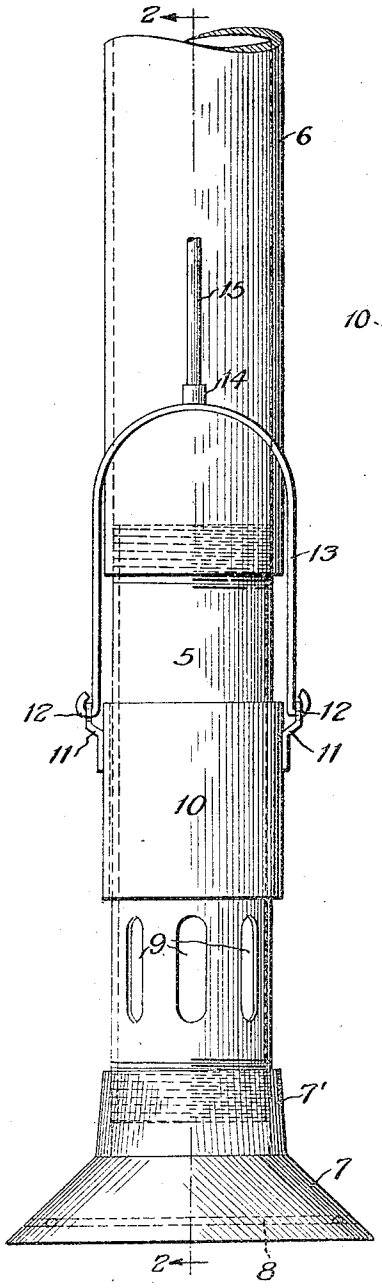
Sept. 16, 1924. 1,508,521

J. W. KREUSER

EXCAVATOR

Filed Nov. 3, 1922

Fig. 1



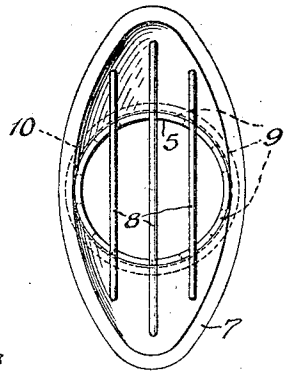
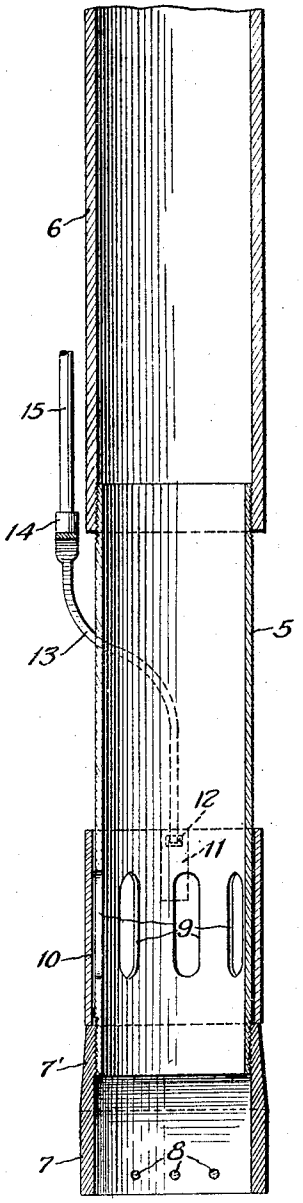


Fig. 3

Fig. 2



Witness:
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Patented Sept. 16, 1924. 1,508,521

UNITED STATES PATENT OFFICE.

JOHN W. KREUSER, OF CHICAGO, ILLINOIS.

EXCAVATOR.

Application filed November 3, 1922. Serial No. 598,743.

To all whom it may concern:

Be it known that I, JOHN W. KREUSER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Excavators, of which the following is a specification.

This invention relates to improvements in excavators and has reference more particularly to that type of machine employed in removing sand and gravel from sand and gravel pits by means of a continuously acting suction.

Hydraulic excavators of this type commonly employ a suction pump located on the shore or bank, a suction tube, with one or more flexible joints therein, and extending from the suction side of the pump out over the water and at its outer end resting on a scow or raft directly above the sand or gravel bed to be excavated, a depending tube section flexibly connected to the free end of the main pipe section that is supported on the raft or scow, and a flaring mouthpiece equipped with a coarse screen for preventing the passage into the tube of stones, sticks and other foreign matter too large or heavy to be handled by the apparatus. On the raft or scow is a hand winch connected to the depending tube section for raising and lowering the latter when required. In the operation of such machines in ground where a considerable percentage of such stones and other foreign matter is found in the sand, these will, at more or less frequent intervals, accumulate in front of the screen and clog the latter to such an extent as to render the suction impotent to withdraw the sand in an efficient manner. When this occurs, the workman on the raft or scow raises the suction mouth by means of the winch sufficiently to insert a long handled wire scoop or basket therebeneath, and then signals the engineer on shore to cut off the suction, thus causing the stones and other foreign matter to drop from the screen into the scoop or basket; he then removes the latter and its contents, and lowers the depending tube section and resets the suction mouth in the sand, and again signals for the resumption of the suction blast. This involves considerable labor and waste of time, especially if the engineer on shore happens to be temporarily off duty; and the main object of the present invention is to provide a simple and efficient attachment on the lower end of the suction tube by which, when the described situation arises, the suction effect on the mouth of the tube can be easily broken at the mouth of the tube itself by the workman on the raft or scow who is controlling the movement and positions of the suction mouth itself.

In order that the invention may be readily understood by persons skilled in the art, I have, in the accompanying drawing, illustrated a simple and practical embodiment of the principle of the invention, and referring thereto—

Fig. 1 is a side elevation of the lower end portion and the mouth of a suction tube equipped with my improved suction-breaking device and showing the sleeve valve open;

Fig. 2 is a vertical axial section of the same, showing the sleeve valve closed; and

Fig. 3 is a bottom plan view.

Referring to the drawings, 5 designates a short tube constituting the lower section of the depending suction tube 6 which is suspended in the water above the sand or gravel pit from the raft or scow. On the lower end of the tube 5 is a flaring mouthpiece 7 across the face of which extend longitudinal wires or rods 8 forming a reticulated wall or screen to limit the size of the particles drawn upwardly through the tube. The neck 7′ of the mouthpiece 7 is preferably screwed onto the lower end of tube section 5, and the upper end of the latter is preferably screwed into the lower end of tube 6

In the wall of the tube section 5, just above the neck 7′ of the mouthpiece are formed a series of vertical ports 9 preferably of the narrow generally oval form shown; and encircling the tube 5 with a loose sliding fit is a sleeve 10 which has the function of a valve in relation to the ports 9. To opposite sides of the sleeve 10 are welded or otherwise secured lugs 11 formed with eyes 12 to receive the lower hooked ends of a bail 13. On the upper end of the bail is welded or otherwise secured a sleeve 14 forming a coupling for the lower end of a lifting rod, wire or chain 15 which extends upwardly to or above the upper end of the tube 6 in convenient reach of the operator on the raft or scow. The upper portion of the bail 13 and its lifting device 15 lie, of course, at one side of the suction pipe,

In the normal operation of the apparatus, the sleeve valve 10 is in its lowermost position shown in Fig. 2, wherein its lower end rests upon the upper end of the neck 7′ of the mouthpiece 7, and the sleeve completely covers the series of ports 9, maintaining the integrity of the suction. When, however, the face of the mouthpiece 6 becomes sufficiently clogged by large particles to interfere with the free and ready upflow of sand or gravel through the tube, the tube and mouthpiece are raised sufficiently to enable the wire scoop or basket to be inserted therebeneath, and the workman on the raft or scow raises the sleeve valve 10 by pulling upwardly on the rod or chain 15, exposing the ports 9 to the flow of water therethrough, which instantly breaks the suction at the mouthpiece and causes the obstructing particles to drop away from the screen and into the scoop or basket, which latter is then removed, the suction mouth replaced in working position, and the sleeve valve 10 allowed to drop back by gravity to a position in which it fully covers the ports 9.

From the foregoing it will be seen that my invention provides a simple and effective means for clearing the mouthpiece of the suction tube from obstructions by the attendant operating the suction tube and without requiring the preliminary shutting off of the suction blast and the turning on of the same later after the mouthpiece has been cleaned; the suction being continuous, and being locally broken only at the mouthpiece itself.

I am aware that the broad feature of a valve located in the suction tube adjacent to the suction mouth, with operating means therefor extending to the boat, raft or scow from which the suction tube is manipulated, has heretofore been known; but, so far as I am aware my present invention is novel in the employment of a valve mounted to slide up and down on the suction tube, and especially in the form of a sleeve. Such a valve is superior to a hinged flap valve, since the latter is easily clogged and held in partly open position by dirt and gravel flowing through the port or ports, while my improved valve is self-cleaning and certain in its action. Such a valve is also superior to valves of the rotary type, in that it is self-closing by gravity and does not have to be both opened and closed manually. It is also more efficiently self-cleaning than a rotary valve.

I claim—

1. In a hydraulic excavator, the combination of a depending suction tube having a port formed in the wall thereof near its lower end, a mouthpiece attached to the lower end of said tube and equipped with a screen, a sleeve valve mounted to slide endwise on said suction tube for opening and closing said port, manually operable means for actuating said valve, and stops for limiting the extent of movement of said valve.

2. In a hydraulic excavator, the combination of a depending suction tube section screw threaded at its upper and lower ends and having a port formed in the wall thereof near its lower end, a mouthpiece having a tapped neck screwed onto the lower end of said tube and a screen across its mouth, an upper suction tube section having a tapped lower end screwed onto the upper end of said first-named tube section, a sleeve valve mounted to slide endwise on said first-named tube section for opening and closing said port, and manually operable means for actuating said valve.

3. In a hydraulic excavator, the combination of a depending suction tube having a port formed in a wall thereof near its lower end, a mouthpiece attached to the lower end of said tube and equipped with a screen, a sleeve valve mounted to slide endwise on said suction tube for opening and closing said port, a bail pivotally connected to said sleeve valve, and a pull member connected to said bail and extending upwardly alongside said suction tube.

JOHN W. KREUSER.