

No. 681,138.

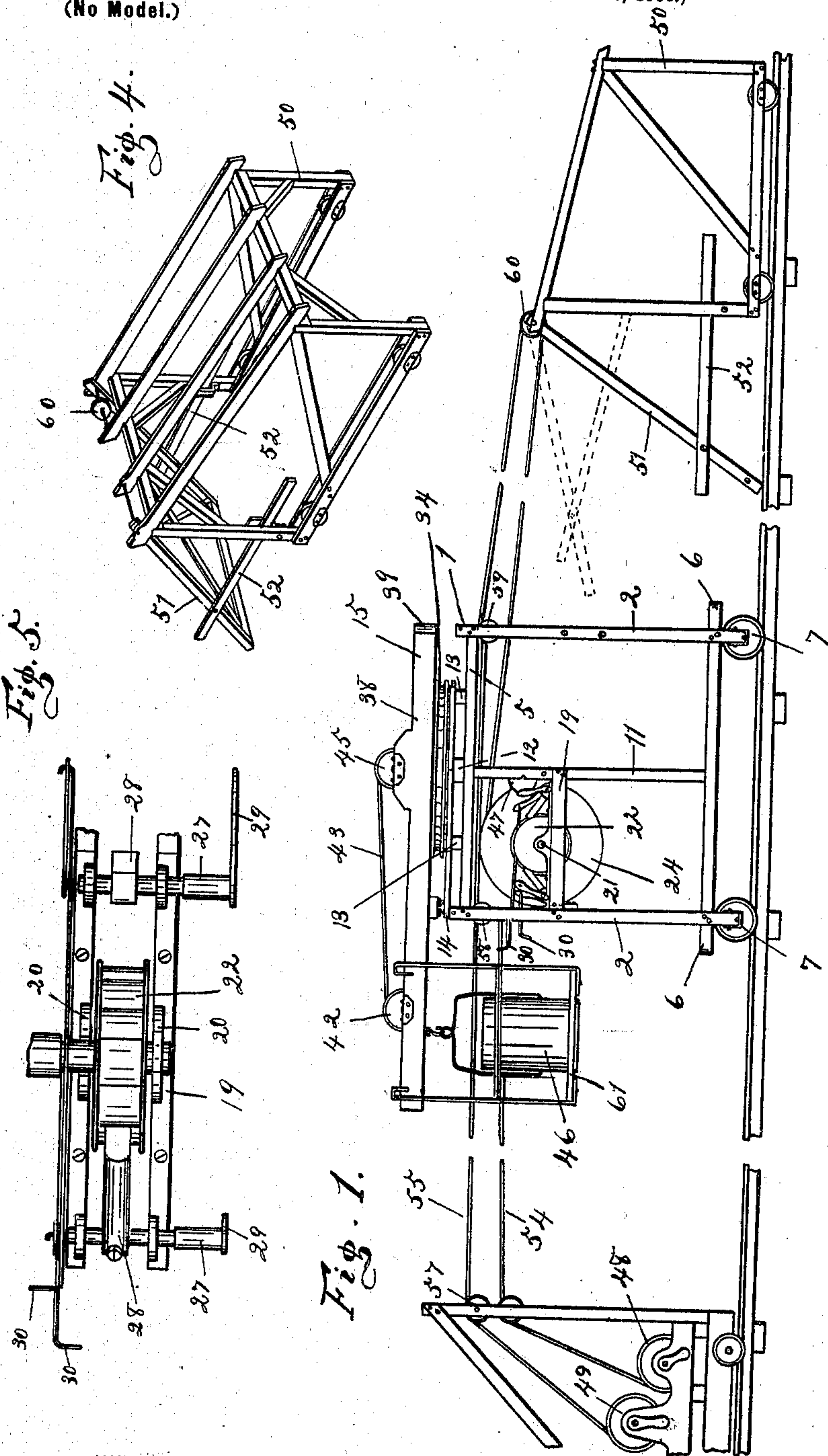
Patented Aug. 20, 1901.

J. L. POTTER.
HOISTING AND CONVEYING APPARATUS.

(Application filed Jan. 13, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 2.

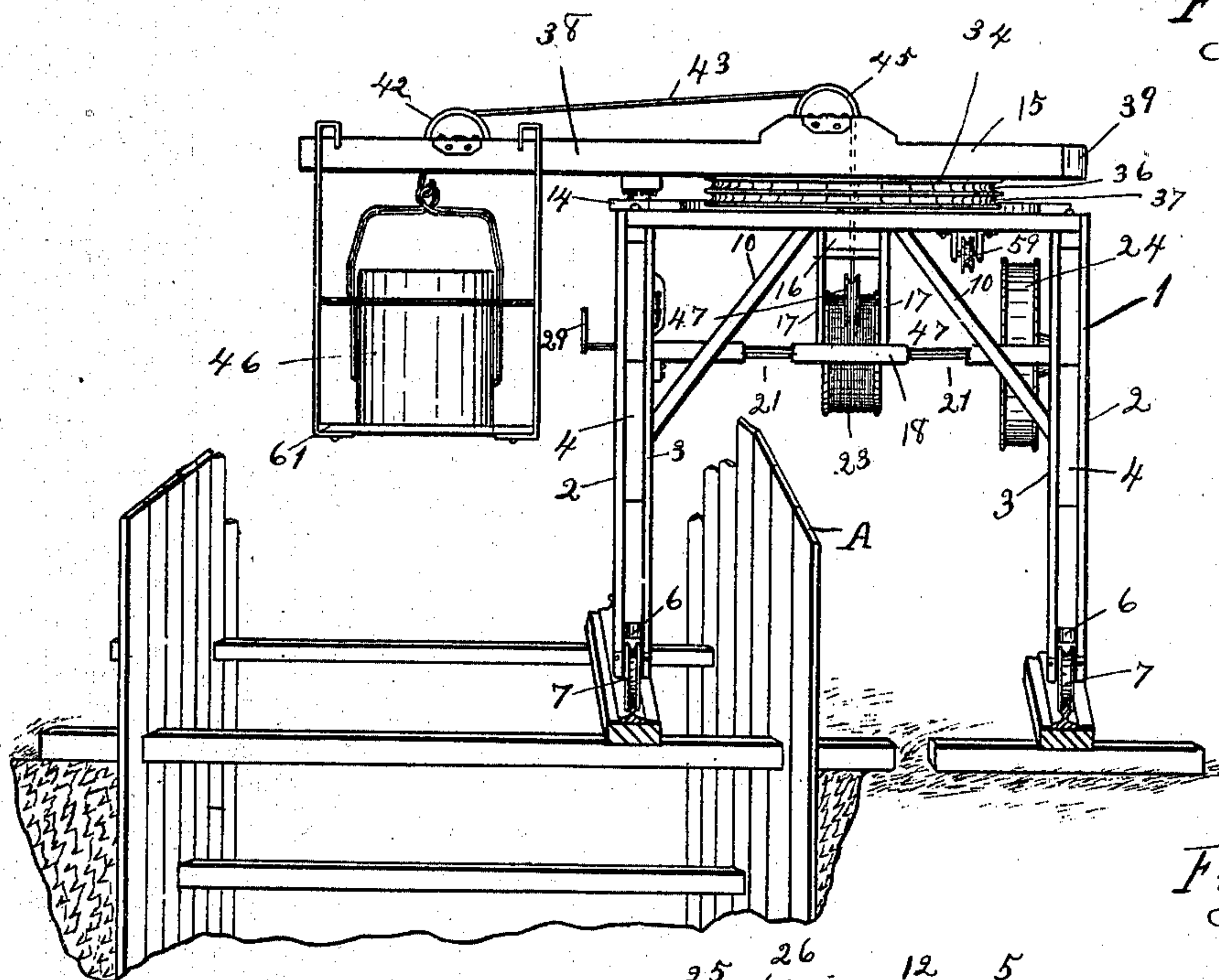
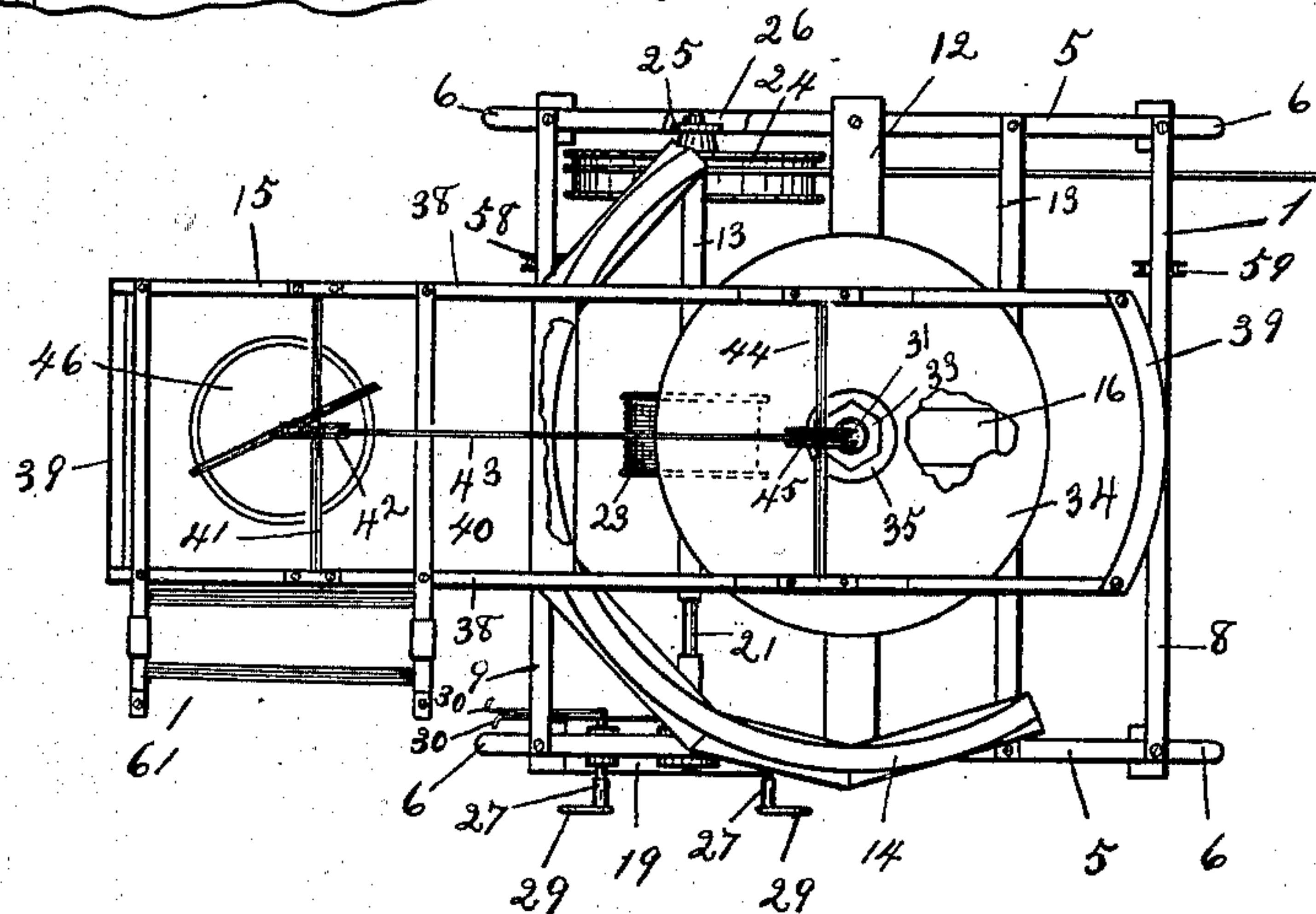


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH L. POTTER, OF INDIANAPOLIS, INDIANA.

HOISTING AND CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 681,138, dated August 20, 1901.

Application filed January 13, 1900. Serial No. 1,321. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. POTTER, a citizen of the United States, residing at Indianapolis, in the county of Marion, in the State of Indiana, have invented certain new and useful Improvements in Hoisting and Conveying Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My present invention relates to improvements in that class of hoisting and conveying apparatus employed in sewer-trench excavation, in which the well-known progressive or back-filling method is employed.

The objects of my improvement are to provide a hoisting and conveying car adapted, when employed on a surface track for narrow trenches, to span or straddle the trench and its sheeting, which usually projects upwardly several feet, and so constructed that it can be operated with equal facility on a trackway lengthwise of the trench, arranged either upon the shore of the trench outside of the sheeting or directly over the trench and between the sheeting of wide trenches, and also adapted to span but one row of said sheeting upon very wide trenches, and yet is adapted to hoist the bucket vertically upward in any of the above situations.

Another object of my invention is to provide a hoisting and conveyer car which in addition to its usual function of hoisting and conveying the load is also adapted for excavating.

My improvement consists of a hollow longitudinally-open hoisting and conveyer car having a pivoted horizontally-swinging arm from which the bucket is suspended and from which it is manipulated by the operator, the said car being actuated by hoisting and draft cables operated from a power-house at a distance and adapted to be operated with equal facility whether the trackway be arranged directly over the trench or upon one shore of the trench outside of the sheeting or astride of either one or both rows of the upwardly-projecting trench-sheeting.

In the accompanying drawings similar ref-

erence characters indicate like parts throughout the several views.

Figure 1 is a side elevation of my improved apparatus shown on a surface trackway in connection with the power-house and portable tower, with which it is connected by means of the operating-cables, the said cables and trackway being broken away in part. Fig. 2 is an end view of my improved car in operative position on a trackway which requires the car to span one row of the trench-sheeting with the pivoted arm in a position at right angles to the position shown in Fig. 1. Fig. 3 is a plan view of my improved car with the pivoted horizontal arm in the position shown in Fig. 1. Fig. 4 is a perspective detail of my improved portable tower. Fig. 5 is a detail plan of the ratchet mechanism.

The car 1, of proper dimensions and of suitable material, consists of an upright frame longitudinally open at its lower portion to enable it to span or straddle the upwardly-projecting trench-sheeting A when in use. The specific form of the frame of the car is immaterial so long as it possesses this straddling function, but is preferably constructed as follows:

The four upright corner-posts of the car are each formed of the pieces 2 and 3, Fig. 2, in parallel arrangement, rigidly connected in the two rear posts by the intermediate block 4, arranged near the middle of their length. The front and rear posts are rigidly united at their upper end by the cross-piece 5 and at their lower end by the parallel beams 6, arranged between the said pieces 2 and 3, as shown, directly above the supporting-wheels 7, which are mounted on short axles journaled in the lower end of said uprights 2 and 3. The said rear parts are connected at their upper ends by a cross-piece 8, and the forward posts are rigidly connected by a cross-piece 9, and they are each strengthened by the oblique braces 10. Midway of the said corner-posts and on the said beams 6 are erected the uprights 11, having their upper end rigidly secured to the said pieces 5. Midway of the cross-pieces 8 and 9 is arranged a horizontal beam 12, rigidly secured to the supporting-pieces 5 equidistant from the beam 12, and upon each side thereof are rigidly fixed the cross-pieces 13 on the same supports 5. On

these transverse parts 12 and 13 is rigidly fixed a circular trackway 14, Fig. 3, for the pivoted swinging arm 15, hereinafter described. Midway the ends of the pieces 12 and 13 is rigidly fixed a cross-piece 16. This supporting-beam 12 is further strengthened at its center by the short uprights 17, rigidly supported at their lower end by the cross-piece 18, rigidly secured at each end to the said uprights 11. At a proper elevation on one of said forward corner-posts and the corresponding upright 11 are rigidly secured the parallel horizontal pieces 19, separated, as shown, and provided with proper journal-boxes 20, in which one end of the transverse shaft 21 is rotatably mounted and is provided with a fixed ratchet-wheel 22. This shaft 21 is provided at the middle of its length with a fixed winding-drum 23 and at its opposite end with a large rigid actuating-wheel 24 and has said opposite end rotatably mounted in a proper journal-box 25 on a rigid supporting-piece 26. On the said pieces 19, in cooperative relation with said ratchet-wheel 22 and in suitable bearings, are rotatably mounted the shafts 27, one upon each side of said ratchet-wheel, provided upon each end with an operating-crank 29 and having a fixed pawl 28, adapted to form a holding engagement with said ratchet-wheel to regulate and control the rotation of the said shaft 21. The crank-arms 29 are provided with proper operating-levers 30, the outer ends of which are within convenient reach of the operator on the car-platform, about to be described. In a suitable opening through the said beam 12 and piece 16 at their junction is rigidly fixed the vertical tube 31, secured in position by a nut 32 on the lower end thereof and a nut 33 on its upper end. On this tube 31 is pivotally mounted the circular wheel or disk 34, provided upon each side with a washer 35, and also provided with a pair of peripheral grooves 36 and 37 for the purpose hereinafter described. On this wheel 34 is rigidly fixed a swinging arm adapted to carry the operator and the loaded bucket, constructed as follows: The two parallel and horizontal side pieces 38, of proper dimensions, are connected at their ends by proper cross-pieces 39 and are rigidly secured to the said wheel 34 in any proper manner. At a proper point on the said side pieces 38 and to the bottom thereof is rigidly fixed a cross-piece 40, provided upon its lower face with a proper number of rollers adapted to run on the said trackway 14. At or near the extended end of said arm is arranged a fixed transverse shaft 41, carrying at or near the middle of its length a loose pulley 42, from which the hoisting-bucket is suspended by means of the hoisting and draft cable 43. A second transverse shaft 44 is arranged on said sides 38 at a suitable point and is provided at the middle of its length with a loose guide-pulley 45 for the said hoisting-cable 43, having one end secured to the bail of

the bucket 46, thence passes over the said guide-pulleys 42 and 45 and down through the said tube 31, and then over a third guide-pulley 47 on a short shaft between the said uprights 17, and is then wound upon the said winding-drums 23. Obviously the said pivoted or swinging arm may be made fixed or stationary instead of pivoted, if desired, without departing from the scope of my invention. It is also obvious that the platform for the operator need not necessarily be supported from the extended end of the said arm, but may be supported from the side of the car adjacent to the hoisted bucket, particularly where the said arm is fixed instead of pivoted.

The power-house is of the usual or any proper construction with the usual winding-drums 48 and 49, upon which the cables are wound and from which they are actuated in a well-understood manner.

My improved portable tower consists of a longitudinally-open frame 50 of any proper construction having the spanning or straddling construction of the said car, whereby it is adapted to pass over projecting trench-sheeting or other obstructions as it is moved forward from time to time. It is also provided upon its forward end with a pivoted brace-frame 51, provided with the pivoted braces 52, whose inner ends are adapted to rest against the adjacent posts of the tower-frame when in use. Obviously this frame 51 can readily be swung upward when the tower is moved forward, and will thus clear all ordinary obstructions.

My improved portable spanning-tower is of course operated on the same track as the power-house and is provided with proper wheels for that purpose.

The operation of my improvement thus described is obvious and, briefly stated, as follows: By operating the winding-drum 48, on which the draft and stay cable 54 is wound, the other end being secured to the car at a suitable height to be out of the way of the workmen and sheeting, the car will be drawn forward to any desired position for hoisting a loaded bucket, where it will be stayed by said cable against the strain of the hoisting and draft cable 55, having one end secured to the winding-drum 49, it then being passed over a guide-wheel 57 on the power-house, a pair of guide-wheels 58 and 59 on the car, and a guide-wheel 60 on the tower, and then has its other end secured to the perimeter of the actuating-wheel 24. When it is desired to hoist the loaded bucket from the trench, the draft-cable 55 is actuated from its engine-drum, thereby so rotating the shaft 21 as to wind the bucket-hoisting cable 55 on its drum 49, thereby elevating the bucket, the ratchet mechanism having previously been disengaged to permit the rotation of the shaft 21. When the bucket is hoisted, it is then locked in position in any well-known manner. The

shaft 21 is also locked against rotation by its ratchet mechanism, whereby the continued strain on the draft-cable 55 will draw the car rearwardly to the dump. The bucket is then 5 dumped and the car is returned to the forward end of the trench by the draft and stay cable, as described. The empty bucket is then lowered by gravity when released from its holding engagement. A suitable platform 10 61 is properly suspended from the extended end of the said swinging arm, upon which an operator stands in a position to conveniently manipulate the said locking mechanism by means of the levers 30 and in which position 15 he can signal the engineer, who manipulates the engine-drums. Obviously my invention can by means of the swinging arm hoist, convey, and dump the bucket with equal facility whether it is operated over the trench or at 20 one side thereof. This swinging arm can have its short end so extended as to hoist a bucket from both ends thereof in the same manner without departing from the spirit of my invention.

25 To excavate by means of a plow or scraper by my invention, which is very desirable, particularly in starting a trench, the plow or scraper is secured to the bucket-cable and then operated in the usual manner by said 30 operation cables. The said arm may of course be fixed, if desired, instead of being pivoted, and it may, as before stated, be provided with two extended ends, whereby two buckets can be operated instead of one.

Having thus described my invention, what 35 I desire to secure by Letters Patent is—

1. The combination in a hoisting and conveying apparatus of a longitudinally-open car; a horizontal arm mounted on said car, and provided with a platform adapted to sup- 40 port the bucket and the operator from one of its extended ends; means for operating the bucket; and hoisting and draft cables operated from a power-house at a distance.

2. The combination of a hollow longitudi- 45 nally-open hoisting and conveying car; a pivoted arm mounted thereon having a platform for the operator, and guide-wheels for the bucket-hoisting cables; means for hoisting and lowering the bucket; and a pair of oper- 50 ating-cables actuated from a power-house at a distance.

3. A hoisting and conveying apparatus for sewer-trench construction consisting of a hol- 55 low car provided with a pivoted arm carrying the suspended bucket and the operator upon one extended end thereof; means for operating said bucket and for securing the same in its suspended position; and a pair of op- 60 erating-cables actuated from a power-station at a distance.

Signed by me at Fort Wayne, Allen county, State of Indiana, this 6th day of January, A. D. 1900.

JOSEPH L. POTTER.

Witnesses:

ADELAIDE KEARNS,
ALICE KEARNS.