

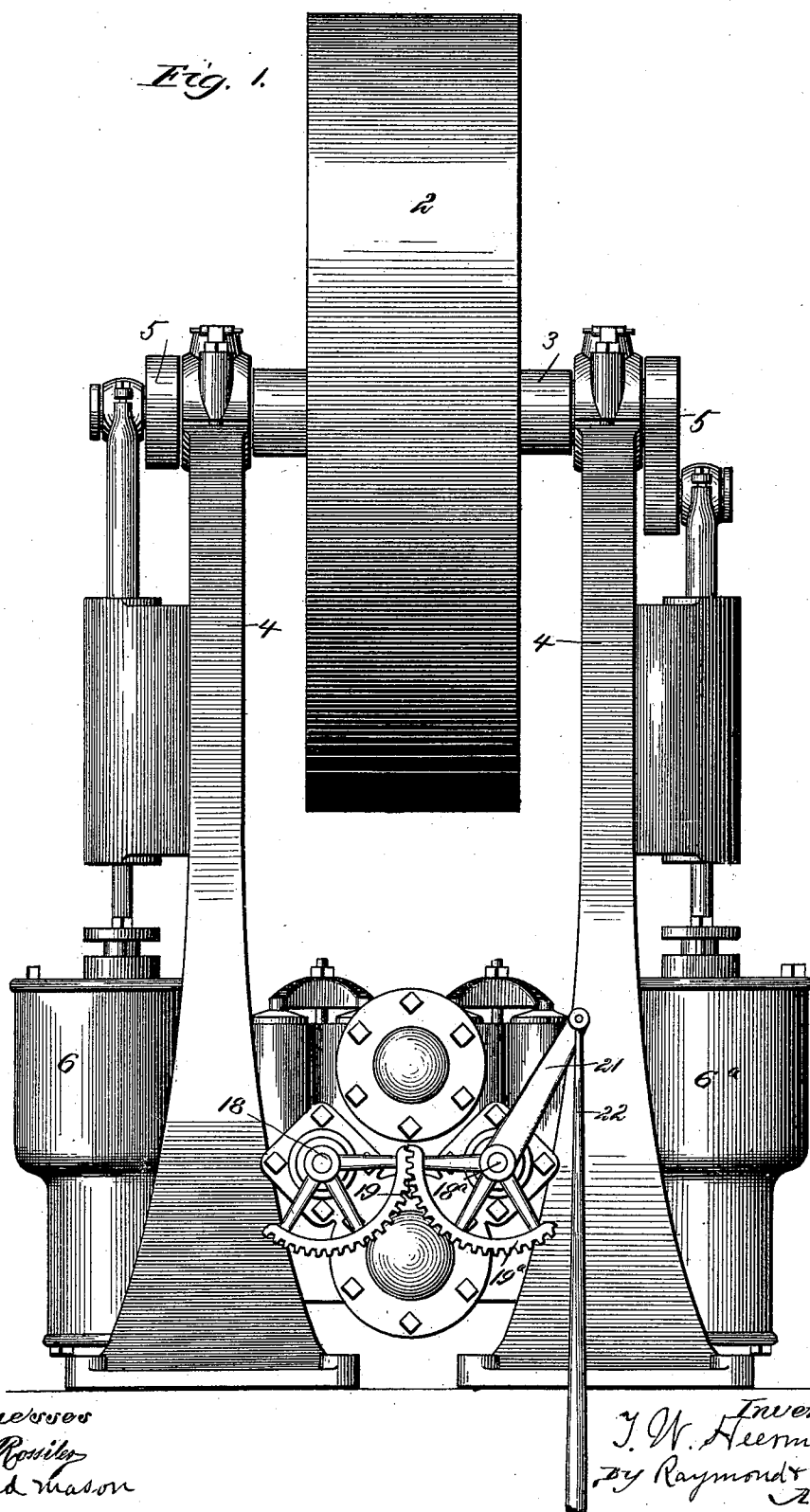
No Model.)

3 Sheets—Sheet 1.

T. W. HEERMANS.
PUMP.

No. 510,859.

Patented Dec. 12, 1893.



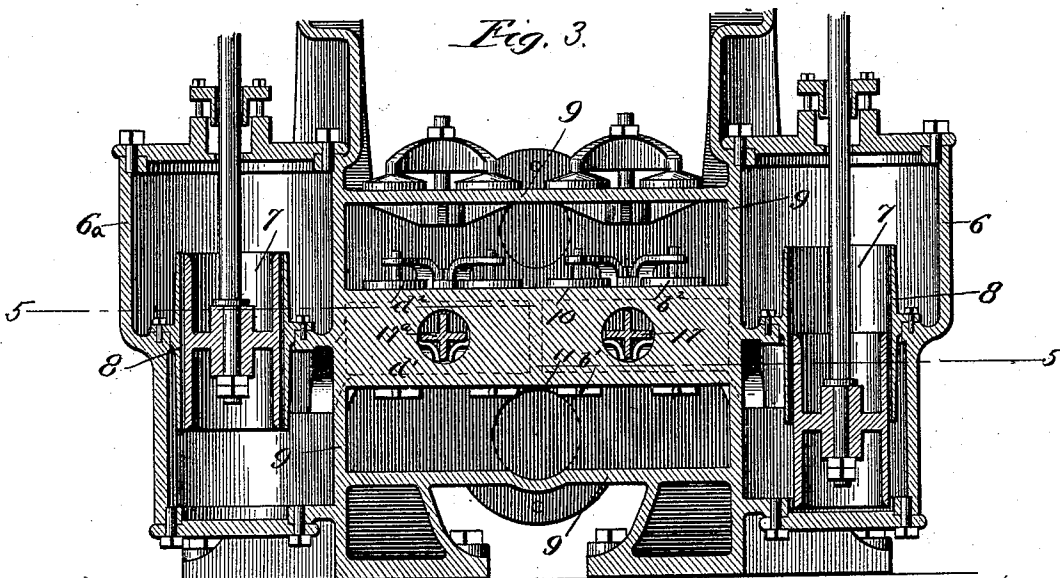
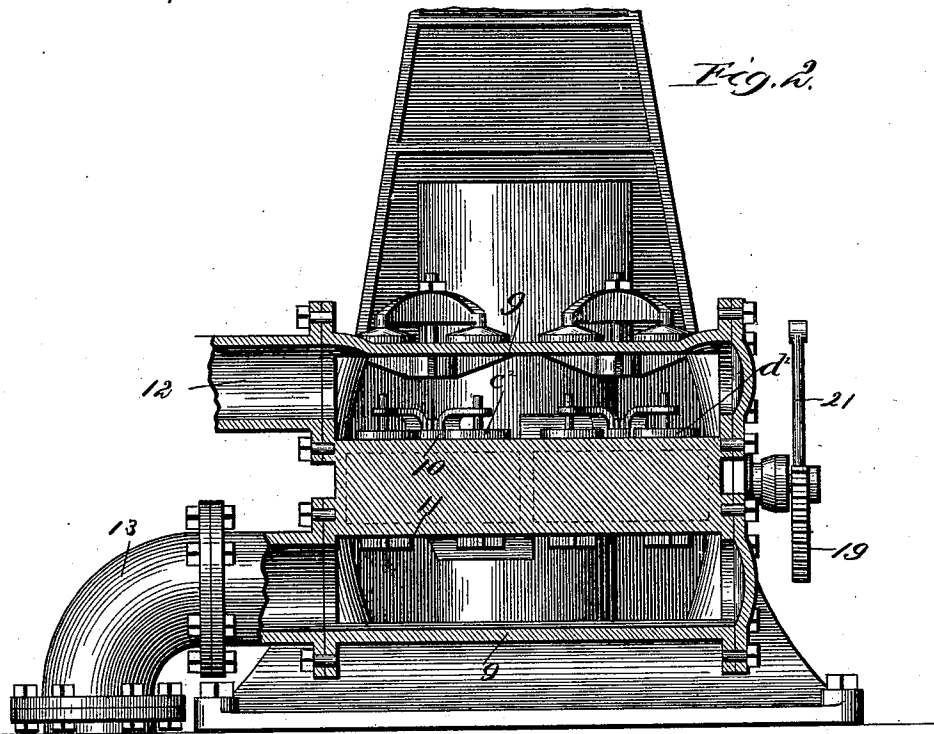
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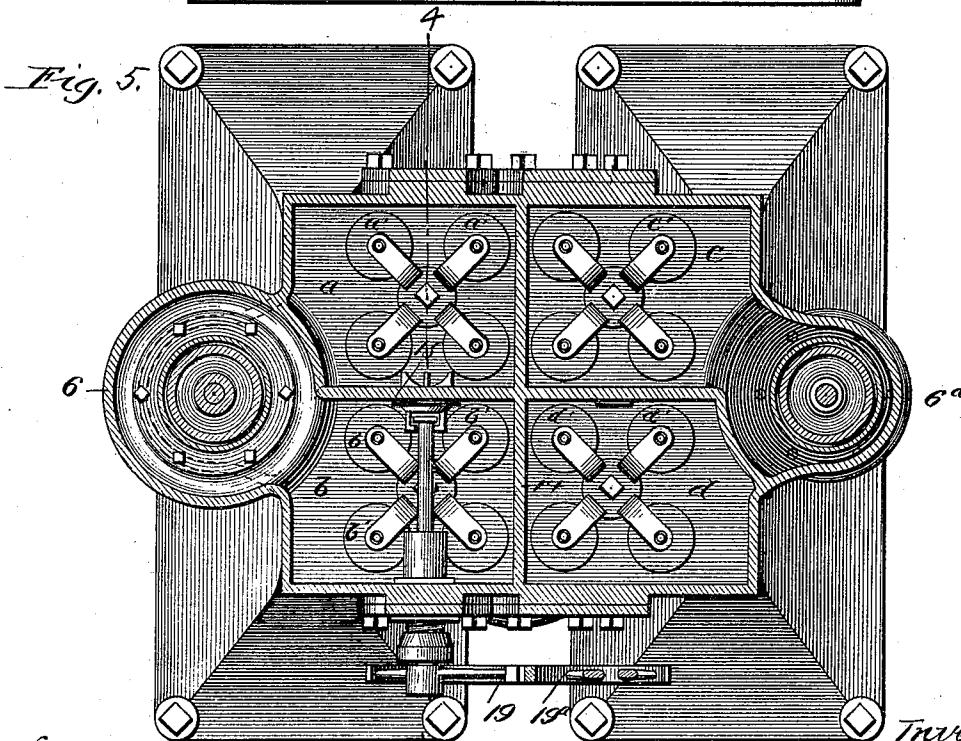
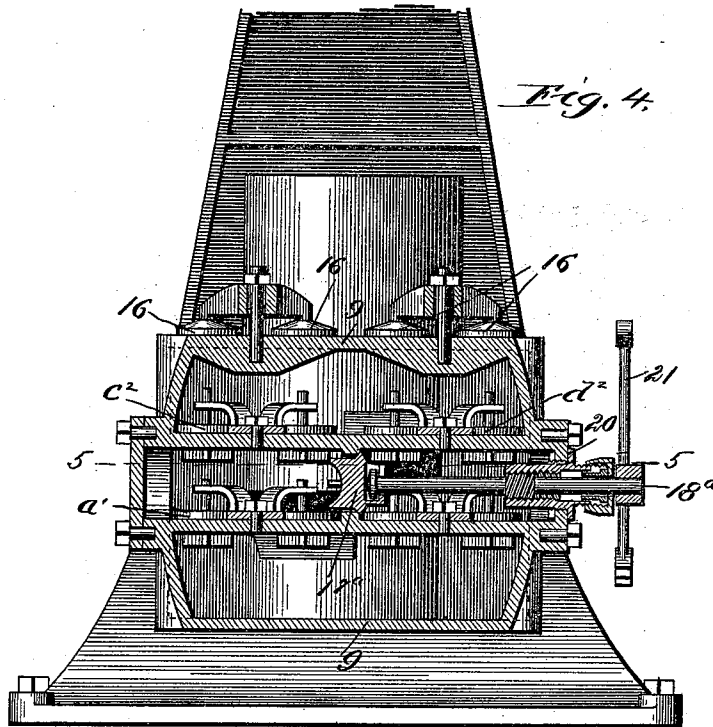
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No. 510,859.

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UNITED STATES PATENT OFFICE.

THADDEUS W. HEERMANS, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL COMPANY, OF ILLINOIS.

PUMP.

SPECIFICATION forming part of Letters Patent No. 510,859, dated December 12, 1893.

Application filed January 31, 1891. Serial No. 379,765. (No model.)

To all whom it may concern:

Be it known that I, THADDEUS W. HEERMANS, a citizen of the United States, residing in Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention relates more especially to pumps for operating hydraulic elevators, or for furnishing power for other purposes; and it relates more especially to means for operating said pumps so that the pump may be thrown out of operation when the required working pressure is exceeded without the stoppage of its movement.

The object of my invention is to effect a simple arrangement of the valves and valve chambers of the pump and to adapt thereto a by-pass device which may be operated automatically or by hand for the purpose of stopping the operation of the pump without stopping its movement.

In the accompanying drawings, Figure 1 is a side elevation of the pump embodying my invention. Figs. 2 and 3 are vertical central sections of the valve chambers, showing also the lower portion of the pump frame, Fig. 2 being on a plane at right angles to the line joining the pump cylinders, and Fig. 3 being on a plane parallel thereto, thus exhibiting the interior of the cylinder. Fig. 4 is a vertical section on a plane parallel to that of Fig. 2, said plane passing through at the line 4, 4, Fig. 5, the last named figure being a horizontal section on line 5, 5, Figs. 3 and 4.

In the drawings just named, which I will now proceed to describe in detail, my invention is shown as applied to a pump adapted to be driven by a belt, but is equally applicable, as will appear from the description, to a pump driven in any other manner.

2, Fig. 1, is a belt pulley which is mounted upon a shaft 3, journaled in the top of standards 4, 4 and having cranks 5, 5 at its opposite extremities, said cranks operating plungers 7, 7 or pistons in the cylinders 6, 6^a in the ordinary manner (*vide* Fig. 3). Said cylinders 6, 6^a are attached, or form part of the frame of the pump and are provided as usual with linings or bushings 8, 8. In the space

between the standards 4, 4 and the cylinders 6, 6^a is formed a chamber bounded by four walls 9, and the chamber so formed is subdivided into three compartments by horizontal partitions 10, 11. The upper compartment so formed connects with the outlet pipe 12 and the lower compartment connects with the inlet or suction pipe 13. The middle compartment is again subdivided into four chambers by the vertical partitions 14, 14, 15, 15 (*vide* Fig. 5), said subdivisions forming the valve chambers connecting with the ends of the cylinders 6, 6^a. The compartment marked *a* connects with the lower end of the cylinder 6; the compartment *b* connects with the upper end of the same cylinder. The compartment *c* connects with the upper end of the cylinder 6^a and the compartment *d* connects with the lower end of said cylinder. Valves *a'*, *b'*, *c'* and *d'*, seen in Fig. 5, connect with the suction chamber, and a corresponding set of valves, partially seen in Fig. 4, marked *c*², *d*² control the connection between the valve chambers and the discharge chamber. The discharge valves *a*², &c., are accessible through hand holes of the discharge chamber, which hand holes are closed by caps 16.

The operation of the valves will be obvious from the foregoing description and the specification of the drawings.

In order to control the operation of the pump without stopping its motion, I provide openings in the partitions 15, 15, between the compartments *a*, *b* which connect with the opposite ends of the cylinder 6; and between the compartments *c*, *d* which connect with the opposite ends of the cylinder 6^a. Said openings are provided with valves 17, 17^a (*vide* Figs. 3, 4 and 5), which are so connected together as to be capable of simultaneous operation when desired. The devices for operating said valves consist of stems 18, 18^a attached thereto and connected on the outside of the pump by segmental gears 19, 19^a as seen in Fig. 1, so that they may be revolved together. Each spindle has a quick thread cut thereon, as shown upon spindle 18^a, and this thread engages with the thread cut in bushing 20 secured to the machine; so that the partial revolution of the spindle 18, and

18^a serves to open the valves 17, 17^a. The
spindles 18, 18^a are operated by an arm 21,
Fig. 1, attached to one of the segmental gears
19, 19^a and are connected by means of a rod
5 22, or its equivalent, to a hand or automatic
device which may be put into operation when
it is desired to stop or start the flow of water
through the pump. It is obvious that if the
valves 17, 17^a be opened, the water instead of
10 being forced out of the pump, will simply cir-
culate from one end to the other of the cylin-
ders 6, 6^a through their corresponding valve
chambers which are placed in connection by
opening said valves 17, 17^a, while the closure
15 of said valves will cause the pump to resume
its work.

It is contemplated in the use herein de-
scribed to employ an automatic device gener-
ally for controlling the opening and closure of
20 the by-pass valves 17, 17^a, but the automatic
device for so doing is not herein illustrated,
as it forms no part of the present invention
and various devices for this purpose are well
known.

25 I claim—

1. The combination with the cylinders of a

duplex pump of a valve chamber connecting
with suction and discharge chambers and sub-
divided into four compartments, each com-
partment connected with one end of one of 30
the cylinders, passages or openings through
the division walls separating the compart-
ments connected with the opposite ends of
each cylinder; and by-pass valves connected
to operate simultaneously, fitted to said open- 35
ings, substantially as described.

2. The combination, with the cylinders of a
duplex pump, of a valve chamber, connected
with a suction or discharge chamber, and sub-
divided by partitions into four compartments, 40
each compartment connected with one end of
one of the cylinders; passages or openings
through said partitions; by-pass valves fitted
to said openings and mounted upon threaded
valve stems, the outer end of said stems hav- 45
ing intermeshing gears whereby said valves
may be operated simultaneously, substan-
tially as described.

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Witnesses:

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