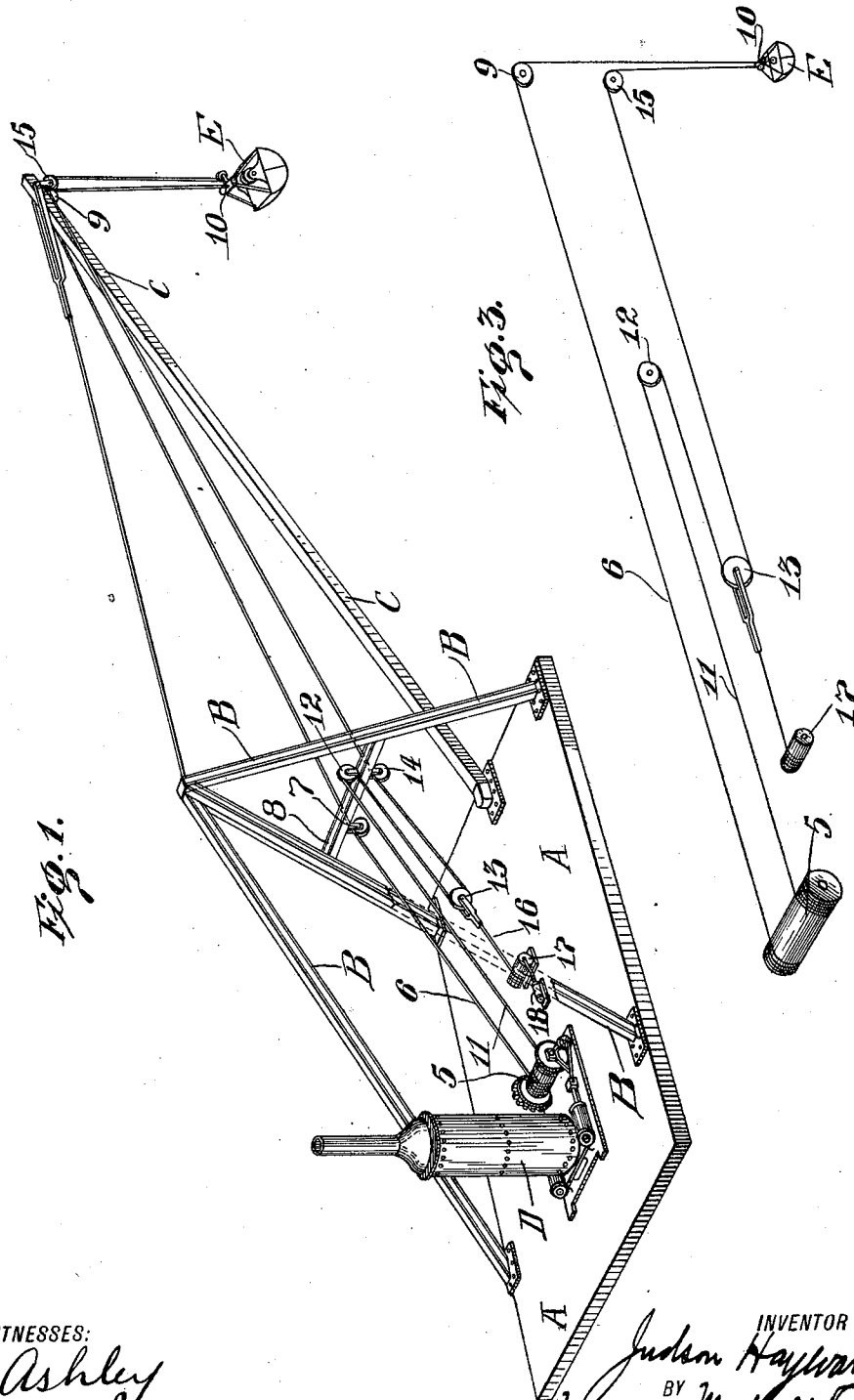


J. HAYWARD.  
EXCAVATING AND CONVEYING APPARATUS.  
APPLICATION FILED DEC. 22, 1909.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 1.

1,000,677.



WITNESSES:  
C. S. Ashley  
E. Plaugan

INVENTOR  
Judson Hayward  
BY  
Macdonald, Macdonald & Company  
ATTORNEYS

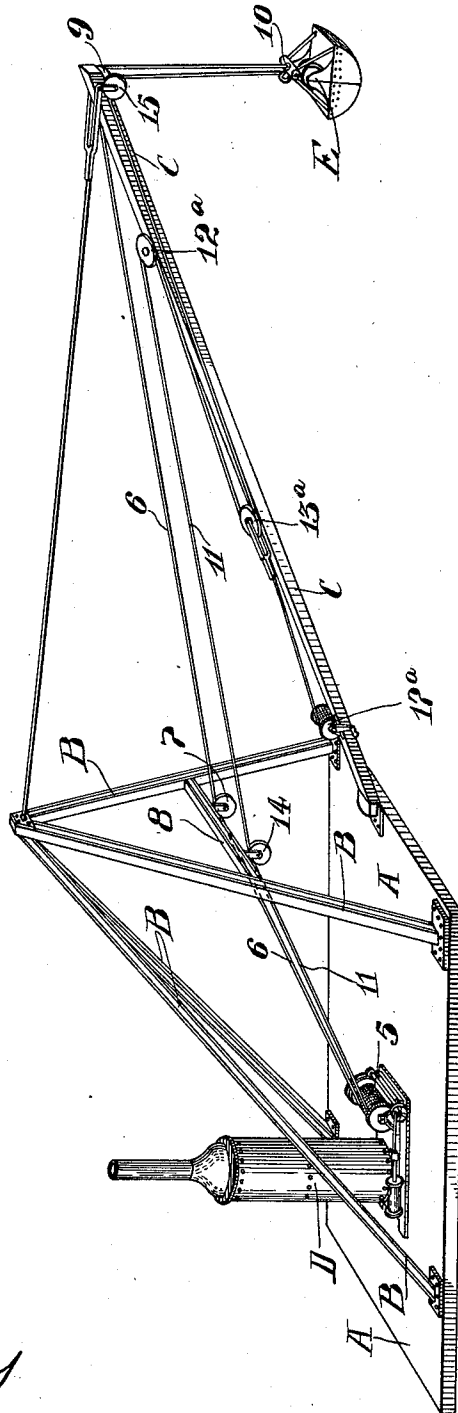
J. HAYWARD.  
EXCAVATING AND CONVEYING APPARATUS.  
APPLICATION FILED DEC. 22, 1909.

1,000,677.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:  
C. S. Ashley  
E. Flanagan

INVENTOR  
Judson Hayward  
BY  
Maddonald, Maddonald & Company  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

JUDSON HAYWARD, OF HACKENSACK, NEW JERSEY.

## EXCAVATING AND CONVEYING APPARATUS.

1,000,677.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed December 22, 1909. Serial No. 534,417.

*To all whom it may concern:*

Be it known that I, JUDSON HAYWARD, a citizen of the United States, and a resident of Hackensack, in the county of Bergen and State of New Jersey, have invented certain novel and useful Improvements in Excavating and Conveying Apparatus, of which the following is a specification.

The present invention relates to certain novel and useful improvements in apparatus adapted to be employed in digging, dredging and excavating, and in the hoisting and conveying of materials.

In the present instance, I have shown my improvements used in conjunction with a bucket of the type ordinarily known as a clam-shell bucket and have also illustrated a stationary, A frame derrick, but I wish to be understood that I do not limit the invention to this particular application, as it may be applied to other forms of apparatus without departing from the spirit of the invention or exceeding the scope of the claims.

Heretofore, in apparatus of this character, so far as I am aware, it has been customary to employ a double drum engine for operating the bucket lines, one of said drums actuating the closing line of the bucket, while the second drum was employed for actuating the hoisting line. Such a method of operation is comparatively expensive and involves the employment of engines of relatively great horse power. However, as the power required to close the bucket is relatively much less than that required to hoist and convey the load, I have found it unnecessary to employ a drum of relatively great horse power, such as is commonly found in connection with a double-drum engine.

Therefore, in the present invention, it is my purpose to operate or wind both the closing and hoisting lines from a single drum, the bucket itself being closed upon the material by means of a small winch or auxiliary drum of relatively small horse power, actuating a supplemental line engaging at one end with a loop in the closing line. By such a construction, I attain a considerable saving of horse power, dispense with the employment of a relatively large, expensive engine, and provide a structure embodying the desired features of simplicity, durability, strength and economy of cost and operation.

My invention consists in the construction, combination and arrangement of parts set forth in and falling within the scope of the appended claims.

In the accompanying drawings, wherein, by way of illustration, one embodiment of my invention is delineated, Figure 1 is a perspective view of an apparatus provided with my improvements, in this instance the auxiliary, bucket-closing drum being shown as mounted upon the deck or platform; Fig. 2 is a similar view showing the drum for closing the bucket as mounted upon the boom of the derrick; Fig. 3 is a diagrammatic view illustrating the rope leads.

Referring now to the accompanying drawings in detail, A designates a platform or deck upon which is mounted the A frame B and the pivoted boom C.

D indicates as an entirety an engine of any approved type having the single drum 5. Connected to and operated by this drum is the hoisting line 6, passing over sheave 7, suspended from the cross-bar 8 of the A frame, said hoisting line extending thence to and over the sheave 9 adjacent to the end of the boom C, the end of said line being connected in any suitable manner to the bucket E. In the present instance, the end of the line is connected as at 10 to the head of such bucket. The bucket closing line 11 is also connected to the drum 5 at one end and leads thence through the sheave 12, mounted on the cross-bar 8 of the A frame, thence through the loose or flying sheave 13, thence over the sheave 14 on the bar 8 of the A frame, to the sheave 15 suspended from the boom, thence down to the power wheel of the bucket E, where it is connected in the ordinary manner to operate to open and close the bucket.

The loose or flying sheave or pulley 13 has attached thereto the line 16 actuated by the relatively small drum or winch 17. This drum 17, in Fig. 1, is shown as mounted upon the deck or platform and is operated by an engine conventionally illustrated at 18. However, the winch or drum 17, may, if desired, be operated by hand power.

The above is a description of the construction of the apparatus shown in Fig. 1. In the construction shown in Fig. 2, the hand winch or drum 17<sup>a</sup> is shown as located upon the boom within convenient reach of the operator, while the loose or flying sheave 13<sup>a</sup>

lies horizontal, as does the sheave 12<sup>a</sup>, through which the closing rope leads.

In describing the operation of my invention, I will refer particularly to Fig. 1. Assuming the bucket to be open and resting upon the pile of material, to take the load, the drum 5 is slacked off so that the hoisting and closing lines 6 and 11 are free and slack and the drum 5 is held stationary by its friction. The small auxiliary winch or drum 17 is then rotated, taking in on the line 16 and pulling the sheave 13 toward the drum until the bucket is closed on the load. The drum 17 is then held stationary and the bucket is ready to hoist. Friction is now released on the drum 5 and the latter rotated to take up both lines 6 and 11, the line 11 of course running freely through the sheaves 12, 13 and 14, as the sheave 13 is held stationary by the drum 17. The operation of the drum 5 in winding takes up the lines 6 and 11 evenly and in unison until the bucket has reached the desired height. If necessary the boom C is then swung to the desired position and the bucket is ready to discharge. Such discharge is accomplished by holding the drum 5 stationary and slackening off the line 16 from the drum 17, the bucket then opening by gravity and discharging the load.

The advantages incident to the construction herein described will be readily apparent to those skilled in the art. The winch or drum 17, as heretofore stated, may be relatively small and inexpensive and of comparatively low horse power, while the employment of an additional high-powered drum to form a double-drum engine would largely increase the cost of operation and involve the needless waste of considerable power. Furthermore, with this construction, the bucket is always under absolute control and may be hoisted in either its open or closed position.

Having thus described my invention, what I claim is:

1. An apparatus of the class described, comprising a bucket, a drum, hoisting and closing lines operated by said drum, a sec-

ond drum independent of the first mentioned drum, and means engaging with the closing line and operated by said second drum, to close the bucket.

2. An apparatus of the class described comprising a bucket or the like, an engine, a single drum for said engine, hoisting and closing lines operated by said drum, and connected to said bucket, and auxiliary means independent of said drum and engine for operating the closing line to close the bucket.

3. An apparatus of the class described, comprising a bucket or the like, a hoisting line for said bucket, a closing line, a drum operating both of said lines in the hoisting of the bucket and auxiliary means engaging with and actuating the closing line to close the bucket.

4. An apparatus of the class described, comprising a bucket, a hoisting line and a closing line for said bucket, a single drum of relatively great power for both of said lines, and a second drum of relatively small power connected to and actuating the closing line for closing the bucket.

5. An apparatus of the class described comprising a suitable derrick, a bucket, a single drum engine, hoisting and closing lines for the bucket connected to the drum of said engine, and means independent of said drum for actuating the closing line to close the bucket, said means comprising a second drum and a running connection between the drum and the closing line.

6. An apparatus of the class described, comprising a suitable support, a bucket, hoisting and closing lines for the bucket, a drum operating both said lines, and means independent of said drum for operating the closing line to close the bucket, said means including a loose or flying sheave, a line connected thereto, and a drum for operating said line, said sheave engaging with a loop in the closing line.

JUDSON HAYWARD.

Witnesses:

J. M. BITTNER,

R. B. CAVANAGH.