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PATENTED JUNE 27, 1905.

W. HEFFRON.
PORTABLE OVERHEAD TRAMWAY.

APPLICATION FILED APR. 15, 1905.

3 SHEETS—SHEET 1.

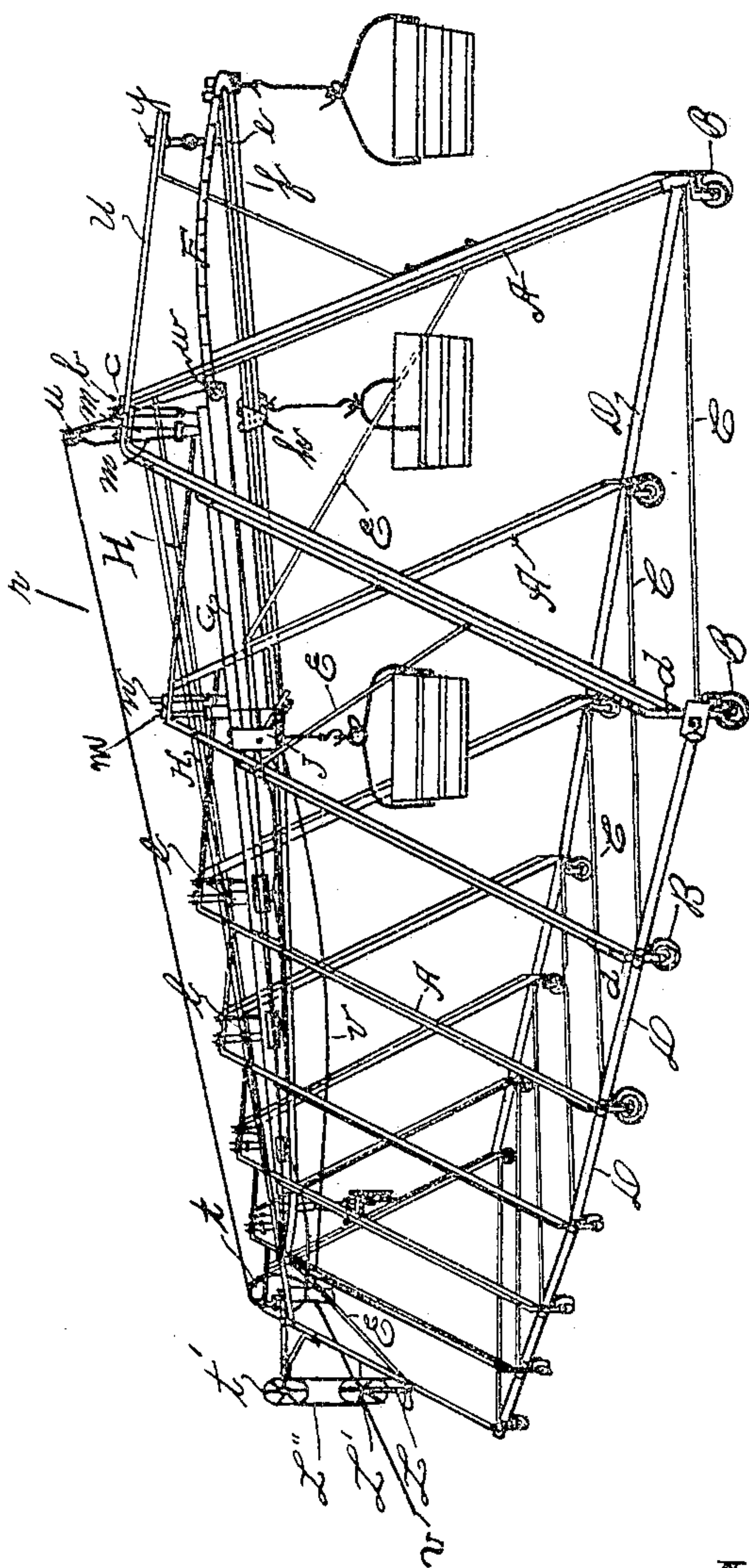


FIG. 1.

Witnesses.

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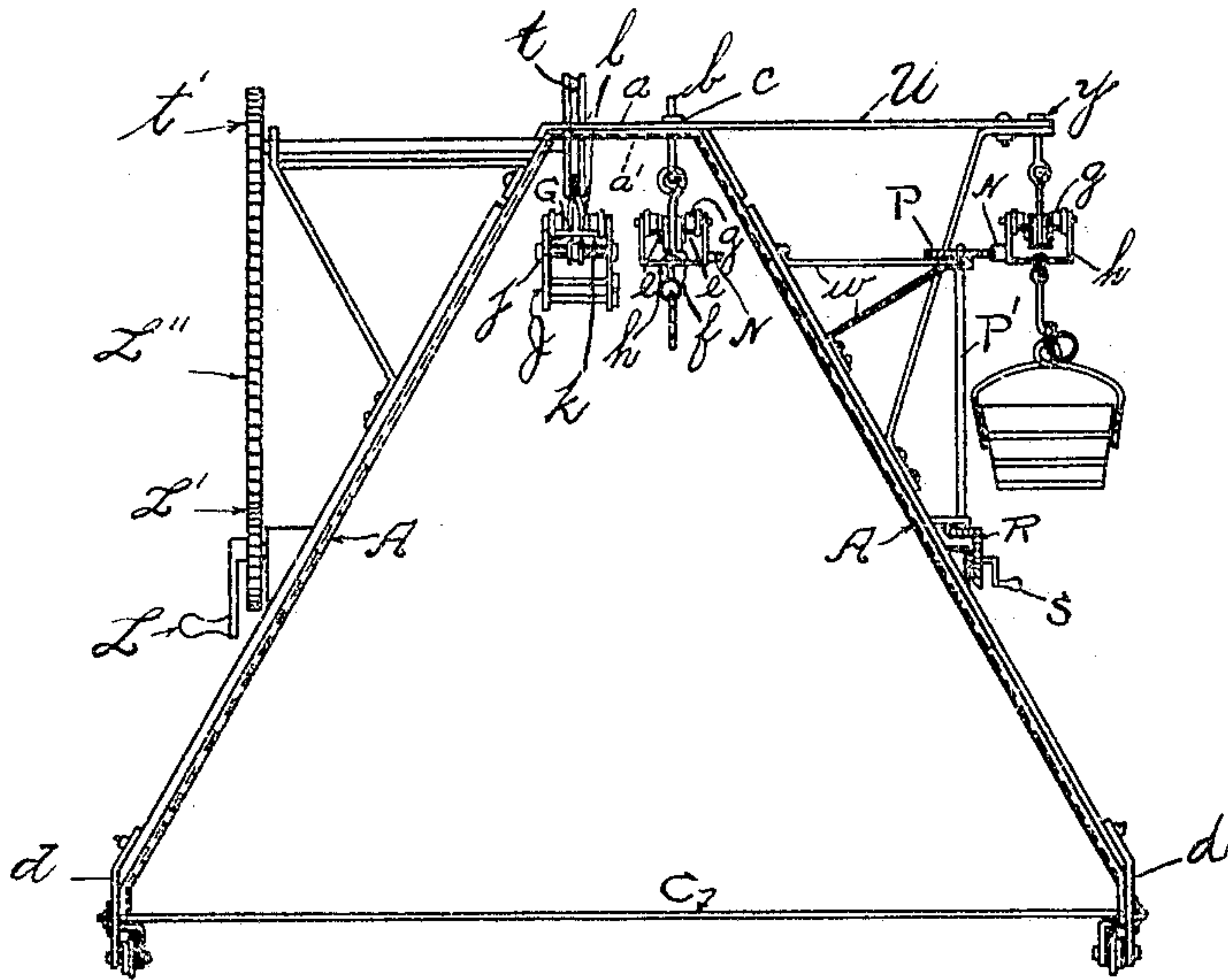


FIG. 2.

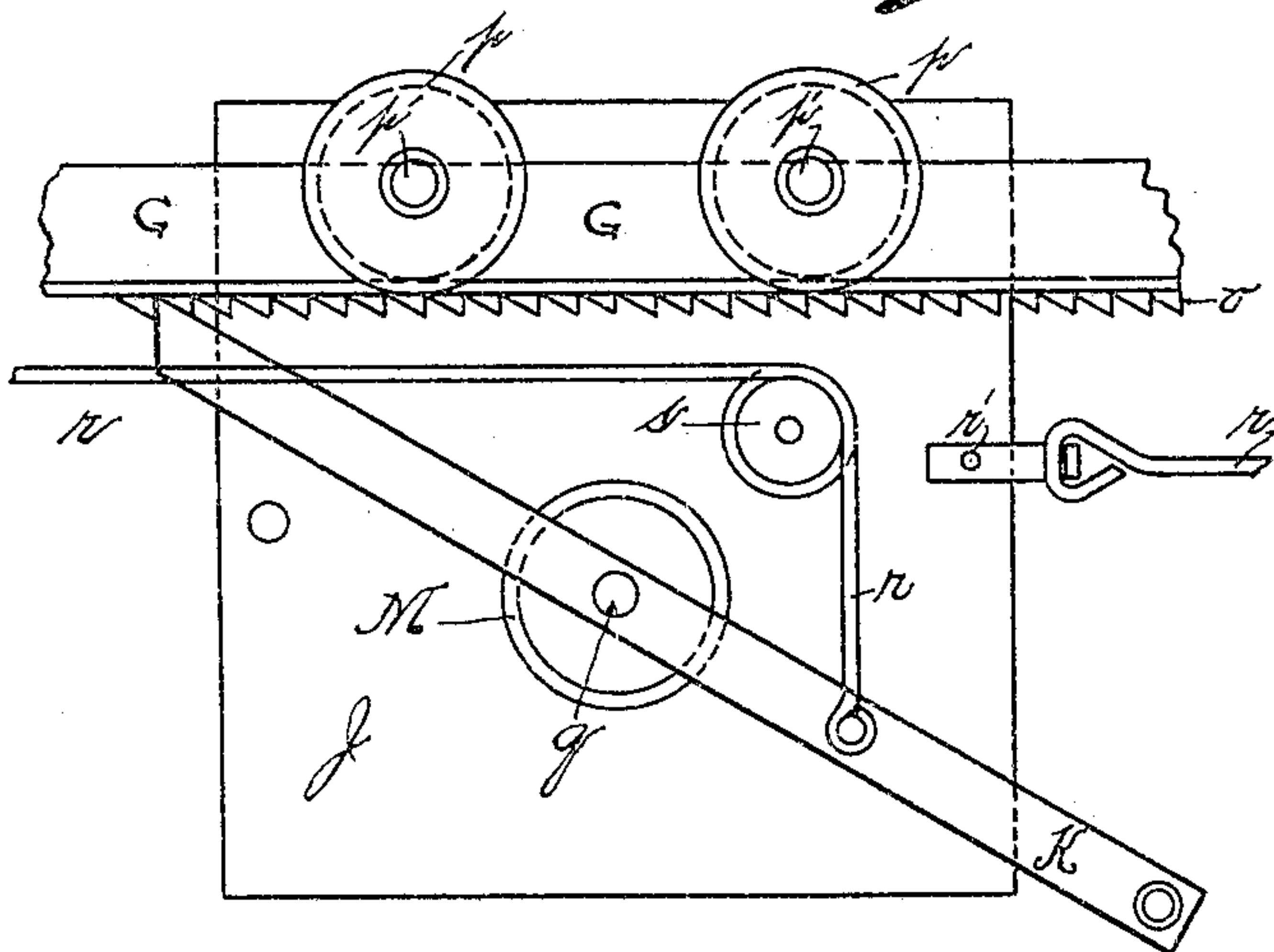


FIG. 3.

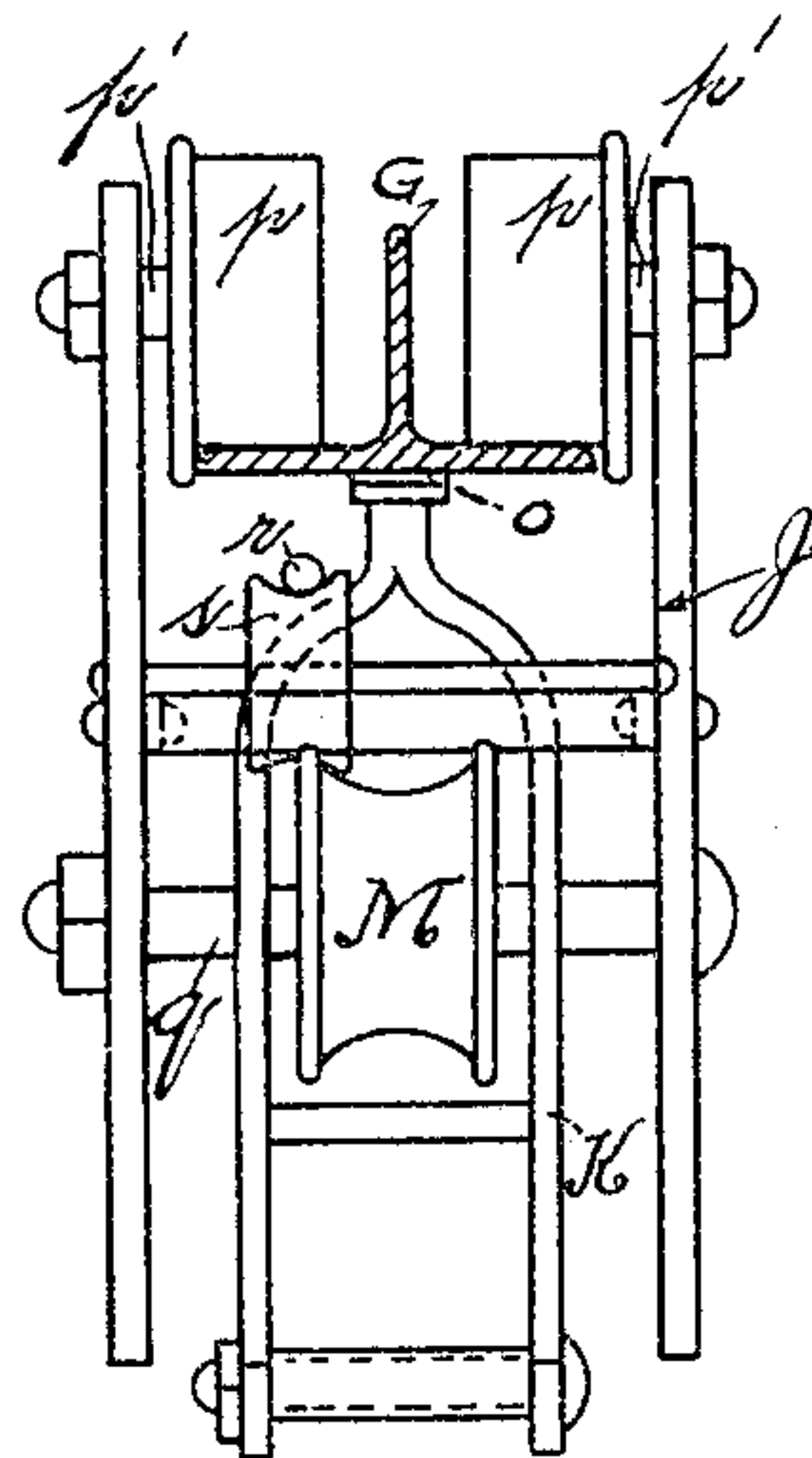


FIG. 4.

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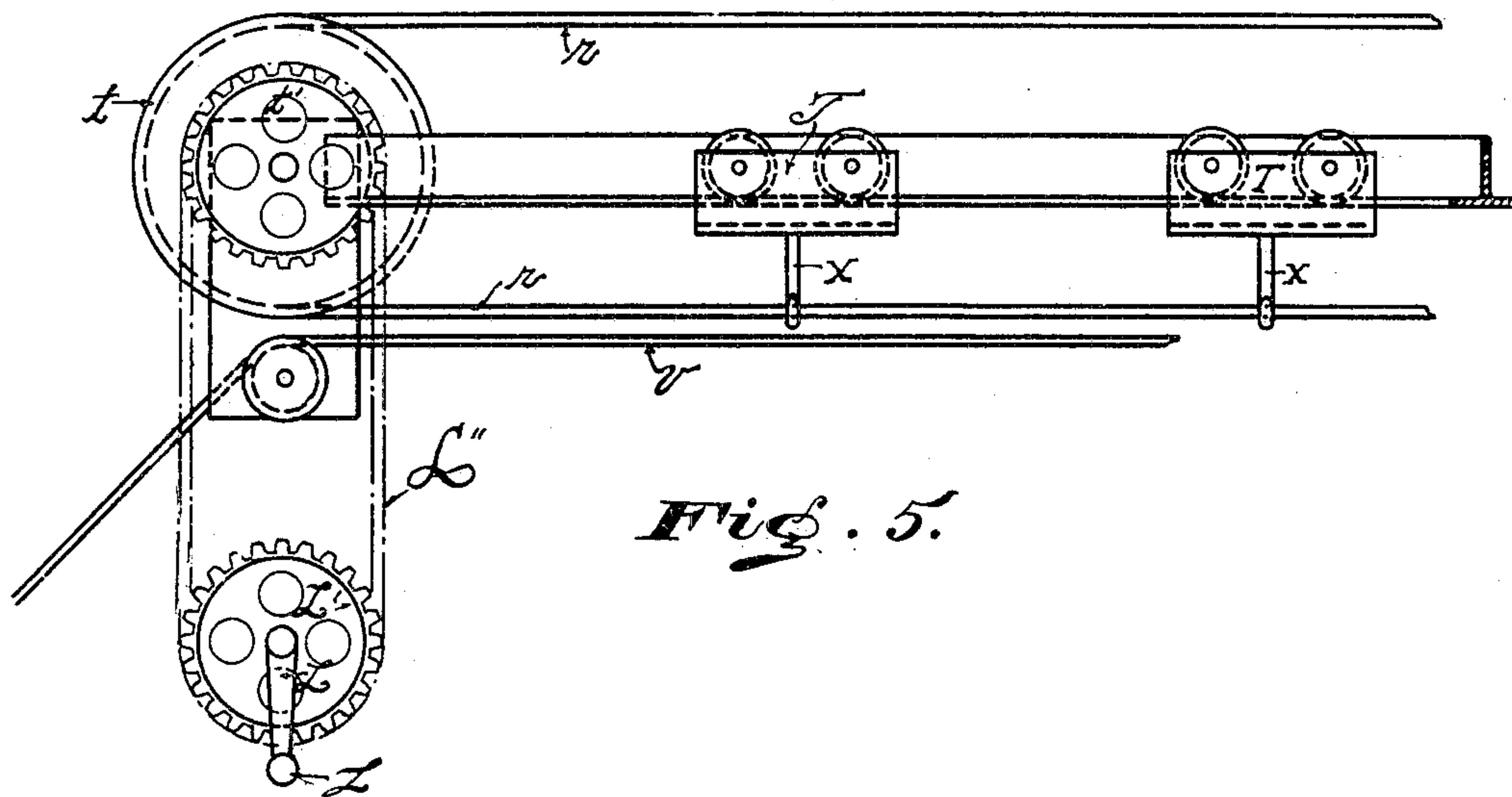


Fig. 5.

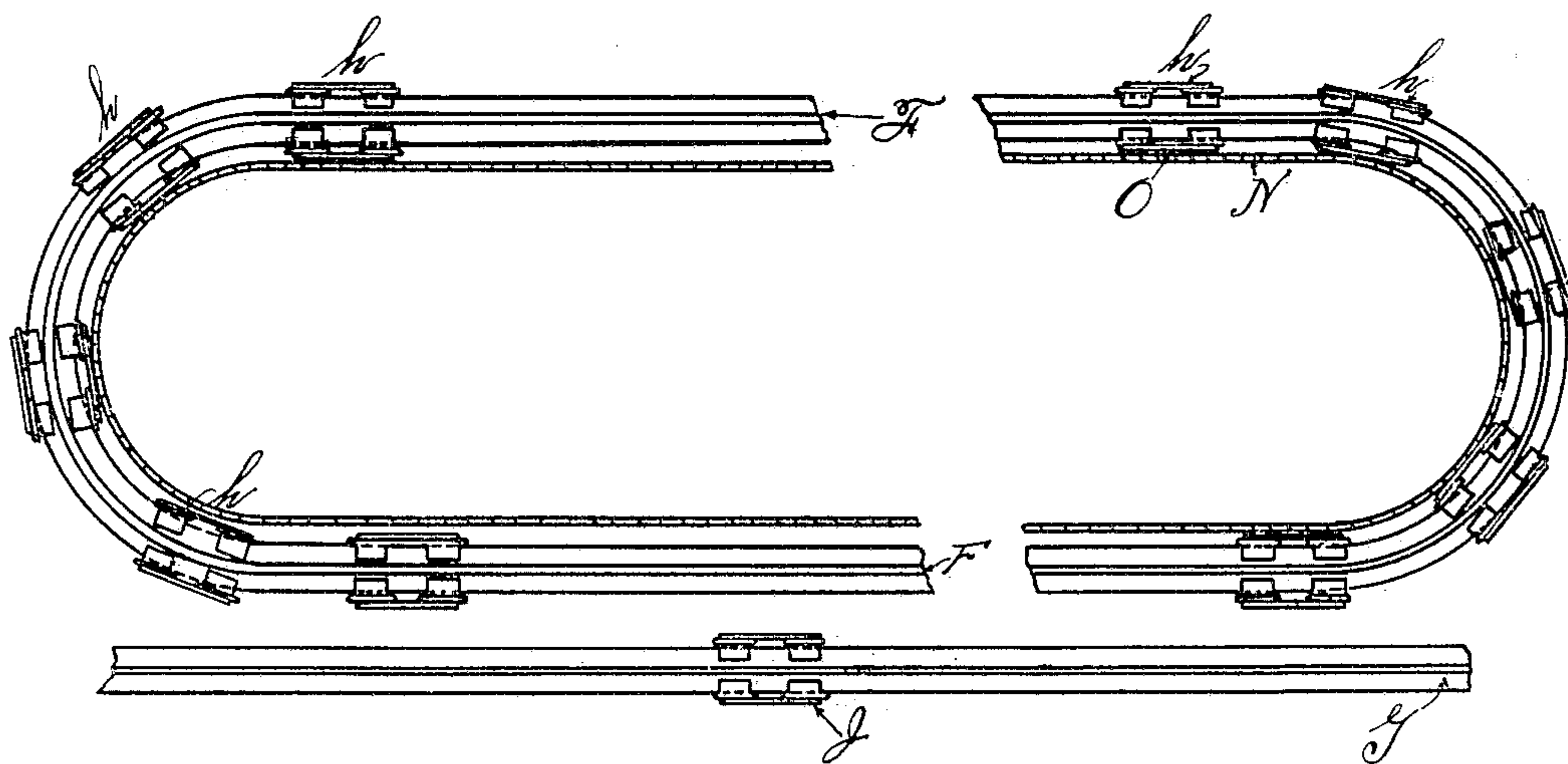


Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM HEFFRON, OF CINCINNATI, OHIO.

PORTABLE OVERHEAD TRAMWAY.

SPECIFICATION forming part of Letters Patent No. 793,193, dated June 27, 1905.

Application filed April 15, 1905. Serial No. 255,826.

To all whom it may concern:

Be it known that I, WILLIAM HEFFRON, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Portable Overhead Tramways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of my specification.

My invention relates to a portable overhead tramway, more especially adapted for use in connection with excavating-work where it is intended to remove the dirt from the point of excavation to some other predetermined place, the dirt or material being carried in the vessel or receptacle into which it is originally placed to the place of its deposit without the necessity of carting or handling the same. In a device of this kind it is of course necessary that the same be so constructed that as the point of excavation or the place of deposit changes or the work progresses the tramway may be extended or added to or taken from one end and added to the other, as the case may be, so as to adapt itself to the conditions which are constantly changing.

The further purpose of my invention is to provide means whereby the receptacles or vessels carrying the dirt or other matter may be quickly transferred to the travelers adapted to carry the filled receptacles to the place of deposit and return them to the point where they are to be refilled without interfering with the mechanism wherewith the filled receptacle or vessel is hoisted from the trench or ground after the same has been filled.

Another purpose of my invention is to permit of as many vessels or receptacles being used as is desired and at as many different points, and yet to permit of the constant or continuous use and operation of any one of the receptacles over the tramway by its respective carrier without interfering with any of the other vessels or receptacles, thus permitting as many independent gangs of workmen to be employed as may be desired.

In the drawings, Figure 1 is a perspective view of my improved overhead tramway, showing the same with a number of buckets

or receptacles suspended thereon, one suspended from the hoist-block or traveler and the others suspended from the carriers. Fig. 2 is an end elevation of the same, taken from the farther end of Fig. 1. Fig. 3 is a vertical sectional view of one of the hoist-blocks or travelers, showing the manner of mounting the dog therein, whereby the backward movement of the hoist-block is normally prevented. Fig. 4 is an end elevation thereof. Fig. 5 is a detail view of the windlass or winding mechanism whereby the position of the hoist-blocks or travelers is regulated, together with a number of idlers whereby the slack in the operating ropes or cables is taken care of. Fig. 6 is a top plan view of the tramway with the supporting-uprights and connections intermediate of the uprights omitted to more clearly illustrate the construction of the tramway and means used for operating the carriers or travelers along the tramway from place to place.

Like letters of reference indicate identical parts in the respective figures.

A represents uprights or supports, preferably diverging from the top, as shown in Figs. 1 and 2, which may be made of any suitable material of sufficient strength, such as channel or angle iron or wood, each one of which is preferably provided with a connecting member or bar *a* and *a'* at its top end, properly secured thereto, the bar or transversely-disposed member on the one support or upright A being so secured thereto as to permit it to lap over the top of the bent or transversely-disposed bar *a'* on the opposite upright or support A. These bars may be bolted together, or they may be secured by the suspending yokes or U-shaped bolts *b*, which are adapted to take on both sides of the bars *a a'* and through a cross-plate *c*, resting on top of the bar *a*. These yokes or U-shaped bolts *b* are of course threaded to receive nuts at the ends. By employing the yokes or U-shaped bolts *b* I thus provide means from which one of the tracks can be suspended. Of course it is readily understood that in place of the U-shaped bolt *b* an eyebolt or bolt with a hook might be employed, which could take through openings in the bars *a a'*, and thus

answer the same purpose for which the yoke or U-shaped bolt *b* is intended.

The uprights or supports A are preferably provided at their bottom ends with casters or rollers B, suitably mounted thereon, so that the same may be transported from place to place conveniently.

C represents tie-rods or transverse braces, one of which is preferably provided for each side of the supports or uprights A. These tie-rods are shown as taking through the casting or plates *d*, whereby the casters B are secured to the uprights. Of course it is readily understood that these transverse rods C may be secured to the uprights or supports in any other suitable manner. By their use any spread or further divergence of the uprights which might result from the strain applied at their upper ends is prevented.

D represents horizontal brace-rods or longitudinal members whereby the relative position of one set of uprights A with the adjacent set of uprights A at their lower ends is maintained. These horizontal brace-rods or longitudinal members may be constructed of any suitable material, such as angle-iron or the like, as is desired. One of these longitudinal brace-rods or members D is provided intermediate of the lower ends of each adjacent upright or support and is suitably bolted thereto, the castings or plates *d* being preferably provided with openings to receive bolts whereby they may be secured. The uprights or supports A might also be braced by diagonal braces or rods E, should it so be desired, which are simply bolted to the uprights A; but I find in practice that as the greater strain is had on the end uprights these diagonal braces E need simply to be employed between the two end uprights or supports A.

F is a continuous or circuitous track, which is preferably composed of angle-iron in sections, as seen at *e*, (see Fig. 2,) which may be secured to the board *f* by bolts or otherwise, or this board *f* might be omitted and the angle-irons *e e*, which are secured to opposite sides of the board *f*, may simply be secured together in such a manner as to receive and provide a runway for the rollers *g* of the carrier or traveler *h*. I have shown the carriers or travelers *h* as preferably provided with four rollers adapted to ride on the angle-irons *e* of the track F, and it is understood that the angle-irons are so secured in place as to present a flat upper surface. As an illustration of the omission of the board *f* I have shown the track F simply composed of the angle-irons *e* bolted together at the curve. It is understood that this track is put up in sections, so that it may be readily added to or taken from, as the case may be.

Supported from the bars *a a'* adjacent the track F is another track G, which may be constructed in a similar manner as track F—that is, by taking a pair of angle-irons *j* and *k* and

securing them together, so as to provide a horizontal surface extending to either side whereupon the rollers of the hoisting-block or traveler may take, or instead of using angle-irons an inverted-T rail might be employed, the vertically-extending portion thus permitting the rail to be suspended from above. Suitably connected to the upwardly-extending member of the rail G by bolts or otherwise is the supporting member or clamp *l*, to which is pivotally united the eyebolt *m*. The eyebolt *m* takes through a cross-piece or cross-plate *n*, similar to the plate *c*, heretofore described in connection with the U-shaped bolts *b*, whereby track G is suspended. This track G is also, of course, put up in sections, as is the track F. The track G is provided on the under-side with a serrated surface or rack, as can more clearly be seen in Fig. 3 at *o*, the purpose of which will hereinafter be set forth.

In order that the upper ends of the uprights or supports A may be more thoroughly braced and their relative positions maintained, I provide the top longitudinal brace-rods H, which are preferably made of a length corresponding with the distance it is intended to set the uprights apart. These brace-rods H are bolted to the uprights A near their upper ends on both sides of the tramway, as can clearly be seen in Fig. 1. Of course it is understood that these uprights or supports A might be braced in any other suitable manner, if it is necessary, and I have simply suggested what I believe to be the preferable manner of bracing.

Adapted to ride on the track G is the block or traveler J, whose construction can more clearly be seen in Figs. 3 and 4. I have termed this block the "hoist-block," as it is by the use of this block that the filled receptacles are hoisted up to the track, where they may be linked onto or transferred to the carrier-blocks which travel on the track F. The hoist-block is preferably constructed of metal, having the two side walls, and between them at the upper side and journaled therein are the flanged wheels *p*, of which I prefer to provide two pairs, each wheel *p* having its independent journal *p'*. (See Fig. 4.) The wheels *p* ride on the track G, as can more clearly be seen in Figs. 2 and 4. The block J has pivotally secured between its walls the pawl or dog K, which has its pivotal point at *q*. (See Figs. 3 and 4.) The dog or pawl K is so pivoted to the block J that its greatest weight will be to the forward end of the block, thereby tending to have the forward end of the dog or pawl K below its pivotal point *q*, which brings the other end into mesh with the serrated surface or rack *o* on the rail or track G, as can more clearly be seen in Fig. 3. The pawl or dog K has attached to it at a point forward of the pivotal point *q* a cable or rope *r*, (see Fig. 3,) which passes over a roller or sheave *s*, which is journaled between the walls of the block J. This rope or cable *r* extends from

the pawl or dog K over the roller or sheave *s* and back to a sheave *t*, which is properly mounted at the end of the tramway, where the operator may control the relative position of the hoisting-block J by operating the sheave *t* through the turning of the crank L, which turns the sprocket wheel and chain L' L'', which in turn revolves the sprocket *t'*, secured to or on the same shaft or spindle of the sheave *t*. The parts just described can more clearly be seen in Fig. 5. It will be seen that by turning the sheave *t*, about which the rope *r* may be wound once or twice, so as to control the same, that the rope *r* is wound up on one side, thereby lifting the dog or pawl K at its forward end and releasing it from the rack *o*. This cable or rope *r* is preferably shown as extending from the opposite side of the sheave *t* along over the tramway, over pulley *u* at the end of the tramway, and down over a suitable pulley *u'* and back to the block J, where it is attached at the point *r'*. (See Fig. 3.) It will thus be seen that the position of the hoisting-block J on the track G can be controlled from the end of the tramway and its position changed from time to time, as desired. I have thus described a single hoist-block or traveler as secured to the track G; but it is of course understood that any number of them may be used and that the rope or cable *r* could be secured to the dogs or pawls K of each block or traveler.

The purpose of providing the rack *o* on the track G and the dog K on the hoist-block is to prevent the hoist-block J from being drawn toward the operating end of the tramway whenever a filled vessel or bucket is being hoisted, as would be its natural tendency.

The hoist-block or traveler J is provided on the pivotal point *q* with a pulley or wheel M, (see Figs. 3 and 4,) over which the hoist cable or rope *v* (see Fig. 1) takes, which cable or rope is provided at its free end with a hook or means for engaging with the bail or a link secured to the bail of the bucket or vessel. The rope or cable *v* extends from the pulley or wheel M in the hoist-block J on back to the operating end of the tramway and on to a windlass or winding mechanism, which may be operated by any suitable power. After the filled vessel or bucket has been hoisted up to the tramway the same is "hooked" onto or suspended from the carrier or traveler *h* and propelled along the track F to the desired point of deposit, and the emptied vessel or bucket is continued in its travel on the return portion of the track F back to the operating end of the tramway and onto the point where the vessel or bucket is to be again filled. Then the free end of the cable or rope *v* may be hooked onto the bail or link of the vessel or bucket and the connection with the carrier *h* discontinued to permit the vessel or bucket to be lowered to the ground for the purposes of refilling.

Various means might be employed whereby the carriers *h*, of which there may be any desired number, are propelled along the track F; but I have shown one in the nature of a sprocket-chain N, (see Fig. 6,) which takes over fingers or prongs O, fixedly secured on the carriers or travelers *h*. These fingers O take into the links of the sprocket-chain N, so that when the chain is wound or moved the carriers *h* must travel therewith. The sprocket-chain may be operated by a sprocket-wheel P, (see Fig. 2,) which is secured to the end of the shaft P' and is suitably mounted or secured to the side of the end upright A by braces *w*. The shaft P' is operated by the beveled gearing R, which may be operated by the crank S.

By providing the ends of the tramway where the curve or return is made in the track with a number of idlers properly supported from the end supports A, about which the sprocket-chain N may take, the chain N may be kept in its proper position when the carriers *h* are at points along the track F other than at the curve or turn. It is of course understood that the idlers must not extend into the path of the fingers or prongs O on the carriers *h*, but just sufficiently to keep the sprocket-chain N approximately in its proper course. I have also illustrated the track G as provided with a number of idlers T T, (see Fig. 5,) which may practically be of the same construction as the blocks or carriers *h* and provided with a dependent arm *x*, provided with an eye or opening at its end through which the rope *r* may take. In practice, however, this rope *r* is preferably given one turn about the dependent arm *x*, so that these idlers may retain their relative positions along the track G as the hoist-blocks J are drawn from place to place.

In order to properly support the track F to the outside of the uprights or supports A, I provide the brackets U, preferably having one bracket for each section, from the end of which I have the link or bolt Y take into the board *f*, to which the angle-irons are secured, or into the upwardly-extending flange of the angle-irons if the track is constructed without the board or plank *f*, as has been heretofore described.

I have thus described what I consider to be the preferable construction; but it will be readily understood that various modifications might be made without departing from the spirit of my invention—as, for instance, the uprights A might have their upper ends bent so as to take over each other and be secured together, and thus do away with the connecting-bars *a a'*, or in place of the dog-and-rack mechanism for holding the hoist-block or traveler other gripping mechanism may be employed for retaining the traveler against movement in one direction normally, and I do not wish to be understood as limiting myself

to the precise construction shown and described; but

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

5 1. A portable overhead tramway comprising a set of uprights diverging from their upper ends, members or bars for connecting the upper ends of the oppositely-placed uprights, two horizontally-disposed members or tracks
10 suspended from said connecting members, one of said members or tracks being circuitous or endless, travelers adapted to move along said tracks or members, and means for controlling the operation of the same, substantially as
15 shown and for the purpose described.

2. A portable overhead tramway comprising a set of uprights diverging from their upper ends, members or bars secured to the upper ends of the uprights, the member on the
20 one upright adapted to overlap the member on the oppositely-placed upright, two horizontally-disposed members or tracks adjacent each other, means for securing the connecting members or bars at the upper ends of the up-
25 rights and for suspending the tracks, one of said tracks being circuitous or endless, a rack secured to the other track, travelers adapted to ride along on said tracks, and means for controlling the operation of the same, sub-
30 stantially as shown and for the purpose described.

3. A portable overhead tramway comprising a set of uprights, members or bars connected at the upper ends of the uprights, the
35 member or bar on the one upright adapted to overlap the member or bar on the oppositely-placed upright, transverse brace-rods for connecting the lower ends of the oppositely-disposed uprights, longitudinal members for con-
40 necting the lower ends of the adjacent uprights, horizontally-disposed members or tracks adjacent each other, one of said members or tracks being circuitous or endless, and the other track provided with a rack, travel-
45 ers adapted to ride along on said tracks, the traveler on the one track provided with a pawl or dog normally held in mesh with the rack on the track, and means for controlling the operation of said traveler, substantially as shown
50 and for the purpose described.

4. A portable overhead tramway comprising a set of uprights diverging from their upper ends, members or bars connected to the upper ends of the uprights and transversely
55 disposed, two horizontally-disposed members or tracks suspended from the transversely-

disposed members at the upper ends of the uprights, one of said tracks being circuitous or endless, the other track provided with teeth or rack on its under side, a hoist-block or
60 traveler adapted to ride along on said track, said hoist-block or traveler provided with a pawl or dog normally held in mesh with the rack, and means for controlling the operation of said traveler or hoist-block from one end
65 of the tramway, substantially as shown and for the purpose described.

5. A portable overhead tramway comprising a set of uprights, transversely-disposed members or bars for connecting the upper
70 ends of the oppositely-placed uprights, transverse connecting rods or bars whereby the lower ends of the uprights are braced, longitudinally-disposed members for connecting the lower ends of the adjacent uprights, two hori-
75 zontally-disposed tracks suspended from the transversely-disposed members or bars at the upper ends of the uprights, one of said tracks provided with teeth or rack on its under side, the other track being circuitous or endless
80 and extending about the outside of the uprights, brackets secured to the uprights and having connection with the part of the circuitous track to the outside of the uprights, a hoist-block or traveler adapted to ride along
85 said track with the rack, said hoist-block provided with a dog or pawl normally held in mesh with the rack on said track, and means for controlling the operation of the hoist-block from one end of the tramway, substan-
90 tially as shown and for the purpose described.

6. A portable overhead tramway comprising a set of uprights diverging from their upper ends at which the oppositely-placed up-
95 rights are connected, two horizontally-disposed members or tracks suspended between the uprights, one of said tracks being circuitous or endless and extending around about the outside of said uprights, a hoist-block or traveler adapted to move along on said tracks,
100 means intermediate of said hoist-block and its track whereby it is normally held from movement in one direction, and means connecting with said hoist-block or traveler, whereby its operation is controlled from one
105 end of the tramway, substantially as shown and for the purpose described.

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