the ring and around the shaft or stem of the valve. Fig. 7 is a front elevation of the leather packing and the supporting-ring. Fig. 8 shows in central cross-section said ring and packing on line *zz* of Fig. 7, the netting, and the cross-barred port of the valve.

My invention is a three-way valve adapted particularly for use with elevators which operate by water-power.

My invention consists of the novel construction and combination of the several parts specifically set forth in the claims.

In the drawings the case for the valve is shown at A, having a central space or bore for a valve-seat and three tubular branches or ways B, C, and D, radially arranged at equal distances apart and opening into said central space or bore. The supply-pipe E opens into the tubular branch B through the hole or aperture *a* therein and the exhaust-pipe F into the tubular branch C through the hole or aperture *b* therein, and the pipe G, which opens into the tubular branch D through the hole or aperture *c* therein, communicates with the cylinder (not shown) wherein the plunger operates to raise and lower the elevator-car. Each pipe is provided with screw-threads at its end, which engage with the screw-threaded bore of a collar H, the latter being bolted to the lower side of the adjacent branch by bolts *d d*. Each of said tubular branches B, C, and D has screw-holes *ee* on the exterior rim thereof, and caps I are secured by

bolts *f f* in said screw-holes to tightly close the outer ends of said tubular branches, respectively.

On the bottom of the valve-case is the base-plate J, integral therewith, which has a central annular flange *g* and a central circular recess or socket within said flange.

The top of the valve-case is a cover K, secured to the case by the bolts *h*, and having a central head or boss K' centrally bored, as shown in Fig. 3, with two internal shoulders *i* and *j*.

L is the usual stuffing-box, secured adjustably to the head or boss K' by the bolts *k* and containing the packing-ring, arranged and operating in the well-known manner. The stuffing-box L at its bottom is received into the central opening of the head or boss K' and rests upon the shoulder *i* therein, as seen in Fig. 3.

The central portion of the valve-case is tubular, as indicated by the dotted lines in Fig. 1 and as shown in the transverse section in Fig. 4.

A shaft or valve-stem M passes through the stuffing-box L and the central head or boss K' of the cover K, and its lower end is seated in the central circular recess or socket within the annular flange *g* of the base-plate J. Within said annular flange *g* of the base-plate J is placed an adjusting-ring *g'*, and three or any suitable number of set-screws *g''*, having each a long tapering point, pass through screw-threaded holes in said base-plate into the space between the inside of the annular flange *g* and the outside of the adjusting-ring *g'*.

Rollers *l* are supported in the central circular aperture or bore of the head or boss K' of the cover K in contact with the valve-stem M and serve as bearings for said valve-stem to reduce the friction of its turning. An adjusting-ring *g'''* surrounds said rollers *l* and occupies the space between them and the bore of the head or boss K' of the cover K. Similar rollers *m* are provided for the lower end of said valve-stem for the same purpose and are mounted within the adjusting-ring *g'* between it and the valve-stem M. By means of the set-screws *g''* said adjusting-ring can be

moved into proper adjustment and position to center said shaft and rollers or to compensate for wear.

Upon the valve-stem M is secured the valve N, whose bottom has a central circular recess (shown in section in Fig. 3) to receive the upper portion of the annular flange *g* of the base-plate J. A port O extends transversely and diagonally through the valve N, as indicated in dotted lines in Figs. 3 and 5 and as most plainly shown in the cross-sectional view, Fig. 4. The direction of said port through the valve is such that the ends of the axial line of its bore are distant one hundred and twenty degrees from each other upon the circumference of said valve. The valve N is snugly seated in the valve-case, but is rotatable therein by means of its stem or shaft M, so that its port O may be brought into position to be continuous with either two of the three ways or branches B, C, and D, as may be desired.

The valve N has a cylindrical surface which is covered by a sheet of brass or other metal, (indicated at *n*.) This metallic sheet *n* in the parts thereof extending over the openings of the port O is cut, as illustrated in Figs. 2, 5, and 8, into a series of parallel slots, thus leaving parallel cross-bars *o*. These slots and bars may either be in directions parallel with the top and bottom of the valve, as shown in Fig. 2, or inclined at an angle, as shown in Fig. 5, the latter being the preferred form.

The inner surfaces of the tubular portions or branches B, C, and D are beveled, as shown in Figs. 3, 4, and 8, and a rubber ring P is placed upon the beveled portion of each. A leather packing-ring Q is placed upon each rubber ring P and has its inner edge cut to a bevel and extended, as clearly shown in said figures. A metallic supporting-ring R is placed upon each packing-ring Q, and bolts *p p* pass through said rings P, Q, and R into the beveled portion of the tubular branch B, C, or D, as the case may be. From the peculiar groined shape of the valve-case and the branches thereof, caused by the intersection of their bores, said metallic ring R must be somewhat bent transversely into a curve, as seen in Figs. 3, 4, and 8, and the metallic ring is necessary in order to rigidly confine the packing-ring Q and make it conform to that groined shape and thus to keep the beveled part of the packing-ring free and in proper contact along its inner edge with the cylindrical surface of the valve N.

A wire-netting S is held by the bolts *p p*, as shown in Figs. 3, 4, and 8, within and across the bores of the tubular branches B and D.

Having described the several parts of my improved valve, I will now explain its operation.

The valve N being in the position in the valve-seat illustrated in Figs. 2, 3, and 4, the water from the street-main or other source under pressure passes through the supply-

pipe E into and through the branch or way B, through the port O of the valve N, and through the branch or way D into and out of the pipe G. This pipe G conducts the water into the cylinder (not shown) wherein the usual plunger moves to raise or lower the elevator-car. When the car has been raised to the desired height and is about to descend, the valve-stem M is turned one hundred and twenty degrees and the port O of the valve N is then continuous with the bores of the branches C and D, while the bore of the branch B is closed by said valve. The water then flows from the cylinder (not shown) wherein the plunger is now descending, into and through the branch or way D, through the port O of the valve N, into and through the branch or way C, and thence out through the exhaust-pipe F into the waste. If, however, the valve-stem M and valve N are turned only sixty degrees, all the ways B, C, and D are closed and no water can flow through the valve in any direction.

The nettings S and the cross-bars *o* of the metallic sheet *n* on the cylindrical surface of the valve N prevent dirt, sticks, and other foreign substances contained in the water from entering the valve to clog or injure the same.

The free and beveled edge on the inner side of the leather ring Q is held by the metallic supporting-ring R in close contact with the cylindrical surface of the valve N and constitutes an effective packing. The cross-bars *o* of the metallic covering-plate *n* of the valve N prevent said edge of the leather packing-ring Q from sinking into the port O of said valve and, together with the metallic supporting-ring R, keep the leather packing-ring constantly in its proper curved shape.

By means of the detachable caps I access is given into the tubular branches, respectively, so that the packing-rings Q may be reached and properly placed in relation to the valve N to fit snugly thereon and secured in position by the supporting-rings R.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. The improved valve herein described, having a valve-case with three tubular branches having open ends, a rotatable cylindrical valve mounted in said valve-case and capable of closing all said tubular branches, but provided with a transverse port through it, which is made continuous with either two of the branches, when desired, by the partial rotation of the valve, pipes opening into said tubular branches, respectively, caps to cover the open outer ends of said tubular branches and a leather packing-ring in each tubular branch arranged to lie in contact with the cylindrical surface of the valve, substantially as specified.

2. In combination with a valve-case, having a tubular bore and a plurality of tubular branches or ways, a cylindrical valve mounted rotatably in said bore and provided with a port through it transversely, which by the

partial rotation of the valve may be made continuous with either two of said tubular branches, and flexible packing-rings, suitably supported in said tubular branches bent as shown and secured in position in the branches, respectively, and adapted to lie in contact with the cylindrical surface of the valve, substantially as described.

3. In combination with a valve-case, having a tubular bore and a plurality of tubular branches or ways, a cylindrical valve mounted rotatably in said bore and provided with a port through it transversely, which by the partial rotation of the valve may be made continuous with either two of the tubular branches, a flexible packing-ring adapted to lie in contact with the cylindrical surface of the valve, and a metallic supporting-ring upon said packing-ring secured to the interior surface of a tubular branch and adapted to confine said flexible ring in position to maintain its said contact with the valve, substantially as shown.

4. In combination with a valve-case having a tubular bore and a plurality of tubular branches or ways, a cylindrical valve mounted rotatably in said bore and provided with

a transverse port, a metallic sheet covering the cylindrical surface of the valve, but cut away into a series of alternate bars and slots arranged parallel with each other and registering with the openings of said valve-port, and a flexible packing-ring suitably supported in a tubular branch of said valve and adapted to lie in contact with the metallic covering upon the cylindrical surface of the valve, substantially as set forth.

5. In a valve having a tubular bore and a plurality of tubular branches or ways, a cylindrical valve mounted rotatably in said bore and provided with a transverse port, a flexible packing-ring adapted to lie in contact with the cylindrical surface of the valve, a supporting-ring, suitably mounted and adapted to hold said packing-ring in operative position and a netting stretched across the tubular branch or way and held upon said supporting-ring by bolts, substantially as specified.

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Witnesses:

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