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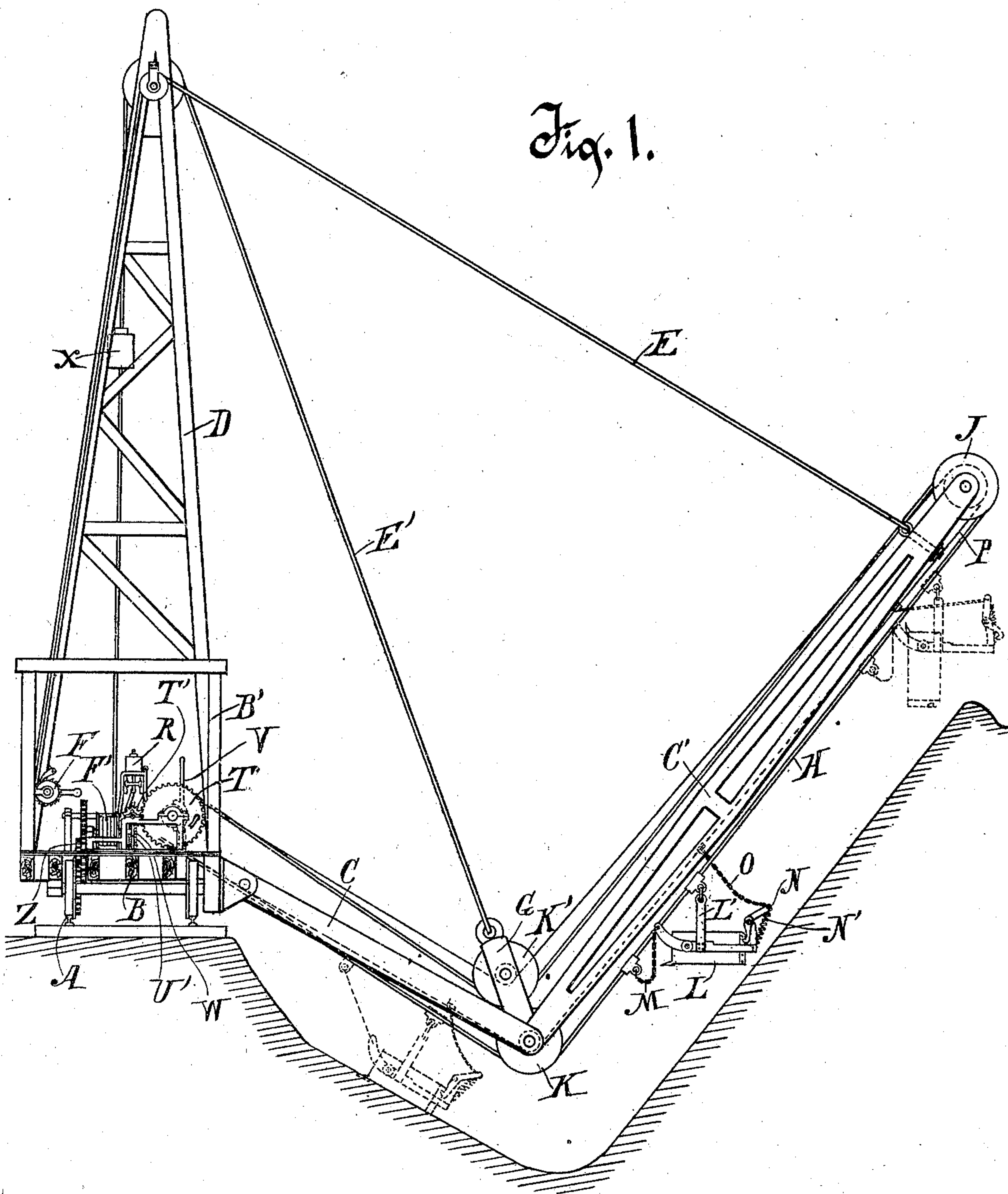
E. RUUD.
EXCAVATOR.

2 Sheets—Sheet 1.

No. 502,469.

Patented Aug. 1, 1893.

Fig. 1.



Witnesses.

A. K. Kenev.

Anna C. Faust

Inventor.

Edwin Ruess

By Benedict Morell
Attorneys.

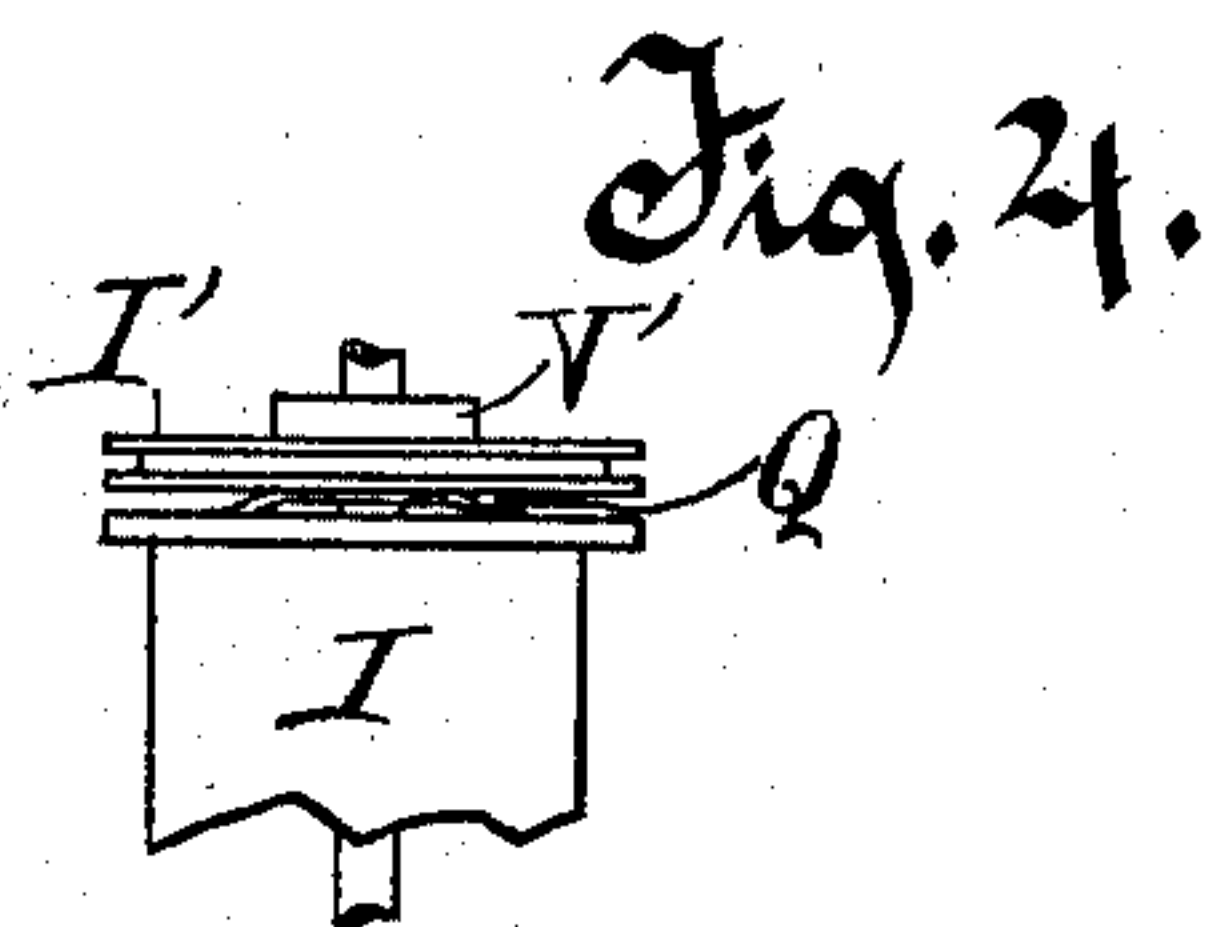
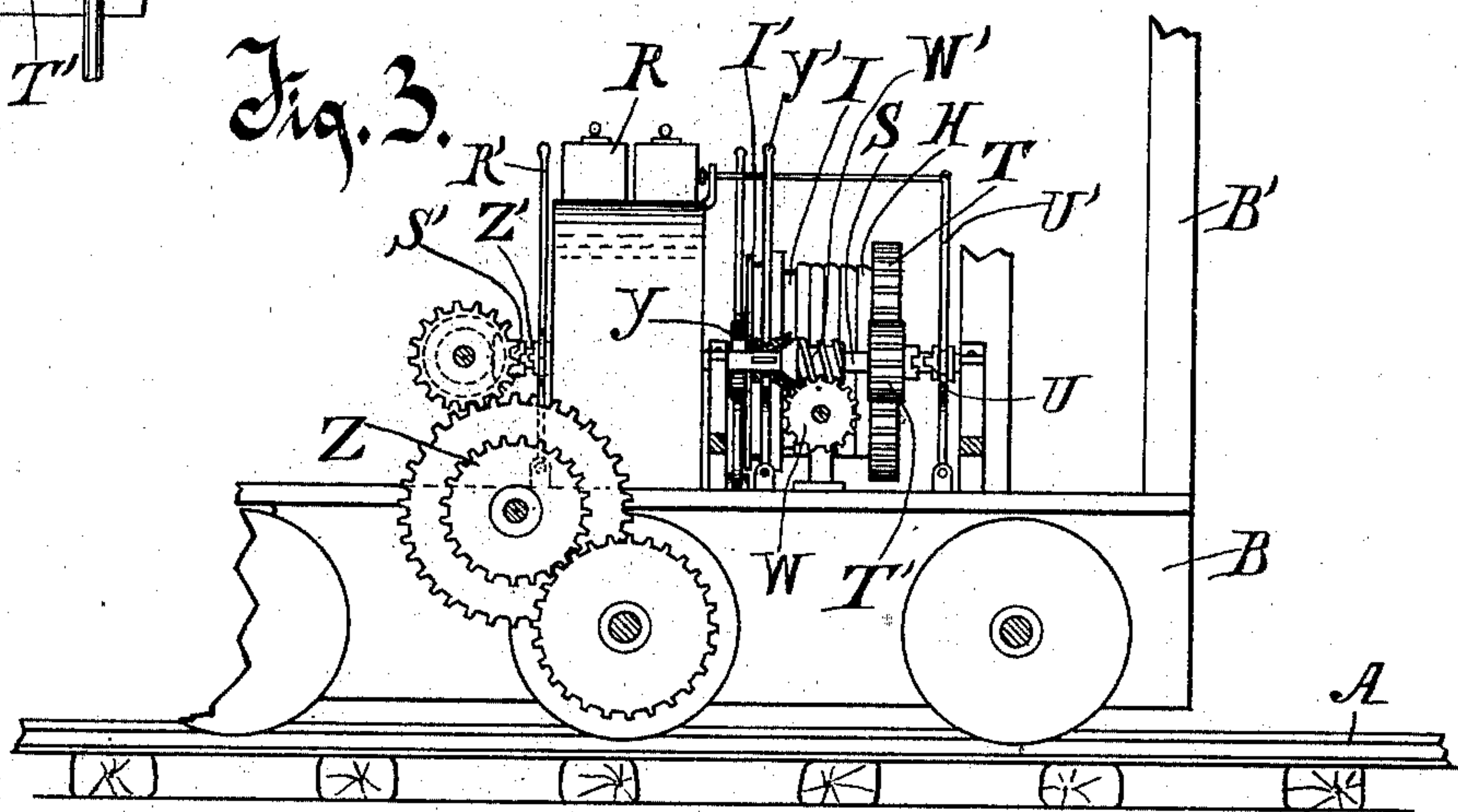
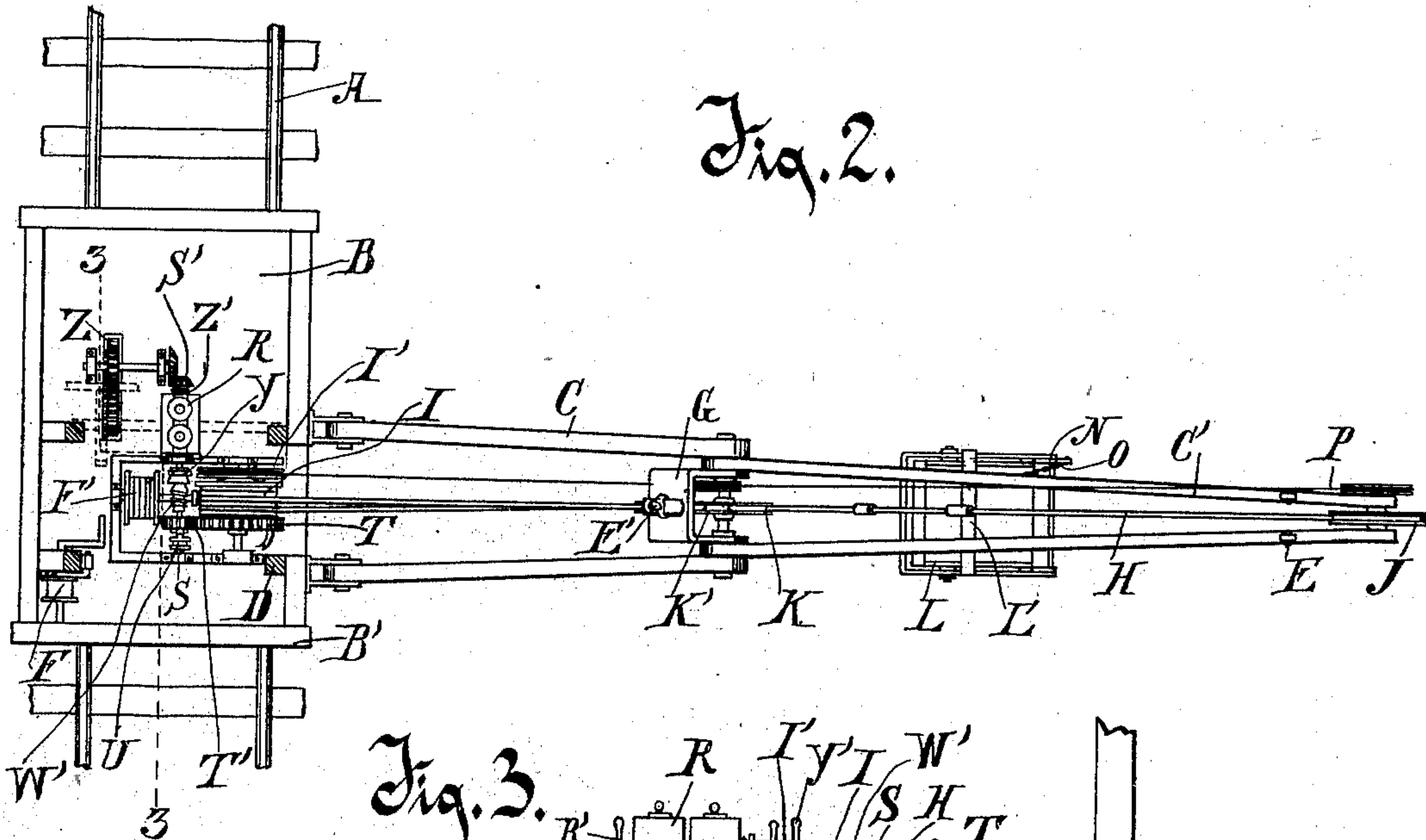
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2 Sheets—Sheet 2.

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A. Keeney

Amos V. Faust

Inventor.

Edwin Ruud

By Benedict Morell
Attorneys.

UNITED STATES PATENT OFFICE.

EDVIN RUUD, OF KENOSHA, WISCONSIN.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 502,469, dated August 1, 1893.

Application filed January 21, 1893. Serial No. 459,040. (No model.)

To all whom it may concern:

Be it known that I, EDVIN RUUD, of Kenosha, in the county of Kenosha and State of Wisconsin, have invented a new and useful
5 Improvement in Excavators, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

In some portions of the United States, particularly in those parts that border the Missouri river, a practice has been adopted of burning the tenacious clay, commonly known as "gumbo" found in that region, producing thereof a tile or stone-like material which being
15 broken into suitable pieces, forms an excellent ballast for railroads.

The object of my invention is, to provide a machine to excavate the clay from its bed and to convey and dump it on the fire or combustible material arranged for burning.
20

With this and incidental objects in view, my invention consists of the device and parts thereof hereinafter described and claimed.

Figure 1, is an elevation of the complete improved device. Fig. 2, is a top plan view of the device, the upright frame or mast being omitted. Fig. 3, is an elevation of that part of the mechanism seen on line 3—3 of Fig. 2, looking toward the right. Fig. 4, is a
30 detail.

These beds of clay or gumbo are usually in such situation that a railway track can be run directly onto such a bed or alongside of it, and a car carrying the apparatus is run
35 out on the track, and the clay is excavated alongside of the track, and moved to a little distance therefrom and dumped on a fire where it is burned.

Fig. 1 illustrates the general method of excavating and transporting the clay by means of my improved apparatus.
40

In the drawings, A, is a railway track and B, is a suitably constructed flat car, adapted to travel on the railway track. The car is
45 shown as having a frame B', erected thereon adapted to receive a siding and cover, to inclose it, if desired. A boom or arm consisting of two members C C', pivoted together at their joining extremities, is pivoted to the
50 side of the car and projects laterally therefrom. An upright frame or mast D is mounted rigidly on the car. A cable E secured to

the outer extremity of the boom, runs over a pulley in the top of the mast and is wound on a windlass F, axled in suitable bearings
55 therefor on the frame. The windlass is provided with a crank for rotating it, and with a rack and pawl to lock it releasably against rotation in one direction. This cable supports the outer extremity of the boom, and is
60 adapted for raising and lowering it. A cable E', attached to the bail G, pivoted to the boom at its medial joint, runs over a pulley in the top of the mast and is wound on the winch F'. This cable E', supports the boom medi-
65 ally, and is adapted by rotating the winch to raise and lower the boom medially. A cable H is secured to and is wound several times about the drum I, and runs over the pulley J, at the outer extremity of the boom and on
70 the guide pulleys K K', located at the joint of the boom and journaled respectively, on the pivot pin of the boom, and in the bail G.

A scooping bucket L, open at the front and rear ends, is pivoted in front of its center of gravity the frame L', which frame is suspended
75 pivotally on the conveyer cable H. The bucket is by means of the frame so suspended on the cable as to hang normally level when locked in position thereto, by means herein-
80 after to be described. The frame L', is also connected at its front end to the cable H, by a chain M, which holds the bucket in the position shown in dotted lines at the left, while being hauled toward the car, in the process
85 of filling it.

In an apparatus for excavating, mounted on a car as this apparatus is, it is desirable that the scooping up of the clay for loading the bucket, be accomplished while the bucket
90 is being hauled toward the car as the great strain necessary for that purpose would, if put on the bucket while moving in the other direction, be liable to overturn or break the car or apparatus mounted thereon. In load-
95 ing the bucket it is hauled toward the left and the clay is scooped into it, and when filled the motion of the cable is reversed and the bucket is run out to the end of the boom, where its outer extremity is released from
100 its frame, and the bucket by gravity tilts in the manner shown in dotted lines at the right in Fig. 1, and its load is dumped on the fire. For locking the bucket releasably in horizon-

tal position to the frame I', a lever latch N, is pivoted medially to a suitable part of the frame L', and is adapted to engage a catch on the rear end of the bucket. The lever latch is held up to its work by a spring N', connected to one arm of the latch and to the frame. For automatically tilting this lever latch, it is connected by a chain O, to an endless cable P, running on pulleys mounted on the boom concentric with the pulleys J, K and K', and also runs on a pulley I', concentric with and adjacent to the drum I. The cable P, is driven by the pulley I', which is held yieldingly but sufficiently firmly therefor, to the drum I, by a spring Q, shown in detail in Fig. 4. The pulley I', is loose on the axle of the drum. For operating this mechanism, an engine R is located on the car. This engine may be of any of the many suitable forms in common use, but preferably has two cylinders and corresponding pistons, piston rods and cranks, whereby the shaft S may be driven in either direction, being made reversible at the will of the operator. The drum I is connected operatively to the shaft S by means of the toothed wheel T, rigid on the axle of the drum, and a pinion T', loose on the shaft S, meshing with the wheel T, and arranged to be locked to its shaft S, by means of a clutch U, splined on the shaft and adapted to be shifted into and out of engagement with the pinion by a suitable hand lever U', which straddles the clutch and rides in a suitable groove therein. The pulley I' which normally rotates with the drum I, being held yieldingly thereto by the spring Q, is provided with a brake V, consisting of a lever handle pivoted at one end to the frame and provided medially with a shoe which rides on a cylindrical hub V' rigid to the pulley. By applying this brake to the pulley I' the bucket is automatically dumped. The process is as follows: While the loaded bucket is moving with the cable H toward the outer extremity of the boom, when the cable P (also running concurrently therewith) is stopped, by applying the brake V to the pulley I', the chain O, by the onward movement of the bucket on the cable H, pulls on the lever latch N tilting and releasing it from the rear end of the bucket, which tips down by gravity and discharges its load. The movement of the cable H is stopped at the moment the bucket is released and dumps. By reversing the movement of the shaft S, the cable H, is run in either direction as desired. For connecting the winch F', to the shaft S, operatively, the axle of the clutch is provided with a pinion W, which gears with a worm W', loose on the shaft S. A collar clutch Y, splined on the shaft S, is adapted to engage frictionally a cone-bearing on the worm W', and lock it to the shaft. A lever handle Y', pivoted at one extremity to the frame, straddles the clutch and rides in a groove therefor, by which the clutch is thrown into and out of engagement with the worm.

The cable E' winds on the winch F' and by the rotation of the winch, the boom may be raised or lowered medially as is necessary to adapt it to excavating at a higher or lower level.

For running the car on which this apparatus is mounted, on the track A, the shaft S, is connected operatively to a train of wheels Z, which communicate motion to a set of wheels of the car, through a toothed wheel fixed on the axle thereof. For connecting the shaft S operatively with the train of wheels Z, a pinion S' loose on the shaft S, meshes with a pinion belonging to the train of wheels. A collar clutch Z', splined on the shaft S, is adapted to engage the pinion S', and lock it to its shaft. A lever handle R', pivoted at one extremity to the car frame, straddles the clutch and rides in a groove therein, and is adapted to shift the clutch into and out of engagement with the pinion S'. A weight X, hung on the cable E' serves as a counterpoise to the weight of the boom, and lessens the strain on the winch.

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

1. The combination substantially as described, of a car, a boom pivoted to the car and projecting laterally therefrom which boom is formed of two members pivoted to each other medially, a vertical mast fixed on the car, cables attached to the boom at its free end and medially, which run on pulleys in the mast, and means for winding the cables.

2. The combination substantially as described, of a car, a boom pivoted to the car and projecting laterally therefrom, which boom is formed of two members pivoted to each other medially, means for supporting the boom adjustably at its extremity and medially, a conveyer cable running reversibly on the boom a tiltable excavating bucket secured to and carried on the cable, and means for operating the cable.

3. The combination of a car, a boom supported on the car, and projecting laterally therefrom, a conveyer cable running reversibly on the boom, a tiltable bucket supported and carried on the cable and means for operating the cable reversibly, substantially as described.

4. The combination of a car, a boom supported on and projecting from the car, a conveyer cable running on the boom, a tilting bucket supported on and traveling with the cable, a swinging latch adapted to engage the bucket and hold it against tilting, another cable running on the boom independently of the former cable, but normally concurrently therewith, to which latter cable the swinging latch is connected, and means for stopping temporarily the motion of the latter cable, substantially as described.

5. The combination with a car, and a laterally projecting boom supported thereon, of pulleys in the boom, a drum on the car, a cable running on the drum and pulleys, a tilt-

able bucket supported and carried on the cable, and means for rotating the drum and thereby running the cable alternately back and forth with its bucket, substantially as described.

5 6. The combination in an apparatus of the character described, of a car, a boom projecting from the car, a rotatable drum on the car, a cable running on the drum and on the boom, 10 adapted to carry a bucket, a pulley loose on the drum axle, a spring holding the pulley yieldingly to the drum, a cable running on the pulley and alongside the former cable, and a brake for holding the pulley against rotation 15 with the drum, substantially as described.

7. The combination in an apparatus of the character described, of a car, a mast erected thereon, a medially jointed boom pivoted to the car and projecting laterally therefrom 20 adapted to support a traveling bucket thereon, a cable attached to the outer extremity of the boom and running over a pulley on the mast, another cable attached to the boom medially and running over a pulley on the mast, 25 and independent means on the car for winding up the boom supporting cables, substantially as described.

8. The combination in an apparatus of the

character described, of a car, a laterally projecting jointed boom pivoted to the car, a 30 winch journaled on the car, a cable attached medially to the boom running thence over an elevated pulley and winding on the winch, a pinion fixed on the axle of the winch, a worm loose on a driving shaft on the car, a clutch 35 splined on the driving shaft and means for shifting the clutch into engagement with the worm, substantially as described.

9. The combination in an apparatus of the character described, of a car, an engine mount- 40 ed thereon, a drum also mounted on the car and carrying a conveyer cable running on a boom projecting from the car, a winch mounted on the car adapted to wind a cable arranged to support the boom adjustably, a train of 45 wheels gearing with an axle of the car, a driving shaft driven by the engine, and means substantially as described for connecting the shaft operatively severally to the drum, to the winch, and to the train of wheels. 50

In testimony whereof I affix my signature in presence of two witnesses.

EDVIN RUUD.

Witnesses:

C. T. BENEDICT,
A. L. MORSELL.