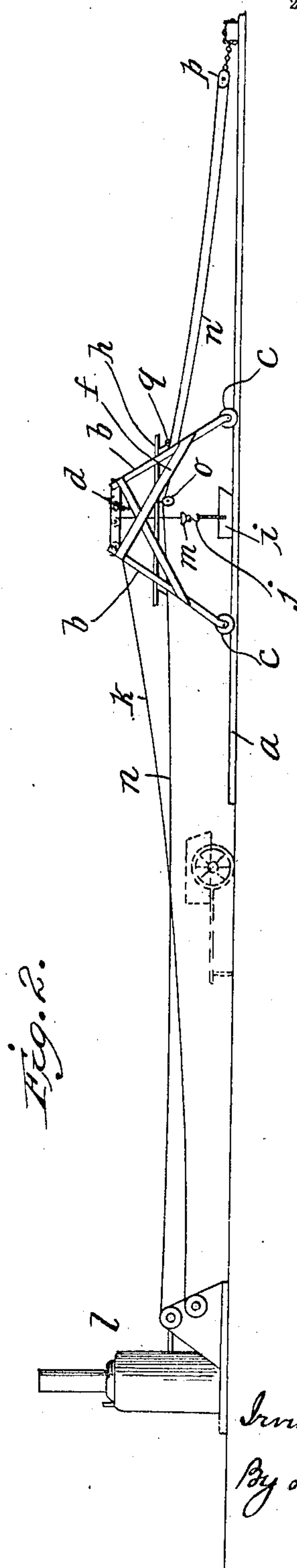
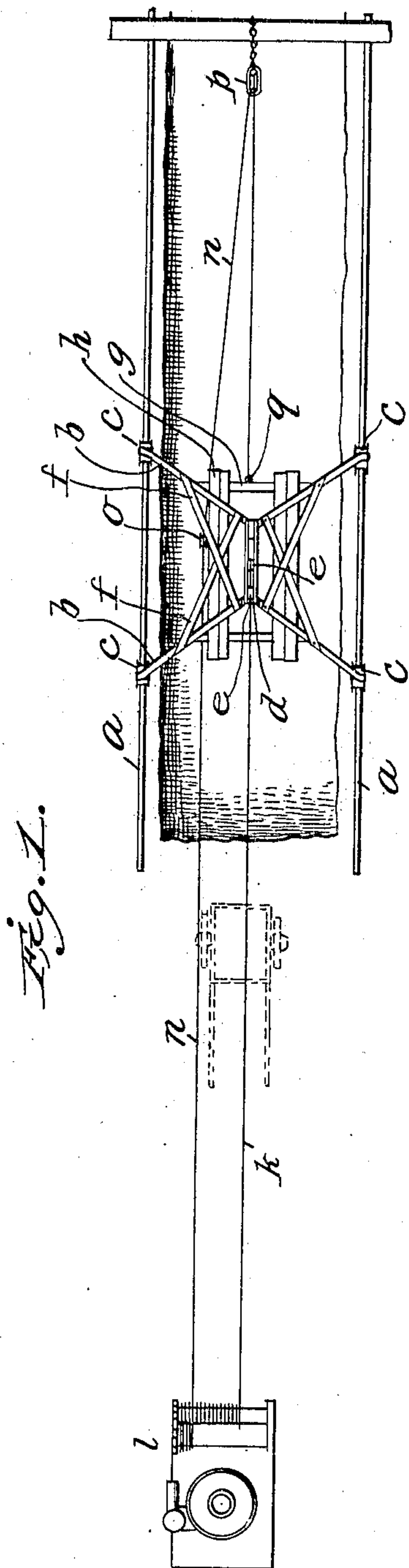


No. 843,239.

PATENTED FEB. 5, 1907.

I. J. SMITH.
CONVEYER FOR EXCAVATING.
APPLICATION FILED OCT. 18, 1906.

2 SHEETS—SHEET 1.



Witnesses

Edwin L. Yewell
L. B. Bridge

Inventor

Irving J. Smith,
By David T. Davis,

Attorneys

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2 SHEETS—SHEET 2.

Fig. 3.

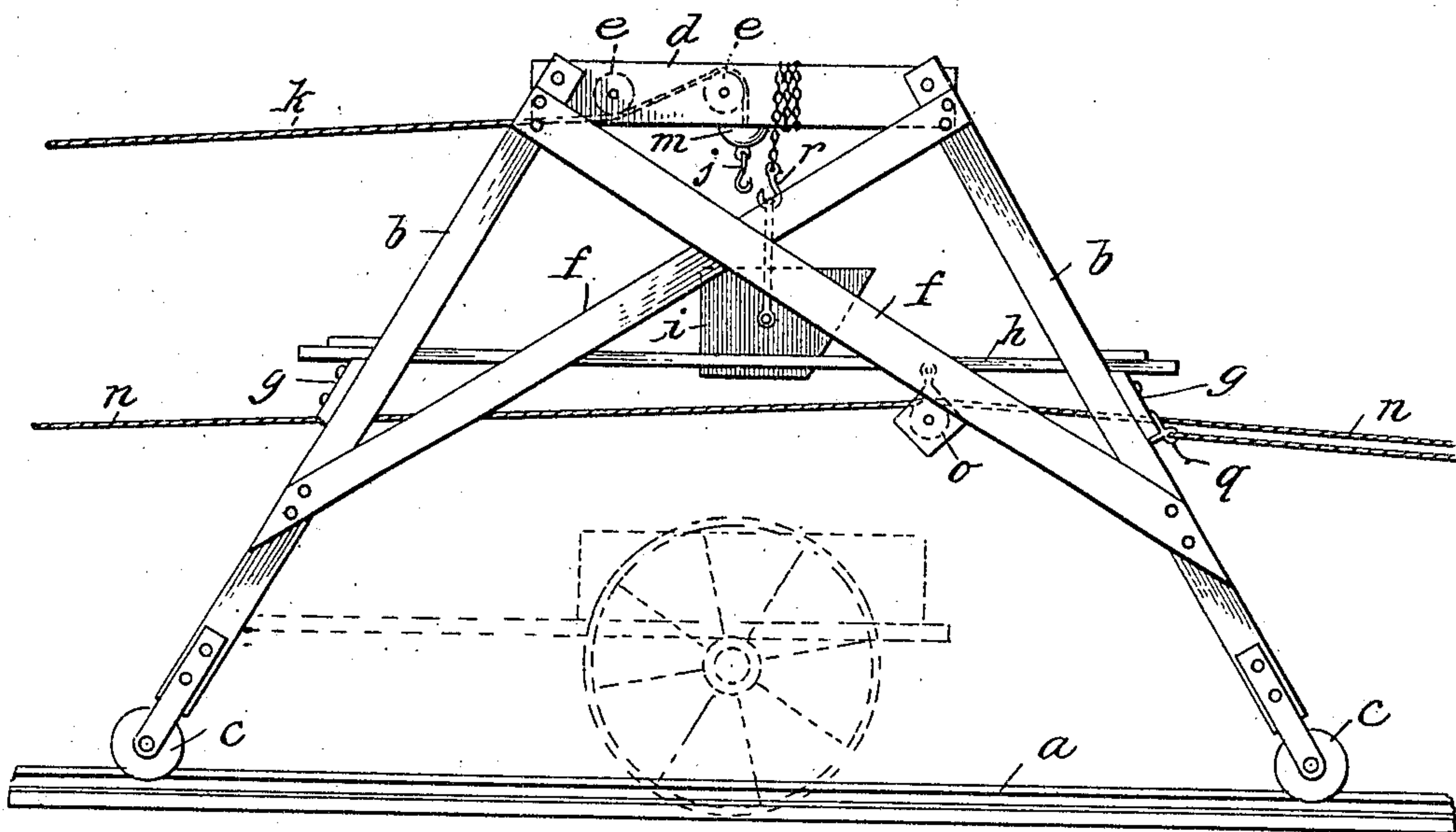
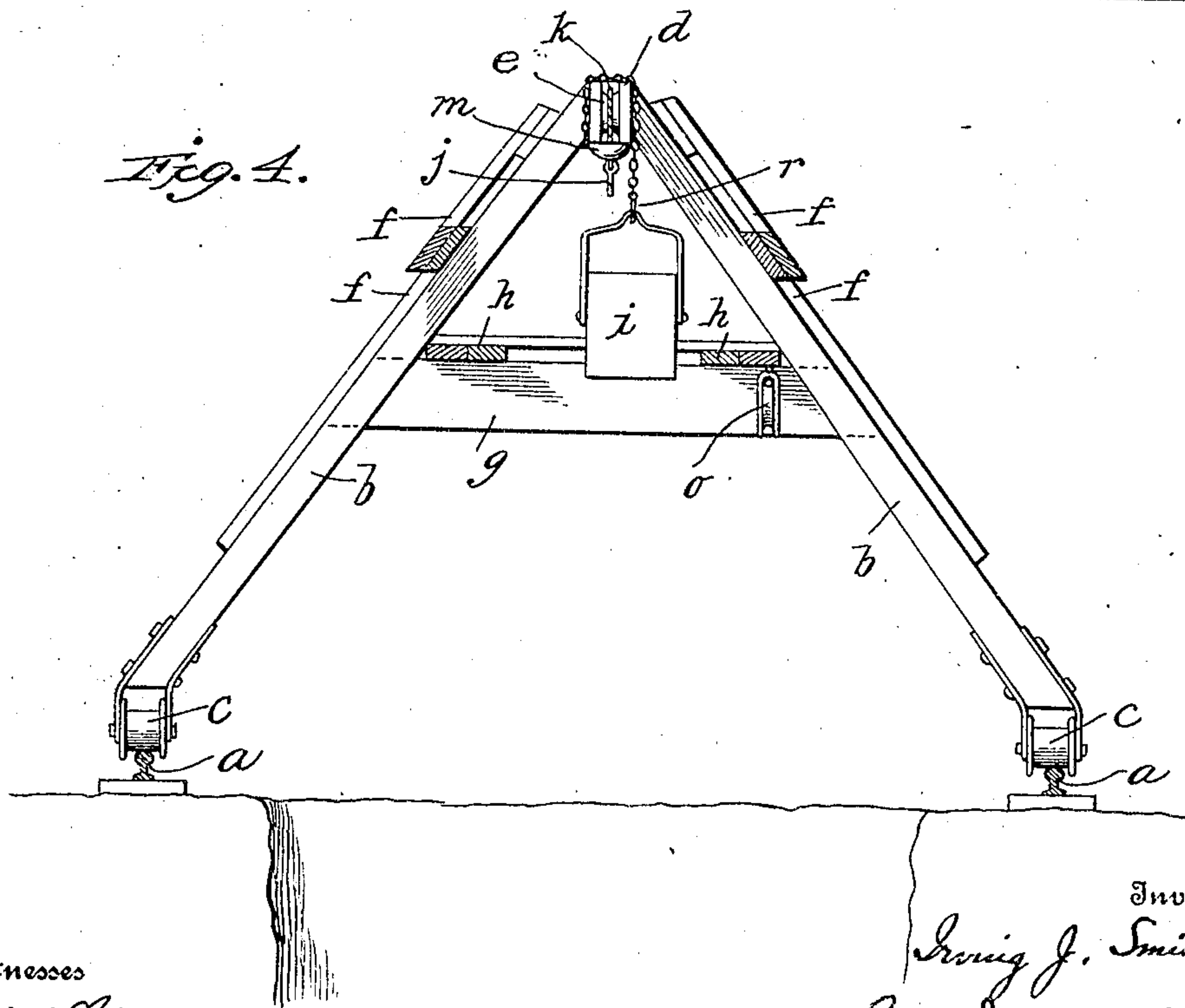


Fig. 4.



Witnesses
Edwin L. Jewell
A. H. Bridge

Inventor
Irving J. Smith
By Davis & Davis

Attorneys

UNITED STATES PATENT OFFICE.

IRVING J. SMITH, OF RICHMOND, VIRGINIA.

CONVEYER FOR EXCAVATING.

No. 843,239.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed October 16, 1906. Serial No. 339 205.

To all whom it may concern:

Be it known that I, IRVING J. SMITH, a citizen of the United States of America, and a resident of Richmond, county of Henrico, State of Virginia, have invented certain new and useful Improvements in Conveyers for Excavating, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view showing my apparatus in position for digging a trench; Fig. 2, a side elevation thereof; Fig. 3, a side elevation in detail of the traveling derrick, and Fig. 4 a vertical sectional view of the same.

The object of this invention is to provide extremely simple and inexpensive apparatus for excavating trenches, the apparatus being so constructed and arranged that the excavated dirt may be carried back from the point of excavation and dumped into a cart for transportation away or be dumped back upon the finished part of the sewer or other structure laid in the trench.

To the accomplishment of this object and such others as may hereinafter appear, the invention consists of the parts and combination of parts hereinafter fully described, and particularly pointed out in the appended claims, reference being had to the accompanying drawings, forming a part of this specification, in which the same reference characters designate like parts throughout the several views.

Referring to the drawings by letters, *a* designates a pair of rails temporarily laid on the ground, one at each side of the trench, these rails extending beyond the trench at both ends. Mounted on the track and adapted to travel back and forth upon the same is a frame or derrick composed of the four corner legs or beams *b*, each of which carries at its lower end a roller *c*, which runs upon one of the rails. The rollers are each provided with two flanges, and its tread surface is considerably wider than the tread of the rail. The object of thus providing the rollers with double flanges and making the bearing portion of the periphery wider than the rail is to permit a limited lateral shifting and oscillation of the derrick without displacing the frame from the rails, thereby avoiding the necessity of laying the rails accurately.

The four corner-posts of the frame incline upwardly and inwardly, thereby giving to the frame a substantially pyramidal shape, the upper ends of the posts being connected

by a pair of horizontal top beams *d*, suitably spaced apart for the reception and protection of a pair of pulleys *e*. Crossed side braces *f* connect the corner-posts at each side of the frame, and horizontal beams or bars *g* connect the corner-posts across the ends of the frame, these cross-bars affording a support for suitable platform-boards *h* for the support of an attendant.

The hoisting-bucket *i* is of any approved pattern, and adapted for connection to its bail is a depending hook *j*, carried at the end of the hoisting-rope *k*, which rope passes up over the central pulley *e* and down under the other pulley *e* and then downward and forward to the drum of the engine *l*. Just above the hook *j* on the rope *k* is affixed a stop *m*, which is adapted to abut against the under side of the beams *d* when the load is lifted to its highest point. Another rope *n* runs from a drum of the engine to the left side of the derrick, where it passes over a pulley-block *o*, and thence to and around the dead-block pulley *p*, fixed to the ground at a point beyond the forward end of the trench. From this dead pulley *p* the rope *n* runs back and is fixed stationarily to the derrick at *q*.

It will be observed that when the filled bucket is hoisted out of the trench through the hoisting-rope *k* the hoisting-rope will first lift the bucket until the stop-block *m* abuts against the top beams of the derrick, and then further pulling upon the hoisting-rope pulls the derrick along the tracks toward the engine to the point of dumping. The earth may be dumped back upon the completed part of the sewer, or it may be dumped into carts which may be backed or driven into a position in line with the travel of the bucket. The arrangement of the ropes *k* and *n* is such as not to interfere with the proper placing of the carts or wagons, the rope *k* being above the vehicles and the rope *n* being carried over to the left side of the apparatus far enough to be out of the way of the teams. It will be observed that the cross-bars *g* are arranged high up on the posts of the derrick, so that the derrick can readily pass over and be caused to straddle the cart, as shown more particularly in dotted lines in Fig. 3. After the load is dumped the engine is operated so as to pull on rope *n* and pay out rope *k*, and the derrick will then be drawn back to the point of loading. In this manner it will be observed that the excavation of the dirt will be accomplished with great expedi-

tion and by the employment of an apparatus which is exceedingly simple and inexpensive in comparison with the trench-excavating apparatus now universally employed, consisting of expensive trestle-work running the full length of the trench and endless cables, &c. A feature of great importance is the arranging of the pull-ropes in such manner that the carts and wagons may be readily hauled into position between the engine and the trench, where the earth that is to be hauled away may be dumped directly into them.

To release the combined hoisting and pulling rope *k* from the strain of the load after the load is lifted out of the trench, and thereby contribute to safety in operation, I employ a supplemental hook *r*, which depends from the top cross-beams of the derrick and is so positioned that it may be engaged in the bail of the hoisting-bucket to take off the strain of the load entirely from the hoisting-rope, so that this rope shall not have on it the combined strain of lifting the loaded bucket and drawing the derrick to the dumping-point. It will be observed also that the hoisting and pull ropes are so arranged as to be out of the way of the workmen who are at work in the trench and also that the derrick is so constructed that it may be hauled back and forth upon the tracks without interfering with or injuring any of the workmen along the trench, this being accomplished by locating the cross connecting-bars *g* at a point high up upon the corner-posts of the derrick-frame.

By arranging the side braces *f* in the manner shown it will be observed that the sides of the derrick are open and unobstructed, thereby permitting the workmen to have free access to the trench at both sides during the loading of the bucket.

I have shown an engine with two drums; but it is obvious that I may use any other mechanism or engine for operating the hoisting and pull ropes. It is also obvious that instead of employing the simple hoisting-bucket shown I may employ a scraper-bucket and attach the same to the hoisting-hook *j*, so that the mere act of hoisting the scraper will cause the same to be filled in a manner well known.

Another feature of importance lies in the peculiar manner of constructing the derrick-

frame, whereby is given a considerable resilience, thereby enabling it to adjust itself to compensate for considerable inequalities and unevenness in laying the tracks, thus avoiding the necessity of any great care in laying the rails. This yielding capacity in the derrick-frame is obtained by using a four-post frame and connecting the posts together at points high up from the ground.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In apparatus for excavating trenches, rails laid alongside the trenches, a derrick or hoisting frame adapted to travel on the rails, an engine located beyond one end of the trench, a combined hoisting and pull rope *k* extending from a drum of the engine to the top of the derrick and provided with a hoisting-hook and a stop, a hoisting-bucket carried by said hook, a stationary or dead pulley at the far end of the trench, a pulley on the derrick at one side of the center thereof, and another pull-rope *n* extending from the drum of the engine forward over the pulley at the side of the derrick and forward to the dead pulley and back again to the derrick where it is attached, substantially as set forth.

2. In an apparatus for excavating trenches, rails laid alongside the trenches, a derrick or hoisting frame adapted to travel on the rails, an engine located beyond one end of the trench, a combined hoisting and pull rope *k* extending from a drum of the engine to the top of the derrick and provided with a hoisting-hook and a stop, a hoisting-bucket carried by said hook, a stationary or dead pulley at the far end of the trench, a pulley on the derrick, and another pull-rope *n* extending from the drum of the engine forward over the pulley on the derrick and forward to the dead pulley and back again to the derrick where it is attached, substantially as set forth.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 13th day of October, 1906.

IRVING J. SMITH.

Witnesses:

C. G. BURTON,
WM. P. REDD.