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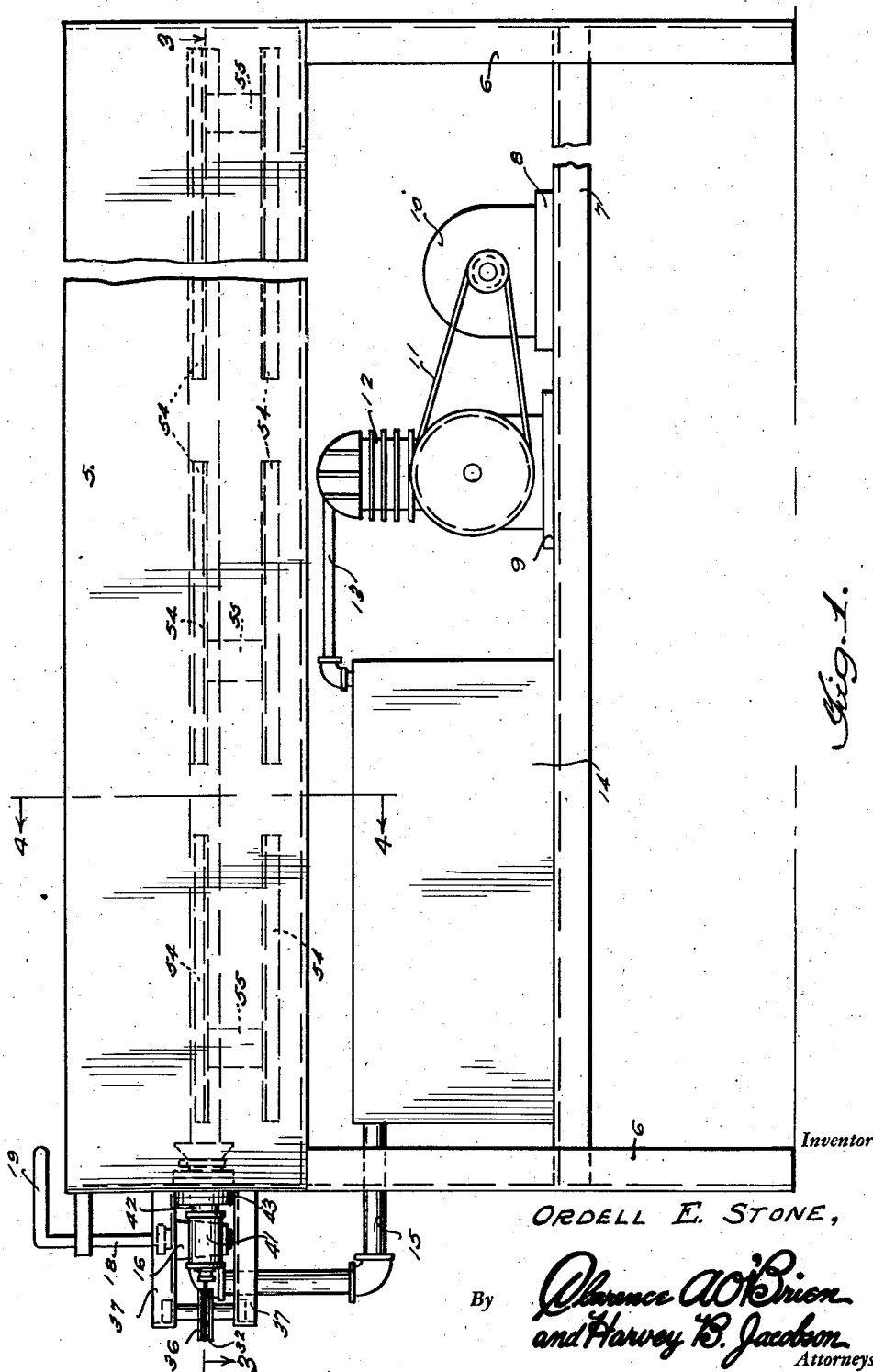
O. E. STONE

2,408,240

SANITARY PIPE WASHER

Filed April 15, 1944

4 Sheets-Sheet 1



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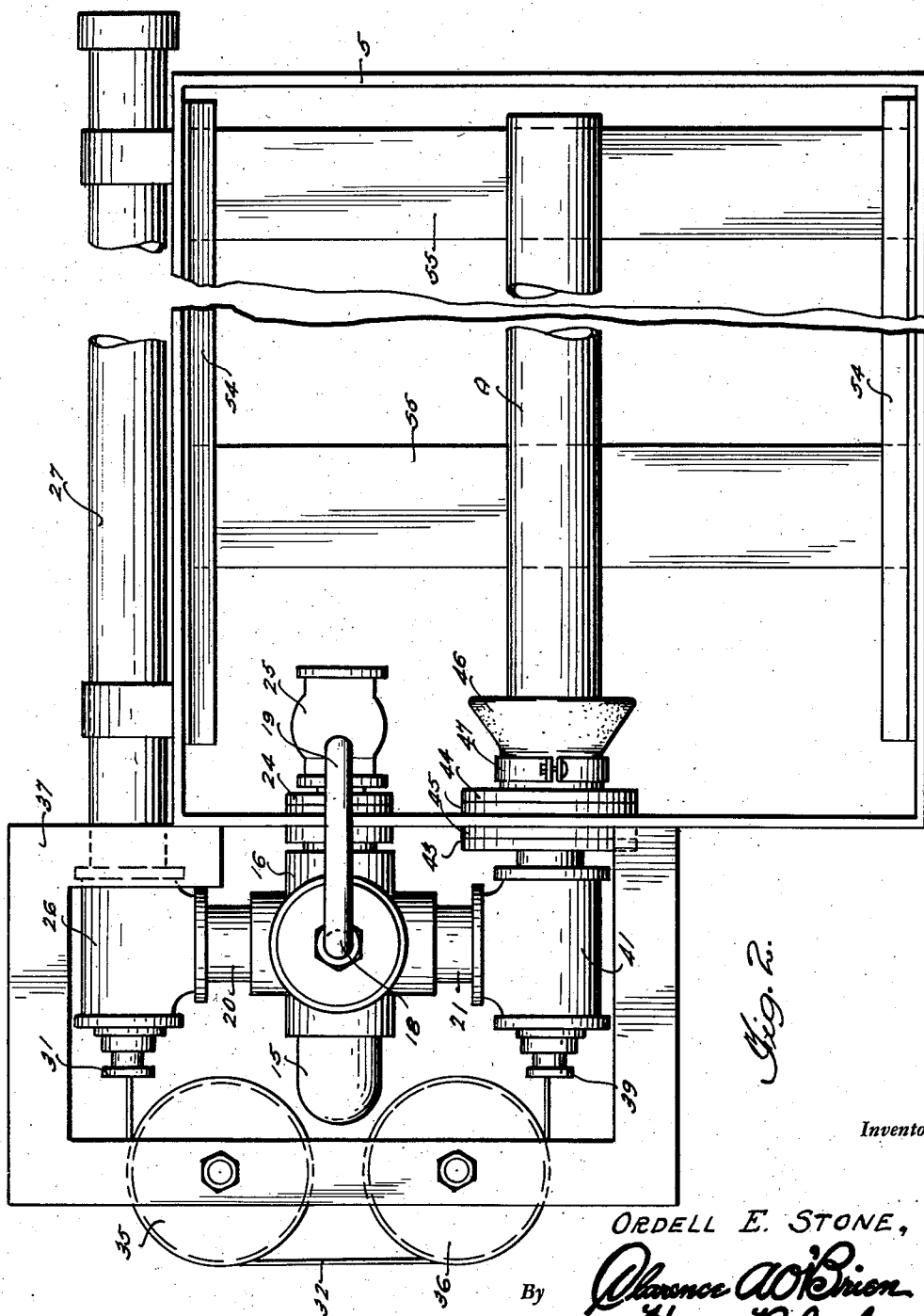
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SANITARY PIPE WASHER

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SANITARY PIPE WASHER

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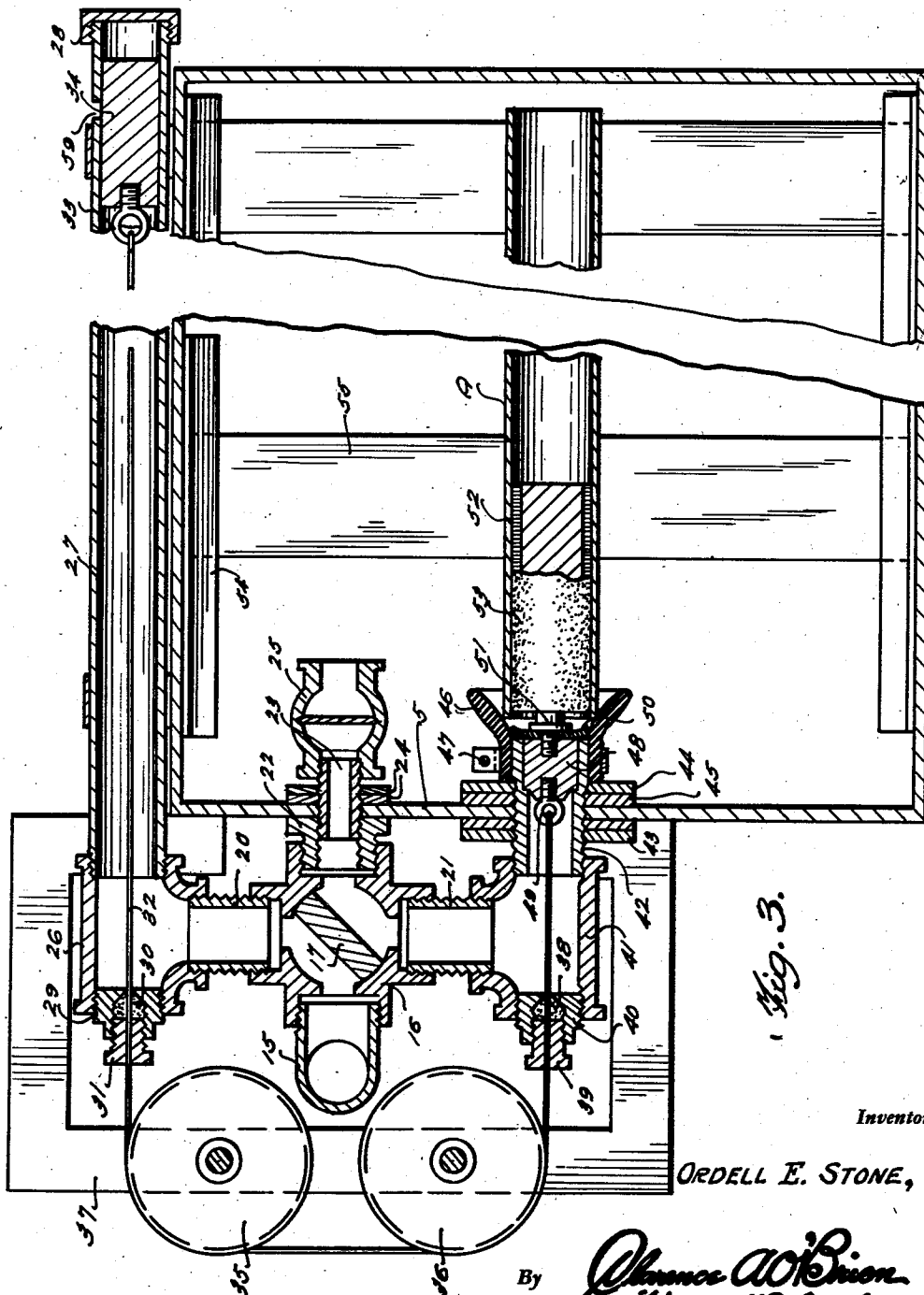


Fig. 3.

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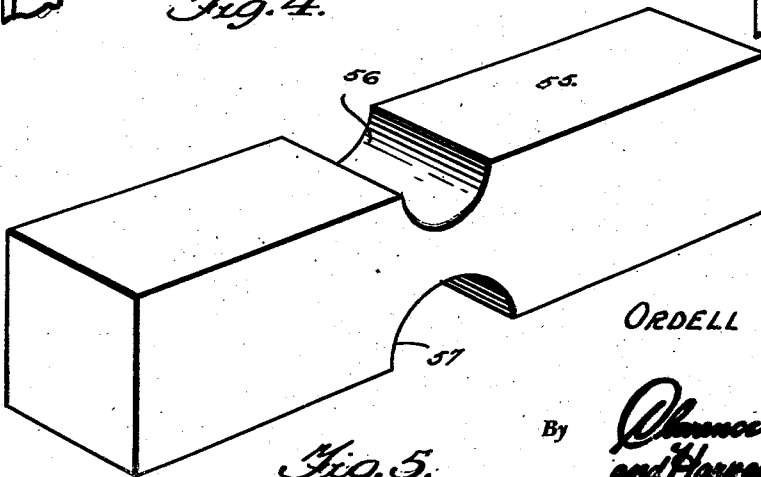
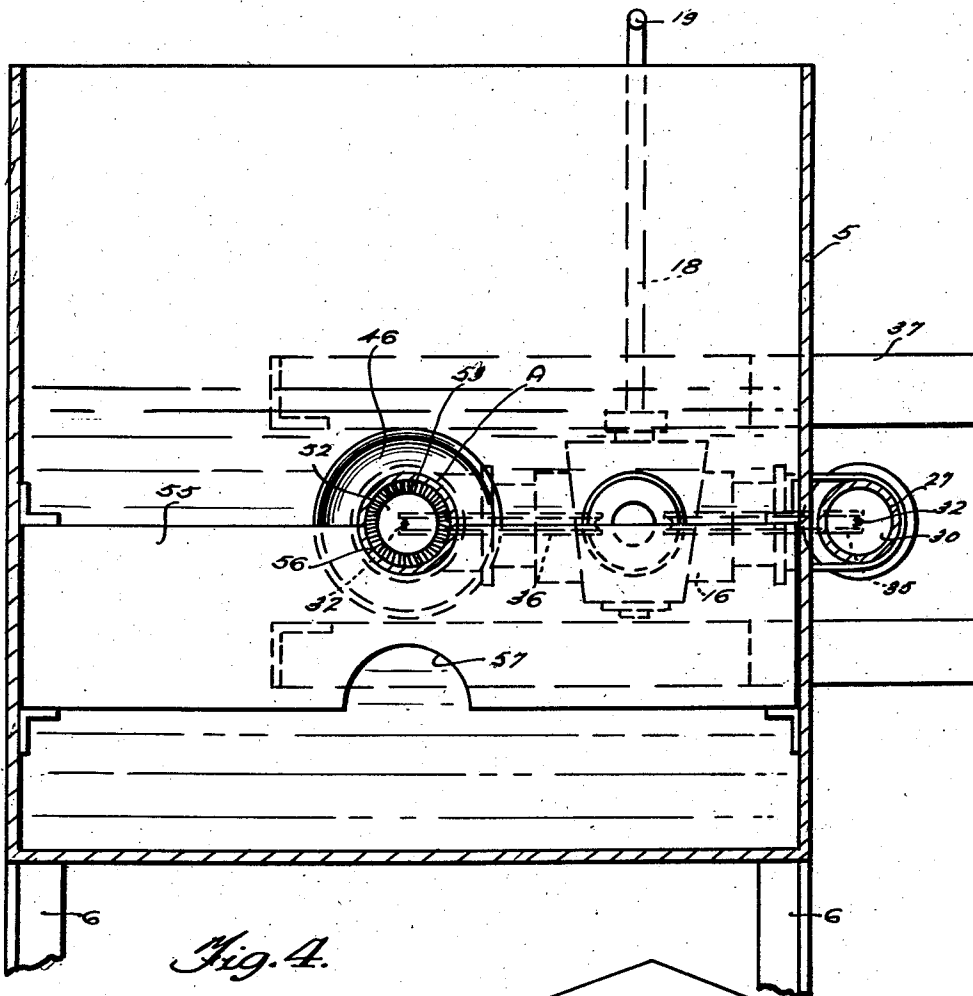
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SANITARY PIPE WASHER

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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SANITARY PIPE WASHER

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2 Claims. (Cl. 15—88)

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This invention relates to new and useful improvements in washing apparatus and more particularly to a machine for washing sanitary pipes such as are used in dairies, creameries and other food handling plants.

The principal object of the present invention is to provide a machine capable of accommodating most common sizes of pipes.

Another important object of the invention is to provide a machine which will not only be positive acting and time-saving but highly efficient in thoroughly cleaning pipes.

Other objects and advantages of the invention will become apparent to the reader of the following description.

In the drawings:

Figure 1 is a side elevational view of the machine.

Figure 2 is a fragmentary top plan view.

Figure 3 is a horizontal sectional view taken substantially on the line 3—3 of Figure 1.

Figure 4 is a fragmentary vertical sectional view taken on the line 4—4 of Figure 1.

Figure 5 is a perspective view showing one of the pipe supporting blocks.

Referring to the drawings wherein like numerals designate like parts, it can be seen that numeral 5 denotes an elongated tank for containing a suitable washing solution and this tank is supported by corner legs 6, preferably of angle iron construction. Longitudinal members 7 connect the legs 6 and platforms 8, 9 bridging these members 7 serve to support an electric motor, which by drive means 11 drives a compressor 12, which has a pipe connection 13 with a storage tank 14 supported by members 7. It is preferable that some form of pressure responsive device be employed in conjunction with the reservoir 14 for cutting on or shutting off the compressor 12 in order to hold the pressure in the reservoir 14 constant.

Leading from the reservoir 14 is an air conduit 15 which connects with a three-way valve 16, this valve 16 including a rotatable valve element 17, which is adapted to be rotated by a stem 18 and hand lever 19. (See Figure 1.)

From opposite sides of the valve 16 pipe sections 20, 21 extend. To one of the remaining two sides of the valve 16, the conduit 15 connects, while the remaining sides of the valve receives a bushing 22, internally threaded to accommodate one end portion of a short threaded tube 23 which is disposed through one end of the tank 5 and has nuts 24 thereon (with preferably suit-

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able packing means) for holding these parts in fixed position with respect to the tank wall.

A check valve 25 is provided on the remaining end of the tube 23, so that air can be bled from the pipe section 21 while air is being supplied to the pipe section 20 with the valve element 17 in the position shown in Figure 3. With the valve element turned 90° from the position shown, air is bled from pipe section 20 while air is being supplied to pipe section 21.

The pipe section 20 connects to a T-fitting 26 from which an elongated cylinder 27 extends, substantially the full length of the tank 5 and at the outside thereof, this cylinder being capped at its outer end as at 28. The remaining end of the T-fitting 26 has a threaded plug 29 therein and in this plug is a packing gland 30 including a compression screw 31. The compression screw 31 and the plug 29 have openings therethrough to accommodate a wire or cable 32, which at one end connects to an eye 33 on a piston 34 operating in the cylinder 27. This cycle extends over a pair of pulleys 35, 36 mounted within a frame structure 37.

The other end of the cable 32 extends through a packing gland 38 and a compression screw 39 therefor, this gland being located in a plug 40 in one end of a second T-fitting 41 located at the outer end of the pipe section 21.

A threaded tube 42 extends from the remaining end of the T-fitting 41 and through an opening in the adjacent end wall of the tank 5. Nuts 43, 44 are provided on this threaded tube 42 and suitable packing means 45 is provided between the nuts and the adjacent sides of the tank wall.

At the tank end of the tube 42 a rubber cup or cone 46 is secured thereto by a clamp 47. It will be noted here, (see Figure 3) that while one end of the cable 32 connects to a piston 34, the remaining end connects to a piston 48 by way of an eye 49. The piston 48 has a leather or rubber wiper 50 at its outer end and this end of the piston 48 is connected by a suitable connector 51 to a brush structure which includes a core 52 and bristles 53 at the periphery thereof.

Along the side walls of the tank 5 are angle iron members 54 for supporting blocks 55. One of these blocks is shown in Figure 5, the same having a small transverse groove 56 at its top side and a larger pipe receiving groove 57 across its bottom side. It is preferable that the angle iron members 54 be in the form of spaced sections, so that conveniently, the blocks 55 can be dropped and inverted whenever the need requires. The blocks 55 can be shifted along the angle iron

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members to accommodate pipe of various lengths.

With the different size grooves, different size pipes can be accommodated.

In the operation of the machine, it can be seen that the desired solution is first placed in the tank 5. It is presumed that a proper pressure exists in the reservoir 14. The pipe to be cleaned is fed upon the blocks 55 and shifted to a position permitting the brush 52 to be inserted in one end thereof, the pipe being shown in Figure 3 and denoted by reference character A. The pipe is further shifted until the end receiving the brush is brought snugly against the resilient cup 46 so that no air pressure will be lost.

The valve element 17 is now rotated, for instance, to the position shown in Figure 3 so that air is delivered to the cylinder 27. This will force the piston 34 along the cylinder 27 and air will be expelled through a vent 59, in advance of the piston 34. The vent 59 is inwardly from the cap 28, so that as the piston 34 passes the vent 59 the piston will be brought to a gradual stop due to the cushioning effect of the air that is trapped between the cap and the vent 59.

The reverse operation of the machine takes place when the valve element 17 is turned 90° and air is delivered against the piston 48. The brush 52 is driven along the pipe A, as the piston 34 returns to a position adjacent the T-fitting 26 during this operation of the piston 34 returning; the air in advance of the same is expelled by way of the check valve 25. This back and forth motion of the brush 52 can be repeated as many times as thought necessary.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

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Having described the invention, what is claimed as new is:

1. In a pipe-washing machine, a tank for a washing solution, means in said tank for supporting a pipe in horizontal position immersed in said solution, a brush in said tank for reciprocation in said pipe to force the solution through the pipe and fitting in said pipe to brush the inside thereof, and means for reciprocating said brush comprising a piston fitting in said pipe and operatively connected to the brush, a cylinder extending alongside the tank, a second piston in said cylinder, pneumatic means for exerting pressure against the pistons alternately to move the same in opposite directions relatively, and operating connections between said pistons whereby movement of either piston under pneumatic pressure against the same causes the other piston to move in an opposite direction relative to the direction of movement of the pressure-operated piston.

2. In a pipe-washing machine, a tank for a washing solution, means in said tank for supporting a pipe in horizontal position immersed in said solution, a brush in said tank for reciprocation in said pipe to force the solution through the pipe and fitting in said pipe to brush the inside thereof, means for reciprocating said brush comprising a piston fitting in said pipe and operatively connected to the brush, a cylinder extending alongside the tank, a second piston in said cylinder, means for moving said pistons in one and the same direction alternately under pneumatic pressure, and means for causing each piston during its movement in said direction to impart movement to the other piston in a relatively opposite direction.

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