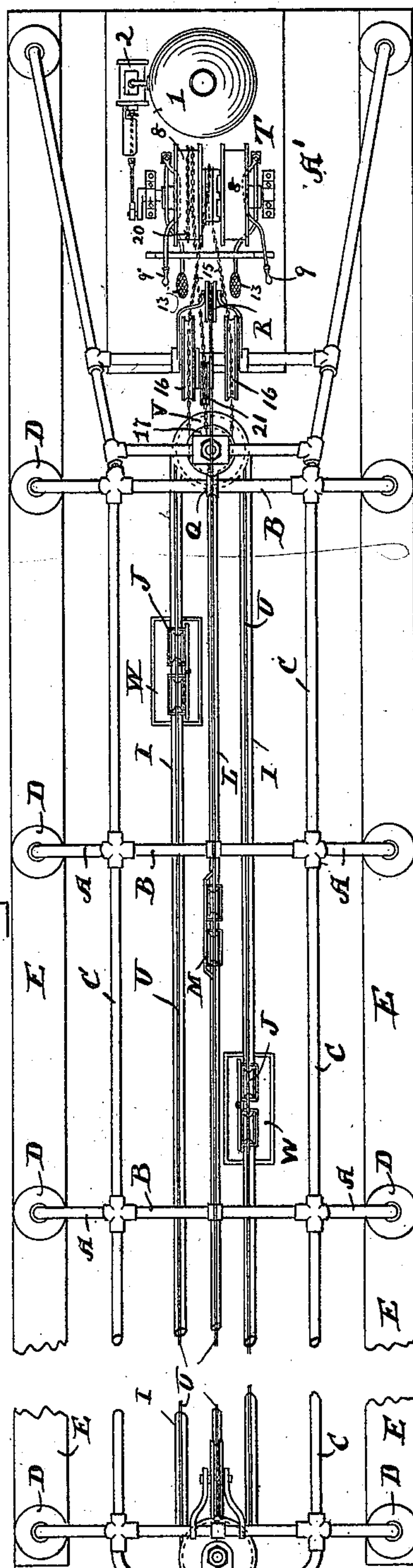
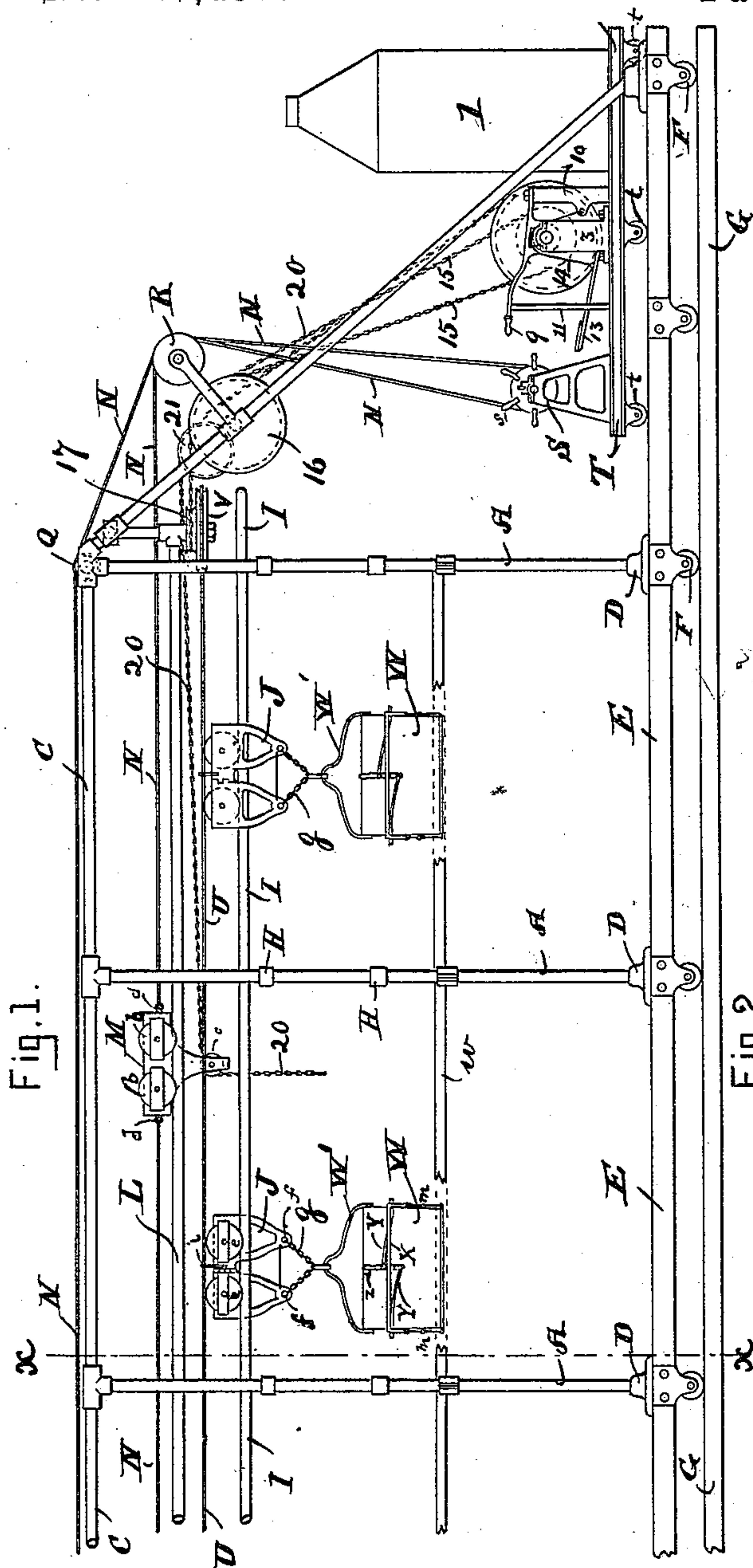


3 Sheets—Sheet 1.

Patented May 20, 1890.



Witnesses
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(No Model.)

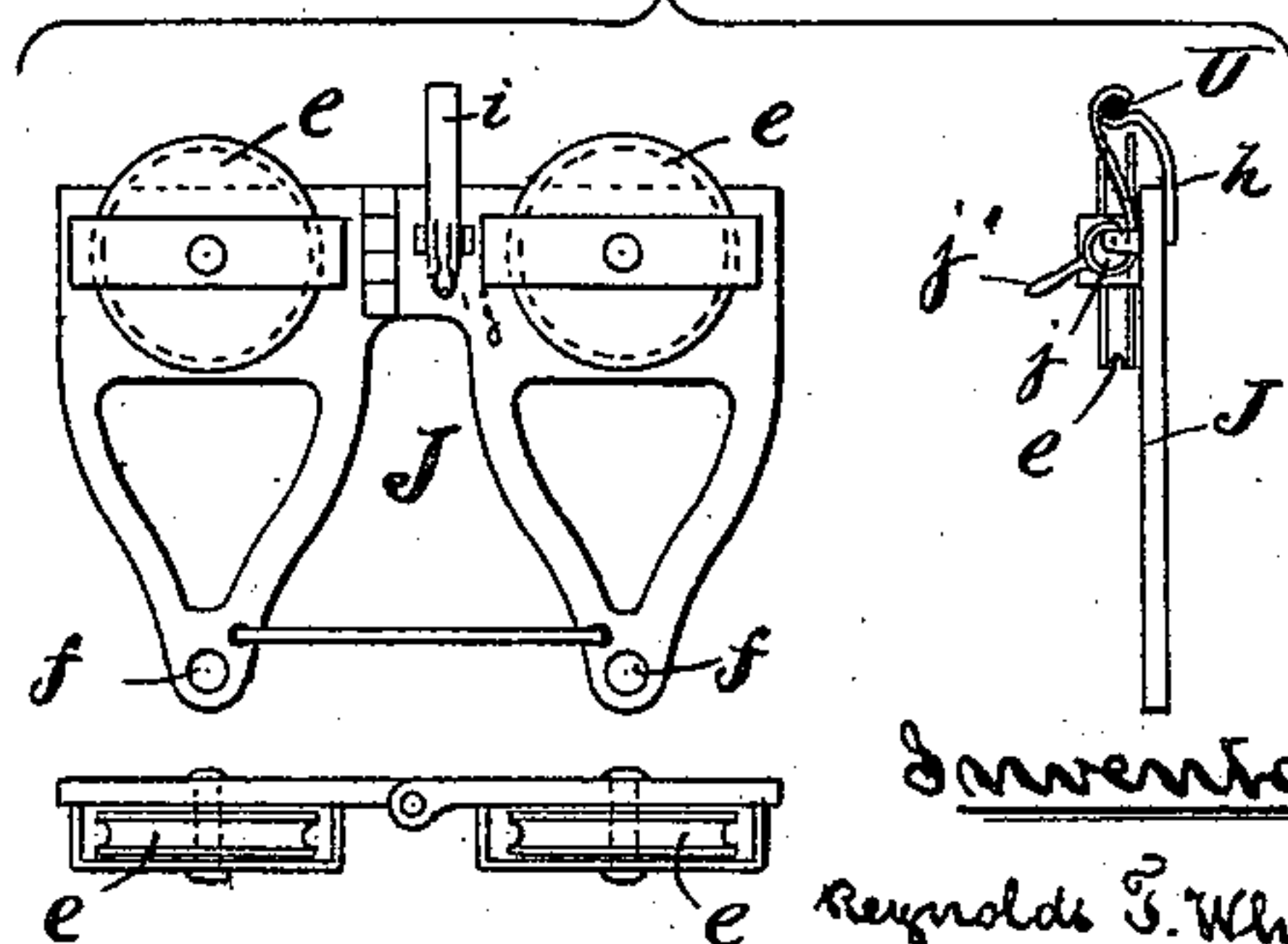
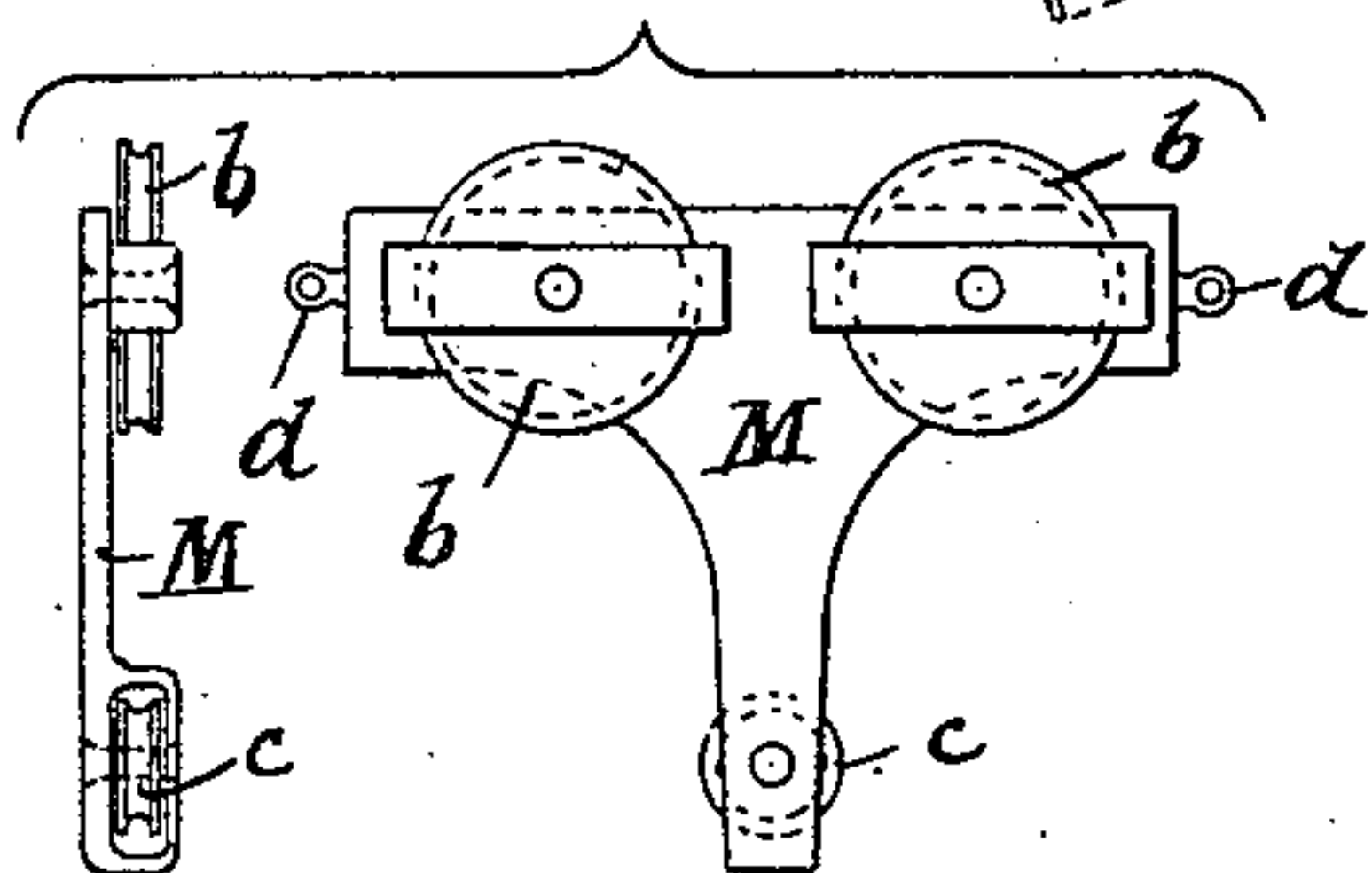
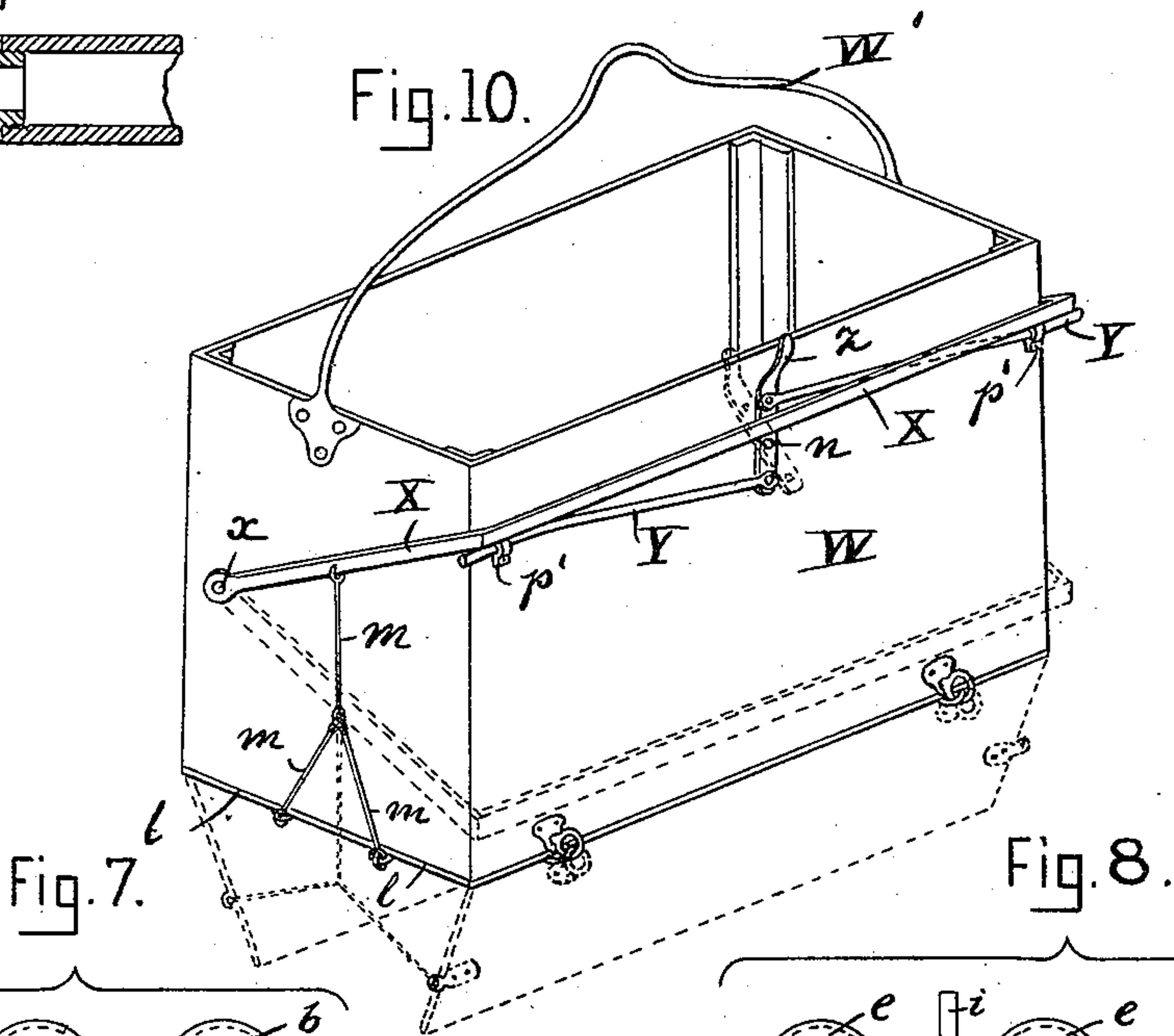
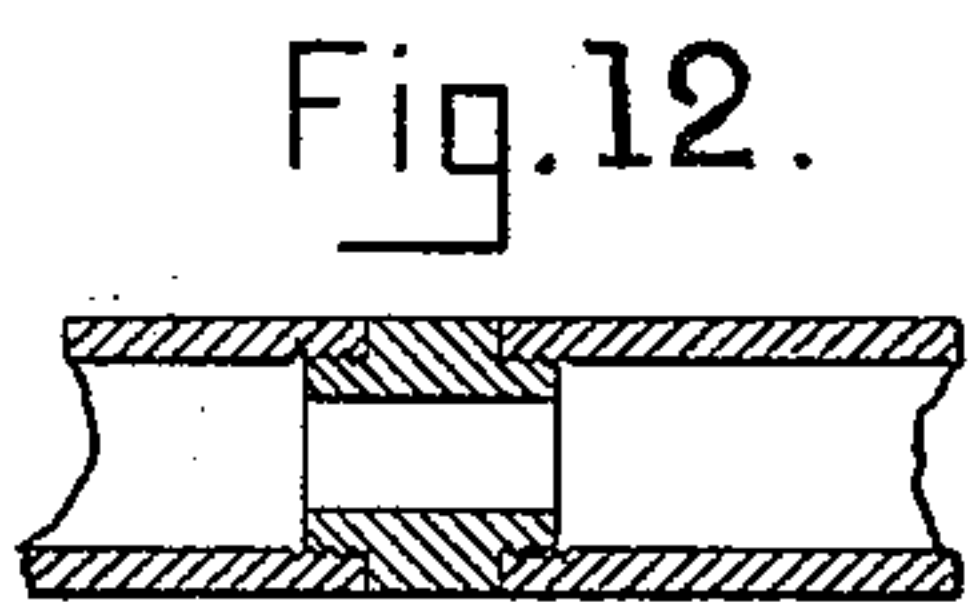
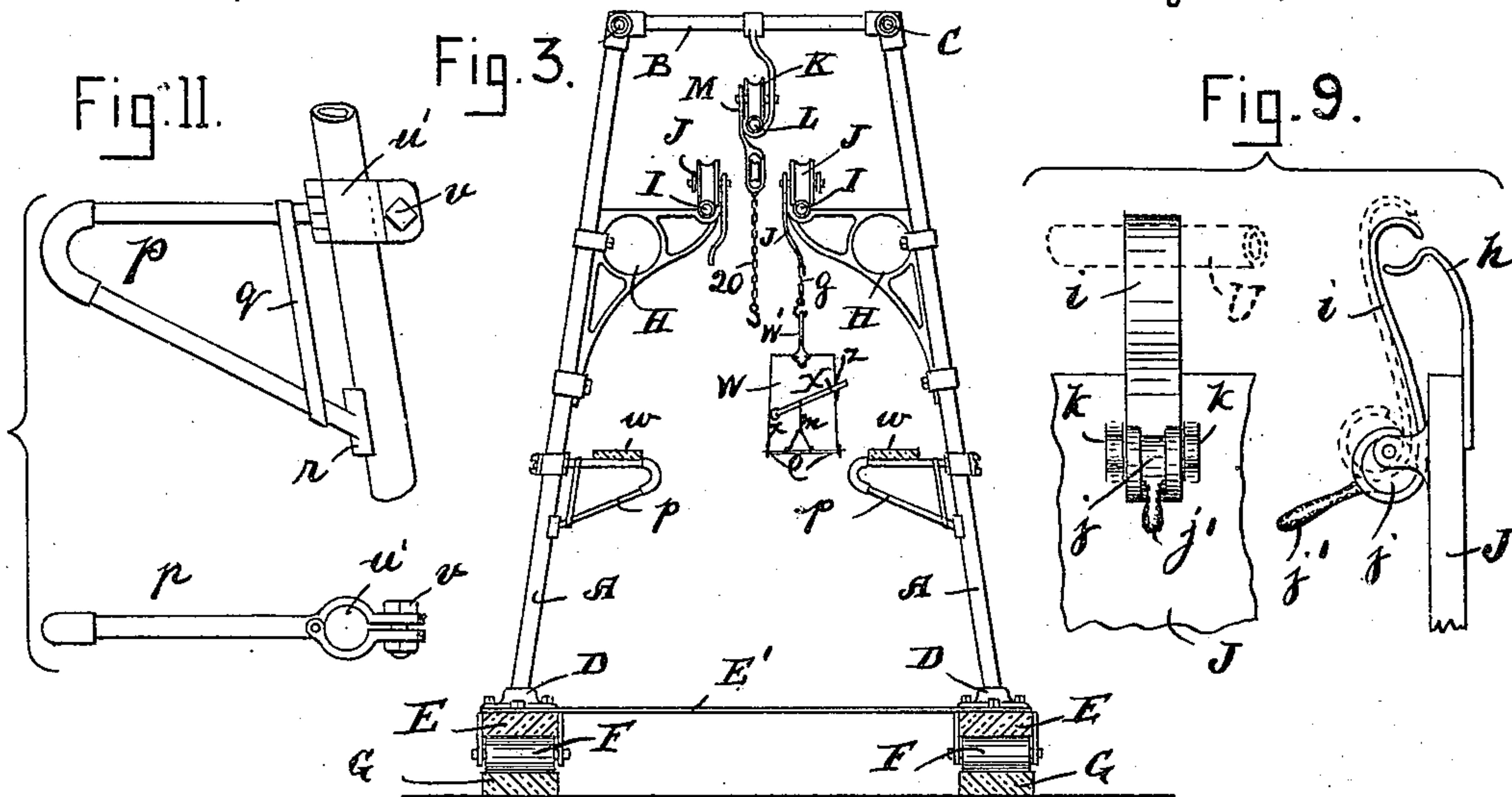
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R. T. WHITE.

APPARATUS FOR RAISING AND MOVING EARTH.

No. 428,437.

Patented May 20, 1890.



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(No Model.)

3 Sheets—Sheet 3.

R. T. WHITE.

APPARATUS FOR RAISING AND MOVING EARTH.

No. 428,437.

Patented May 20, 1890.

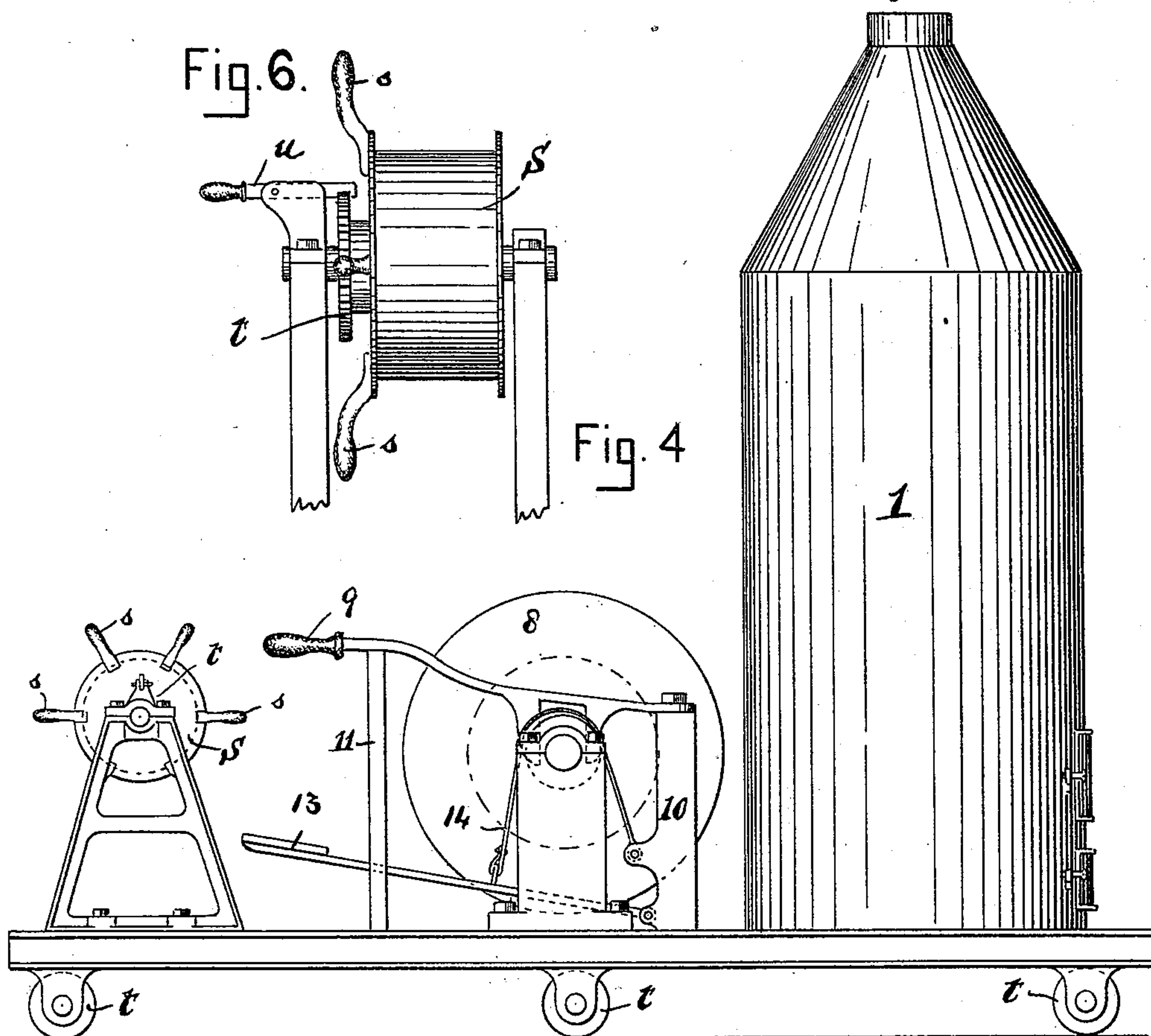
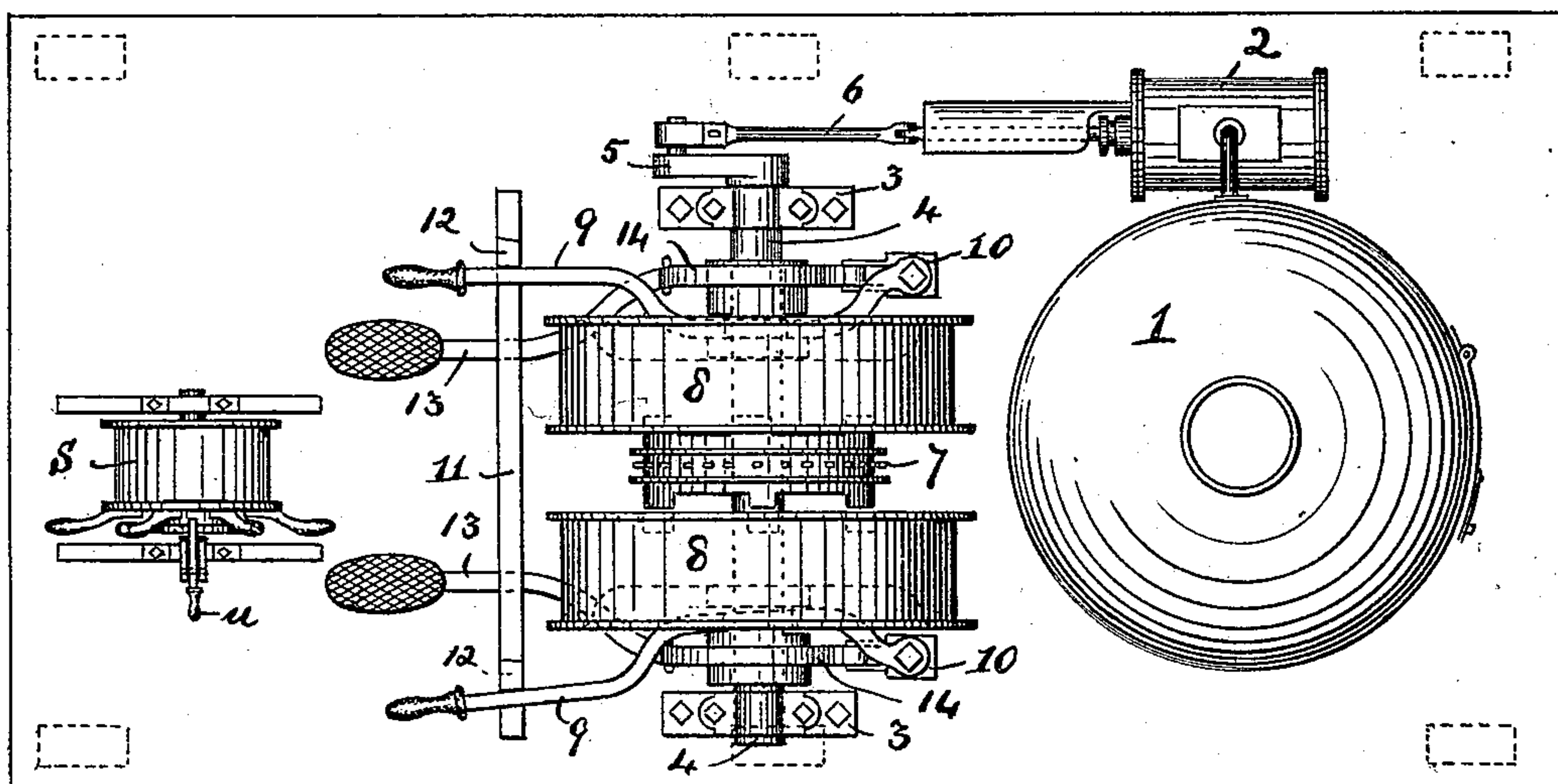


Fig. 5.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR RAISING AND MOVING EARTH.

SPECIFICATION forming part of Letters Patent No. 428,437, dated May 20, 1890.

Application filed December 9, 1889. Serial No. 333,119. (No model.)

To all whom it may concern:

Be it known that I, REYNOLDS T. WHITE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Raising and Moving Earth, of which the following is a specification.

The object of my invention is to construct an apparatus for raising and moving earth, particularly adapted for use in excavating cellars or for laying sewers; and the invention consists in constructing the frame in such manner that it can be readily put together or taken apart for transportation, the parts being interchangeable, and in certain details of construction hereinafter fully set forth, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 represents a side elevation of an earth-moving apparatus embodying my invention. Fig. 2 is a plan or top view of the same. Fig. 3 is a vertical section taken on line xx of Fig. 1. Fig. 4 is a side elevation of the machinery for operating the apparatus, drawn on a larger scale. Fig. 5 is a plan or top view of the same. Figs. 6 to 12 are details of various parts.

The frame of the apparatus is of wrought-iron pipe, and consists of standards A A, cross-pieces B B, and longitudinal pieces C C, secured together by suitable connections. The lower ends of the standards A A are secured in sockets D D, fastened to stringers or girders E E. The stringers or girders E E are kept from spreading by means of bars E', (see Fig. 3,) and are carried by rollers F F, that rest or travel upon blocks, ways, or tracks G G, so that the whole frame may be moved along as required or held stationary thereon by dogs or other suitable means. A platform is provided at the rear end of the structure for carrying a truck T, that is provided with the boiler-engine and hoisting apparatus, as hereinafter described.

To the standards A A are secured brackets H, that carry pipes I, which form the track or ways for the carrying-travelers J to run upon. This track is continuous, the two side tracks being connected at their ends by a half-cir-

cular pipe, so that the travelers J can run entirely round the structure.

To the cross-pieces B B are secured hangers K, that carry a straight pipe L, that forms a track for the hoisting-traveler M to run upon. The hoisting-traveler M (shown enlarged in Fig. 7, Sheet 2, which represents a front and side elevation) consists of a piece of metal a of the form shown, and provided with two wheels $b b$ to travel upon the track L, and immediately in the center below these two wheels $b b$ is a small wheel c , over which the hoisting chain or rope passes. Each end of this traveler is provided with eyes $d d$, to which are secured each end of the rope or chain N, that passes round a pulley P at the forward end of the apparatus and over pulleys Q R at the rear end down to and around a windlass S, mounted upon the truck T. (See Figs. 1, 4, 6, and 7.) This windlass is provided with handles s , and also a notched wheel t , into which the lever u falls and prevents the windlass from turning when the traveler M is in the desired position. When it is required to move the traveler M to another part of the apparatus, all that has to be done is to press on the handle of the lever u and rotate the windlass until the traveler is in the position desired.

The carrying-travelers J (shown on a larger scale in Fig. 8, Sheet 2) are made in two parts hinged together, as shown, each part being provided with a wheel e , that runs upon the track I, and provided at their lower ends with eyes $f f$, to which the chains g , for carrying the buckets, are secured. The object of making these travelers in two parts and hinging them together is that they will readily run round the end curved portion of the tracks. To each of these travelers is secured a gripping device for taking hold of an endless rope or chain U, that passes round pulleys V V' at each end of the apparatus, the rope or chain U having a continuous motion imparted to it, as hereinafter described. The gripping device is shown enlarged in Fig. 9, Sheet 2, and consists of a stationary jaw h , that passes under the rope, and a movable jaw i , that passes over the rope. This jaw i is carried by a cam j , mounted upon a shaft

or pin supported by brackets *k*. A handle *j'* is connected to the cam *j*. It will be seen that when the handle *j'* is down, as shown, the movable jaw *i* will grip upon the rope, and the rope, being in motion, will cause the traveler *J* to be carried along until the handle *j'* is lifted to the raised position, as shown in dotted lines, when the grip upon the rope will be released and the traveler will then stop.

W W are buckets for raising and carrying the earth. One of these buckets is shown on an enlarged scale in Fig. 10. It consists of a rectangular box, preferably of iron, and provided with two flaps *l l*, that form the bottom.

These flaps are hinged to the sides of the bucket, and are connected at each end by means of bars, links, or chains *m m* to a lever *X*, fulcrumed at each end at *x*, so that when the lever *X* is in the raised position, as shown, the flaps will be closed, but when in the lowered position, as shown in dotted lines, the flaps will be open to allow the contents of the bucket to fall out. To lock the lever *X* in the raised position, two bolts *Y Y* are secured at their inner ends to a hand-lever *Z*, that is fulcrumed at *n*, one of the bolts being connected above and one below the fulcrum, as shown, the outer ends of the bolts *Y Y* passing through eyes *p' p'* to support and guide them.

W' is a bail by means of which the bucket is hoisted and carried. I prefer to make the bucket slightly larger at the bottom than at the top, so that when dumping the load there will be a clear run and no liability of the earth adhering to the sides of the bucket.

To the standards *A*, I secure brackets *p*. (See Fig. 11.) These brackets I form of pipe, as shown, connected together by a metal strap *q*. The lower end of the bracket is provided with a plate *r*, that rests against the standard *A*, and the upper end is provided with a hinged clamp *u'*, secured by a bolt *v*, so that it can readily be attached to or detached from the standard *A*. Upon these brackets *p*, I place a board or boards, so as to form a platform *w* for the man or boy that attends to attaching and detaching the buckets to stand upon.

In Fig. 12 I have shown the means I prefer for connecting the pipes that form the rails *I* and *L*, so as to have an unbroken surface for the travelers to run upon.

The mechanism for hoisting and conveying is shown drawn to an enlarged scale in Figs. 4 and 5, in which *T* is a truck mounted upon wheels *t*, so that it can be run onto and removed from a platform *A'* at the rear end of the apparatus, and when in the desired position is secured by dogs, chains, or other suitable means. Secured upon the truck *T* is a boiler 1 and engine 2. 3 3 are standards in which is mounted a shaft 4, on one end of which is a crank 5, secured to the piston-rod 6. In the center of the shaft 4 is secured a sprocket-wheel 7, the sides of which are provided with projections that form a clutch to cause the

pulleys or drums 8 8 to revolve when thrown into gear. The drums 8 are mounted loosely upon the shaft 4, so that they can be shifted into or out of gear with the clutch by means of hand-levers 9 9, fulcrumed at the rear end to standards 10, and the forward ends passing over a bar 11, provided with stops 12, so that when the levers 9 are placed on one side or the other of the stops 12 they will be locked and the drums 8 prevented from shifting. In the drawings I have shown one of the drums 8 in gear and one out of gear.

13 13 are foot-levers fulcrumed to the lower end of the standards 10, and 14 14 are straps of metal secured at one end to the standards 10, then passing over the bars or hub of the pulleys 8, and connected at the other end to the lever 13, so as to form a brake.

15 is an endless chain (see Figs. 1 and 2) that passes round the sprocket-wheel 7, over idle-pulleys 16, and round a sprocket-wheel or pulley 17, secured to the pulley *V*, so that when motion is imparted to the sprocket-wheel 7 it will cause the wheels 17 and *V* to revolve, and with them the endless rope or chain *U*.

20 is a chain, one end of which is secured to the drum 8, and then passed over an idle-pulley 21 and wheel *c* in the traveler *M*, its other end being provided with a hook for lifting the buckets *W*.

The operation is as follows: The apparatus having been placed in the desired position and the engine started, a continuous motion is imparted to the rope or chain *U* by the chain 15. A bucket having been filled, the chain 20 is lowered and the bucket attached. It is then hoisted to the required height, and the hook on the chain *g* is placed in the bail *W'*. Then the chain 20 is slackened and the bucket left suspended on the traveler *J*. The handle *j'* is then forced down, and the movable jaw *i* of the gripping device is brought onto the rope *U* and tightly grips it, which, being in motion, causes the traveler *J*, with the bucket *W*, to be carried along to the rear of the apparatus. When it has arrived in the place it is desired to dump the load, the handle *Z* is pushed to one side and the flaps *l l* fall down, thereby dumping the load. The lever *X* is then raised and the lever *Z* pushed over, thereby locking it ready for another load. (If desired, the grip may be released while the load is being dumped.) The traveler then passes round the end of the apparatus to the other side, and when it arrives at the point for lowering the grip is released and the hook on the chain 20 placed in the bail *W'* and hoisted a short distance, when the bucket will be carried by the chain 20 ready to be lowered. The grip is then again placed on and the traveler carried round the end to the other side ready to receive another loaded bucket.

Although I have shown only one hoisting-traveler *M*, any desired number may be employed; but of course a similar number of drums 8 will have to be mounted upon the driving-shaft 4, for as the shaft runs contin-

uously to impart a continuous motion to the
endless rope U a separate rope or chain 20
would have to be employed for each hoisting-
traveler, as these ropes would not be em-
5 ployed in raising buckets at the same time, as
a separate drum is required for each rope, said
drums being loosely mounted upon the driv-
ing-shaft and only run when the clutch is in
gear, and any desired number of carrying-
10 travelers J may be employed.

What I claim as my invention is—

1. In an apparatus for raising and moving
earth, the endless track I, carrying-traveler
J, endless rope U, and suitable mechanism for
15 imparting a continuous motion to said rope,
in combination with a hoisting-track arranged
between but above the level of said endless
track, hoisting-traveler M, and endless rope
N, substantially as and for the purposes set
20 forth.

2. The combination, with the carrying-trav-
eler, of an earth raising and moving appara-
tus, a gripping device consisting of a station-
ary jaw *h*, secured to one side of the traveler,

and a movable jaw *i* and cam *j*, secured on the 25
opposite side of the traveling frame, and han-
dle *j'*, for operating the cam, substantially as
set forth.

3. In combination with the bucket W, the
bolts Y Y and hand-lever Z, for retaining or 30
releasing the lever X, substantially as shown
and described.

4. An apparatus for raising and moving
earth, consisting of the following elements: an
endless track for the carrying-travelers, which 35
are provided with a gripping appliance, an
endless rope or chain for carrying said trav-
elers along, a hoisting-traveler capable of be-
ing held in any desired position, a track there-
for, and suitable mechanism for operating the 40
same, substantially as set forth.

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

REYNOLDS T. WHITE.

Witnesses:

EDWARD S. BEACH,
FREDERIC E. LUM.