F. Wagner. Sheet 1, 2 Sheets.

Reciprocating Meter

No. 91,991. Patented Jun. 29, 1869.

Fig. 1.

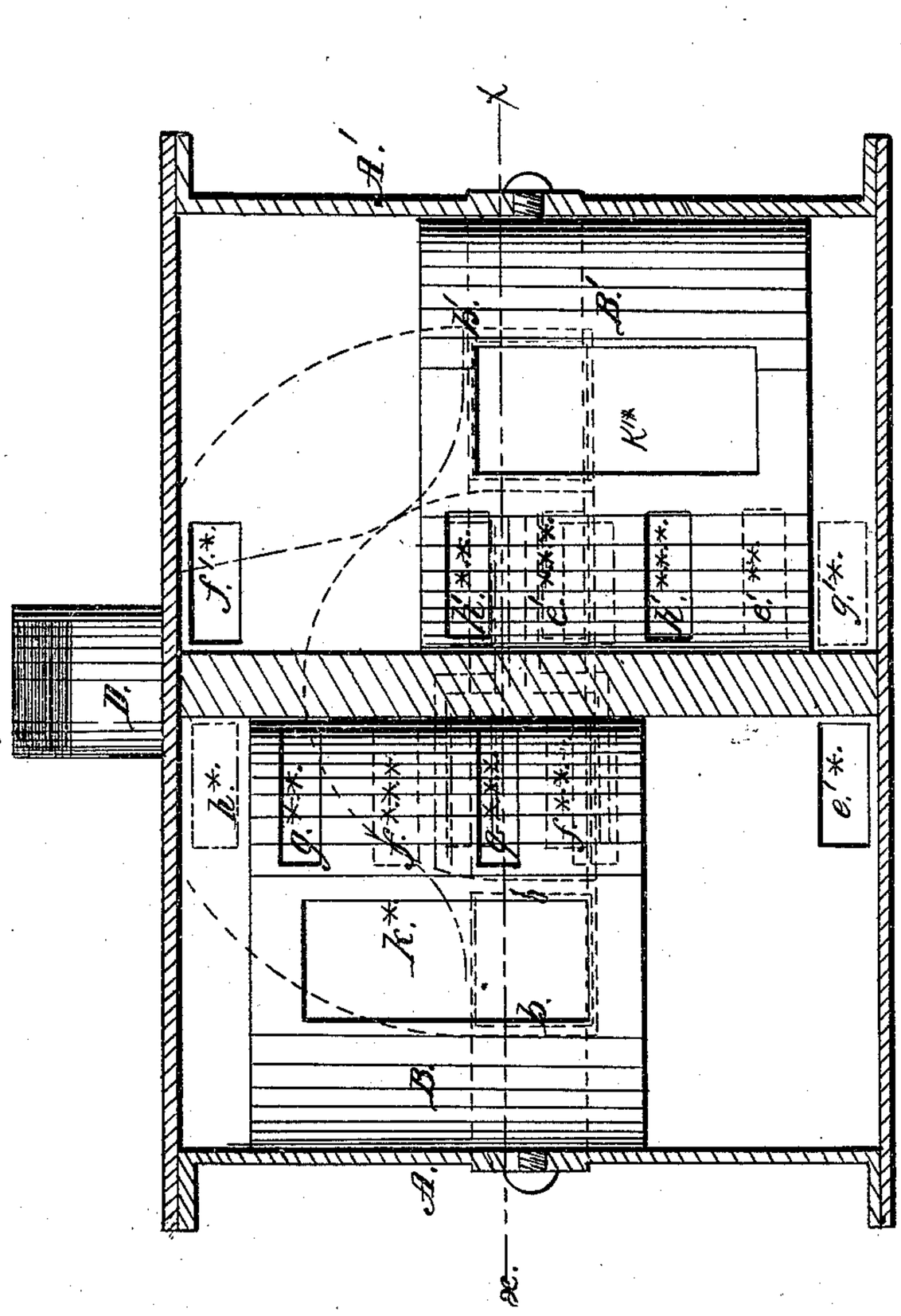

Fig. 4.

Section a.b.

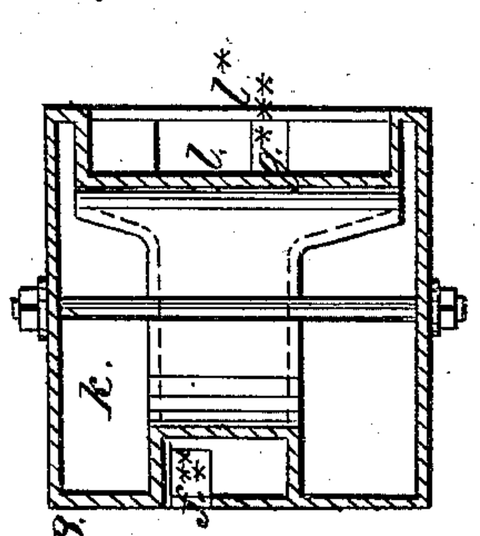

Fig. 5.

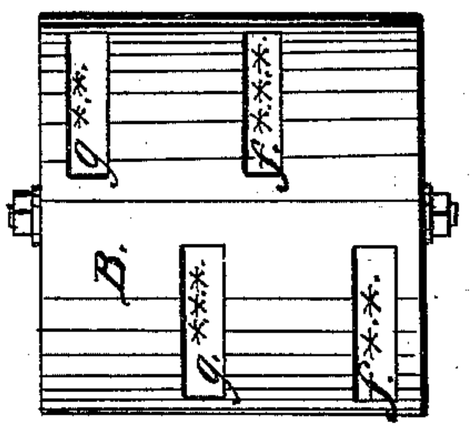

Fig. 3.

Section y.z.

Witnesses:
C Wahlers
Ernest F. Kastenhuber

Inventor:
Frank Wagner
per Van Santvoorde &
Alleys.

F. Wagner Sheets, 2 Sheets

Reciprocating Meter.

No. 91,991. Patented Jun. 29, 1869.

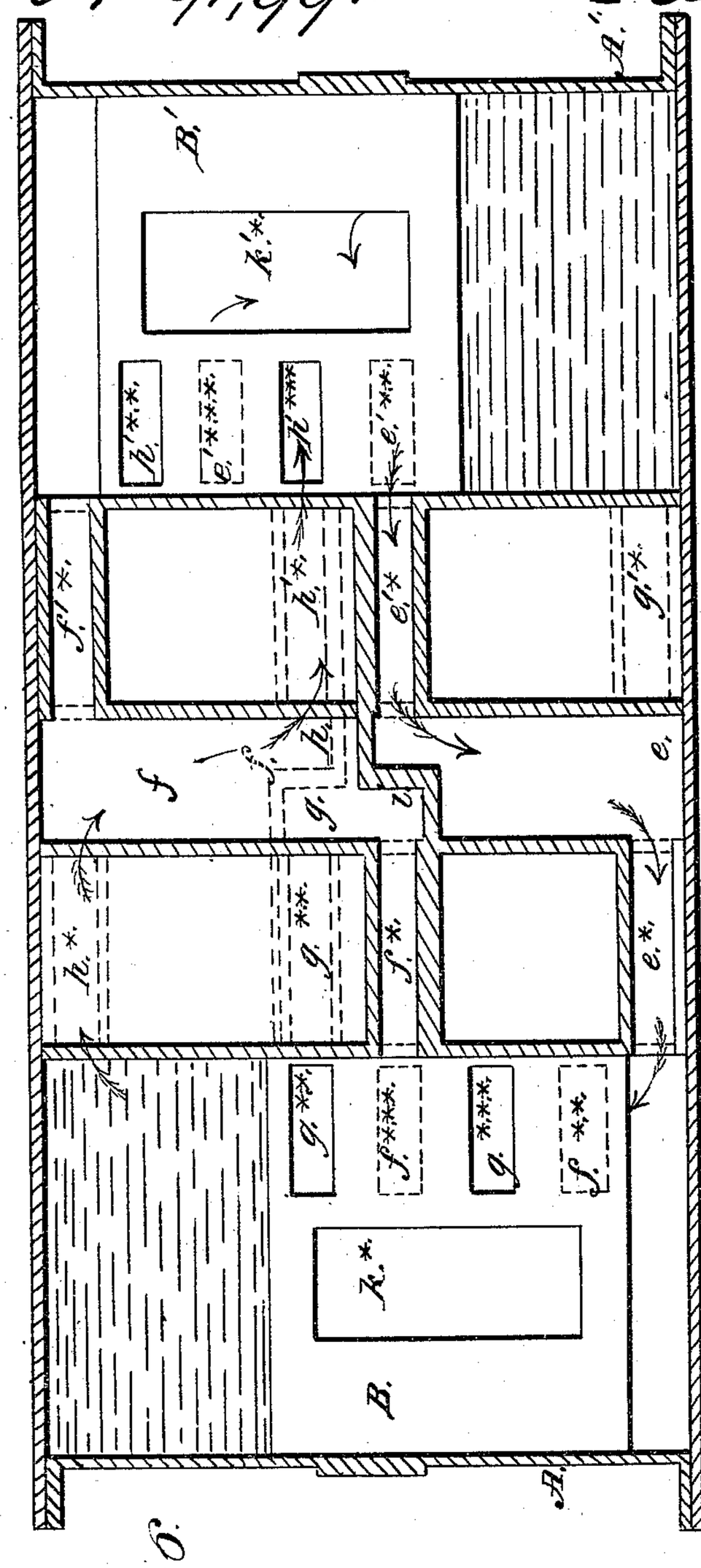

Fig. 3.

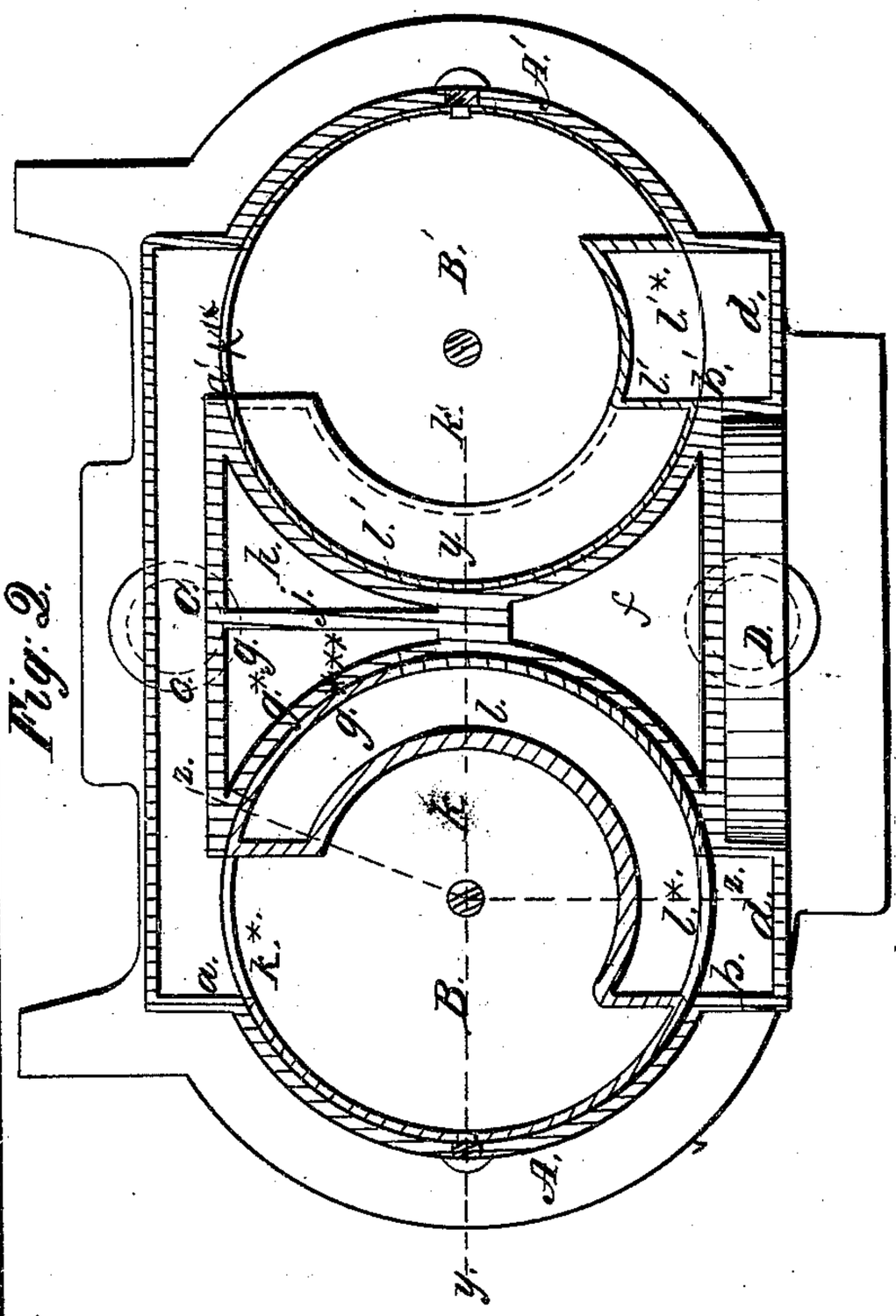

Fig. 2.

Witnesses.
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Ernest F. Hastenbleen

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United States Patent Office.

FRANZ WAGNER, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND JOSEPH METZNER, OF SAME PLACE.

Letters Patent No. 91,991, *dated June* 29, 1869.

IMPROVEMENT IN FLUID-METERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, FRANZ WAGNER, of the city, county, and State of New York, have invented a new and useful Improvement in Fluid-Meters; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 represents a horizontal section of this invention.

Figure 2 is a vertical section thereof, the line *x x*, fig. 1, indicating the plane of section.

Figure 3 is a longitudinal section of one of the pistons detached, the plane of section being indicated by the line *y y*, fig. 2.

Figure 4 is a similar section in the plane *z z*.

Figure 5 is a side view of one of the pistons detached.

Figure 6 is a diagram, serving to explain the operation of my meter.

Similar letters indicate corresponding parts.

My invention consists in an improvement on the patent, No. 75,225, granted to me for fluid-meters, on the 3d day of March, 1868.

In said patent, it will be seen, I use cylinder-valve, or piston-valve, and my improvement consists in doubling or duplicating my said piston-valve or cylinder-valve, thereby saving the piston and gearing required in my former patent. I am thus enabled to furnish a much greater supply of water than I could by the single piston-valve, my cylinder or valve obviating the use of the piston, thereby cheapening the cost and simplifying the construction of my meter.

The advantages in my improved meter are, economy of material, economy of labor and space.

My meter consists of two cylinders, A A′, situated side by side, and furnished with pistons B B′.

Each of the cylinders is provided, at about the middle of its length, with two openings, *a b a′ b′*, one diametrically opposite the other, the openings *a* and *a′* to communicate, through a channel, *c*, on the outside of the cylinders, with the supply-pipe C, and the openings *b b′*, through a channel, *d*, on the opposite side of the cylinders, with the delivery-pipe D.

Between the cylinders A A′ are four chambers, *e f g h*, situated on opposite sides of the partitions *i j*.

The chamber *e* communicates with the cylinder A through a port, *e**, and with the cylinder A′ through a port *e′**.

The chamber *f* communicates with the cylinder A through a port, *f**, and with the cylinder A′ through a port, *f′**.

The chamber *g* communicates with the cylinder A through a port, *g**, and with the cylinder A′ through a port, *g′**.

The chamber *h* communicates with the cylinder A through a port, *h**, and with the cylinder A′ through a port *h′**, the ports *e** and *h** being near the ends of the cylinder A′, while the port *f** is in line with the port *e**, and the port *g** in line with the port *h**, in the interior of the cylinder A, and the port *e′** is in line with the port *f′**, and the port *h′** in line with the port *g′**, in the interior of the cylinder A′.

The pistons B B′ are hollow, and their interior forms a supply-chamber, *k k′*, and a delivery-chamber *l l′*, and the supply-chambers communicate, through apertures *k* k′**, with the openings *a a′* in the cylinders, and through them with the supply-channel *c*, while the delivery-chambers *l l′* communicate, through apertures *l* l′**, with the openings *b b′* in the cylinders, and through them with the delivery-channel *d*.

Each of the supply-chambers is provided with two ports, *f** g** e′** h′***, and each of the delivery-chambers with two ports, *g*** f*** h′*** e′****.

The situation of these ports, in relation to each other and to the ports in the cylinders, will be best understood from the diagram, fig. 6, where the cylinders are shown in section, and those parts which are cut away are represented in dotted lines, while the pistons are shown in elevation, so that the ports *g** g*** h′** h′****, which appear in full outlines in the pistons, correspond to the ports *g* h′** of the cylinders, which appear in dotted outlines, (being in the upper halves of said cylinder, which are cut away in fig. 6,) and the ports *f** f*** e′** e′****, shown in dotted lines in the pistons, and situated on their under sides, correspond with the ports *f* e′** in the cylinders, shown in full lines, and situated in the lower half of said cylinders. The operation is as follows:

If the pistons occupy the positions shown in fig. 6, the fluid from the supply-pipe C passes into the supply-chambers *k k′* of both pistons, and from the supply-chamber *k*, through the ports *g** g**, into the chamber *g*, between the two cylinders, and out of this chamber through the port *g′**, under the piston B′, which, being already at the extreme end of its stroke, remains stationary; but at the same time the fluid from the supply-chamber *k′* of the piston B′ passes through the ports *e′** e′** into the chamber *e*, between the two cylinders, and from this chamber, through the port *e**, into the cylinder A, where it acts against the piston B, and causes the same to move to the opposite end of its cylinder.

The fluid in front of this piston is displaced, and it passes through the port *h** into the chamber *h*, thence through the ports *h′* h′**** into the delivery-chamber *l′* of the piston B′, and through the aperture *l′** and channel *d*, to the delivery-pipe.

When the piston B has arrived at the opposite end of its stroke, or in the position shown in fig. 1, the

fluid from the supply-chamber *k* of said piston, (which is in continuous communication with the supply-pipe,) passes through the ports *f*** *f** into the chamber *f*, from this chamber, through the port *f'**, into the cylinder A', and it acts against the piston B', so as to drive the same out to the opposite end of its stroke.

The fluid before this piston is then driven out through the port *g'**, chamber *g*, ports *g** *g****, into the delivery-chamber of the piston B, and thence, through the apertures *l** *b* and channel *d*, to the supply-pipe.

When the piston B' has arrived at the end of its stroke, the position of both pistons is that shown in fig. 1.

The fluid then passes through supply-chamber *k'*, ports *h'** *h'**, chamber *h*, and port *h**, into the cylinder A, and the piston B is caused to move, while the fluid before this piston discharges through port *e**, chamber *e*, ports *e'** *e'****, delivery-chamber *l'*, openings *l'**.*b'*, channel *d*, and pipe D.

From this description it will be seen that the fluid discharges always through the same piston through which it enters, and that each piston acts as the supply and discharge-valve for the cylinder of the other piston.

It is obvious that either of the pipes C D can serve as delivery or supply-pipe, and the function of the chambers in the piston will be changed accordingly.

Nothing now claimed in the application of I. B. Van Deusen, with which this application has been in interference, is herein intended to be claimed.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

The construction and arrangement of the meter-case A A', the two cylinders B B', with four valve-ports and delivery-chambers *l l'*, and the four chambers or passages intermediate between the two cylinders, with intervening partitions *i j*, substantially as and for the purposes shown and set forth.

FRANZ WAGNER.

Witnesses:

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ERNEST F. KASTENHUBER.