

C. BRESNAHAN.
PUMPING APPARATUS.
APPLICATION FILED FEB. 14, 1912.

1,050,916.

Patented Jan. 21, 1913.

2 SHEETS-SHEET 1.

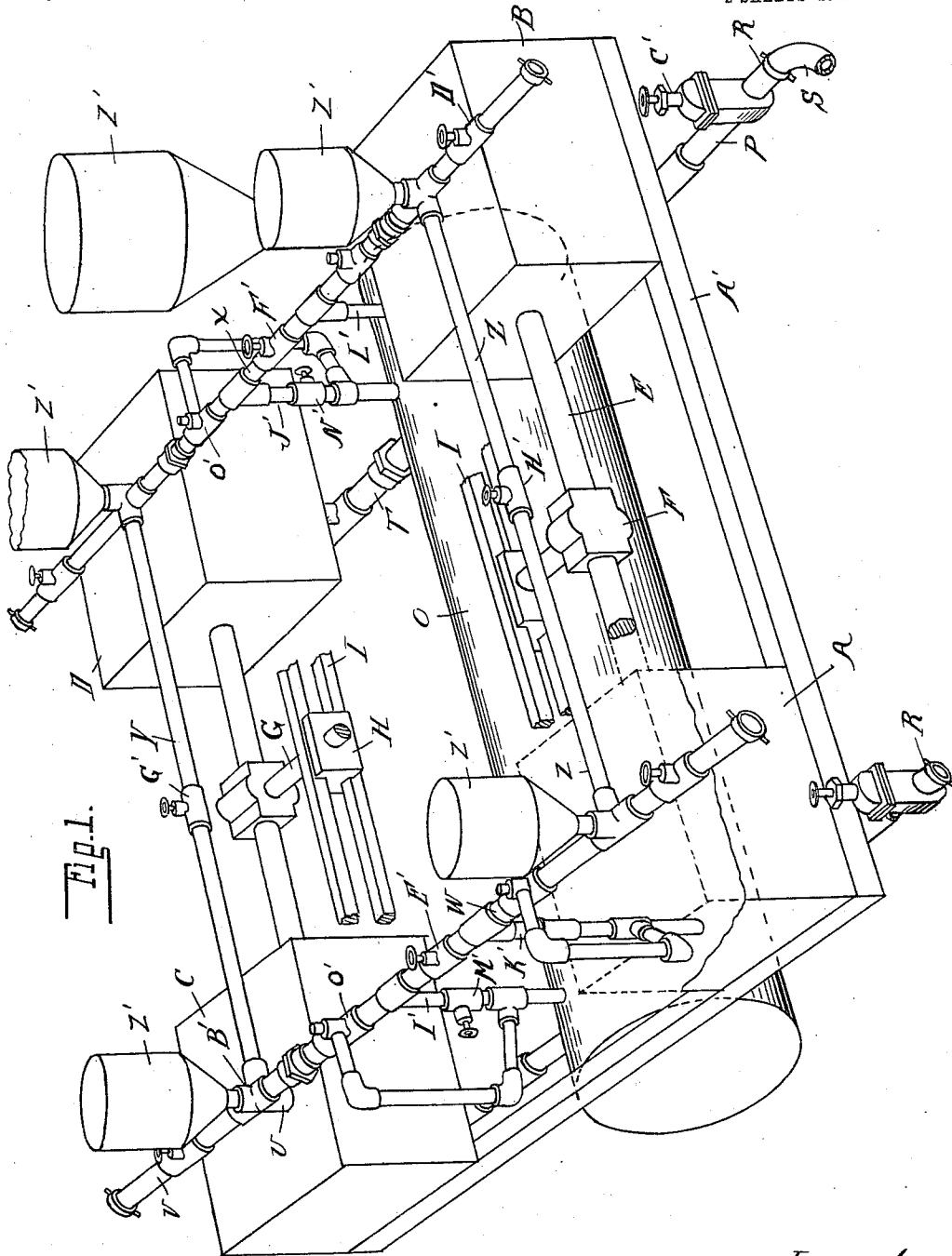


Fig. 1.

Witnesses
H. B. Ford
James O. Parry

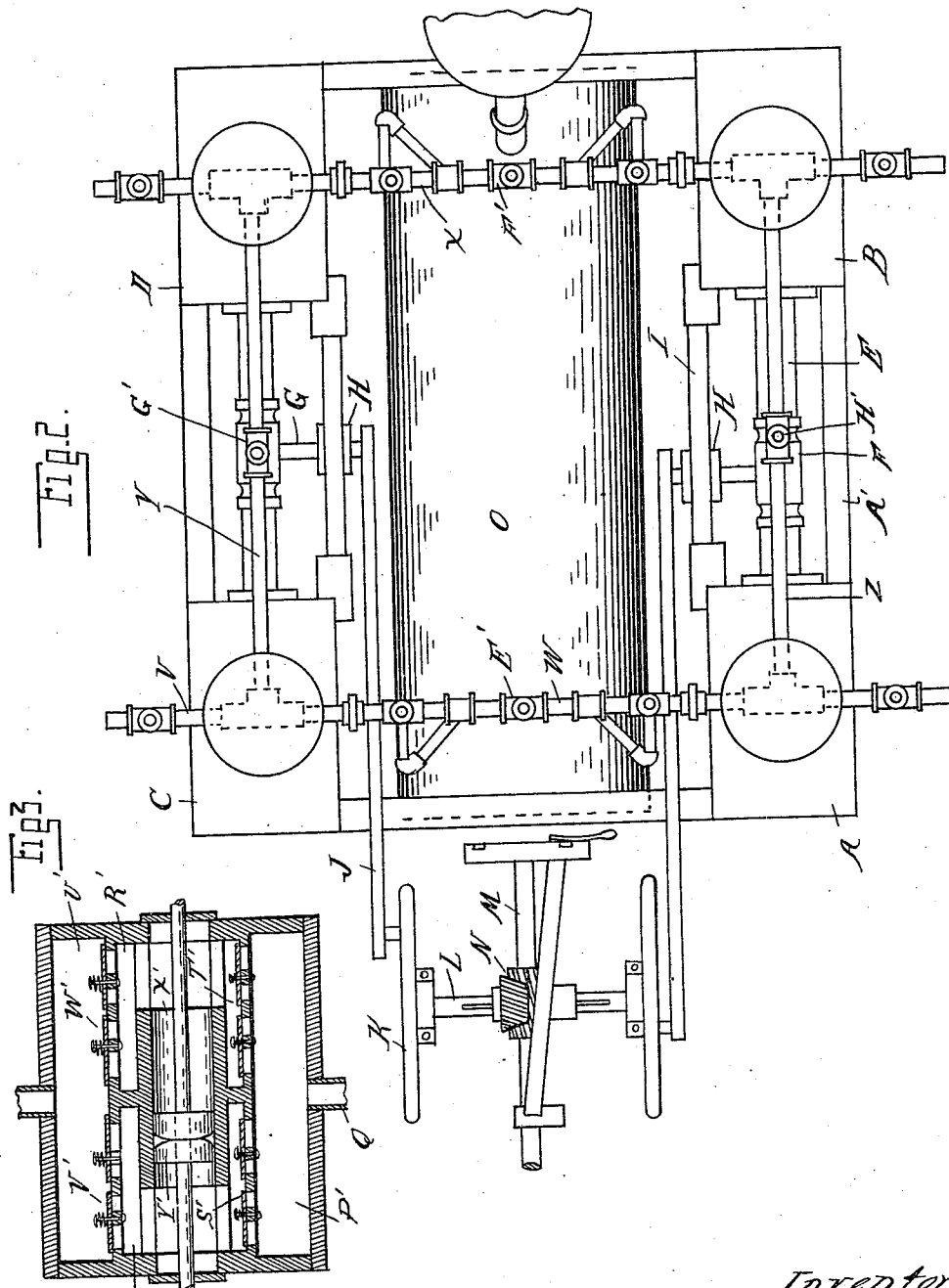
Inventor
Cornelius Bresnahan
By *[Signature]*
Att'y

C. BRESNAHAN.
PUMPING APPARATUS.
APPLICATION FILED FEB. 14, 1912.

1,050,916.

Patented Jan. 21, 1913.

2 SHEETS—SHEET 2.



Witnesses
W. K. Foad
James O. Barry

Inventor
Cornelius S. Bresnahan
By *[Signature]*
[Signature]

UNITED STATES PATENT OFFICE.

CORNELIUS BRESNAHAN, OF DETROIT, MICHIGAN.

PUMPING APPARATUS.

1,050,916.

Specification of Letters Patent.

Patented Jan. 21, 1913.

Application filed February 14, 1912. Serial No. 677,449.

To all whom it may concern:

Be it known that I, CORNELIUS BRESNAHAN, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Pumping Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to pumping apparatus and more particularly to that type of pumping apparatus in which a plurality of pumps are employed.

The invention has among the objects thereof to provide a pumping mechanism which has several inlets and outlets and which will discharge a plurality of uniform and continuous streams irrespective of a variance in the amount of liquid admitted at each inlet, to provide a device which will avoid the pulsation of the pumps being transferred to the streams discharged, and to provide for the cutting off of one or more outlets without affecting the operation of the pumps.

Other objects of the invention will hereinafter appear.

The invention resides in the peculiar construction, arrangement and combination of parts as will be more fully hereinafter described and particularly pointed out in the claims.

I will illustrate and describe my invention as embodied in a mechanism designed for use with a fire apparatus, though it is equally applicable to pumping devices for other uses.

In the drawings,—Figure 1 is a fragmentary perspective view of a pumping apparatus embodying my invention; Fig. 2 is a top plan view; and Fig. 3 is a section through one of the pumps.

The apparatus may be provided with any suitable number of pumps but is herein shown as having four, designated respectively by A, B, C and D, each pump being of the double acting type. These pumps are arranged in pairs upon a frame A' with the piston rods E of the pumps of each pair connected together as by members F which carry laterally projecting pins G that extend through reciprocating bearings H.

I are guides for the reciprocating bearings and J are pitman rods connected to the extensions of the pins and through the medium of which the piston rods are actuated.

K are rotary members or wheels to which the outer ends of the pitmen are connected, the pitmen being secured to their respective wheels at a variance of about 90° in the circumferences of the latter, and L is a driven shaft upon which the members K are fixed. This shaft is driven from a drive shaft M by a worm gear N, the drive shaft being rotated by any suitable means (not shown).

Arranged beneath the frame and intermediate the pairs of pumps is a tank O the purpose of which will hereinafter appear.

Each of the pumps is provided with an inlet conduit composed of a horizontal portion P and a vertical branch Q connecting the inlet chamber of the pump with the horizontal portion. The latter is provided at its outer end with a coupling R for engaging the coupling on a supply hose S leading to the hydrant or other source of supply, and beyond the vertical branch has an extension T which is in open communication with the tank O. Also leading from each pump is an outlet pipe U which connects with a discharge conduit V while the several discharge conduits are connected by laterally extending pipes W and X and longitudinally extending pipes Y and Z. The lateral and longitudinal cross connections and the outlet and discharge conduits for each pump are preferably all secured to a single fitting as B'.

C' and D' designate valves controlling the inlet and discharge conduits respectively, and E', F', G' and H' are valves in the cross connections. Leading from the cross connections W and X upon opposite sides of the valves E', F' are return branches I', J', K' and L' which at their lower ends open into the tank and intermediate their ends are provided with valves M'. N' are by-passes from the lateral cross-connections to the return branches around the valves, and O' are pressure relief valves controlling the by-passes.

The pumps may be of any suitable construction but in order that a continuous stream will be discharged from the outlet each is preferably of the following novel construction: The pump casing is provided at the bottom with an inlet chamber P' into which the conduit Q discharges. This chamber is common to the two piston compartments Q', R', but admission between the latter and the inlet chamber is controlled by independent sets of valves S', T'.

At the top of the casing is a common discharge chamber U' and communication between this chamber and the compartments Q', R' also is controlled by separate sets of
5 valves as V', W'.

X' is the cylinder and Y' is the piston which may be of any suitable construction. By this arrangement of parts upon the forward stroke of the piston, water will be
10 drawn into the compartment Q' while the water in the compartment R' will be forced past the valves W' into the discharge chamber. Upon the reverse movement of the
15 piston the water in the compartment Q' will be forced past the valves V' into the chamber U'. Thus upon each stroke of the piston water is supplied to the discharge chamber.

In operation, assuming that all four discharges are to be employed, the valves C', D', E', F', G' and H' are opened and the
20 valves M' closed. The several inlets are connected to the hose leading from the hydrants or other source of supply and suitable power applied to the shaft M reciprocating the piston rods E. Following the
25 working of one of the pumps as A, upon the reciprocation of the piston, water is drawn in through the inlet conduit for the pump A and forced out of the outlet into
30 the discharge conduit thereof. Any surplusage of water, entering the inlet will pass through the extension T into the tank. If the supply for inlet of the pump A exceeds that of the pump B the water forced
35 through the outlet for the pump A will enter the cross connection Z as well as the discharge for the pump A, equalizing the amount of water forced through the discharge conduits of the two pumps. In the
40 same manner if the stream discharging from the pump C is less than that of the pump A the cross connections W will serve as an equalizer. If the supply for the pump A is less than that of the other pumps and less
45 than desired, water will also be drawn from the tank through the extension T, further serving to equalize the discharge of the several pumps. In case the pressure of the stream discharging from the pump exceeds
50 the pressure limit of the hose the check valve O' will be opened, permitting a portion of the discharge to be by-passed to the tank. Thus it will be seen that not only is there means connecting the discharge conduits
55 of the several pumps for equalizing the streams discharged but also by connecting the inlets for the pumps with a common storage tank, the amount of water drawn by each pump will be equalized.

60 Any one or more of the pumps may be cut out without affecting the operation of the apparatus. Assuming one of the pumps

as A is to be cut out, the valves C', D', E' and H' are closed and the valve in the branch K' opened. The supply for the
65 pump A is then drawn from the tank through the extension T and discharged back into the tank by way of the branch K'.

In order that the pulsation of the pumps may not be transferred to the hose, each
70 pump and also the tank are provided with a pressure relief chamber Z', the relief chambers for the pumps preferably being connected to the fittings B'.

What I claim as my invention is: 75

1. In a pumping apparatus, the combination with a plurality of pumps, a separate outlet for each pump having a discharge end leading directly therefrom, and a connection between the outlets independent
80 of the discharge ends for equalizing the streams discharged from said conduits.

2. In a pumping apparatus, the combination with a plurality of pumps, a separate outlet for each pump having a discharge
85 end leading directly therefrom, a connection between the outlets independent of the discharge ends for equalizing the streams discharged from said conduits, and means for cutting off the equalizing connection
90 between the pumps.

3. In a pumping apparatus, the combination of a plurality of pumps, a separate outlet for each pump, independent discharge
95 conduits leading directly from said outlets, a connection between the outlets of two pumps for equalizing the streams discharged from said conduits, and means for cutting off the equalizing connection without affecting
100 the communication between the outlet and discharge conduit of each pump.

4. In a pumping apparatus, the combination with a tank, of a plurality of pumps connected for simultaneous operation arranged upon opposite sides of the tank,
105 separate inlets for the several pumps, connections extending laterally from the inlets and communicating with the tank, independent outlets for the several pumps, conduits connecting the outlets of adjacent pumps
110 upon opposite sides of the tank and conduits connecting the outlets of adjacent pumps upon the same side of the tank, a connection between the tank and one of the conduits that is connected to the outlet of each pump,
115 and a discharge for each pump leading directly from the outlet thereof.

In testimony whereof I affix my signature in presence of two witnesses.

CORNELIUS BRESNAHAN.

Witnesses:

W. J. BELKNAP,
JAMES P. BARRY.