(No Model.) 2 Sheets—Sheet 1.

G. MELCHER.

PUMP.

No. 343,827. Patented June 15, 1886.

Fig. 1.

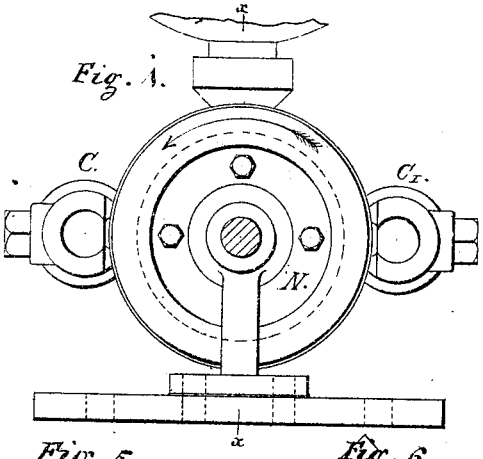


Fig. 4.

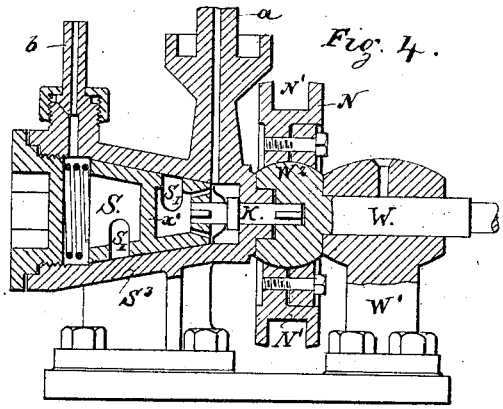


Fig. 5.

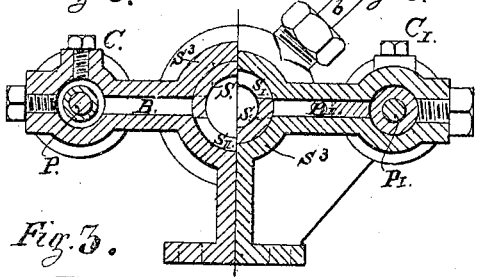


Fig. 6.

Fig. 7.

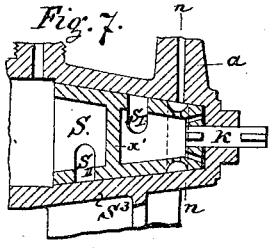


Fig. 8.

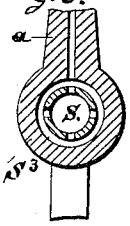


Fig. 3.

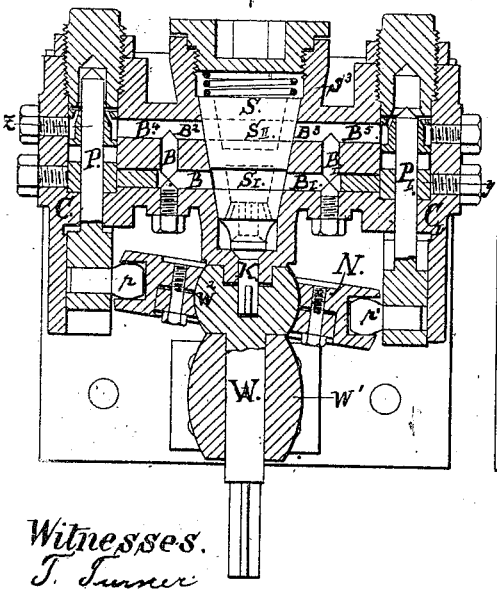
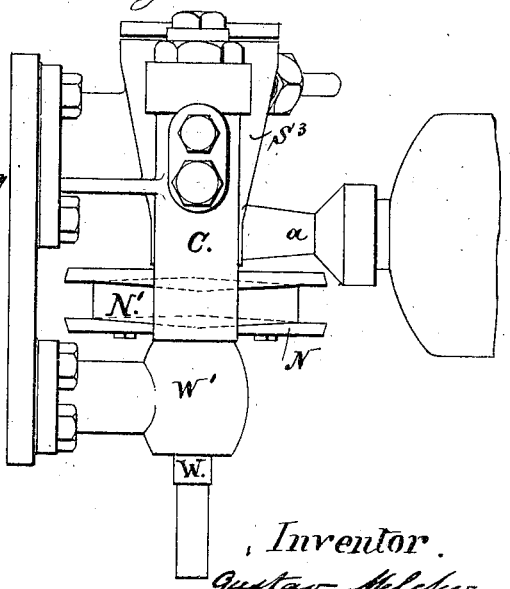


Fig. 2.



Witnesses.
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(No Model.)

2 Sheets—Sheet 2.

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PUMP.

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Fig. 9.

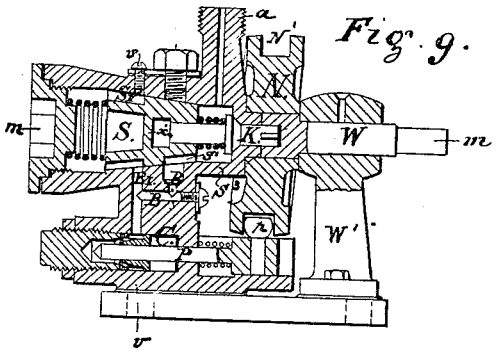


Fig. 11.

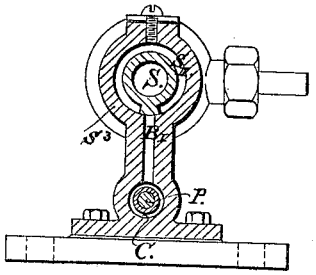


Fig. 17.

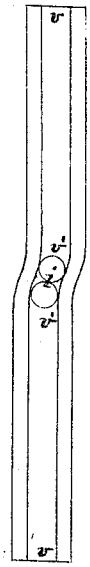


Fig. 10.

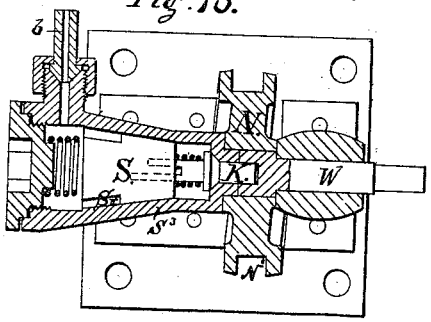


Fig. 12.

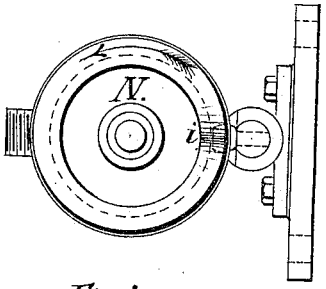


Fig. 14.

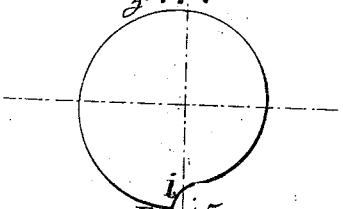


Fig. 13.

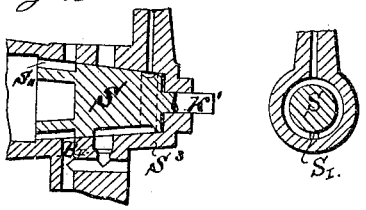


Fig. 15.

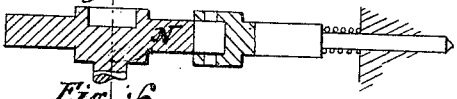
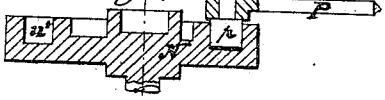


Fig. 16.



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UNITED STATES PATENT OFFICE.

GUSTAV MELCHER, OF DUSSELDORF, PRUSSIA, GERMANY.

PUMP.

SPECIFICATION forming part of Letters Patent No. 343,827, dated June 15, 1886.

Application filed February 18, 1886. Serial No. 192,398. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV MELCHER, residing at Dusseldorf, Prussia, Germany, have invented a new and improved Pump, of which the following specification is a full, clear, and exact description.

This invention relates to the manner of operating reciprocating pumps and an improved revolving valve, whereby the fluid will be discharged at an equal speed during the whole operation.

The invention consists of the various elements of improvement hereinafter more fully pointed out.

In the accompanying drawings, Figure 1 shows an end view, and Fig. 2 a side view, of two pumps, with the valve between the same. Fig. 3 is a horizontal section, and Fig. 4 a vertical section at line *x x*, Fig. 1. Fig. 5 is a section at line *z*, Fig. 3. Fig. 6 is a section at line *y*, Fig. 3. Fig. 7 is a section of the valve and valve-chamber, showing a modification; and Fig. 8, a cross-section at line *n n*, Fig. 7. Fig. 9 is a vertical section of a single pump, and Fig. 10 a horizontal section at line *m m*, Fig. 9. Fig. 11 is a vertical cross-section at line *v v*, Fig. 9, and Fig. 12 is an end view of this pump. The remaining figures represent details and modifications referred to in the following specification.

In Figs. 1 to 6, two pumps, C C', are arranged with the valve-chamber S^3, containing the valve S, between them. The end of the valve-chamber supports the end of the driving-shaft W, which receives its main bearing in the support W'. At the outer end of said shaft a handle or pulley can be attached to operate the same. Between the bearing W' and the valve-chamber S^3 a disk, N, is secured to the shaft W, provided with an annular groove, N', on its periphery, into which guide-blocks *p p'*, attached to the end of the plungers or pump-rods P P', work. This disk may be placed diagonally with the axis of the shaft, to give the necessary amount of motion. The peculiar construction of this annular groove is more fully described hereinafter. The valve-chamber S^3 is conical, and is provided with the suction-pipe *a* at its small end, and with the discharge-pipe *b* at its larger end. The valve S consists of a conical plug fitting into the casing, and is divided, through partition *x'*, into two chambers, provided with openings S' and S'', communicating alternately with the passages B B' and B^2 B^3, leading to the passages B^4 B^5 of the pump-cylinders C C'. The valve S is acted upon by a spring, to force the same into its casing and insure a tight fit, and as the discharge-pipe *b* acts upon the large end of the valve S, the pressure assists likewise to insure the tightness of the valve. The end of the valve S is connected, through the stud K, with the end of the shaft W, through which said valve receives a rotating motion from said shaft W. As shown in the drawings, the passages B B' are closed by the valve S. By rotating the valve in the direction of the arrow, Fig. 1, the opening S' comes in communication with the passage B, and allows the fluid to be drawn from the pipe *a* into the pump C; at the same time the opening S'' comes opposite the passage B^3, and forms thus a communication between the pump-cylinder C' and the discharge-pipe *b*. The openings S' and S'' are of such dimensions that this communication is retained even by the rotation of the valve S until the plungers P P' are moved in the opposite position, when the opening S' will come in position to communicate with the passage B' and the opening S'' with the passage B^2. The annular groove in the disk N, through which the plungers or pump-rods P P' are operated, forms for one-half of the circumference part of a right-handed thread and on the other half of its circumference part of a left-handed thread, and through which the desired reciprocating motion of the plungers P P' is obtained. The disk N is placed upon a circular or ball-shaped hub, W^2, on the shaft W, whereby, by changing the position of said disk N upon this hub W^2, the stroke of the plungers may be increased or diminished, as may be desired.

Figs. 9 to 12 represent a similar arrangement for a single pump, and instead of openings S' S'' into the interior chambers of the valve, corresponding recesses are made in the periphery of said valve, operating with the passages leading to the pump-cylinder in a similar manner as above described.

Instead of a stud, K, connecting the valve S with the shaft W, a projection, K', may be

provided at the end of said valve S, passing through the valve-casing, and connecting with the shaft W. (See Fig. 13.)

The disk N may be made cam-shaped on its periphery, (see Figs. 14 and 15,) or provided with a cam-shaped groove, *n'*, (see Fig. 16,) by which the plungers are operated.

For single pumps the annular groove *m* in the periphery of the disk N can be made of one thread nearly the whole length of the circumference, connected at the ends by a channel, *i*, (see Fig. 17,) which represents the groove laid out in a plane, and when, during the passage from *v* to *v*, the plunger is forced inward, and during the passage from *v'* to *v'* the plunger will be drawn outward.

I claim as my invention—

1. In combination with the plungers or pump-rods P P', the disk N, provided with an annular groove, N', the guide-blocks *p p'*, the shaft W, and the rotating valve S, arranged to operate in the manner and for the purpose described.

2. The combination of the shaft W, stud K, and cylindrical cone-shaped valve S with pumps C C, and with the disk N, for operating the plungers of said pumps, substantially as specified.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GUSTAV MELCHER.

Witnesses:
F. PÜTZ,
C. PÜTZ.