

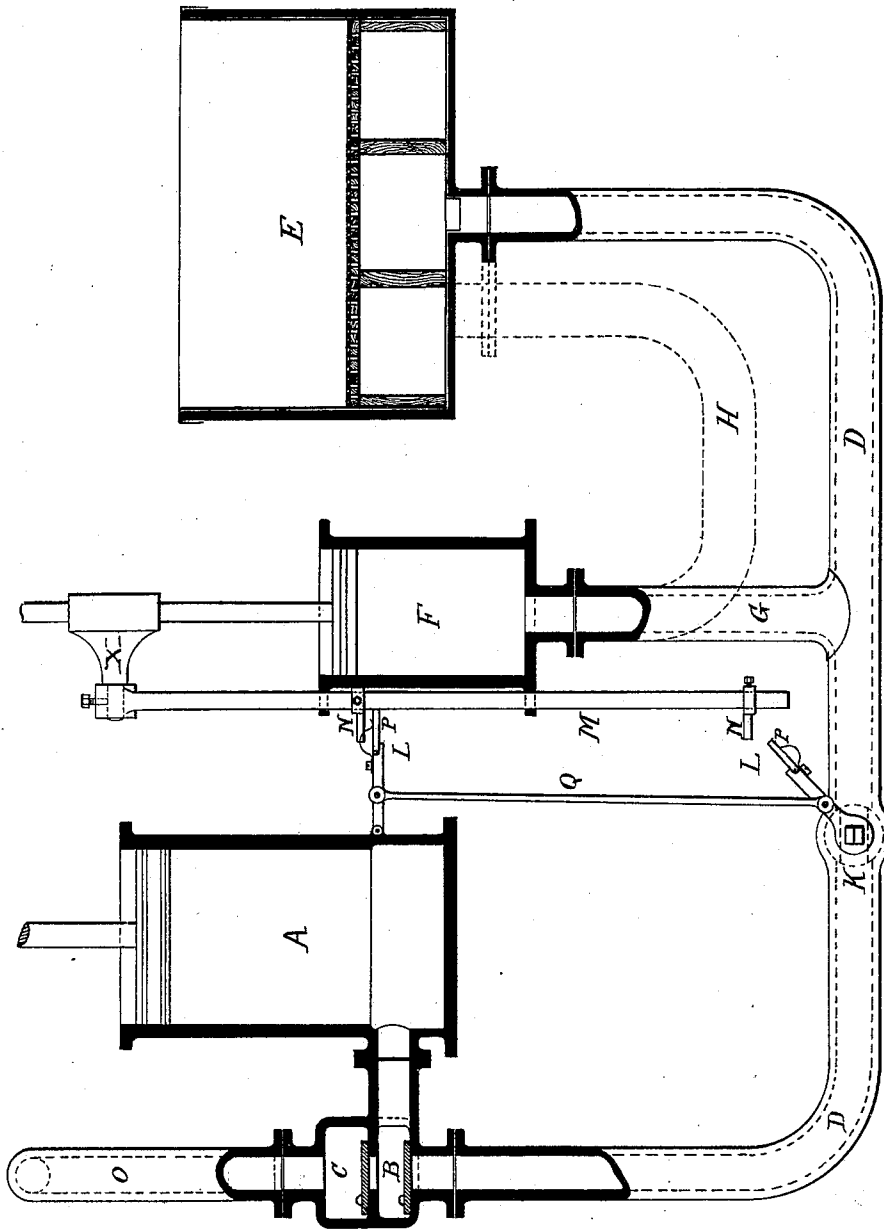
(No Model.)

W. D. BOHM.

APPARATUS FOR ACCELERATING THE PASSAGE OF LIQUIDS THROUGH
FILTER BEDS.

No. 400,185.

Patented Mar. 26, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR ACCELERATING THE PASSAGE OF LIQUIDS THROUGH FILTER-BEDS.

SPECIFICATION forming part of Letters Patent No. 400,185, dated March 26, 1889.

Application filed June 4, 1888. Serial No. 275,949. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DUNSMORE BOHM, of Acton, London, in the county of Middlesex, England, a subject of Her Majesty the Queen of Great Britain and Ireland, have invented an Improved Apparatus for Accelerating the Passage of Liquids through Filter-Beds, of which the following is a specification.

My invention relates to apparatus employed for the separation of liquids from solid matter or slime with which they may be mingled—such as solutions of metals from crushed ore—by drawing them through filter-beds; and it consists of a “combined” suction-pump, which, while drawing the liquid rapidly through the filter-bed by suction, shall also produce a reflux action sufficient to keep the said filter-bed from choking with the slime.

It is well known that where moisture has to be separated from finely-pulverized material or slime by a filter-bed the slime or material so rapidly chokes the filter-bed as shortly to prevent further passage of the liquid. To prevent this consequence, I construct my combined suction-pump as follows, reference being had to the drawing hereunto annexed, and to the letters and figures marked thereon.

A is the main suction-pump, provided with an ordinary single-acting piston or bucket receiving rectilinear motion from any convenient shafting by an eccentric or crank in the usual way. This pump is provided with the ordinary suction and delivery valves, B and C. This pump draws the moisture or liquid in its up (suction) stroke through the suction-valve B and suction-pipe D D through the filter-bed E, and delivers in the downstroke through the ordinary delivery-valve, C, and delivery-pipe O.

F is an auxiliary or combined single-acting bucket or piston pump, but entirely without valves. It also receives reciprocating movement from any rotary shaft by a suitable eccentric or crank, being timed to make its up and down strokes similarly with the main suction-pump A. The effect, then, of the auxiliary or combined pump F is to draw a charge of liquid by suction from the filter-bed E either by a branch pipe, G, from the main suction-pipe D, or by an independent suction-

pipe, H, and on the return-stroke, when the suction-pump proper, A, is delivering through the delivery-valve C and delivery-pipe O, the auxiliary pump F returns its charge direct under the filter-bed, either through the distinct suction-pipe H or the pipe G, connected to the main suction-pipe D. In this latter case, in order to insure that the reflux charge from the auxiliary pump F is returned to the filter-bed and does not lift the suction-valve B, and thus deliver into the delivery-pipe O, I provide a plug-cock, K, or sluice or other convenient valve, in the main suction-pipe. Where a plug-cock is used, it has a straight through-passage and stands fully open, as shown, during the suction-stroke of the two combined pumps, and is closed during the downward delivery-stroke of both pumps. This insures that the reflux charge of the pump F must return under the filter-bed.

To automatically effect the opening and closing of this plug-valve, I employ the following appliance: A rod, M, is fitted so as to have the same reciprocating movement as that of the piston of the pump F—as, for example, by a coupling-arm, X, on its piston-rod—and said rod M is provided with two tappets, N N. The plug-cock K is provided with an arm, L, with a spring-tongue, P, fitted thereon, which will bend in one direction, but is rigid in the other. Another similarly-fitted lever is pivoted at another convenient point above, and they are connected by a rod, Q. As illustrated in the drawing, the suction-stroke has been just completed, the cock K standing with its passage full open. The rod M is about to descend, and the tappet N at the top is about to strike the end of the top lever L, thereby closing the cock K and throwing the lower lever L in such a position that the lower tappet N will come in contact with it in the course of its movement. The lower tappet N in completing its downward movement, however, strikes the spring-pressed pivoted tongue P of said lower lever in that direction in which it gives way, and thus passes the lever in its downward stroke without producing any consequent movement. On the return-stroke, however, this tappet N strikes the spring-pressed pivoted tongue P in its ascent in that direction in which it cannot pivot, and

thus raises the lower lever L, once more re-opening the cock K in the suction-pipe. The effect of the reflux charge upon the filter-bed is that it agitates and lifts the slime and pulverized material upon the filter-bed, and thus
5 frees the same sufficiently to permit the maintenance of a rapid flow through the filter-bed by the suction action of the main pump A.

The reflux charge of the auxiliary pump
10 may be adjusted by altering the throw of its eccentric.

Having now particularly described and explained the nature of my said invention and in what manner the same is to be performed,
15 I declare that what I claim is—

1. The combination, with a filter of an ordinary suction-pump drawing liquid by suction through a filter-bed, of an auxiliary single-acting pump without valves and connected
20 to the filter-casing, substantially as and for the purposes described.

2. The combination, with a filter, of a delivery-pump, A, connected with its casing, an auxiliary pump, F, for causing a reflux through the filter-bed, connected suction-pipes D and
25 G, a valve, K, in said pipe D, between the delivery-pump and the union of said pipe G, and mechanism, substantially as described, for opening and closing said valve in time with the reciprocations of the piston of the auxiliary pump, substantially as hereinbefore specified.
30

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

WILLIAM DUNSMORE BOHM.

Witnesses:

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