H. Schlotter,

Double-Acting Pump,

No. 81,013. Patented Aug. 11, 1868.

Fig. 1.

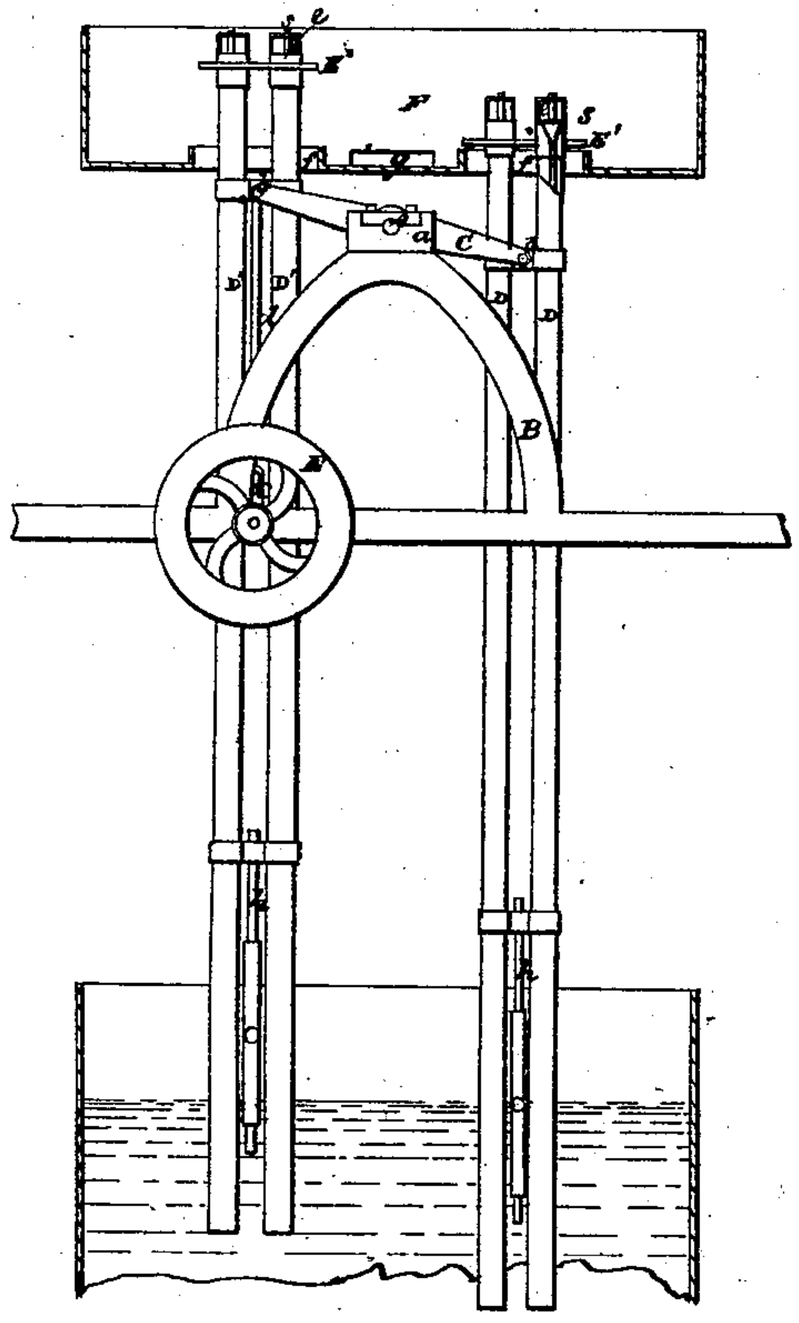

Fig. 2.

Witnesses

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HERMANN SCHLOTTER, OF KOSTRITZ, NEAR GERA, GERMANY.

Letters Patent No. 81,013, *dated August* 11, 1868.

IMPROVEMENT IN APPARATUS FOR RAISING WATER.

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, HERMANN SCHLOTTER, of the town of Kostritz, near Gera, Principality of Reuss, Germany, have invented a new and useful Improvement in Apparatus for Raising Water or other liquids, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a partly sectional elevation of an apparatus constructed in accordance with my improvement, and

Figure 2 a sectional plan of the same.

The principle upon which this, my improvement, is based is, that a body being in accelerated motion will, proportionately to its bulk, and to the square of its velocity, collect in itself a certain quantity of power, the direction of which coincides exactly with that of the power that has produced the motion, provided said body is not diverted from its original course by resistance or extraneous influence, from which general rule of dynamics it follows that, in the case of raising water in or through tubes of a rigid character, the hydraulic pressure decreases in proportion to the square of the acquired velocity. It is upon this principle that it has before been proposed to elevate water by what have been termed spouting-tubes, taking, for instance, a glass tube, open at either end, and immersing the lower one in water, when, by applying the thumb as a seal to the upper end, and reciprocating the tube vertically at a rapid rate, always keeping the lower end under water, and opening and closing at intervals the upper end, the water will gradually but surely be worked up the tube till it is spouted or discharged from the top. Such action being a confirmed fact, it is unnecessary here to farther enter into the theory of the same, or to explain how the removal of the thumb, during one stroke, effects relief of atmospheric pressure, as produced by previous compression, during the opposite stroke, and so causes the water to rise above its outside level till expelled, as described. But my invention in such connection consists in an apparatus for raising water or other liquid by means of a tube or tubes of cylindrical or conical character, hung so as to be capable of a vertical reciprocating action, in a positive manner, by means of suitable mechanism, and provided at its upper end with an air-tight fitting valve, while its lower end is immersed in the water or liquid to be raised. And my invention further consists in a combination of such valvular-fitted tubes, so arranged and fitted with operating-mechanism, as that a counterbalance of the tubes is established, and a most effective action secured at but a trifling expenditure of power.

Referring to the accompanying drawing, A represents a horizontal shaft, supported by or in bearings, *a*, at opposite ends, on a frame or frames, B. This shaft carries double-armed levers or beams, C, that are connected by cross-rods or braces, *b*, which serve to unite, by suitable interpositions or attachments, vertical metallic or other rigid tubes, D and D′. These tubes, of which there may be one or more at opposite ends of the beams, should be so arranged or proportioned as that the tube or tubes at one end of the beam or beams will counterbalance, or thereabouts, the tube or tubes at the opposite end or ends of the same. Said tubes are or may be reciprocated in a vertical direction, the tube or tubes on the one side of the shaft A going up as the tube or tubes on the opposite side are descending, by or through a wheel, E, crank *c*, and pitman *d*, which latter is connected with the beams or one of their cross-braces.

Valves, *s*, opening upwards or outwards, are furnished the tubes D D′ at their top ends or upper portions, said valves either playing freely, or being operated by mechanism to act in an equivalent manner.

E′ E′ are plates or shields, connected with the tubes D D′ on either side, and of such area as that water delivered on or over them, from the upper ends of the tubes, or through side openings, *e e*, above the valves, will be restrained from returning down the walled openings *f*, through which the tubes work, and be caused to flow into a cistern or vessel, F, from which it may escape by an outlet, *g*, or be otherwise drawn.

The tubes D D′ may be guided at their lower portions by guides *h*, the lower and open ends of said tubes always, that is, during the working of the apparatus, dipping below the level of the water it is required to pump or elevate.

From this description, it will be apparent that an apparatus constructed as described, will, by the simple turning of the wheel E, or rocking of the beams C, cause the water or liquid below to be raised through the tubes, and discharged through their upper ends, by or on the principle, hereinbefore specified, of giving to the tubes a vertical and rapid reciprocating action, with their lower or open ends immersed, as described, and the valves at the upper ends of the tubes opening and closing with the lift and fall of the latter to establish the necessary action; and it will furthermore be seen that, there being no dead weight to lift of water, as it rises within the tubes, and a balance being established of the working parts, by the tubes on the one side counterbalancing, or thereabouts, the tubes on the opposite side, a very small amount of power will suffice to work the apparatus, and yet a large and continuous flow of water be established.

What is here claimed, and desired to be secured by Letters Patent, is—

The combination, substantially as shown and described, of tubes D D′, in any desired number, with the rocking-beams C, in such manner, or so arranged in relation thereto, as to produce a counterbalancing action or effect, said tubes being fitted with upper valves, and operating when immersed at their lower ends, and reciprocating, as described, to elevate water or other liquid, as herein set forth.

This specification signed by me, this fifth day of February, one thousand eight hundred and sixty-eight.

HERMANN SCHLOTTER.

Witnesses:

M. CAMPBELL, *United States Consul, Dresden.*

CARL HEINRICH KNOOP.