

No. 694,378.

Patented Mar. 4, 1902.

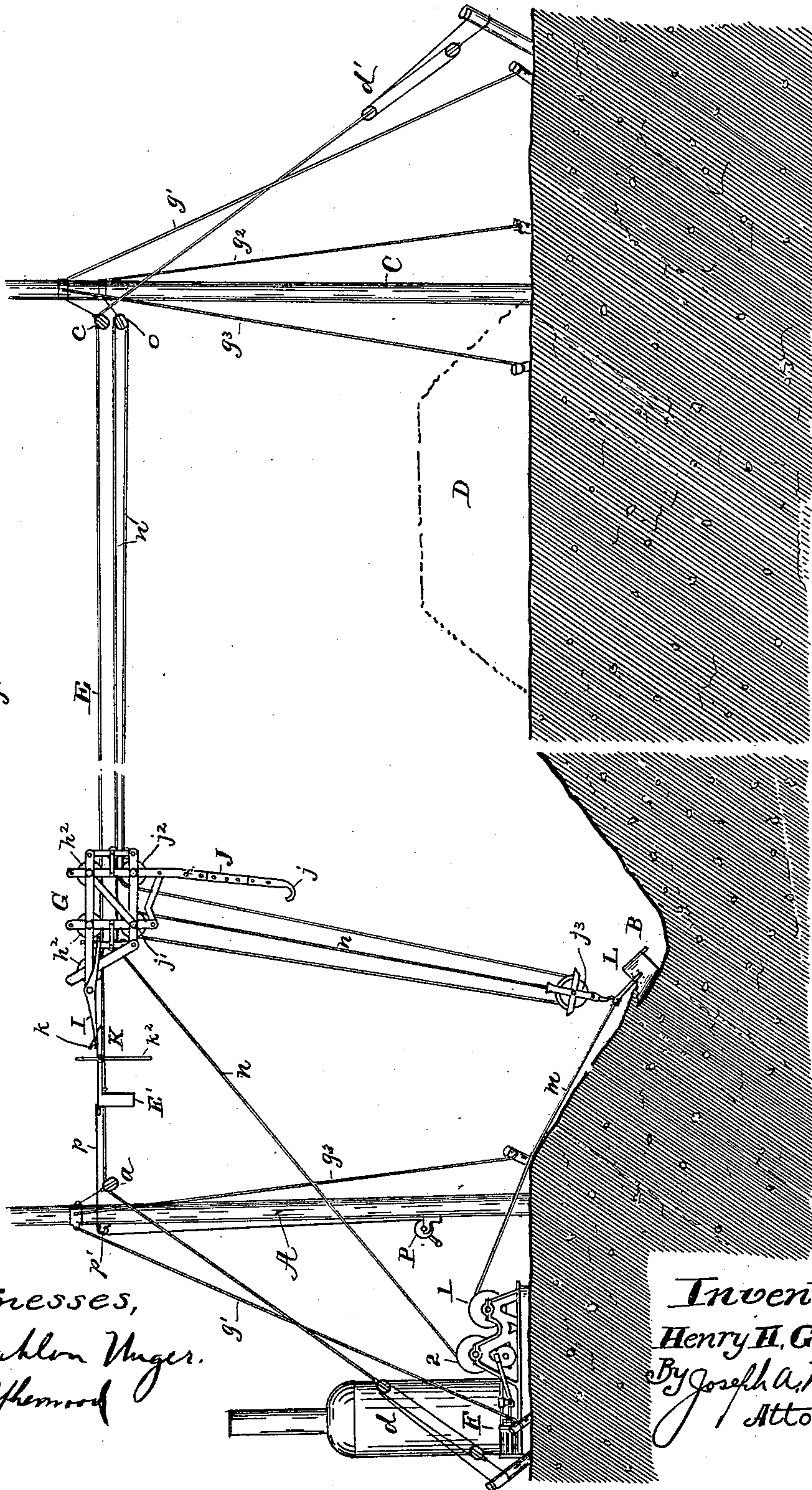
H. H. GUFFIN.
HOISTING AND CONVEYING APPARATUS.

(Application filed Apr. 22, 1901.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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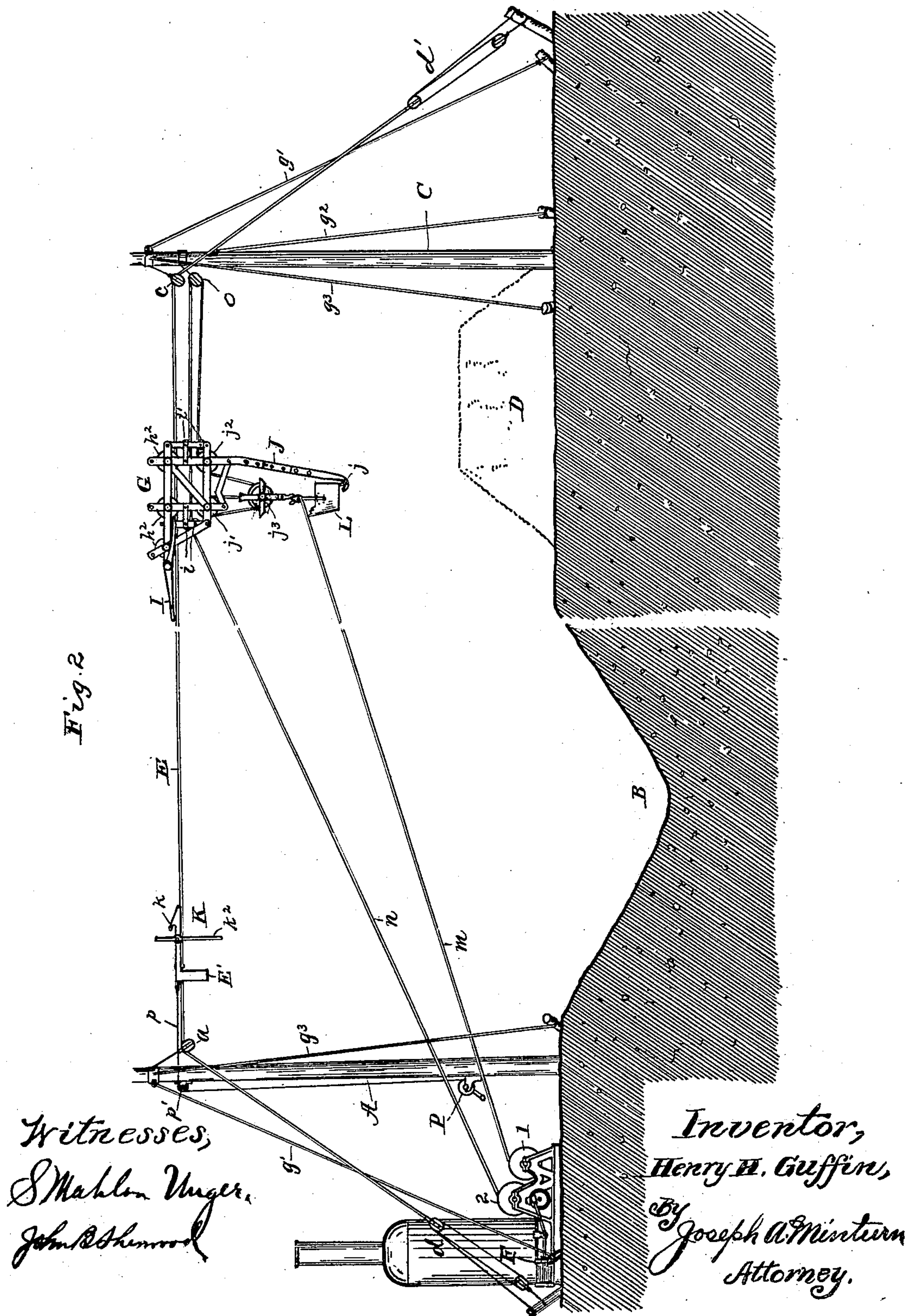
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4 Sheets—Sheet 2.

Fig. 2



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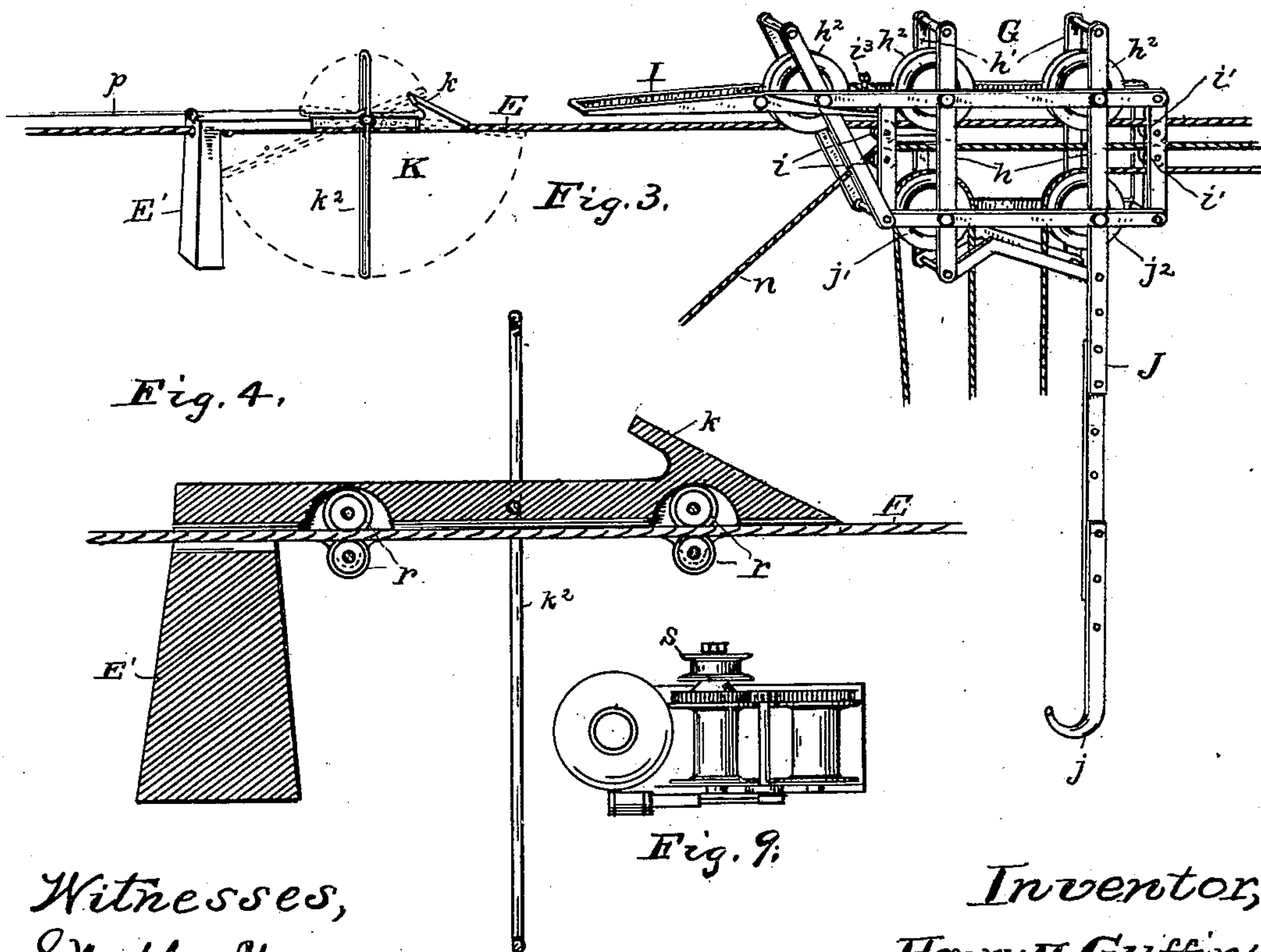
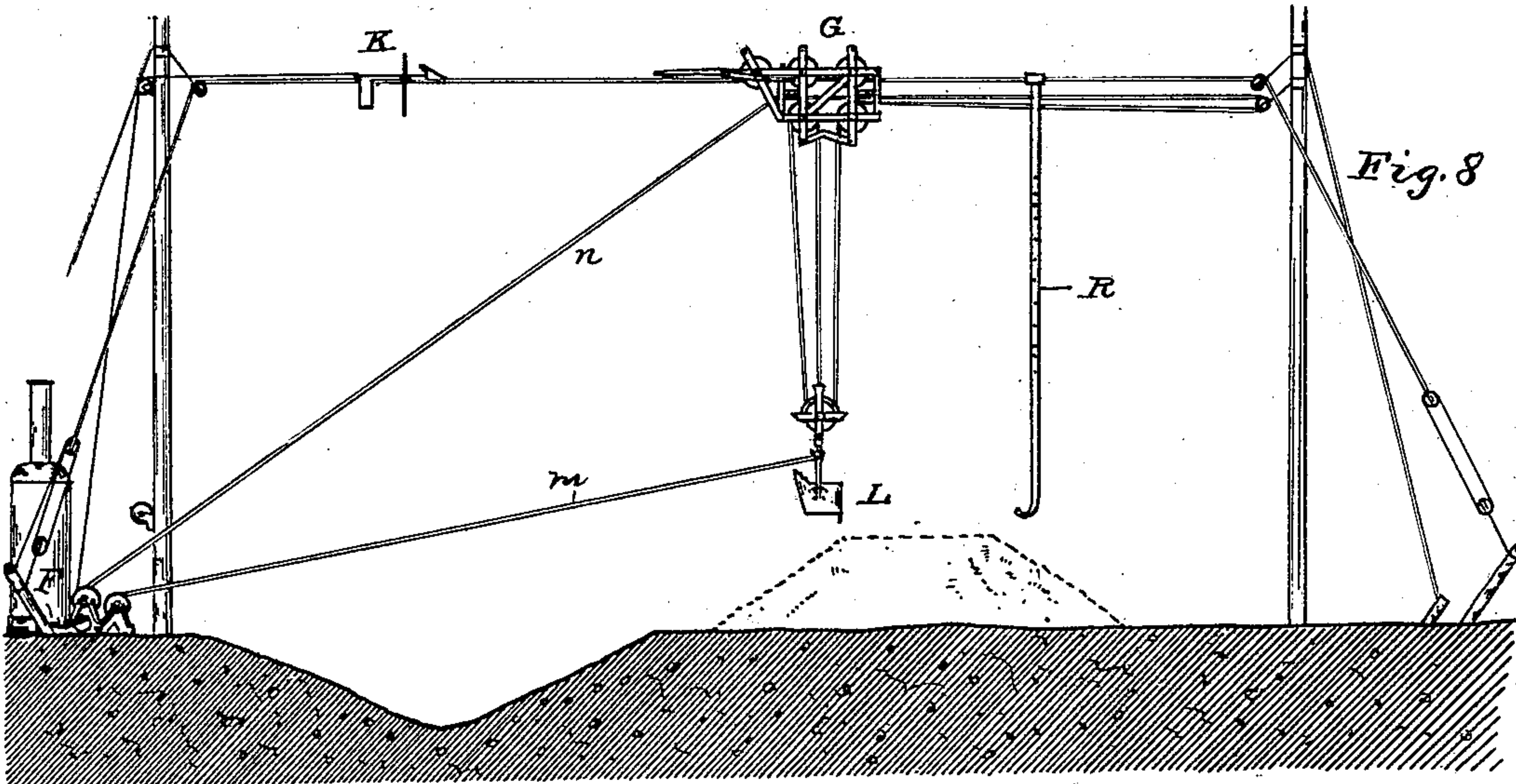
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4 Sheets—Sheet 3.



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(No Model.)

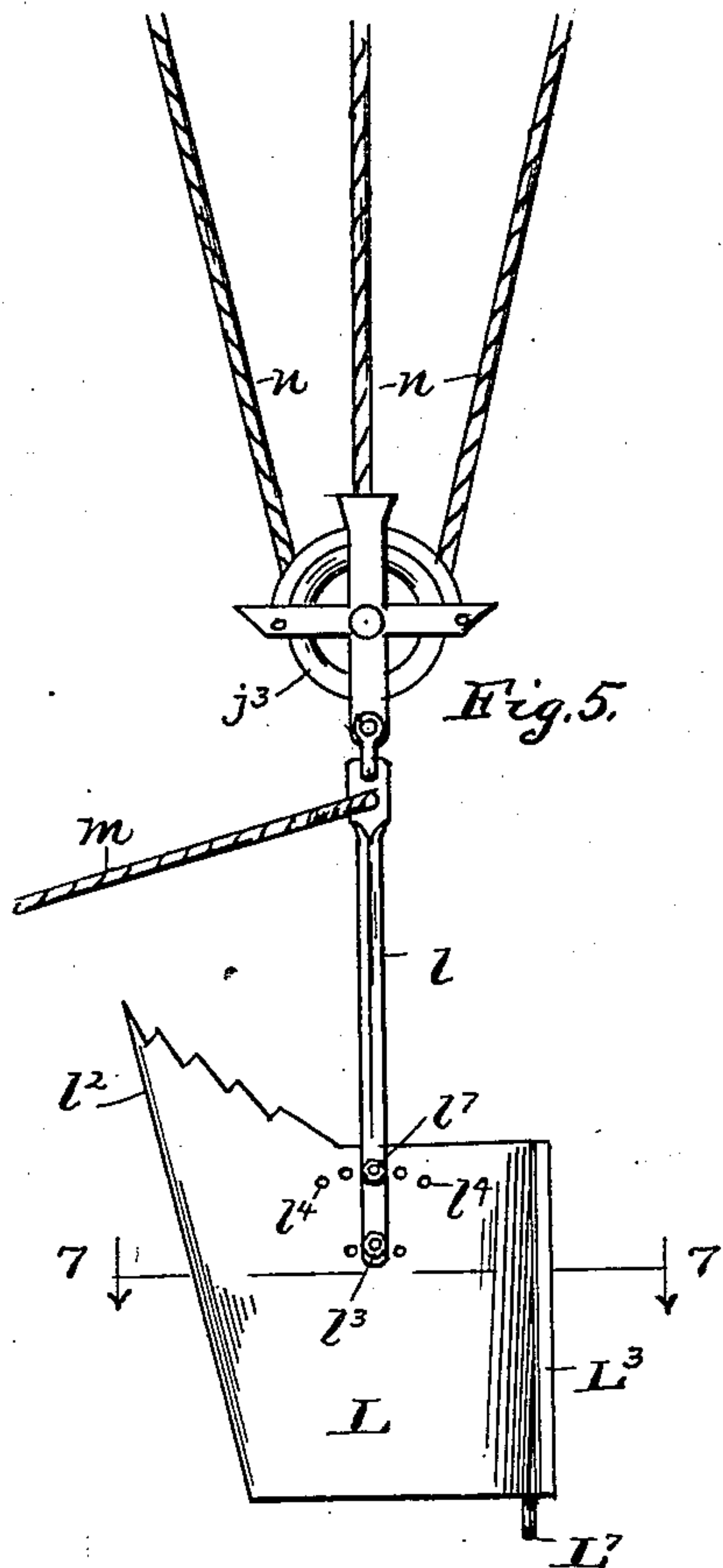


Fig. 5.

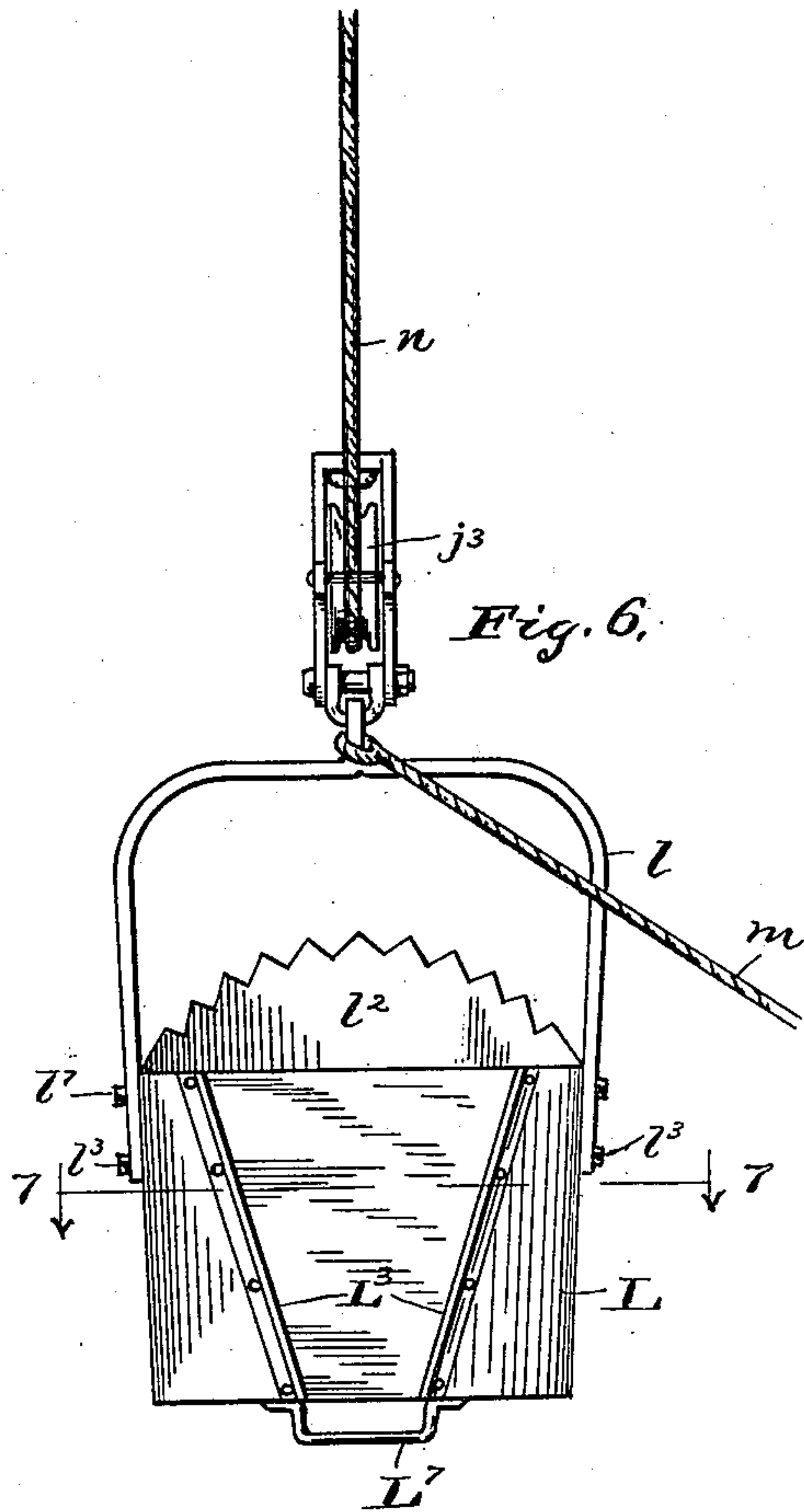
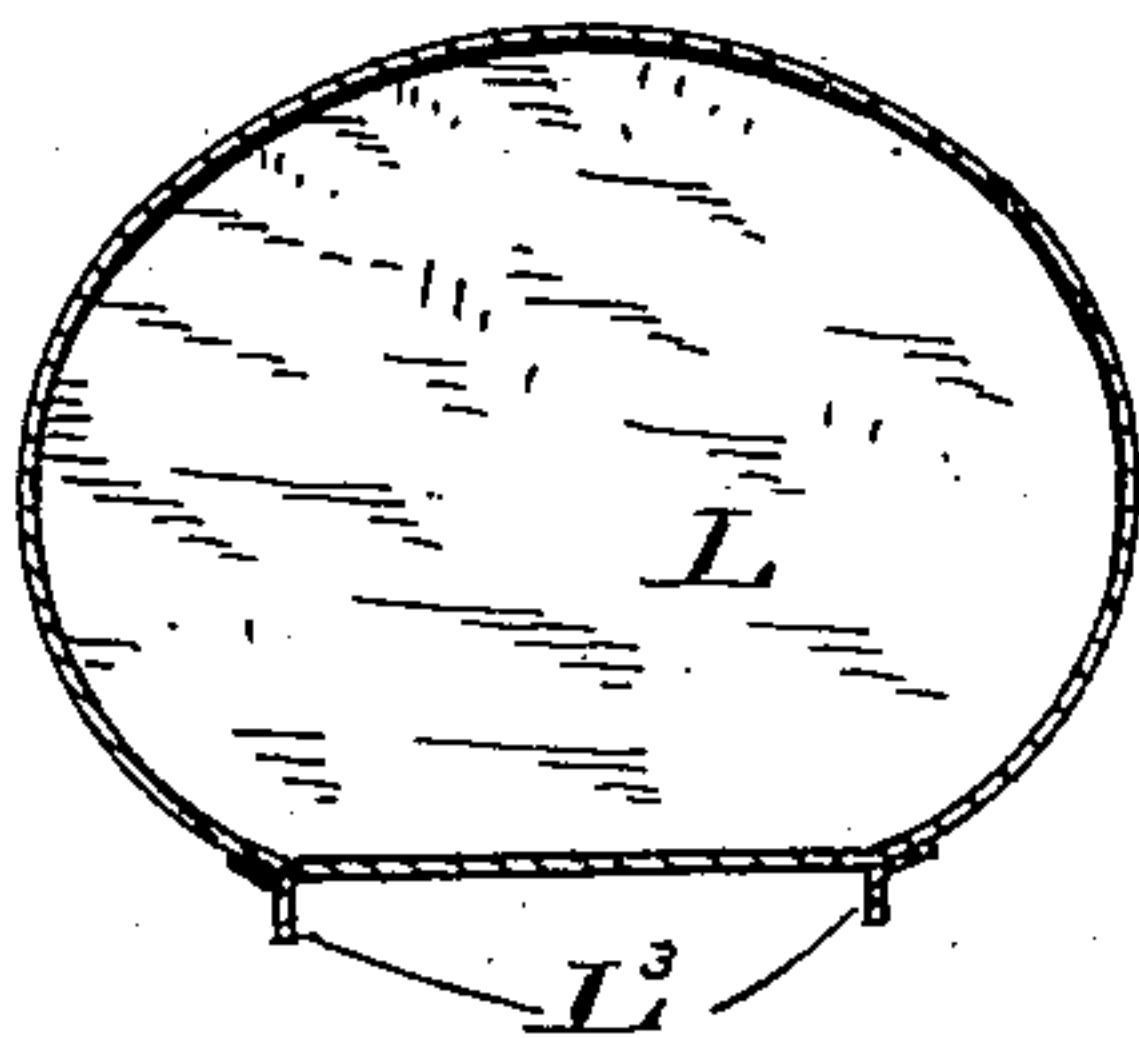


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

HENRY H. GUFFIN, OF INDIANAPOLIS, INDIANA.

HOISTING AND CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 694,378, dated March 4, 1902.

Application filed April 22, 1901. Serial No. 56,870. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. GUFFIN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Hoisting and Conveying Apparatus, of which the following is a specification.

This invention relates to improvements in hoisting and conveying apparatus in which a traveling carriage runs on a tram rope or cable, the load to be conveyed being supported by suspension from said carriage and the carriage and load being controlled and drawn back and forth on the tram-rope by means of cables or ropes operated from a hoisting-engine.

The object of the invention is to provide means whereby a two-drum engine can be made to do the work of a three-drum engine in performing the combined work with two cables, of excavating the material to be transported, hoisting same, and then conveying it to the place of discharge and discharging it. This work heretofore has required three ropes or cables where I use only two, and has required a three-drum engine instead of a two-drum engine, which I am able to use, thereby cheapening the cost of a hoisting and conveying outfit, reducing the number of parts to keep in repair, and simplifying and making easier the operator's work by lessening the number of parts to be handled by him in controlling the mechanism.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a hoisting and conveying apparatus embodying my improvements, in which is shown the receptacle at the bottom of the pit being loaded preparatory to being hoisted and conveyed; Fig. 2, a like view showing the traveling carriage advanced and the receptacle about to be inverted to dump the load; Fig. 3, a detail in perspective of the carriage and the lock for holding it in position over the pit; Fig. 4, a vertical section of carriage-locking device, showing the friction-rollers on which said lock is mounted; Fig. 5, a side elevation, and

Fig. 6 a rear elevation, of the preferred form of receptacle; Fig. 7, a section on the dotted line 7 7 of Figs. 5 and 6; Fig. 8, a side elevation of a modified form of my outfit, in which the cord for hauling in the carriage-lock is attached to the sheave-wheel of the engine and in which the hook for dumping the bucket is suspended from the tramway instead of from the carriage; and Fig. 9 is a plan view of a two-drum hoisting-engine of common form.

Like letters of reference indicate like parts throughout the several views of the drawings.

My invention is designed for use in excavating and conveying earth, sand, gravel, and the like. It is adapted for use in excavating trenches, canals, &c., and especially for taking sand and gravel out of pits where the commercial value of the material excavated for building purposes and the like is the sole purpose of moving it and the low price to be obtained requires an apparatus that can be installed cheaply and operated rapidly at small cost.

I have shown in the drawings an apparatus containing my improvements as they would appear in use for excavating gravel from a gravel-pit.

The device here shown consists of a support A, placed on one side of the pit B, and a second support C, called the "dump-mast," placed on the opposite side of the pit far enough away to allow room for the making of a gravel-pile D with the excavated gravel.

E is the tram rope or cable, which extends across the pit or proposed pit from one support to the other, where it is carried over sheaves *a* and *c*, attached to the respective supports A and C, and the ends of the cable are attached to one of the blocks of the tackles *d d'*, which are anchored to the ground, as shown in Figs. 1 and 2. These tackles are used to tighten up the cable E. By having a tackle at either end of the cable there are two chances to adjust and make the cable taut; but a tackle at only one end of the line might be used instead of one at each end. The supports are firmly anchored to the ground by the guys *g'*, *g''*, and *g'''*, as clearly shown in Figs. 1 and 2.

F is a hoisting-engine of any suitable and well-known construction, having two winding-drums 1 and 2.

G is the carriage, having the side frames $h h'$, the construction of which is clearly illustrated in Fig. 3. This frame has three grooved wheels $h^2 h^2 h^2$, which rest on the cable and upon which the carriage travels along said cable. The frame also has the two pairs of idlers $i i$ and $i' i'$ and the two sheaves j' and j^2 and the extensible rod J, terminating with the hook j . The frame also has the latch-bar I, pivotally secured to the front end of the carriage to engage a lock K on the cable over the pit where the carriage is to halt during the filling of the receptacle. This latch consists of two bars or levers parallel with the cable connected by transverse bars at their ends and pivoted to the front of the carriage at about their centers. A set-screw i^3 forms an adjustable stop to arrest the upward movement of the adjacent cross-bar of the latch and to prevent the transverse bar at the opposite end from dropping down into chafing contact with the cable E.

The receptacle L, which is used to excavate and transport the sand and gravel from the pit, is made preferably of iron or steel and is nearly elliptical in cross-section and is provided with an adjustable bail l , which is secured to the walls of the receptacle opposite its longer diameter. The front of the receptacle has the upper extension l^2 , with serrated edge to more readily penetrate the earth and cause the receptacle to fill as it is drawn forward in the pit by its bail l , and in order to regulate the "bite" of the receptacle into the earth I make the bail adjustable, whereby its angular relation to the front wall of the receptacle can be changed to suit the conditions of the earth to be excavated. The lower ends of the bail are pivotally secured to the sides of the receptacle by the bolts l^3 , and on circles concentric with said pivots are a series of holes l^4 , through which bolts l^7 are passed. The angular position of the bail can be changed by changing bolts l^7 from one set of holes to another. Holes on either side of the bolts l^3 permit of adjustment there also.

The rear of the receptacle is flattened and provided with external flanges L^3 , which approach each other at their lower ends to act as guides to direct the hooked end of rod J of the carriage down to the horizontal bar L^7 at the bottom of the receptacle. The hook of rod J engages this bar L^7 , and when so hooked and the receptacle released by the slacking of the rope or line supporting it the receptacle is dumped by swinging down around this hinge-like support. The bail l has a central lug, through which are two eyes, to the upper one of which the frame of a sheave j^3 is attached, and to the lower eye the rope m , called the "load-line" or "inhaul-line," is fastened. This line m passes thence to the drum 1 of the engine and is wound upon it. When the receptacle

is at the bottom of the pit, it is drawn toward the engine and filled by the winding of the line m upon the drum 1.

The rope n , called the "hoist-line" or "out-haul-line," which is wound upon the drum 2, passes thence between the idlers $i i$ of the carriage and also between the idlers $i' i'$ of the carriage, thence around a sheave in a block o near the top of the mast C, thence around the sheave j^2 on the traveling carriage, thence down and around the sheave j^3 of the receptacle L, thence up and around the sheave j' on the carriage, and thence down to the block or frame supporting the sheave j^3 of the receptacle, where it is made fast.

The drums upon which the ropes m and n are wound are operated by an ordinary hoisting-engine, as before stated, or by any other approved motor, and are provided with the ordinary brakes and levers (not shown) for operating them separately or together.

The lock K consists of a bar laid on top of the cable or tram-rope E. It has the weight E' depending below the cable to lower the center of gravity and maintain the bar in position. The end of the bar toward the carriage G has the oblique surface shown in the drawings terminating at its upper end with hook k , which engages and holds the latch I of the carriage, preventing the carriage from moving away from the lock until its latch-bar is freed from the hook by the bail l^2 . The bail l^2 is pivoted nearest its upper end to the lock-bar K, whereby it is made to stand normally in vertical position. The upper end of the bail, however, is long enough to reach the end of the hook k and serve as a guard when the latch-bar I has passed to the far side of it from entering the hook. In practice when the carriage is held by the lock and it is desired to release it the carriage is moved toward the lock until its latch-bar has passed the bail l^2 . Then the carriage is run back and the latch-bar rides up the bail, over the hook, and the carriage is free.

The operation of my invention is as follows: Taking the apparatus in position shown in Fig. 1, the receptacle at the bottom of the pit is filled by being drawn toward the engine by the winding in of rope m . When full, the receptacle is hoisted out of the pit by the winding of rope n upon its drum 2. The carriage is locked, so it cannot be drawn toward mast C by the winding up of the rope. The receptacle is raised above the hook on bar J, then is let down upon the hook, and then the weight is largely transferred to the bar J. During this hoisting operation the rope m has been slack, but it is now reeled up on its drum and the carriage drawn toward the engine far enough to pass the bail of the lock with its latch-bar. Then, as much of the load of the receptacle is taken off of the outhaul-line n by the support of bar J, the winding of rope n on its drum instead of raising the receptacle draws the carriage and receptacle back to-

ward mast C, the line *m* being loose. When the desired place for dumping is reached, the rope *n* is slacked, which allows the receptacle to swing on hook *j* and invert itself. The carriage is then returned to a locked position over the pit by winding up the line *m*. The receptacle is unhooked by first raising it above the hook by means of line *n*, then lowering it by slacking up on line *n* and causing it to miss the hook by drawing it away with line *m*. The receptacle is lowered into the position of filling with which we started this description, and as the pit may contain water, which may interfere with the complete lowering of the bucket-like receptacle to the bottom of the pit because of its tendency to float, I provide the adjustment of the bail, previously described, to assist in sinking the receptacle by attaching the weight of the sheave and cable where it will have more effective action. This is an additional feature of advantage in the adjustable bail beside that of regulating the bite of the receptacle previously mentioned. As the excavation proceeds the desired place for stopping the carriage and lowering the receptacle changes, and to change the position of the lock on the cable I attach a small cord or wire *p* to the lock K, run it over the pulley *p'* on the mast A, and wind it upon the reel P. By winding this line on the reel the lock will be drawn toward mast A. It can be moved in the outward direction by leaving it hooked to the carriage. Then by slacking up on the line *p* and running the carriage out in the manner heretofore described the lock will be moved toward mast C.

Where a gravel-pile is just being started, and is therefore low, or where the gravel-pit is quite deep, I have found that I can save much time of hoisting the receptacle by not raising it higher than is absolutely necessary to just pass over obstructions. After the receptacle has been raised by rope *n* to the height just mentioned and so the pull on rope *m* would be down instead of up, as in the pit, a pull on the rope *m* will draw the carriage and its load forward enough to unlock it. Then the carriage and its receptacle will move toward the mast C by the winding upon its drum of the rope *n*, because the moving of the carriage requires less power than the hoisting of the receptacle. The receptacle will thus be transported to the dumping-place without being elevated to the hook on the carriage, and a stationary hook suspended from the tram-rope will be required to dump the load. Such a stationary hook is shown at R in Fig. 8.

Where the receptacle is to be filled by hand by men with shovels, the load-line can be dispensed with; but where the load-line is dispensed with the lock for the carriage must have its retaining line or cord loosened each time, so that the lock will be carried out with the carriage in order that the carriage may be returned by reeling in the line, which is

fastened to the lock. In this apparatus a lock mounted on rollers *r r*, as shown in Fig. 4, will be desirable to prevent abrading the cable. Where the line *m* is dispensed with, its drum *l* is not needed and may also be dispensed with.

Most hoisting-engines have a sheave-wheel (see S, Fig. 9) mounted on the end of the drum-shaft, and, if so desired, instead of reeling the line *p* of the lock K by hand it can be wound upon the sheave-wheel by the engine.

I claim—

1. In a hoisting and conveying apparatus, a way, a carriage adapted to travel on said way, a receptacle, a sheave attached to said receptacle, a rope attached to the block of said sheave and passing thence over a sheave in said carriage, thence under the sheave attached to the receptacle, thence over a second sheave in said carriage, thence around a sheave located at a point outside the line of said way, thence back and over an idler located in the carriage, means for operating said rope, and means for dumping said receptacle, substantially as described and shown.

2. In a hoisting and conveying apparatus, a way, a carriage adapted to travel on said way, a receptacle, a sheave attached to said receptacle, a rope attached to the block of said sheave and passing thence over a sheave in said carriage, thence under the sheave attached to the receptacle, thence over a second sheave in said carriage, thence around a sheave located at a point outside the line of said way, a rope attached to the receptacle, means for operating said ropes and means for dumping said receptacle, substantially as described and shown.

3. In a hoisting and conveying apparatus, a way, a carriage adapted to travel on said way, a receptacle, a sheave attached to said receptacle, a rope attached to the block of said sheave and passing thence over a sheave in said carriage, thence under the sheave attached to the receptacle, thence over a second sheave in said carriage, thence around a sheave located at a point outside the line of said way, thence back and through the carriage over an idler located therein, means for operating said rope, means for locking the carriage against movement on said way, means for releasing it, and means for dumping said receptacle, substantially as described and shown.

4. In a hoisting and conveying apparatus, a way, a carriage adapted to travel on said way, a receptacle having a bail capable of adjustment but rigid during excavating and hoisting operations, a sheave attached to said bail, a rope attached to the block of said sheave and passing thence over a sheave in said carriage, thence under the sheave attached to the receptacle, thence over a second sheave in said carriage, thence around a sheave located at a point outside the line of said way, a rope attached to the bail of the receptacle,

means for operating said ropes, a lock to prevent movement of the carriage on the way, means for releasing the lock and means for dumping said receptacle, substantially as described and shown.

5 5. In a hoisting and conveying apparatus, a way supported above the level of the ground, a carriage adapted to travel on said way, a receptacle, a rope attached to the receptacle
10 and passing thence over a sheave in said carriage and around a sheave located at a point outside the line of said way as to the dump-mast, thence back and over an idler located in the carriage, means for operating said rope,
15 and means for dumping said receptacle, substantially as described and shown.

6. In a hoisting and conveying apparatus, a way supported above the level of the ground, and a carriage adapted to travel upon said
20 way, in combination with a receptacle having a bail which can be adjusted and held at different angular positions with relation to the front of the bucket, a sheave attached to the bail, a rope attached to the block of the
25 sheave and passing thence over a sheave in the carriage and thence down around the sheave of the bail and thence over a second sheave of the carriage, thence around a sheave attached to the dump-mast, and a rope at-
30 tached to the bail, each of said ropes being wound upon an independent drum, and said winding-drums and their operating mechanism, substantially as shown and described.

7. In a hoisting and conveying apparatus,
35 a way supported above the level of the ground, and a carriage adapted to travel upon said way, in combination with a receptacle having an adjustable bail and a serrated upwardly-projected upper front edge, a sheave attached
40 to said bail, a rope attached to the frame of the sheave and passing thence over a sheave in the carriage and thence down around the sheave of the bail and thence over a second sheave of the carriage, thence around a sheave
45 attached to the dump-mast, and a rope attached to the bail, each of said ropes being wound upon an independent drum, and said winding-drums and their operating mechanism, substantially as shown and described.

50 8. In a hoisting and conveying apparatus, a way supported above the level of the ground, a hook adjustable in position thereon, a carriage adapted to travel upon said way and having a latch-bar secured to the carriage
55 adapted to engage the hook and lock the carriage, means for releasing the hook to permit it to travel with the carriage, a receptacle, a rope by which the receptacle is supported from the carriage said rope passing over
60 sheaves to form an apparatus for hoisting the receptacle and moving the carriage on the way, a winding-drum upon which said rope is wound, means for operating said drum and means consisting of a hook supported
65 independently of the receptacle to engage a catch-bar on the receptacle for dumping the

load in the receptacle, substantially as described and shown.

9. In a hoisting and conveying machine, a way supported above the level of the ground, 70 a hooked bar adapted to travel on said way, a cord connected to said bar and a reel upon which the cord is wound, a carriage adapted to travel on said way, a latch pivotally secured to the carriage and adapted to engage 75 the hook, means for unhooking the latch, a receptacle, a sheave secured thereto, a rope secured to the frame of the sheave and passing over a sheave in the carriage, thence around the sheave of the receptacle, thence 80 over a second sheave in the carriage, thence around a sheave at the dump-mast and thence to a winding-drum, said winding-drum and means for operating it, and means for dumping the receptacle, substantially as described 85 and shown.

10. In a hoisting and conveying apparatus, a way supported above the level of the ground, a carriage adapted to travel upon said way, a receptacle having a bail and a horizontal 90 bar or bail below its bottom, a rope and tackle for connecting the carriage and receptacle and for actuating the carriage on the way, and a hook supported independently of the receptacle, to engage the bar under the receptacle 95 and assist in dumping said receptacle, substantially as described and shown.

11. In a conveying and hoisting apparatus, a way, a carriage adapted to travel upon said way having a pivoted latch-bar, and a hook 100 adapted to travel upon said way and to engage the latch-bar of the carriage, said hook having a face at an oblique angle, next to the carriage, a cord attached to the hook, a reel upon which the cord is wound and unwound, 105 said hook when its cord is released and it is connected to the carriage, being drawn by the carriage toward the dump-mast and returned by reeling in its cord, substantially as described and shown. 110

12. In a hoisting and conveying apparatus, a way, a carriage adapted to travel thereon, a bar mounted upon the way having an oblique hooked end next to the carriage, said bar being weighted heaviest below the said 115 way, a bail pivoted to the bar to guard the hook and a pivoted latch-bar on the carriage, substantially as described and shown.

13. In a hoisting and conveying apparatus, a receptacle of elliptical form in horizontal 120 section having a bail connected at each end to the receptacle by two bolts, said bail being attached to the receptacle at the widest diameter of the latter, said receptacle having a series of holes to allow an adjustment of 125 the angle of the bail with the front of the receptacle, substantially as described and shown.

14. A receptacle to be used in a hoisting and conveying apparatus, elliptical in hori- 130 zontal section, having a bail attached to its sides at its widest diameter by two bolts at

each attachment, said receptacle having a plurality of bolt-holes whereby the bail may be placed at different angles, the front edge of said receptacle being serrated as and for the purposes specified, and said receptacle having a downwardly-tapering rear flattened side with outwardly-projected flanges on either side of said flattened portion and a horizontal bar projected below the receptacle and below

the termini of said flanges, substantially as is described and specified.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 17th day of April, A. D. 1901.

HENRY H. GUFFIN. [L. S.]

Witnesses:

JOSEPH A. MINTURN,
S. MAHLON UNGER.