A. D. HADSEL.

CABLE EXCAVATOR.

APPLICATION FILED OCT. 14, 1913.

1,103,762.

Patented July 14, 1914.

2 SHEETS—SHEET 1.

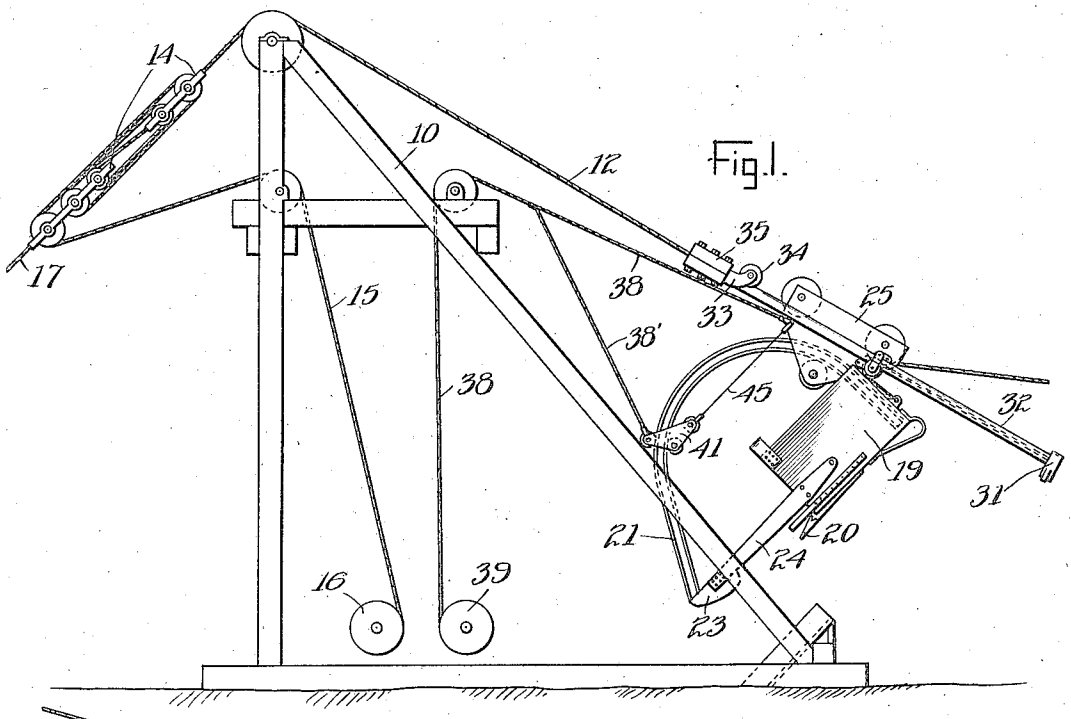


Fig. 1.

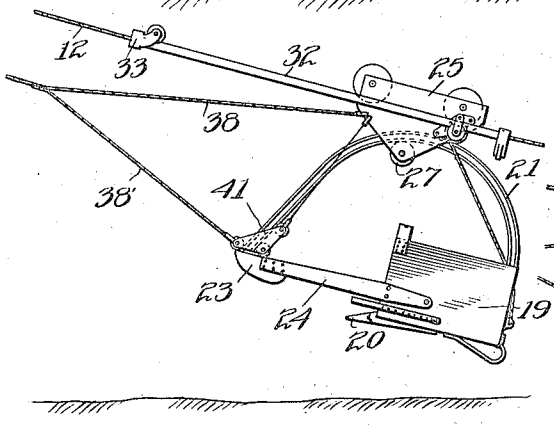


Fig. 2.

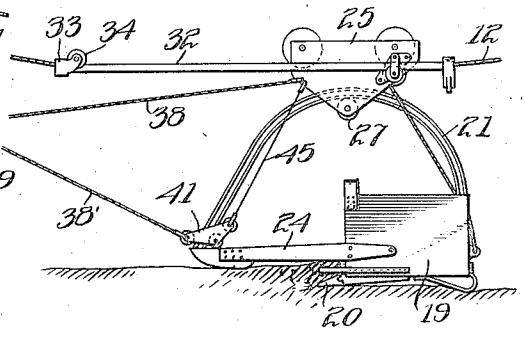


Fig. 3.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 5

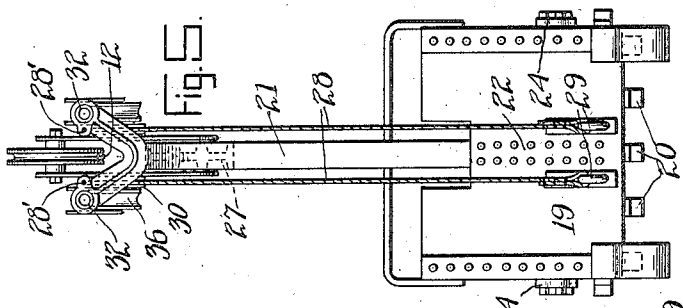


Fig. 4.

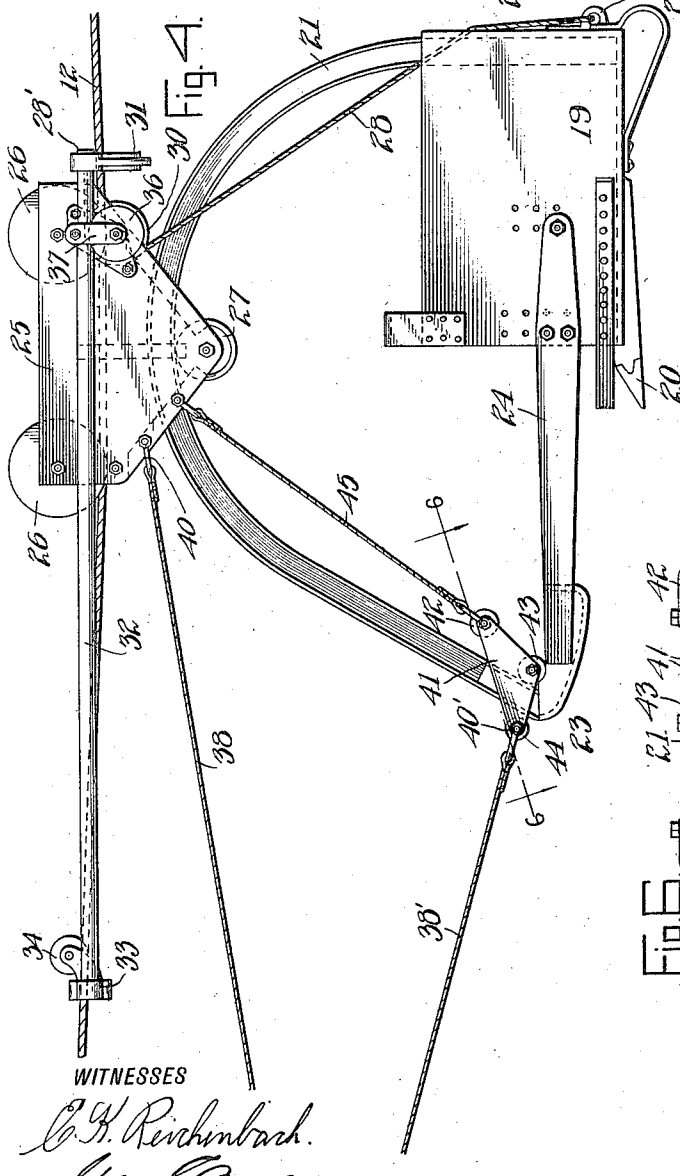


Fig. 6

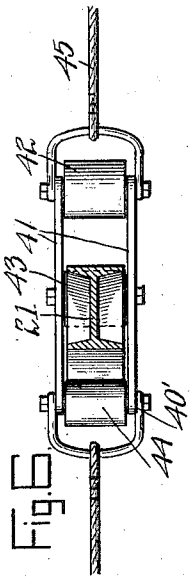
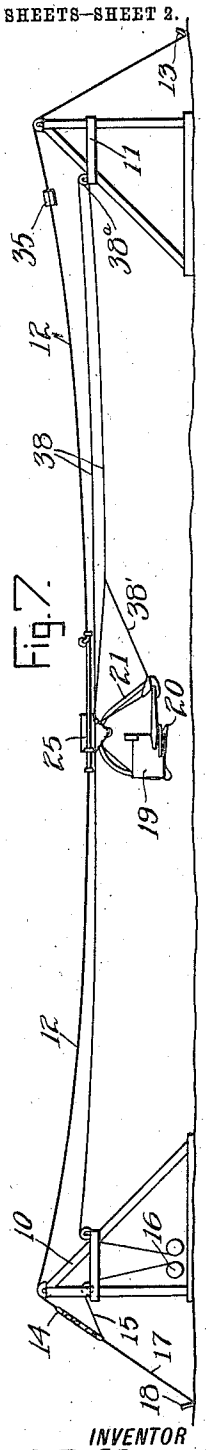


Fig. 7.



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UNITED STATES PATENT OFFICE.

ALVAH D. HADSEL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE CABLE EXCAVATOR COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION.

CABLE-EXCAVATOR.

1,103,762. Specification of Letters Patent. Patented July 14, 1914.

Application filed October 14, 1913. Serial No. 795,058.

To all whom it may concern:

Be it known that I, ALVAH D. HADSEL, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Cable-Excavator, of which the following is a full, clear, and exact description.

This invention relates to excavators of the aerial type and has particular reference to improved means for facilitating the loading, transporting and dumping operations, all from a main power station at one end of the line of excavation.

For a more complete understanding of the invention, including the construction and operation thereof, reference is to be had to the following detailed description and the accompanying drawings forming a part of this specification in which like characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a somewhat diagrammatic view of one of the supporting towers and indicating the excavator bucket in dumping position; Fig. 2 is a view of the bucket in its loaded and transporting position; Fig. 3 is a similar view of the bucket in digging operation; Fig. 4 is an enlarged view of the bucket showing the attachments and supporting means therefor in side elevation; Fig. 5 is a rear elevation of the same; Fig. 6 is a detailed plan view of the bucket pilot and associated runner, on the line 6—6 of Fig. 4; and Fig. 7 is a diagram indicating the adaptation of the improvement for use as when the bucket is to be operated while digging and being transported in a direction opposite from the power station.

The several parts of this apparatus may be made of any suitable materials and the relative sizes and proportions thereof may be variously arranged without departing from the spirit of the invention hereinafter more fully set forth and specifically claimed.

At 10 and 11 are shown spaced elevated towers or supports along the line of which the operation is to be carried on.

12 indicates a main supporting cable extending over said supports and having one end suitably anchored as at 13 and having its other end connected to a block 14. The position of the block 14 with respect to the tower 10 is controlled by a cable 15 connected to a power drum 16, whereby the elevation or degree of tightness of the main cable 12 is determined. An anchor rope 17 is secured at any suitable place as, for instance, at 18, for coöperation with said block 14.

The excavating bucket comprises a body 19 having a closed back and a cutting edge or set of teeth 20 at the front thereof. The main support for the bucket consists of an upwardly curved or arched bail 21 secured at its rear end at 22 to the back of the bucket and extending thence upwardly and forwardly and terminating at its front end at a pilot 23 at a considerable distance from the front of the body of the bucket, said pilot being connected to the sides of the bucket by means of draw bars 24.

A carriage 25 comprises side plates and a pair of wheels 26. Said wheels roll upon the said cable and the carriage supports the main portion of the weight of the bucket through a roller 27 journaled at the lower ends of the side plates and coöperating with the inner edge or face of the bail 21. It will be noted also that the center of gravity of the bucket is always at the rear of said supporting roller 27. The bucket, however, is prevented from dropping below its desired operative position by means of a pair of supporting or dumping cables 28 connected at their lower ends in eyes 29 at the back of the bucket and having their upper ends extending over a pair of pulleys 30 secured to the sides of the carriage 25 and extending thence rearwardly and connected at 28′ in a cross bar or bracket 31 on opposite sides of the main cable 12.

At 32 I show a pair of bars in the form of straight pipes arranged parallel to each other on opposite sides of the main cable, the rear ends of the pipes being secured rigidly to the bracket 31 and having their front ends secured to a block 33 carrying a supporting roller 34. The roller 34 rolls upon the main cable and causes the front ends of the bars 32 or the block 33 connecting them to strike against a bumper 35 preferably of wood adjustably clamped at any desired dumping point along the main cable. The rear or intermediate portions of the bars 32 are supported upon a pair of rollers 36 connected by hangers 37 to the sides of the carriage 25. It will thus be seen that the rear end of the bucket will be supported to a large extent through the cables 28 operating over and supported upon the carriage 25.

The operating or traversing means for the

bucket consists of a draft cable 38 connected at one end to a power drum 39 and at its other end by a clevis 40 to the carriage 25. A branch 38′, however, of said draft cable is connected at 40′ to a runner 41. Said runner comprises a pair of side plates between which are journaled antifriction rollers 42 and 43 on the one side of the bail 21 and an antifriction roller 44 on the other side. In other words, the bail extends and operates between two side plates and the two rollers 43 and 44. The normal position of the runner 41 is, as shown in Fig. 4, in the angle between the bail and the pilot. Draft upon the cable 38′ will thereby be made effective through the draw bars 24 to the bucket. A portion of the draft, however, will be exerted through the clevis 40 and carriage 25. The bucket being in the position shown in Fig. 3, therefore, and with the draft drum 39 operated, the draft cable will cause the bucket to be drawn toward the tower 10 and become filled with earth. When substantially filled, the bucket will be lifted from the ditch by tightening up on the controlling cable 15 so as to lift the main cable and the bucket, whereby the bucket will be swung with its load clear of the ground, as shown in Figs. 2 and 7. The draft upon the cable 38 will be continued by the operator until the dumping point is reached, when the block 33 will strike against the bumper 35, causing the bars 32 to stop and thereby causing the dumping cables 28, through the slightly further continued operation of the bucket, to lift the rear end of the bucket, causing the same to occupy the position shown in Fig. 1. The position of the runner 41 and the branch draft cable 38′, however, will be maintained substantially the same at all times by reason of a short reach 45 directly between the runner and the carriage. When the bucket reaches its dumping position, the operator will stop the drum 39, and when the earth has been dumped the bucket will return to normal position upon release of the draft cable, the bucket righting itself for digging position by reason of the fact of the center of gravity being beyond its main point of support. The bucket will return to its normal position by gravity, the proper control of the main supporting cable 12 being effected by the manipulation of the drum 16.

The device may be readily adjusted as to varying digging conditions, depending upon the nature of the earth being excavated or other circumstances, by variably adjusting the connections at the points 40 and 40′ between the draft cable and the two parts of the bucket 25 and 41.

The diagram of Fig. 7 indicates a slight variation in adaptation of the excavator for operation away from the power station. In this form of the invention the draft cable 38 is carried over a pulley 38ª on the opposite tower 11. The bumper 35 will, of course, be transferred to the other end of the apparatus and the bucket and its attachments will be turned around in the opposite direction. The operation, however, will be substantially the same as that already described.

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

1. In a cable excavator, the combination with a main supporting cable and a carriage movable thereon, of an excavator bucket including a bail secured at one end to one end of the bucket and extending thence upwardly and over a portion of said carriage, and draft means connected to said carriage and coöperating with the end of the bail opposite the bucket.

2. In a cable excavator, the combination with a main cable, a bumper secured thereto and means to control the elevation of said cable, of a bucket, a carriage on the cable to support the bucket therefrom, draft means to cause the carriage and bucket to be traversed along the main cable, and dumping devices including a stiff member movable along and parallel to the main cable into contact with said bumper, said member being supported for longitudinal slidable movement on and independently of the carriage and a flexible connection between the stiff member and one part of the bucket made effective by the continued movement of the draft means after the bumper is engaged, said flexible connection being guided over the carriage between the stiff member and the bucket.

3. In a cable excavator, the combination with a main supporting cable and a bumper secured thereto, of a carriage movable along the cable, a bucket supported upon and suspended below said carriage, said bucket including a bail connected at one end to the bucket body and having its intermediate portion arched and extending through a part of the carriage, draft means connected to the carriage and to the part of the bail remote from the bucket body, and means connected to the bucket body and operating through the carriage against said bumper to tilt and empty the bucket, while the draft means continues in operation.

4. In a cable excavator, the combination with a main cable and a bumper secured thereto, of a carriage movable along said cable, said carriage including a pair of side plates and an antifriction roller journaled between their lower ends, a bucket including an arch-shaped bail movable between the carriage side plates and over said roller whereby the main weight of the bucket is supported upon the carriage, draft means serving to cause the carriage and bucket to

be traversed along the main cable, and dumping mechanism associated with the carriage and the bucket, said dumping mechanism including a stiff member supported upon the carriage for independent movement and adapted to strike against said bumper, and a flexible connection between the stiff member and the bucket serving to tilt the bucket after the bumper is struck and the draft means continues in operation.

5. In a cable excavator, the combination with a main cable, of a carriage movable therealong, an excavator bucket supported by said carriage and including an upwardly arched bail adapted to move longitudinally of the carriage, connections between both ends of the bail and the opposite ends of the bucket, a runner coöperating with said bail and a portion of said connections, said runner including a pair of spaced side plates on opposite sides of the bail, and draft means connected partly to said carriage and partly to said bucket through said runner, substantially as set forth.

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

ALVAH D. HADSEL.

Witnesses:
J. C. LAWRENCE,
J. M. QUIGLEY.