

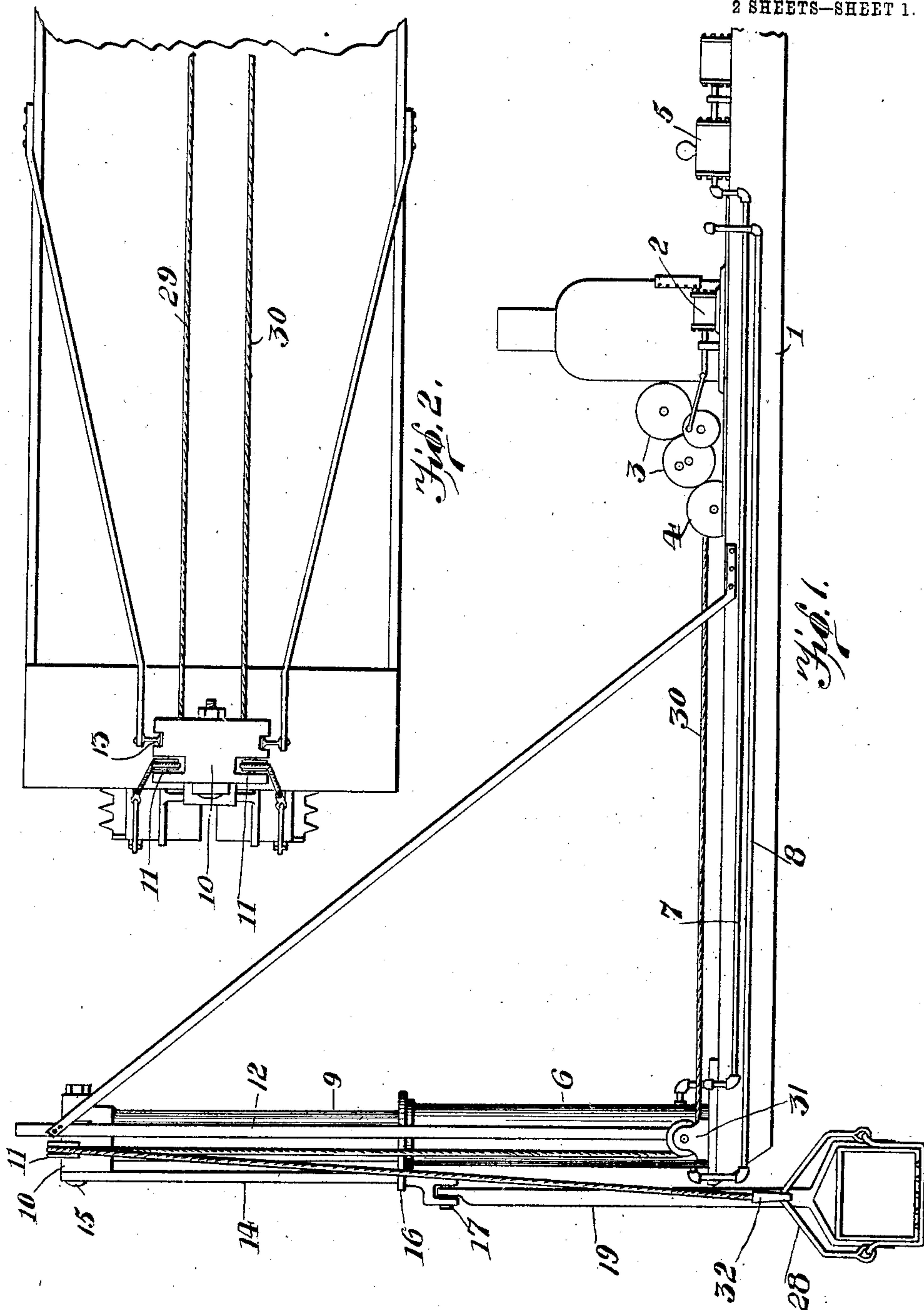
No. 828,141.

PATENTED AUG. 7, 1906.

T. SHADE.  
STEAM AND HYDRAULIC DREDGE.

APPLICATION FILED FEB. 16, 1906.

2 SHEETS—SHEET 1.



Witnesses  
*B. M. Offutt*  
*W. L. Lederer*

Inventor  
*Theodore Shade*

By,

*David C. Wilson*

Attorney

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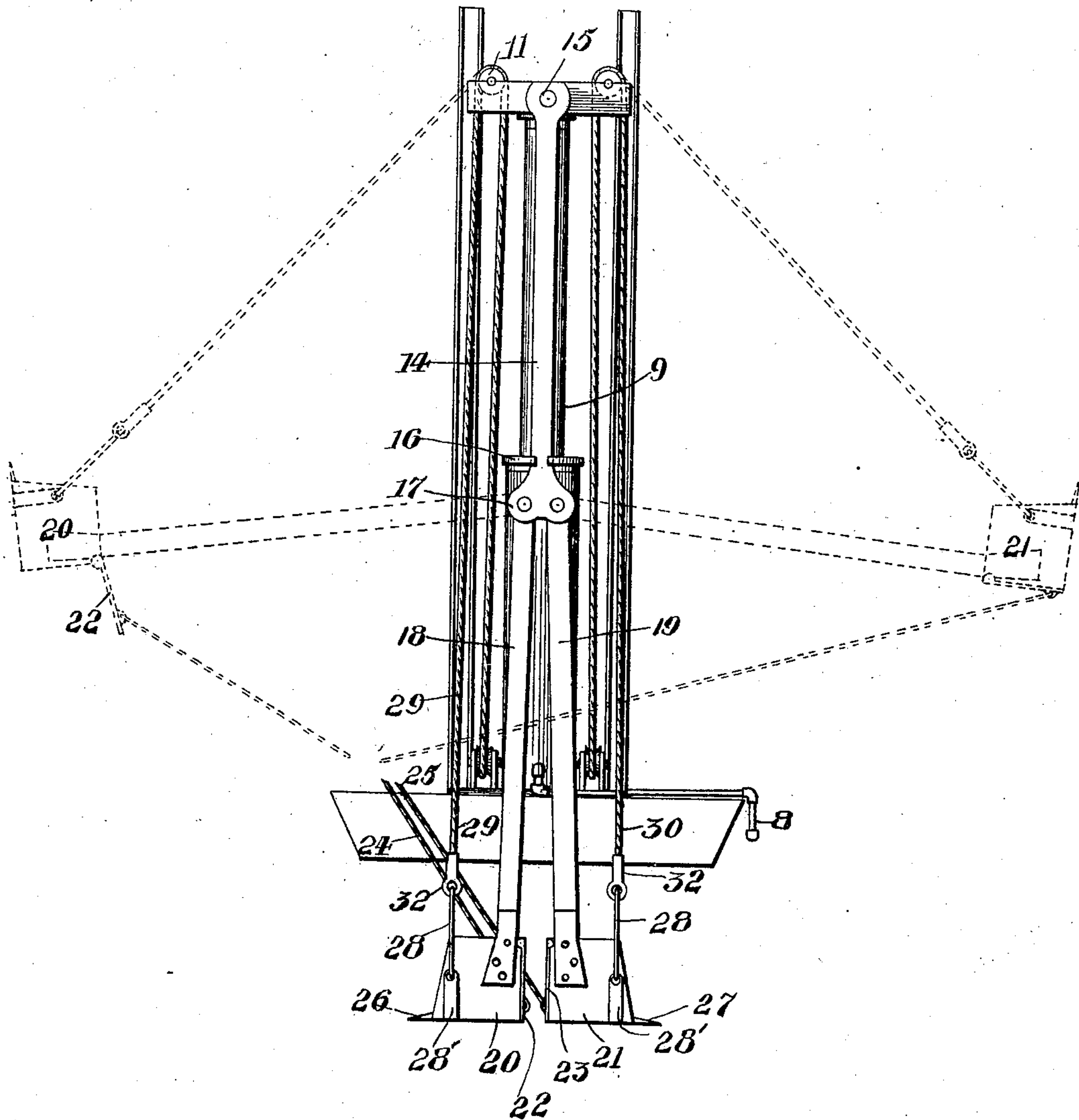
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*Fig. 3.*



Witnesses.  
*Wm. Offutt,*  
*Wm. Lederer*

Inventor  
*Theodore Shade*

By

*David E. Wilson,*

Attorney.



# UNITED STATES PATENT OFFICE.

THEODORE SHADE, OF ABERDEEN, WASHINGTON, ASSIGNOR OF ONE-HALF TO J. W. GIFFEN, OF GREENSBURG, PENNSYLVANIA.

## STEAM AND HYDRAULIC DREDGE.

No. 828,141.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed February 16, 1906. Serial No. 301,407.

*To all whom it may concern:*

Be it known that I, THEODORE SHADE, a citizen of the United States, residing at Aberdeen, in the county of Chehalis and State of Washington, have invented certain new and useful Improvements in Steam and Hydraulic Dredges, of which the following is a specification.

My invention relates to improvements in dredging - machines by which steam and hydraulic power are used jointly in the operation of the said machine and in which two lifting-shovels are used instead of one; and the objects of my improvements are, first, to enable the operator to fill two shovels at once and with one move of the engine; second, to enable the operator by one move of the engine to raise the two filled shovels to the top of the derrick or to any position he may choose for unloading, said shovels raising and remaining in the desired position until ready to unload; third, to enable the operator after unloading the two shovels by releasing his foot-brake on his engine to cause the two shovels to swing back into loading position; fourth, to enable the operator if he wishes to dig deeper than he could with the rigging in the original position to lower the boom and rigging by simply releasing the pressure in the hydraulic cylinder, thus enabling him to dig to any depth he may wish; fifth, to enable the operator if at any time it becomes desirable to use either one or the other of the two shovels independently and to do so without interfering with the shovel which is not being used. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my invention, showing a scow on which rests the engine, pump, and hydraulic cylinders, showing the relative position of these pieces of machinery, together with position of cables and shovels ready to be lowered. Fig. 2 is a top plan view of the same, showing cross-head and guides for raising and lowering stationary rigging. Fig. 3 is an end elevation with booms shown raised in dotted position ready for unloading and means for dumping the same.

Similar numerals refer to similar parts throughout the several views.

Numeral 1 indicates a scow of ordinary

construction having mounted thereon a hoisting-engine of ordinary type. 2 is a steam-cylinder the connecting-rod of which imparts motion to the drums 3 and 4 by means of suitable gearing. (Not shown.) 5 is a hydraulic pump of well-known construction, which injects fluid into cylinder 6 through the pipe-line 7. 8 is a return pipe-line controlling the exhaust fluid from cylinder 6 when it is desirable to lower the rigging. The numeral 9 represents the piston rod or stem of my hydraulic cylinder, to the end of which is secured the cross-head 10, in which are mounted pulleys 11 11, and also provided with recesses which engage the standards 12 and 13 in the up-and-down movement of the cross-head. A connecting-arm 14 is secured to the cross-head by a pin or bolt 15, and its vertical path of travel is assured by means of a guideway 16, which is secured to or integral with the head of the hydraulic cylinder 6. Extending downward from this arm 14 and securely pivoted thereto, as at 17, are the shovel-booms 18 and 19, upon which are fastened (at their lower ends, where they terminate in the shape of yokes) the shovels 20 and 21, which shovels are of the common type used for such purposes and are provided with hinged doors 22 and 23. The doors of said shovels are further provided with automatic latches and are controlled or unlatched by means of ropes 24 and 25, controlled by the operator. To further facilitate in the digging or placer-mining, the shovels are provided with picks 26 and 27. Means for attaching the shovels to the cables is shown by the bails 28 28, which are secured to bands 28' 28' at their ends and connected to cables 29 and 30 by eyes 32 32. Cables 29 and 30 extend from bails 28 and pass over pulleys 11 11 and thence down end pulleys 31 31, which are secured to the platform of the scow, from which pulleys they are connected to the drums 3 and 4, respectively, on the engine, said drums 3 4 being driven by the engine through a suitable gearing. (Not shown.)

The operation of the dredge is as follows: With the machinery in the position as shown in Fig. 1, the operator releases the friction on the drums 3 and 4, and the shovels 20 and 21 descend to the bottom. Operator then opens throttle, and as engine begins to work cable begins to wind up on the drums. As cable



tightens the shovels begin to load and are filled, when the doors of the shovels are brought to a horizontal position, they remaining in said position while the rigid arms are raised to a sufficient height ready for unloading. To unload the shovels, the operator releases the latch by means of ropes 24 and 25 and the doors swing downward, allowing the dirt to fall out. Shovels are then swung back into place for lowering again, and in so doing the doors swing shut and latch themselves.

Should the operator desire to dig deeper in the same place from which he took the first shovelful, he releases the hydraulic pressure by means of a release-valve, which allows piston-rod 9 to move down into cylinder 6, thus lowering the shovels and all rigging. This process may be continued to any depth within the limits of the stroke of the hydraulic piston-rod. To raise rigging, pump up hydraulic cylinder, which causes piston-rod to rise in cylinder, thus raising rigging to original position.

No dredging-machine using two shovels of this nature or no dredging-machine containing a hydraulic lifting and lowering device of this kind has ever been patented.

Therefore what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a dredging-machine the combination of a vertically-movable cross-head, means for moving said cross-head, two swinging arms carried by said cross-head, a shovel car-

ried by each arm and means for moving said arms. 35

2. In a dredging-machine the combination of a movable cross-head, means for moving said cross-head, a plurality of arms pivotally attached to the cross-head so as to swing in vertical planes, a shovel carried by each arm, a door carried by each shovel, means for opening said doors and means for moving said arms, substantially as described. 40

3. In a dredging-machine the combination with a hydraulic cylinder, and a piston mounted in said cylinder, a cross-head carried by said piston, of means for guiding said cross-head, an arm carried by said cross-head and depending therefrom, means carried by said cylinder for guiding said arm in its longitudinal movement and a shovel carried by said arm. 45

4. In a dredging-machine the combination with a shovel and an arm on which said shovel is mounted, of means for pivotally sustaining said arm, means for moving said arm on its pivotal point and means for vertically adjusting said sustaining means, substantially as described. 50

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 60

THEODORE SHADE.

Witnesses:

R. W. DAWSON,  
HARRY E. BLANK.