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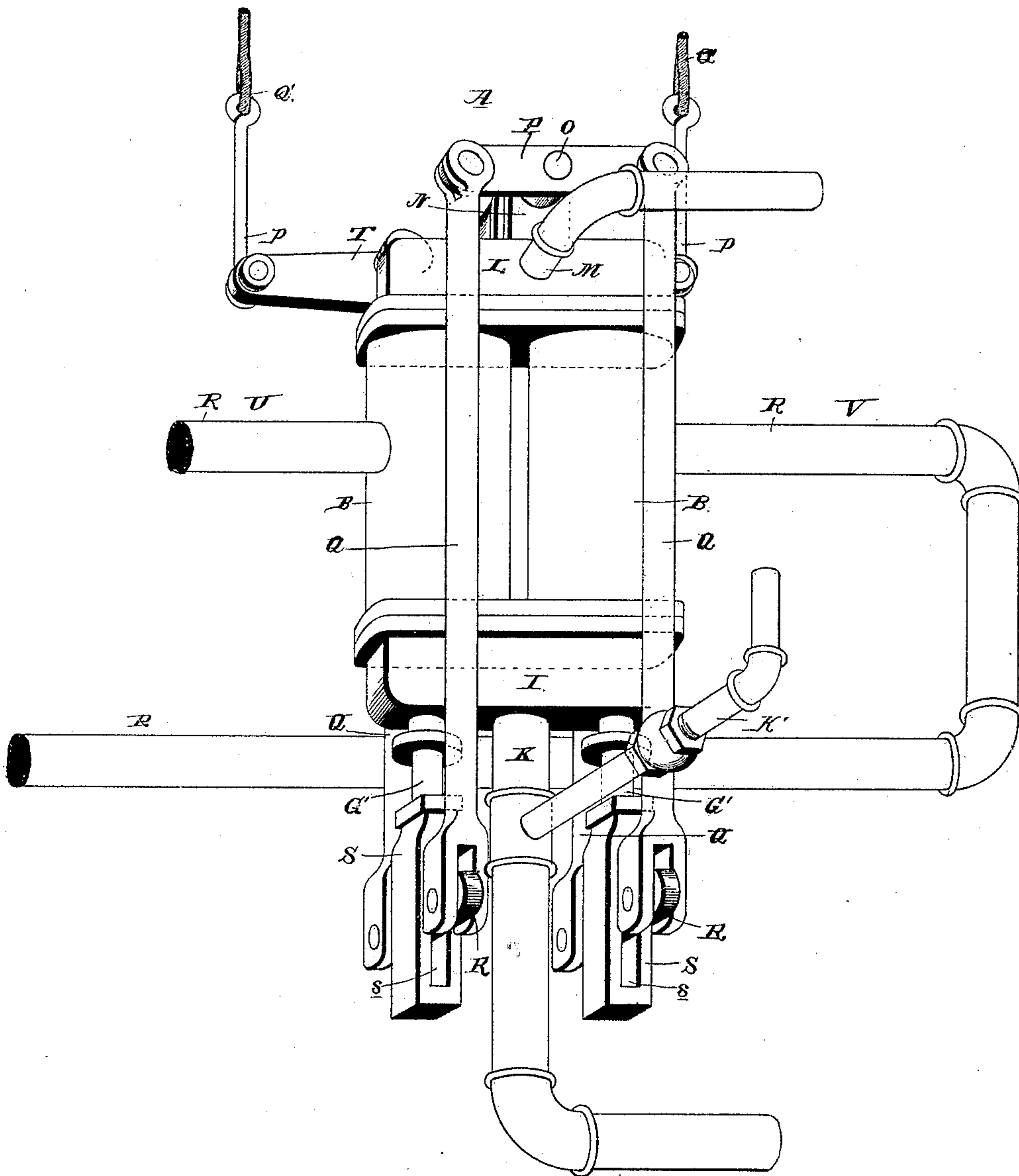
2 Sheets—Sheet 1.

A. & F. E. TURNER.
DUPLEX VALVE.

No. 440,448.

Patented Nov. 11, 1890.

Fig. 1.



WITNESSES:

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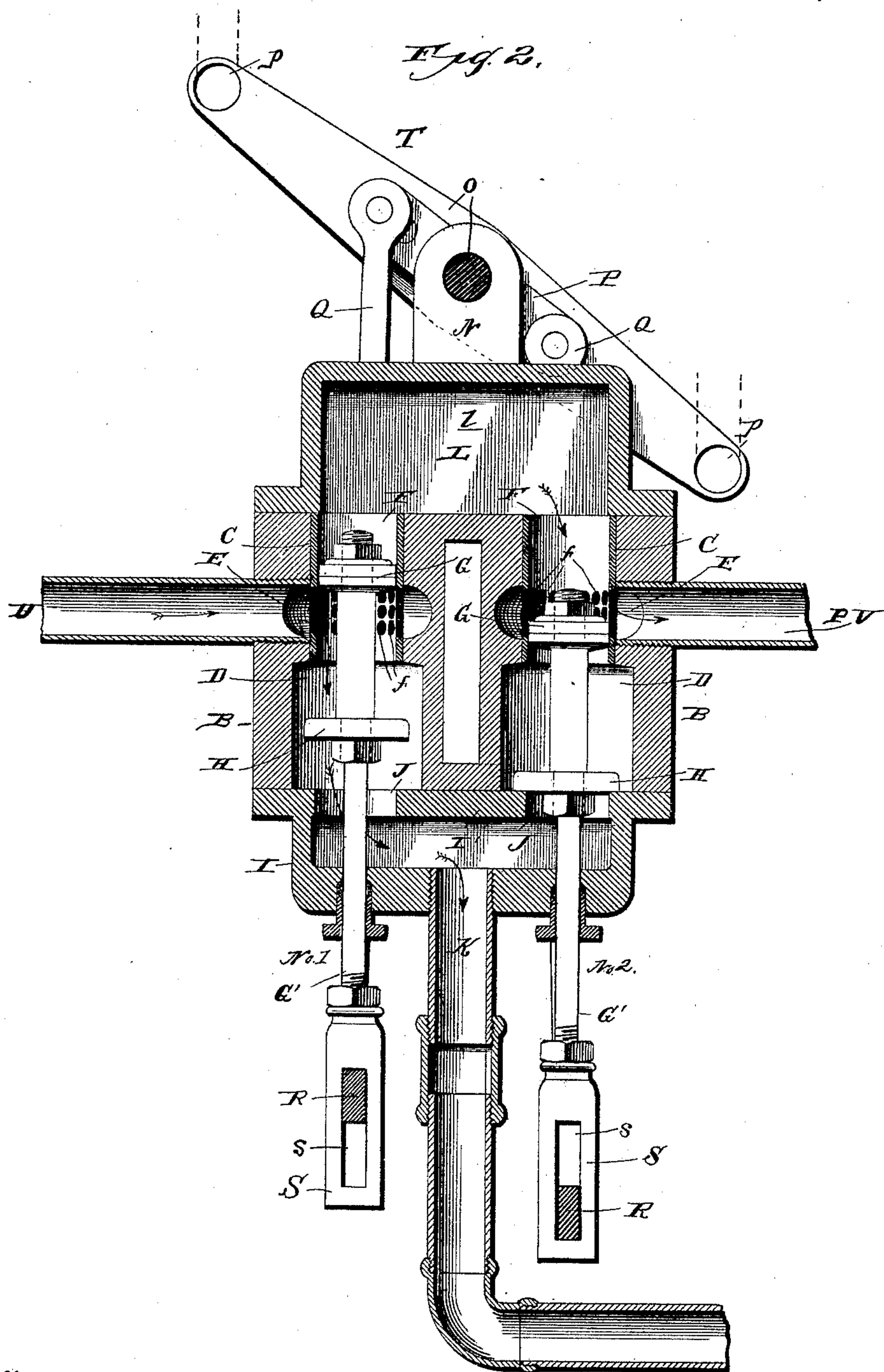
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Witnesses

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UNITED STATES PATENT OFFICE.

ALLEN TURNER AND FREDERICK E. TURNER, OF KANSAS CITY, MISSOURI.

DUPLEX VALVE.

SPECIFICATION forming part of Letters Patent No. 440,448, dated November 11, 1890.

Application filed June 27, 1890. Serial No. 356,951. (No model.)

To all whom it may concern:

Be it known that we, ALLEN TURNER and FREDERICK E. TURNER, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Duplex Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to an improvement in duplex valves; and it consists in the peculiar construction and arrangement of devices, as will be fully described and claimed in the annexed specification.

The object of our invention is to provide a means whereby the supply or discharge of water being cut off the operation of a hand-lever imparts motion to the duplex valves of our invention through a series of sheaves and cables when applied to an elevator, allowing water from a receptacle situated on the roof, preferably, to pass through either one of a series of pipes extending from our duplex valves (according as the elevator has reached its highest or lowest point of travel) into the auxiliary cylinder connected to a valve which controls the admission and exit of water to and from the main cylinder and forcing said connecting-valves until the water is allowed either to discharge from the main cylinder, allowing the elevator to descend, or to supply the main cylinder with water, causing the elevator to ascend, as will be readily understood.

Referring to the drawings, Figure 1 is a perspective view of our invention, showing the connection thereof with the cables. Fig. 2 is a vertical central section of the same, showing the operation of the duplex valves.

Similar letters refer to similar parts in all the figures.

A represents our invention, consisting of the cylindrical casings B B, which have the vertical passage-ways D D therein, the diameter of said passages being decreased about midway of their length, forming the continuous ways C C, which are provided with the annular enlargement E, semicircular in cross-section in the interior walls of the casings B B.

The passage-ways C C are provided with

the pipe-linings F F, which linings are provided with perforations *f*, arranged annularly and in alignment with the enlargement E of the passages C.

Secured to either end of the casings B are the hollow caps or casings L and I, the lower casing I having the opening in which the upper end of the discharge-pipe K is tapped, from which pipe K extends the vent-pipe *k*. The cap I is provided with the partition I', provided with the openings J J, through which operates the piston-rods G' and forming a seat for the puppet-valves H H, which operate in the passages D, the valve-cups G operating at the same time in the passages C C. The pipe M, leading from the supply-tank, is then tapped in an opening in the side of the cap L. Parallel ears or projections N extend perpendicularly and have journaled therein the rocking shaft O. Keyed on this shaft O, at suitable distance from the outer side of the ears N, are the bars P, having the upper end of connecting-rods Q pivotally secured thereto, the lower ends of the same being pivotally secured to the ends of the horizontal bars R, which operate in the vertical slots *s* of the boxing S, secured upon the lower end of the piston-rods G'.

The rocking lever T, keyed on the outer end of the rocking shaft O, has secured by means of links *p* the lower ends of cables Q' to its outer ends, which cables pass around sheaves, (not shown,) which are operated by a suitable lever.

The auxiliary pipes U and V connect with the perforations in the linings F of the casings B by means of the enlargement E of the passages C, the outer ends of the said pipes connecting with an auxiliary cylinder at either end of the same, as will be readily understood.

The normal position of our invention is as shown in Fig. 1. The weight of water from the supply-tank bearing equally on the valves G and passing through the pipes U and V enters the auxiliary cylinder attached to the main valve of the main cylinder and bears equally on either side of said auxiliary piston.

The rocking lever is thrown by suitable means in the direction shown in Fig. 2, and the horizontal or cross bar R will be raised by

means of the rods Q, and said cross-bar abutting against the upper end of the slot *s* of the boxing S will push the valve-stem No. 1, raising the piston G above the perforation *f* of the lining F of the passage C, cutting off the pressure of water from supply-chamber *l* to auxiliary pipe U, at the same time raising the puppet-valve H, allowing the water forced by the operation of the piston in the auxiliary cylinder to pass through the pipe U, passage D, opening J, and escape by way of discharge-pipe K. The water from the chamber *l* instantly by its weight forces the piston G of the valve-stem No. 2 below the perforations, and passing through the auxiliary pipe V into an auxiliary cylinder (not shown) forces the piston through toward the end opposite the entrance of the pipe V, causing the water in the auxiliary cylinder connecting with the pipe U to pass through the said pipe U, perforation *f* in lining F, passage-way D, opening J, and escape by way of discharge-pipe K. Immediately the lever which operates the rock-shaft O is released the water from supply-chamber *l*, exerting its pressure upon piston G of valve-stem No. 1, forces the same below the perforations *f* in lining F and allows the equal distribution of water through pipes U and V against either side of the piston in the auxiliary cylinder, as will be readily understood.

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

1. In a duplex valve, the combination of two cylinders having annular enlargements E, pipes connected with such enlargements, an induction-pipe connected with the tops of

the said cylinders, an eduction-pipe connected with the bottoms thereof, a piston sliding within each of the said cylinders, a piston-rod connected with each of the said pistons and having a slotted lower end projecting below the level of the base of the said cylinder, a rocking arm pivoted upon the top of the said cylinders, a horizontal rod passing through the slot in each of the said piston-rods and sliding vertically therein, and connecting-rods pivotally connected to the said horizontal rods and to the rocking lever, as described.

2. In a duplex valve, the combination of two cylinders, each of the said cylinders consisting of two portions, an upper or restricted portion having an annular enlargement and a lower or enlarged portion, a cap-piece provided with an induction-pipe and connected with the upper ends of the restricted portion of the said cylinders, a chamber connected with an eduction-pipe and with the base of the enlarged portions of the cylinders, a piston within each of the said cylinders carrying a cup-valve within the reduced portion and a puppet-valve within the enlarged portions thereof, the said puppet-valves closing the connection between the said cylinders and the said chamber and being of greater diameter than the cup-valves, and pipes connected with the annular enlargement of each cylinder, as described.

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

ALLEN TURNER.

FREDERICK E. TURNER.

Witnesses:

GEO. G. THORPE,
H. E. PRICE.