

No. 675,046.

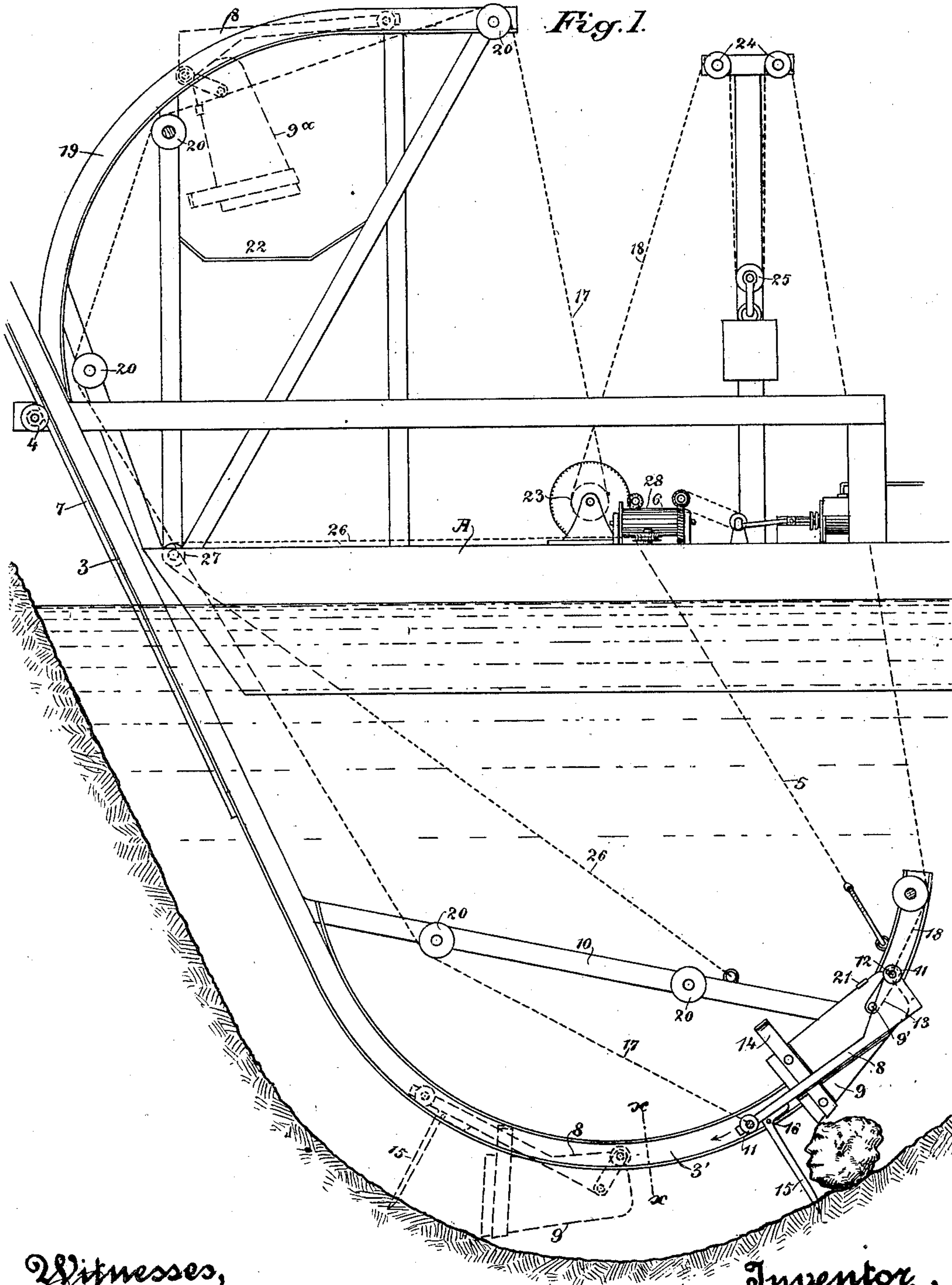
Patented May 28, 1901.

H. LOUGH.
EXCAVATOR.

(Application filed Jan. 26, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,
J. H. Morse
H. F. Aschbeck

Inventor,
Henry Lough
By Durand Strong & Co.
attys

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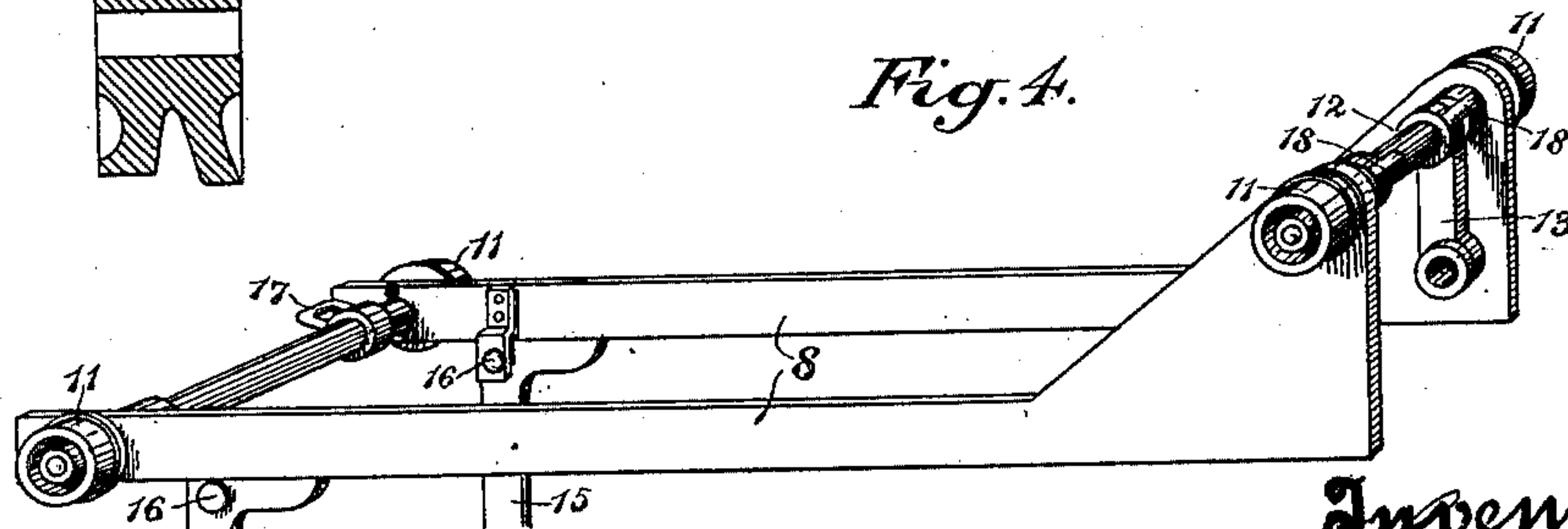
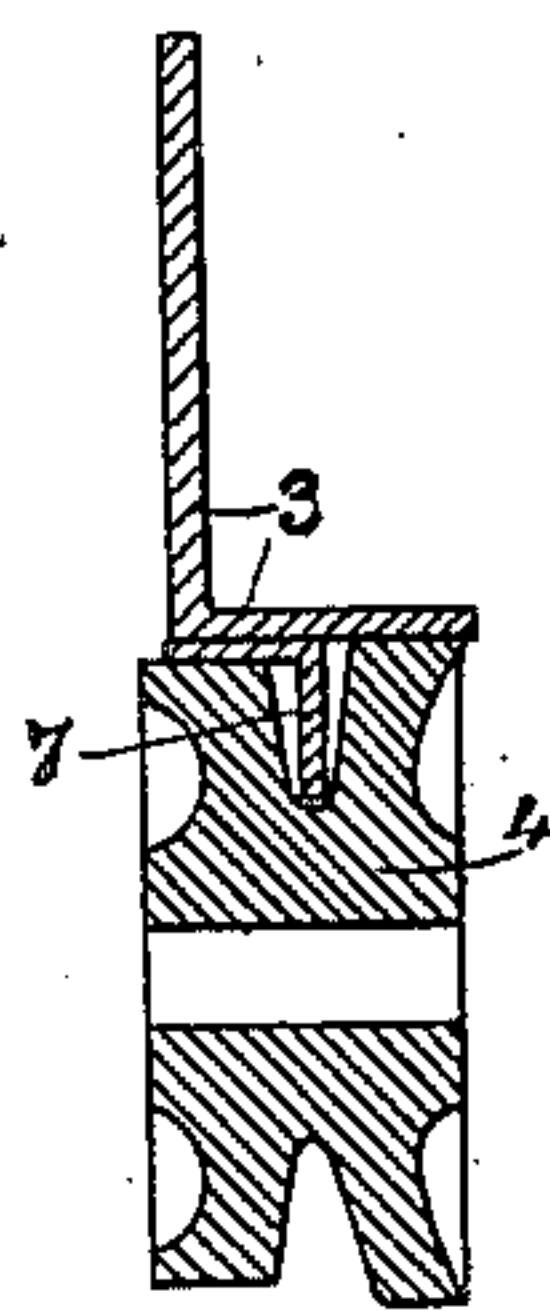
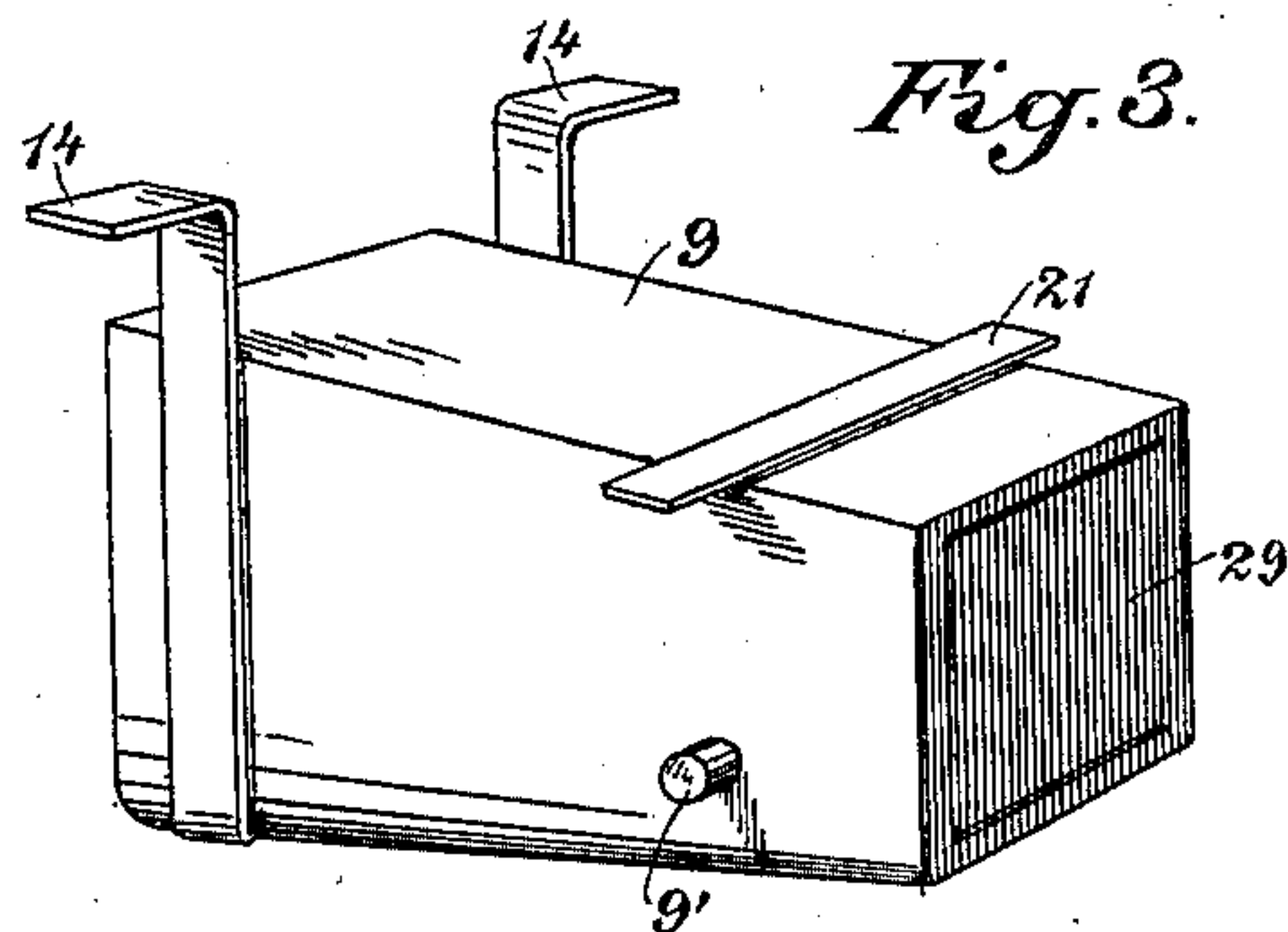
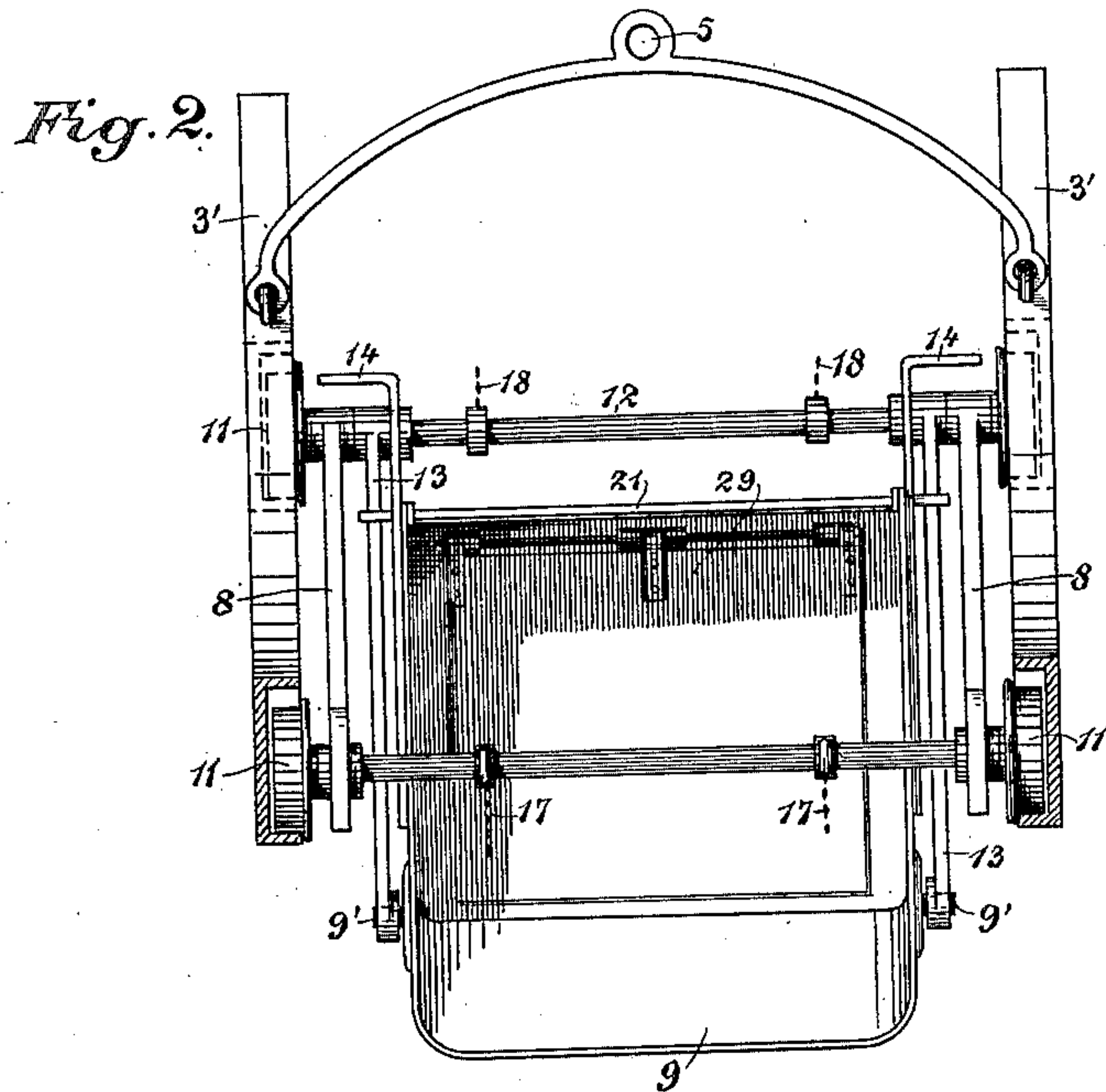
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Witnesses,

H. F. Aschbeck

Inventor,

Henry Lough
for Dewey Strong Ho.
att.

UNITED STATES PATENT OFFICE.

HENRY LOUGH, OF SAN FRANCISCO, CALIFORNIA.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 675,046, dated May 28, 1901.

Application filed January 26, 1901. Serial No. 44,786. (No model.)

To all whom it may concern:

Be it known that I, HENRY LOUGH, a citizen of New Zealand, residing in the city and county of San Francisco, State of California, have invented an Improvement in Excavators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in excavators such as are applicable for use either in dry soil or for dredging in riverbeds and the like.

It comprises an incline tramway upon which the excavating-bucket is adapted to travel, means by which the tramway is adjustable to varying depths of excavations and by which it is advanced and the bucket held to the work, an overhead track upon which the carriage and bucket are adapted to travel and the bucket automatically relieved of its load, and of details to be hereinafter more fully described.

Having reference to accompanying drawings, Figure 1 is a side elevation of the excavator, the front track being removed. Fig. 2 is a lateral section through the track on line *xx* of Fig. 1. Fig. 3 is a view of the bucket. Fig. 4 is a view of the carriage. Fig. 5 is a section through the track-supporting pulley.

While I have shown my device as mounted upon a float or pontoon and adapted as a dredger, it is understood that its support may be a fixed frame or a movable carriage and that it is capable of use wherever it is desired to remove earth by means of excavating-shovels.

A represents a pontoon supporting the mechanism and having suitable moorings by which its position may be adjusted.

3 is an extended tramway supported pivotally upon the rollers 4, and is suspended at its lower end by means of a cable 5, which latter passes around a drum 6. The tram-track in its longer upper portion is of angle-iron form, having on its lower side a projection 7, by which the track is held in position in the grooves of the rollers 4. The lower or curved portion 3' of said tracks is of channel-iron form to prevent displacement of the carriage 8, carrying the bucket or shovel 9. The cross-braces 10 give sufficient rigidity to this part of the track. To these cross-braces are

attached the side ropes 26, which pass over sheaves 27 at the outer corners of the float and thence around the drum 28. These ropes serve to prevent lateral movement of the tramway and to draw it forward in proper position against the breast of the excavation.

The carriage 8 is suitably mounted upon the wheels 11, and from the rear axle 12 are pendent the links 13. In the lower end of these links the trunnions 9' of the shovel are suitably journaled. These trunnions are situated rearward of the center of gravity of the shovel, and while the shovel is free to swing forward on its pivots its rearward movement is limited by the cross-bar 21 striking against the links. Thus the shovel is held to its work as it is drawn forward against the breast of the excavation. The forward end of the shovel is provided with projections 14, which rest upon the sides of the carriage and limit the downward movement of this end of the shovel. On the under side of the carriage are the plows 15, pivoted at 16, which loosen up the earth ahead of the shovel.

The shovel-carriage is made to travel on the tramway by means of the cables 17 and 18. The first is attached to the front of the carriage, and by it the carriage, with its loaded shovel, is moved forward and upward to a point of discharge. The second cable is attached to the rear of the carriage and serves to return the shovel to the bottom of the excavation. These cables are both secured to a drum 23 in such manner that as one is wound up the other is paid out. The cable 18 passes over sheaves 24, and a weighted tension-pulley 25 keeps the cable taut as the track is raised or lowered.

An overhead spur-track 19 is provided, upon which the carriage is directed in its upward movement by means of the hoisting-cable 17 and by reason of the position of the guide-sheaves 20, over which these cables run. As the carriage passes to this spur the shovel gradually turns on its trunnions as a pivot, and at the proper moment, as in the position 9^a, dumps its load into a suitable receptacle 22. The manner in which the shovel is pivoted on the links also allows it to swing free of and pass over obstructions, as boulders, &c., on its return movement. This shovel is made with its lower edge divergent from the

line of travel of the track, so as to offer a flared mouth, and as the side ropes draw the tramway against the breast of the excavation and the cable 17 pulls upon the carriage the
5 shovel is forced into the earth and its filling is assured.

In case the shovel is to be submerged I have provided a gate or valve 29, which swings inward as the shovel descends, allowing the latter to fill and to sink quickly to its
10 position.

The drums 6, 23, and 28 may be driven by any suitable means.

Having thus described my invention, what
15 I claim as new, and desire to secure by Letters Patent, is—

1. The combination in an excavator of a float or support, a tramway suspended therefrom and having an upwardly-extending arm,
20 a roller against which said arm rests and about which the tramway swings by gravitation, said tramway having its lower end curved in an approximately circular arc, a carriage adapted to travel upon the tramway, cables
25 and a driving mechanism by which the carriage may be reciprocated upon the tramway, and a loosely-pivoted swinging scoop on the carriage.

2. The combination in an excavator of a
30 float or support, a tramway having an upwardly-extended arm, and the lower end curved into the arc of a circle, a roller against which the upper part of the tramway rests and about which it is adapted to swing by
35 gravitation, one or more suspending-cables connected with the outer curvature of the arc, and a winding-drum around which said cable passes and by which the position of the tramway may be adjusted.

3. The combination in an excavating apparatus of a tramway having the upper arm extending in an approximately straight line, the lower end curved into an arc of a circle, a float or support having rollers against which
45 the upper arm of the tramway rests, and one or more supporting-cables connected with the outer end of the arc, a revoluble drum on the support about which the opposite end of the cable is passed whereby the tramway is suspended and adjustable, a carriage mounted
50 upon rollers adapted to travel upon the tramway, a hinged swinging scoop suspended from the carriage, ropes or cables connecting with the front and rear of the carriage, guide-pulleys over which the cables pass, a winding
55 drum or drums around which the cables pass, so that one cable is unwound as the other one is wound upon the drum, and the carriage and scoop caused to move forward or back
60 upon the tramway.

4. The combination in an excavating-machine of a tramway having the upper portion extended in an approximately straight line, the lower portion curved into the arc of a circle, a float or support, and means for suspending the tramway therefrom to adjust itself by
65 gravitation, a cable and winding-drum by which the position of the tramway is altered, braces extending across the curved arc and flexible guide-ropes extending from the tramway to the float or support whereby the side
70 motion of the tramway is prevented.

5. The combination in an excavating-machine of a float or support, a tramway composed of an essentially straight upper and a
75 curved lower portion with supports and suspending-cables by which it is movable and adjustable, a carriage having rollers movable upon the tramway, ropes passing around guiding-pulleys and winding-drums by which
80 the carriage may be moved forward or backwardly upon the tramway, a scoop and links by which it is loosely suspended from a carriage with stops to limit its movement with relation to the carriage, and a supplemental
85 spur-track connecting with the upper part of the tramway upon which the scoop is carried by the movement of its controlling-cables, and a dumping receptacle or chute into which its contents are delivered.
90

6. The combination in an excavator of a float or support, a tramway composed of an approximately straight upper and segmental lower portion, with braces and side stays, a carriage with rollers adapted to travel upon
95 the tramway, a scoop, links by which said scoop is suspended from the carriage and stops to limit the swinging movement of the scoop, suspending devices adjustably connecting the tramway with the float, ropes or
100 cables and guide-pulleys over which they pass whereby the carriage and scoop may be advanced following the curvature of the lower part while loading, thence following the upwardly-inclined portion, a spur-track and
105 guides whereby the carriage and scoop are diverted from the tramway, and a receiver over which the bucket is inverted to be emptied, a second cable by which the carriage and bucket are returned to the starting-point,
110 drums about which the cables pass, with driving mechanism therefor, and a weighted tension-sheave to take up the slack of the cables during their adjustments.

In witness whereof I have hereunto set my
115 hand.

HENRY LOUGH.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.