

(No Model.)

2 Sheets—Sheet 1.

W. A. FRY.

HOISTING, CARRYING, AND DELIVERING APPARATUS.

No. 329,546.

Patented Nov. 3, 1885.

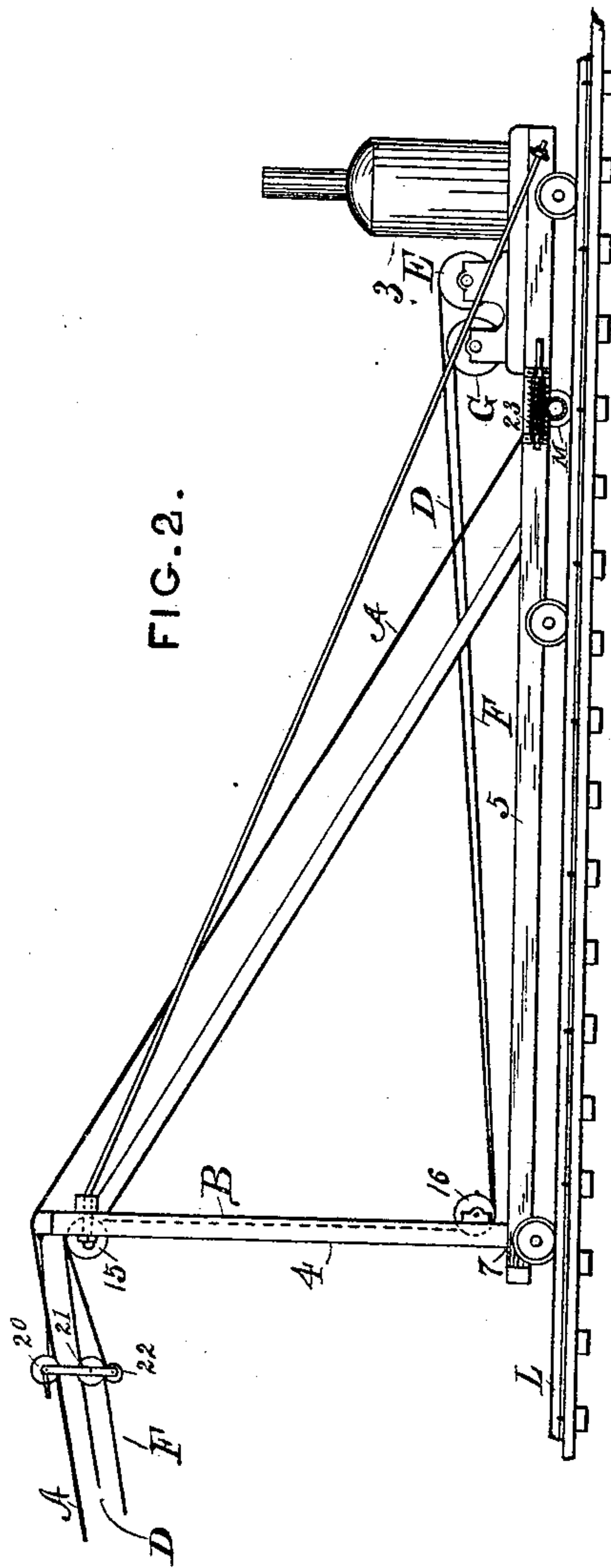
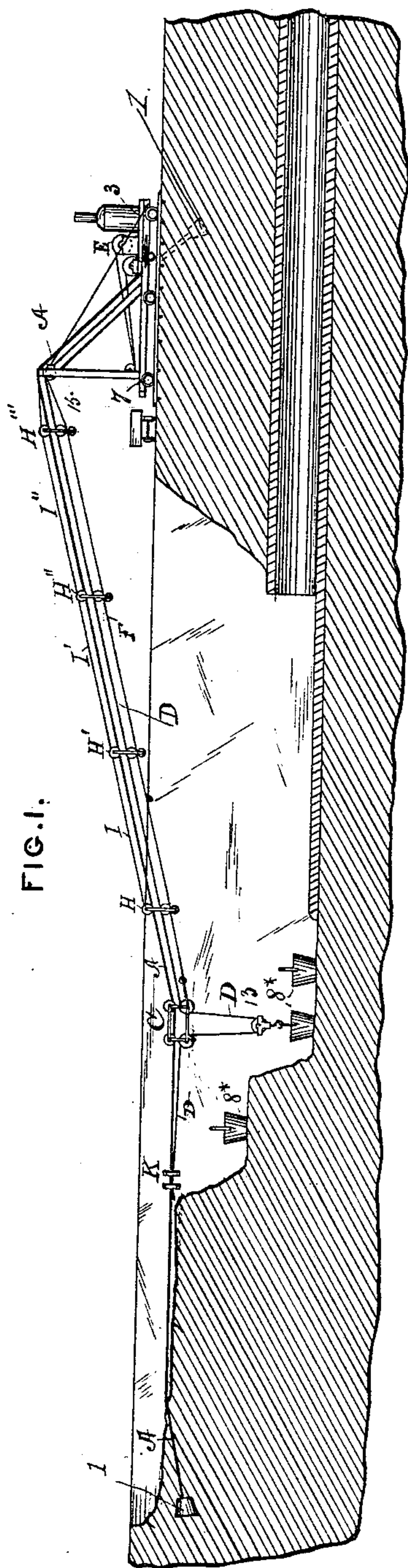
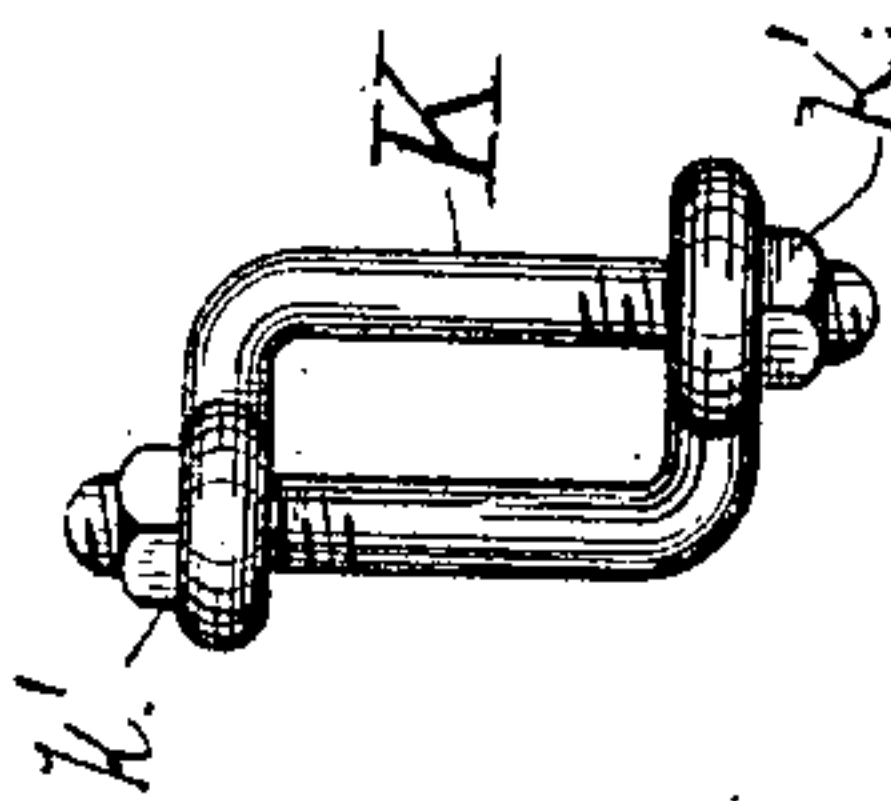


FIG. 3.



Witnesses:

Percy White.
J. E. Edson

Inventor:

William A. Fry
By John J. Hausted for
his Atty.

(No Model.)

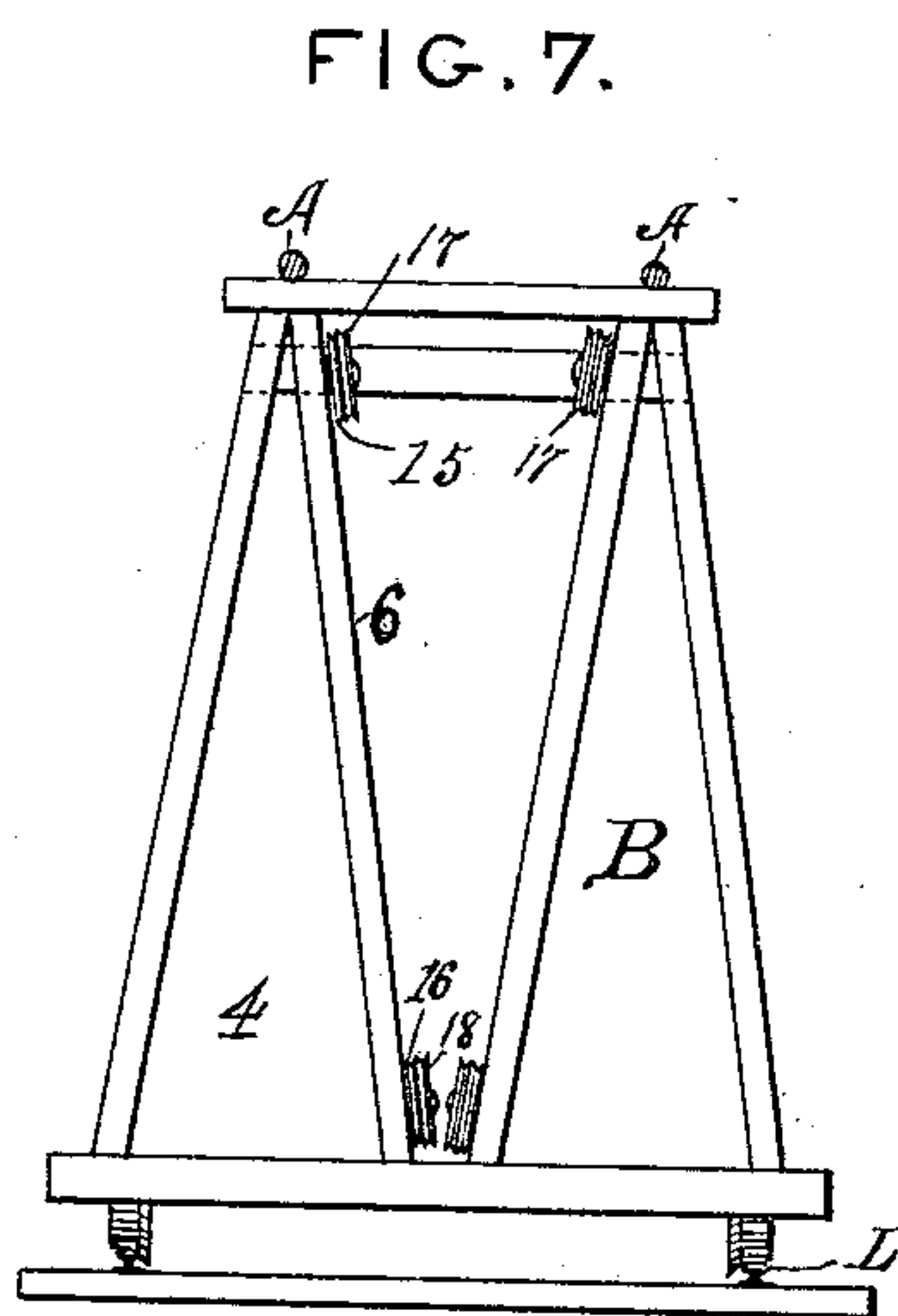
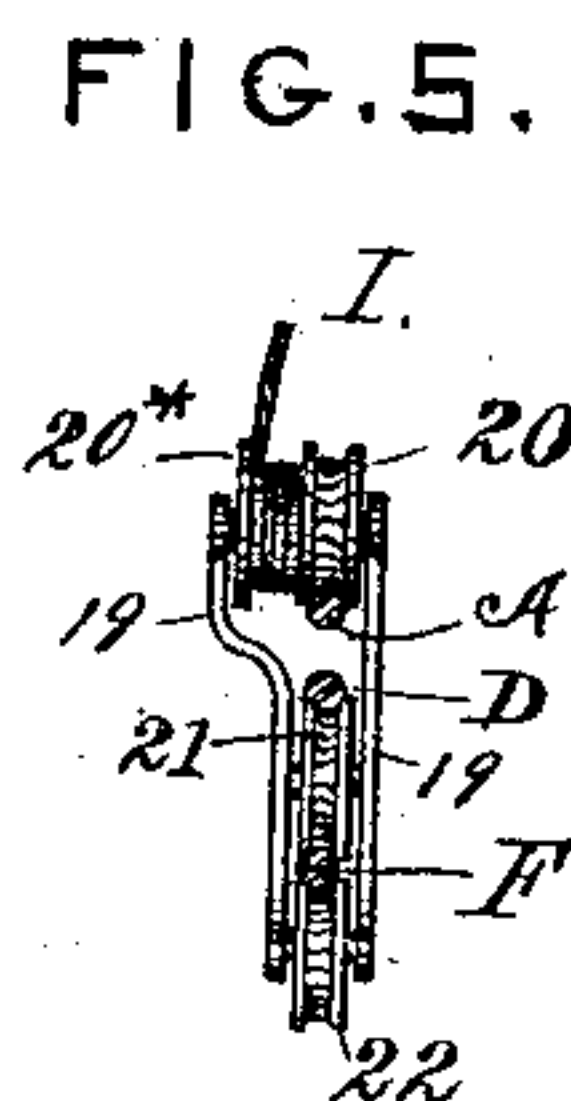
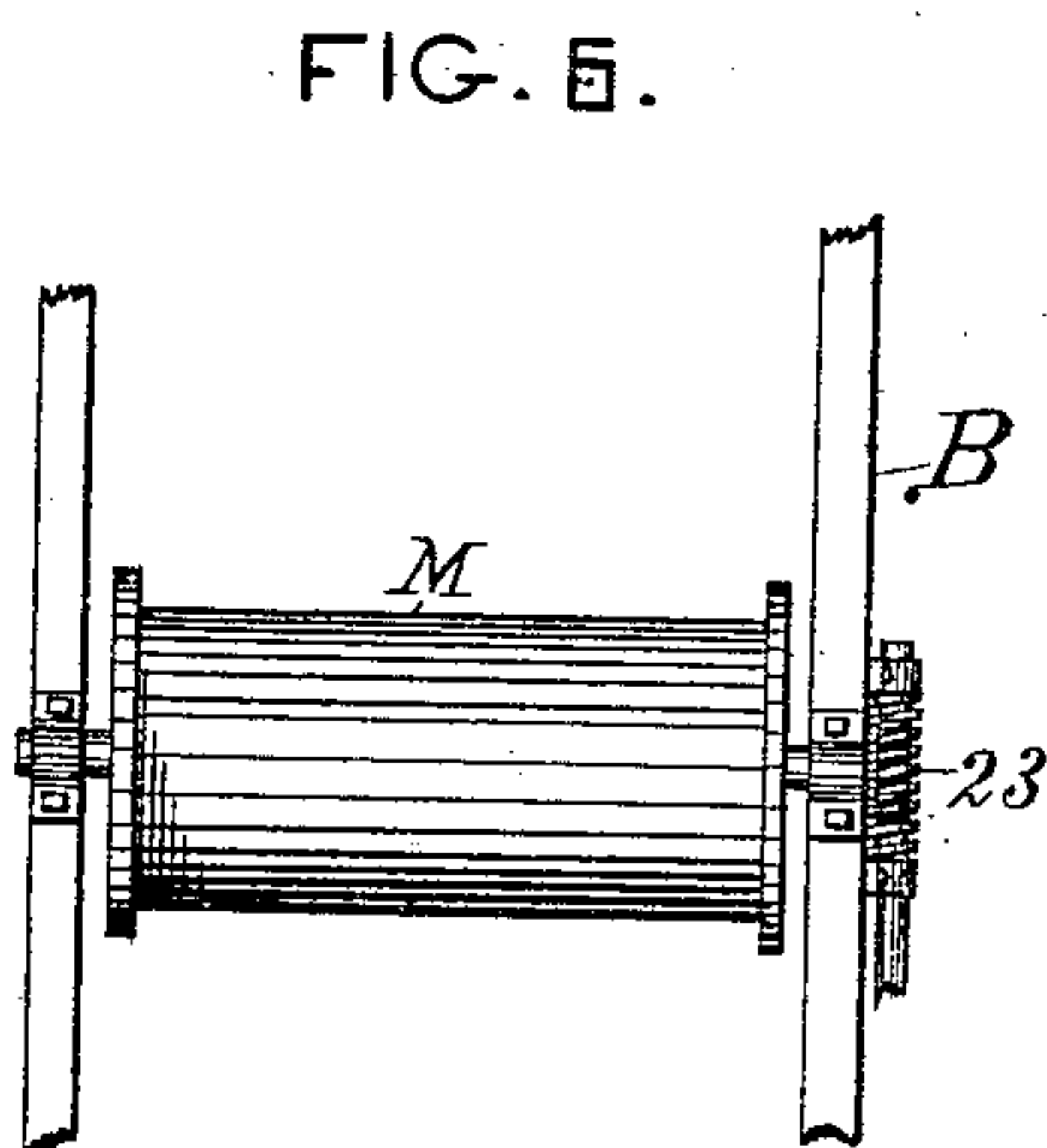
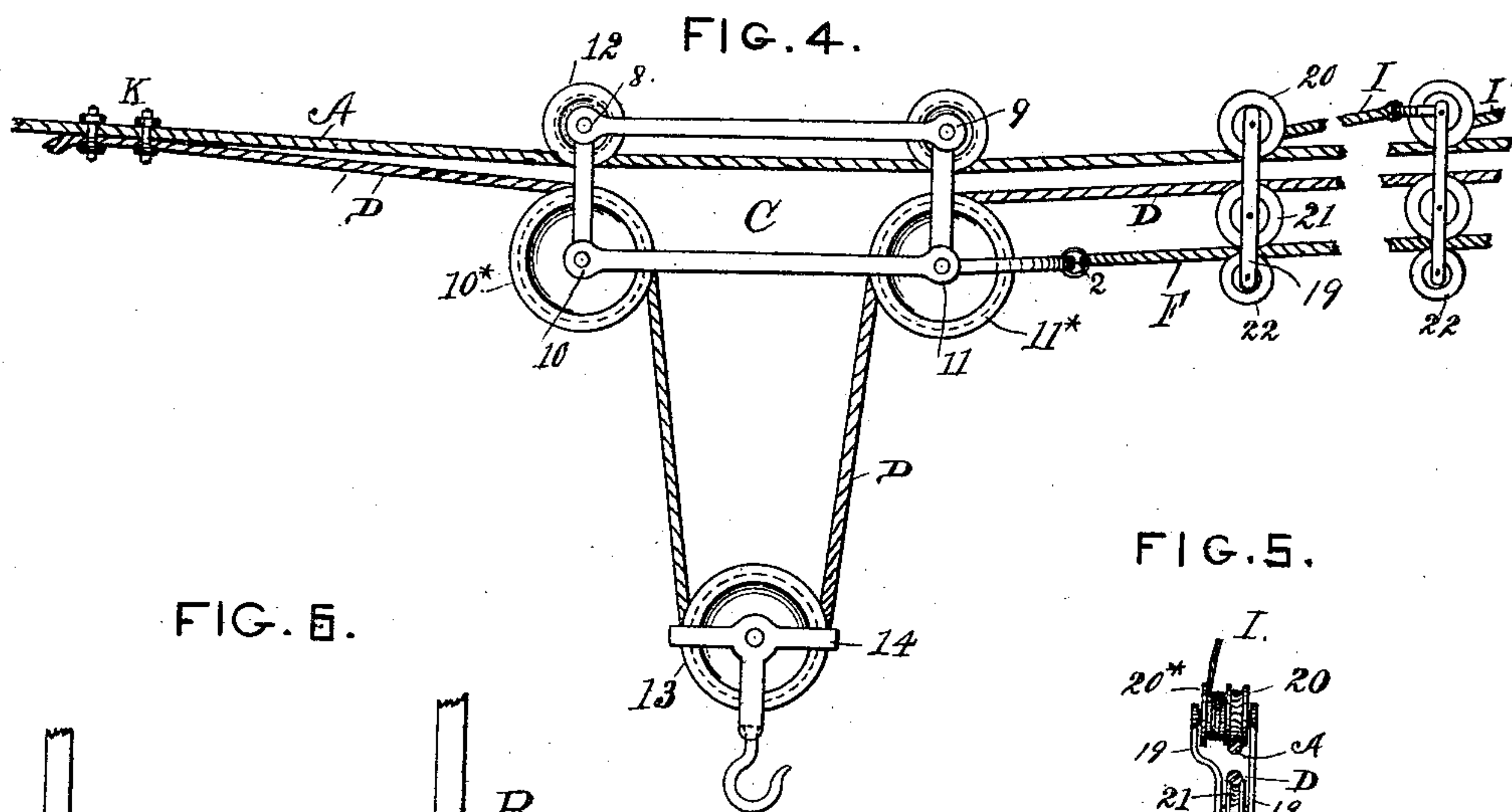
2 Sheets—Sheet 2.

W. A. FRY.

HOISTING, CARRYING, AND DELIVERING APPARATUS.

No. 329,546.

Patented Nov. 3, 1885.



Witnesses:

Percy White.
De Feo

Inventor:

William A. Fry.
By John J. Hallsted for
his attorney

UNITED STATES PATENT OFFICE.

WILLIAM A. FRY, OF WASHINGTON, DISTRICT OF COLUMBIA.

HOISTING, CARRYING, AND DELIVERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 329,546, dated November 3, 1885.

Application filed July 2, 1885. Serial No. 170,531. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. FRY, a resident of Washington city, in the District of Columbia, have invented certain new and useful Improvements in Apparatus or Machinery for Hoisting, Carrying, and Delivering Heavy Bodies, such as Earth, Stone, &c.; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a simple, efficient, and economical apparatus whereby large and heavy bodies may be lifted or hoisted, carried when raised, and deposited or delivered at the desired point—as, for instance, at another place in an excavation, or into cars, wagons, or vessels; and it is also applicable for loading and discharging coal-vessels, lifting out of hatchways and carrying the coal to and delivering it in the coal-yard.

The special construction, arrangement, and operation of the devices will clearly appear from the following.

In the drawings, Figure 1 is a view in elevation illustrating an apparatus embodying my invention and in position for actual use as adapted for hoisting earth, stone, &c., from deep excavations, carrying it directly back for again filling up such excavations step by step after the underground work—such as masonry, sewers, &c.—have been progressively built; Fig. 2, an enlarged partial view in elevation showing the balance frame and connections and an engine supported on such frame; Fig. 3, a detail showing a clip enlarged; Fig. 4, a partial view enlarged showing the articulated carriage and its connections; Fig. 5, an edge view of one of my traversing take-up devices enlarged; Fig. 6, a drum and its connections enlarged, for tightening and holding the cable; and Fig. 7, an end view of the balance-frame.

A is a metallic or other fixed or “standing” rope, secured at both ends, and serving as a track for the carriage. It is either moored at both ends by anchoring in the ground, as shown at 1 in Fig. 1, or to some fixed object;

or it may be so secured at one end only, while its other end is fastened to a frame, B, and on this frame the steam-engine 3 for working the apparatus is preferably supported. This frame B is a triangular balance-frame composed of an upright part, 4, a long horizontal part, 5, and diagonal braces 6. This frame I prefer to provide with wheels to run on a railway-track, as shown, and the steam or other engine is placed on one end of it, and the weight of the engine not only serves to ballast and steady the frame, but, being placed at the greatest practicable distance from that point, 7, which receives the main thrust and strain when the apparatus is at work, it effectually overcomes any tendency of the frame to be pulled over with that point as a fulcrum-point. This arrangement also permits the frame to be put on wheels and placed on a short railroad-track prepared for the purpose, and which greatly facilitates the shifting of both frame and engine from time to time as the work progresses and advances forward.

Two or more stationary or standing ropes, A, may be used with the same frame and engine, as found desirable; and each standing rope is provided with its own jointed or articulated carriage, C, by the aid of which the buckets 8* or other bodies are hoisted, carried and lowered, and deposited. This carriage is of peculiar construction, its frame being substantially a pendent parallelogram jointed, pivoted, or articulated at each of its four corners, 8 9 10 11, so that when running on an inclined rope the points or corners 10 11 may hang vertically from the points 8 9 under all changes of position of this carriage on its track. The upper grooved guide-wheels, 12, of this carriage run on the rope A, and the lower ones, hung at 10 11, are used for the hoisting-rope D, which rope is clipped or fastened securely at any desired point to the rope A, whence it passes over the grooved pulley 10*; thence downward to and around a grooved pulley, 13, mounted in a frame, 14, provided with a hook on which one of the buckets 8* is hung when in use, and thence upward and around pulley 11*, and thence to and over pulleys 15 16 on the balance-frame B to the lifting-drum E on the bed of the engine, this drum serving thus to lift or lower the bucket, as may be needed.

For traversing the carriage and its suspended bucket or other article along the line of the work, a traversing-rope, F, is employed, one end of which is connected in any suitable manner to the carriage, as shown, for instance, at 2; thence it extends to and over pulleys 17 and 18 on the frame B, and thence to the drum G of the engine, the revolution of which serves to wind or unwind it at the will of the attendant at the engine.

As I claim nothing new in the construction of the engine itself, it need only be said here that the engineer can by any well-known means, as by simply turning a lever or otherwise, throw either or both drums into or out of gear or action at will at any time to wind or to permit the unwinding of either or both of the ropes D or F, and thus either the hoisting or the lowering may continue either while the carriage is running or not running. The hoisting or lowering may also be stopped while continuing to run, or the running of the carriage may be stopped while the hoisting or lowering is going on. Two or more hoisting-carriages, C, may be hoisted and run at the same time by simply providing two or more rope-tracks, A, and the hoisting and traversing ropes as above, and guide-pulleys, one balance-frame, B, and one engine answering for all.

H H' H'', &c., represent a series or set of traversing take-up devices, which run on the track and serve to keep the hoisting and traversing ropes from sagging or becoming slack, and also to keep them practically parallel with the track and with each other, and they severally consist of a frame, 19, in which are journaled a pulley, 20, and its attached winding-drum, 20*, (see Fig. 5,) and grooved pulleys 21 22. The pulley 20 runs on the track A. Pulley 21 runs between and on the ropes D F and pulley 22 beneath and on rope F. A rope, I, say about twenty feet long, extends from drum 20* of H to a similar take-up, H', similarly placed on the track and ropes, and a rope, I', similarly extends from the drum on H' to a similar take-up, H'', and so on for the series, the rope from the last of these small drums being secured to the balance-frame B. When the traversing-rope is in action to cause the carriage to dump or deliver its load, the first one, H, of this series of devices is pushed forward by the advancing carriage C as it or any projection thereon comes against it, and as it moves forward the friction of pulley 20 on the track A causes this pulley to revolve, and thus winds up on its drum 20* the rope I, which reached from it to H', and so on in succession, these devices H' H'', &c., are pushed each one toward the next, and their rope connections I I', &c., wound up and not left to hang down, as otherwise they would do. I thus avoid all liability of their becoming in any way entangled or twisted or obstructing the proper action of the apparatus. When the carriage C runs back, which it will do by

its own gravity on an inclined track, all these devices H H', &c., also run back by their own gravity, and the wound cord or rope of the one nearest the balance-frame B first runs out, stopping the device at its original place of suspension on the track A. Then the next one unwinds its cord till it runs out, and so on, each one successively resuming its original place if the carriage be run back far enough.

Clips K, of any appropriate kind, may be used to fasten the hoisting-rope D to the cable or rope A. A desirable form of such clip is shown on an enlarged scale in Fig. 3. By tightening its nuts k' it binds and clips these ropes firmly together as closely as may be needed. The shifting of these clips to a different position upon the rope allows the limit of descent of the buckets, &c., to be varied as desired without any derangement or alteration of any other part of the apparatus. Clips may be dispensed with, and the end of rope D may be permanently fastened to the same mooring with cable A. This cable A may be of any length desired, dependent on the character of the work, and even to the length of several hundred feet or more, so that when the apparatus is ready for working, a long range of work or of excavating and of filling up after excavating may be done without need of moving the engine and balance-frame, or of re-mooring the rope or cable A; but when such moving is done the railway-track L may be extended accordingly over the ground last filled up. In some cases (dependent on the character of the work) the cable A need not be inclined. In such case the empty buckets or the carriage may be pulled back by a cord or rope instead of by gravity. As a rule, it is better to make a full hoist of the bucket or other article to be raised and carried before causing it to run or travel toward its place of delivery. I tighten the cable or cables A to the required degree by means of a drum, M, on the frame B, and this drum may be held from revolving by a common ratchet and pawl; but I prefer to use a worm and gear, as shown at 23 in Figs. 2 and 5, which serve both to tighten the cable and to lock the drum. It will be seen that work may be continued almost the entire distance between the balance-frame B and the moored end 1 of cable A before it will be needful to shift the apparatus to a new position.

The machine works very easily and rapidly, and I find by practical use that it will do the work of many men and many horses and carts or cars, and far more economically and satisfactorily. It is adapted for light as well as for the heaviest kind of work in engineering, railroad construction, certain kinds of tunneling, and the like; and by shifting as desired the position of the balance-frame and engine the raised articles can be deposited at any desired point within a circle whose radius is equal to the distance which the carriage may travel on its cable, this flexible cable and its connec-

tions readily permitting this, as there is no trestle-work for supporting a track to be taken down and rebuilt.

For many purposes the railway-track L may be dispensed with—as, for instance, for discharging from vessels into warehouses and for varieties of light work, and where the work is not a progressing one—and the flexible track-cable A may be fastened at that end where the power is applied directly to the ground or to a building or any fixed object.

I claim as my improvements in apparatus for hoisting, conveying, and delivering earth and heavy articles—

15 1. In combination, the metallic standing or track rope, the jointed or articulated traveling carriage C, hung thereon, the hoisting-rope D, and traversing-rope F, these parts being arranged for joint action, substantially as set forth.

20 2. In combination with the standing-rope A, the hoisting-rope D, adjustably fastened thereto by clips, and a traveling carriage, substantially as and for the purposes set forth.

25 3. In combination, the track-rope A, hoisting-rope D, fastened thereon, traversing-rope

F, balance-frame B, and a steam-engine supported on such frame, all substantially as set forth.

4. In combination with the hoisting, traversing, and track ropes, and with a railway in line substantially with the course of the excavation, a railway-carriage adapted for such track, and ballasted at its rear end by the engine which operates the hoisting mechanism.

35 5. In combination with the track-rope A, hoisting-rope, and traversing-rope, the series of wheeled devices H H', &c., provided with wheels 20 21 22, for running on said ropes, and connected together and to the balance-frame by cords or ropes I I', &c., as and for the purposes set forth.

6. In combination, the track-rope, hoisting-rope, traversing-rope, and a series of take-up devices H H', &c., connected as described, and each provided with a drum for automatically winding up the slack of the cords or ropes I I', &c., all substantially as set forth.

WILLIAM A. FRY.

Witnesses:

PERCY WHITE,
A. B. BROWNE.