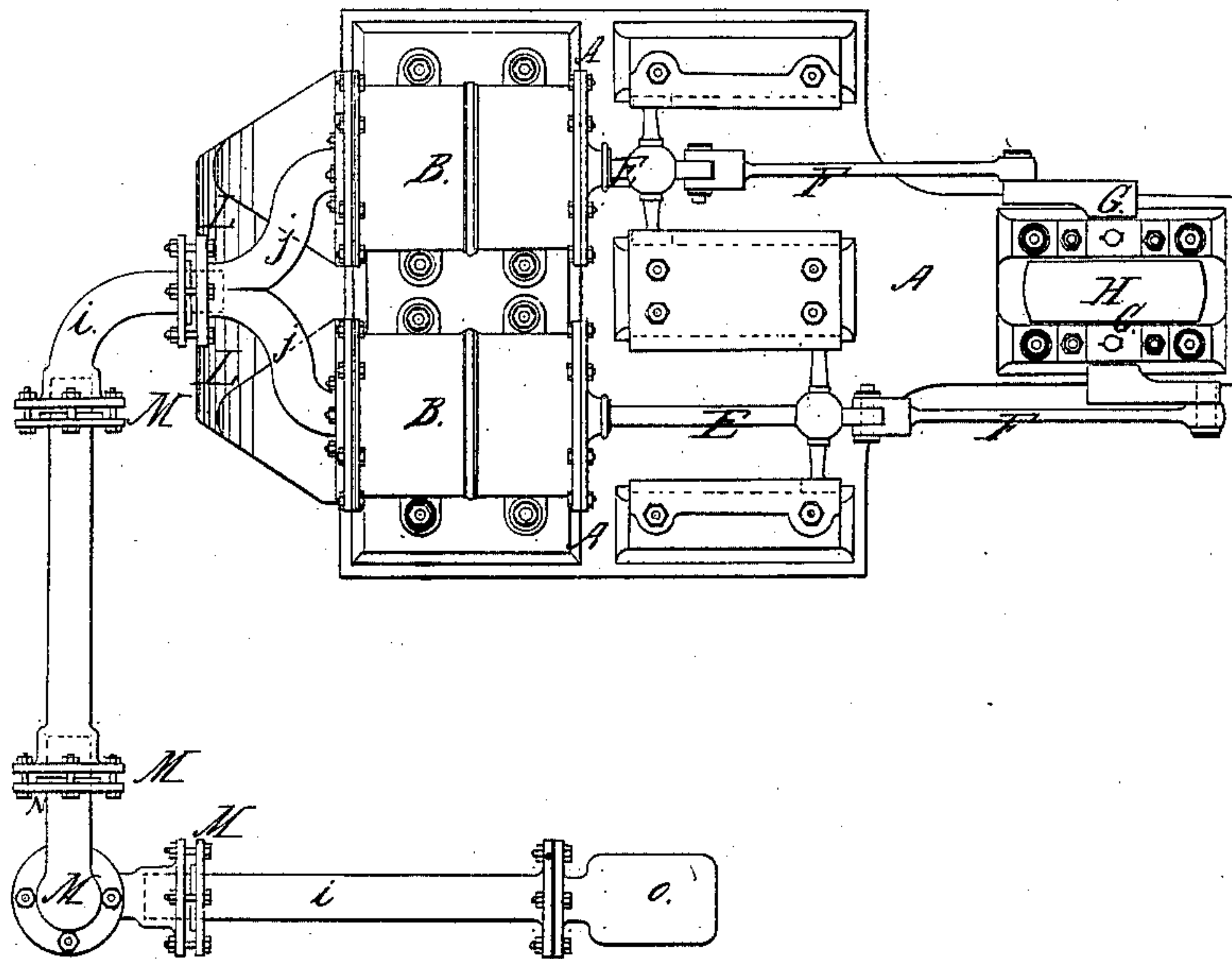
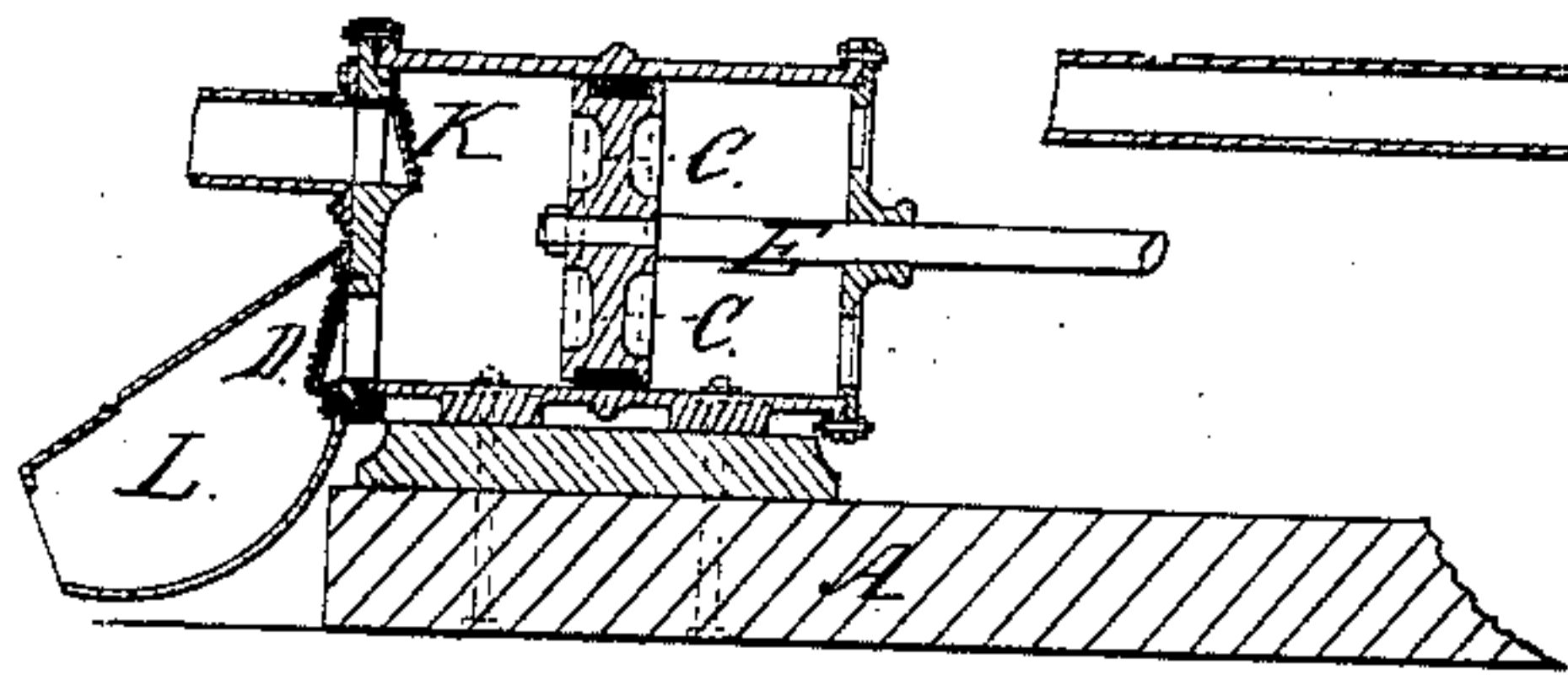


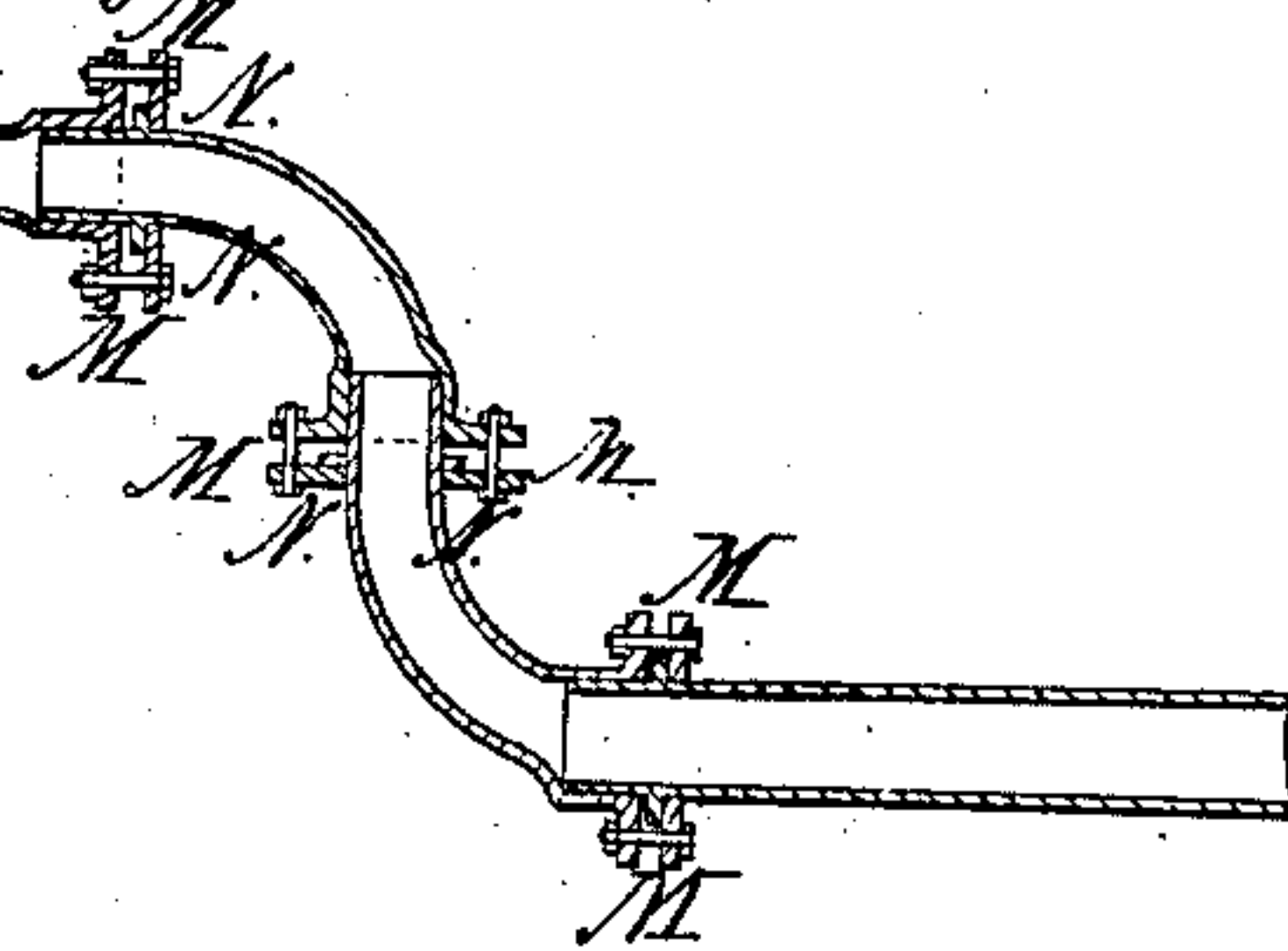
*J. L. Vergniais,*  
*Dredging Machine,*  
*No. 67,384, Patented July 30, 1867.*  
*Fig. 1*



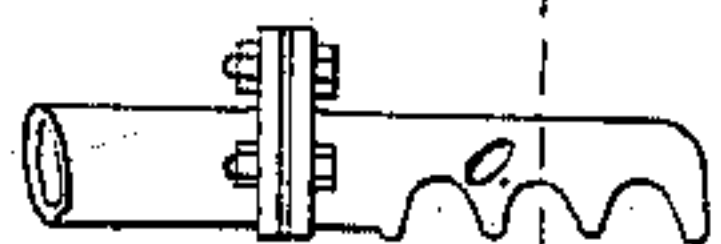
*Fig. 2.*



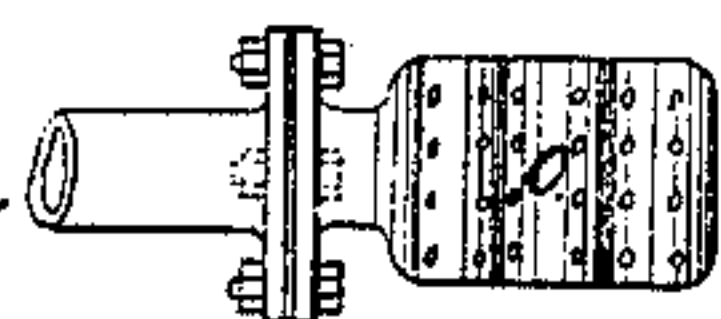
*Fig. 3.*



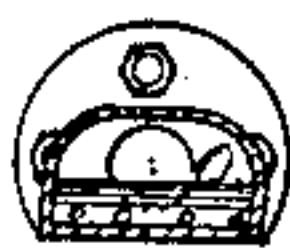
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



*Witnesses:*  
*H. Bonnerille*  
*A. Frick*

*Inventor:*

*J. L. Vergniais*

# United States Patent Office.

JEAN LOUIS VERGNIAIS, OF PARIS, FRANCE.

Letters Patent No. 67,384, dated July 30, 1867.

## IMPROVED DREDGING MACHINE.

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

### TO ALL TO WHOM IT MAY CONCERN:

Be it known that I, JEAN LOUIS VERGNIAIS, of No. 24, Rue du Mont Thabor, Paris, in the Empire of France, civil engineer, have invented a new and useful improvement on a machine to excavate, deepen, scour, and remove the mud, slime, sand, earth, shoal, gravel, stones, shingle, or such like bodies out of harbors, havens, docks, creeks, guts, bars, channels, water-courses, sluices, basins, lakes, ponds, marshes, and such like places; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a view in plane of the machine.

Figure 2, a longitudinal and central section of the pump-chambers, showing how the valves of the sucking-tube are disposed.

Figure 3, a section of said tube, showing how the elbowed knee-pieces (*genouillères*) are jointed together so as to allow of their being stretched horizontally and vertically.

Figure 4, a longitudinal side view of the same.

Figure 5, a view in plane of the under surface of the apparatus placed at the extremity of the sucking-tube, which is called the sucker; and

Figure 6, a transverse section of the same.

In these figures the same letters of reference indicate similar parts.

A is the frame; B, the cast-iron cylinders or pump-chambers; C, the cast-iron pistons; D, the valves of the pump-chambers; E, the rods of the pistons; F, the connecting-rods of the same; G, the shaft of the connecting-rods; H, the driving-wheel of said shaft; I, the sucking-tube; J, the double-branching pipes of the sucking-tube fixed on the pump-chambers; K, the valves of the double-branching pipes; L, the outlet or orifice through which flow the matters forced out; M, the elbowed joints or knee-pieces (*genouillères*) of the sucking-tube, made of iron, cast iron, lead, or copper; O, the sucker.

This invention consists in a combination of means (some of which are perfectly new) constituting a machine fit to extract, and transport a long distance off, by suction and pressure, the mud, slime, sand, earth, shoal, gravel, stones, shingle, or such like bodies, which fill and choke up harbors, havens, docks, creeks, guts, bars, channels, water-courses, sluices, basins, lakes, ponds, marshes, and similar places, and consequently to disinfect and purify, by substituting fresh water, that in which these foul matters stand, and which are carried off with it.

To work the machine the pump-chambers and sucking-tube should be placed in a horizontal position, and the pump-chambers on as near a level as possible with the water, where the operation takes place. With any sort of motive power the pistons C of cylinder B are acted upon by means of the driving-wheel H, the shaft G, the connecting-rod F, and the rods E. The pistons act alternatively by sucking by the double-branching pipes J, and by forcing, by the double valves D and through the orifice of escape or outlet L, the waters and foul matters it may contain. By fixing to the outlet tubes similar to those of forcing, this sucking and forcing may take place at greater or lesser distances by means of the elbowed joints or knee-pieces (*genouillères*) M, the disposition of which, constituting an important feature of the said invention, allows of the turning the sections of the said tubes over on themselves, either horizontally or vertically, so as to place at a greater or lesser distance or height the sucker O in the said directions towards the desired spot. This disposition consists in fitting one in the other the elbowed extremities of two sections of tube, which turn one in the other. The junction of the two is effected by bolts, one of their wormed extremities of which is fixed by nuts to ears in one of the sections, whilst the other extremity runs through an iron rundle, N, about an inch thick, which is held firm by the head of the bolt, as shown in fig. 3, which rundle rests on a ring smelted on the other section of the tube. Instead of running it through a rundle, the extremity of the bolt might be furnished with a hook which would rest on the said ring.

Another important improvement consists in the arrangement of the valves. These valves are placed on an inclined plane, as shown in fig. 2, so as to close themselves by their own weight. The lower parts of the valves D of the pump-chambers B are at a distance of about three and one-half inches from the edges of the pump-chambers, to avoid that the accumulated sand, stones, shingle, or other bodies prevent them from closing.

The sucking apparatus O consists of half a cylinder, one of the ends of which is closed, the other end being



jointed to the sucking-tube. The lower part is closed by a metal plate undulating transversely and having the form of teeth, the almost vertical or slightly-shelving sides of which are perforated. This lower part is placed on the matters to be extracted. The diameter of these perforations must be so calculated that the volume of matters sucked be not in excess of half the distance left between the lower part of the valves and the lower or adjacent edge of the pump-chambers, so as to avoid all obstacle in the closing of these valves. The sum of the diameters of these perforations should be at least equal to the diameter of the sucking-tube. So as not to damage the beach or bank, a metal plate might be fixed on the side of the sucker next to the beach or bank.

In order to prevent the sand or gravel from scratching or otherwise injuring the cylinders, the packing of the pistons is made with plaits or strings of cotton. This packing has the advantage of repelling the sand and gravel without these being able to impregnate themselves. This packing may be replaced by steel springs such as those commonly used for the pistons of steam engines. Finally, the diameter of the forcing-tube, if any be used, should be double that of the sucking-tube.

Having now described the said invention and the manner of carrying the same into effect, I would have it understood that I do not restrict myself to the exact forms and dispositions above described and set forth in the accompanying drawings, which may vary according to the application of the machine without departing from the principle on which it is based; but what I claim and wish to secure by Letters Patent, is—

The combination of the different means which constitute the machine, and notably,

1. The undulating lower face of the sucker, having perforations on the sides of the undulations, substantially as described.

2. The combination with the induction and eduction valves K D and the pump-chambers B of the jointed pipe and perforated undulating-faced sucker, substantially as described.

J. L. VERGNIAIS.

Witnesses:

H. BONNEVILLE,  
H. FRICKER.