(No Model.) 6 Sheets—Sheet 1.

C. H. NOTTER.

TRANSFER CARRIAGE FOR ELEVATED WAYS.

No. 599,973. Patented Mar. 1, 1898.

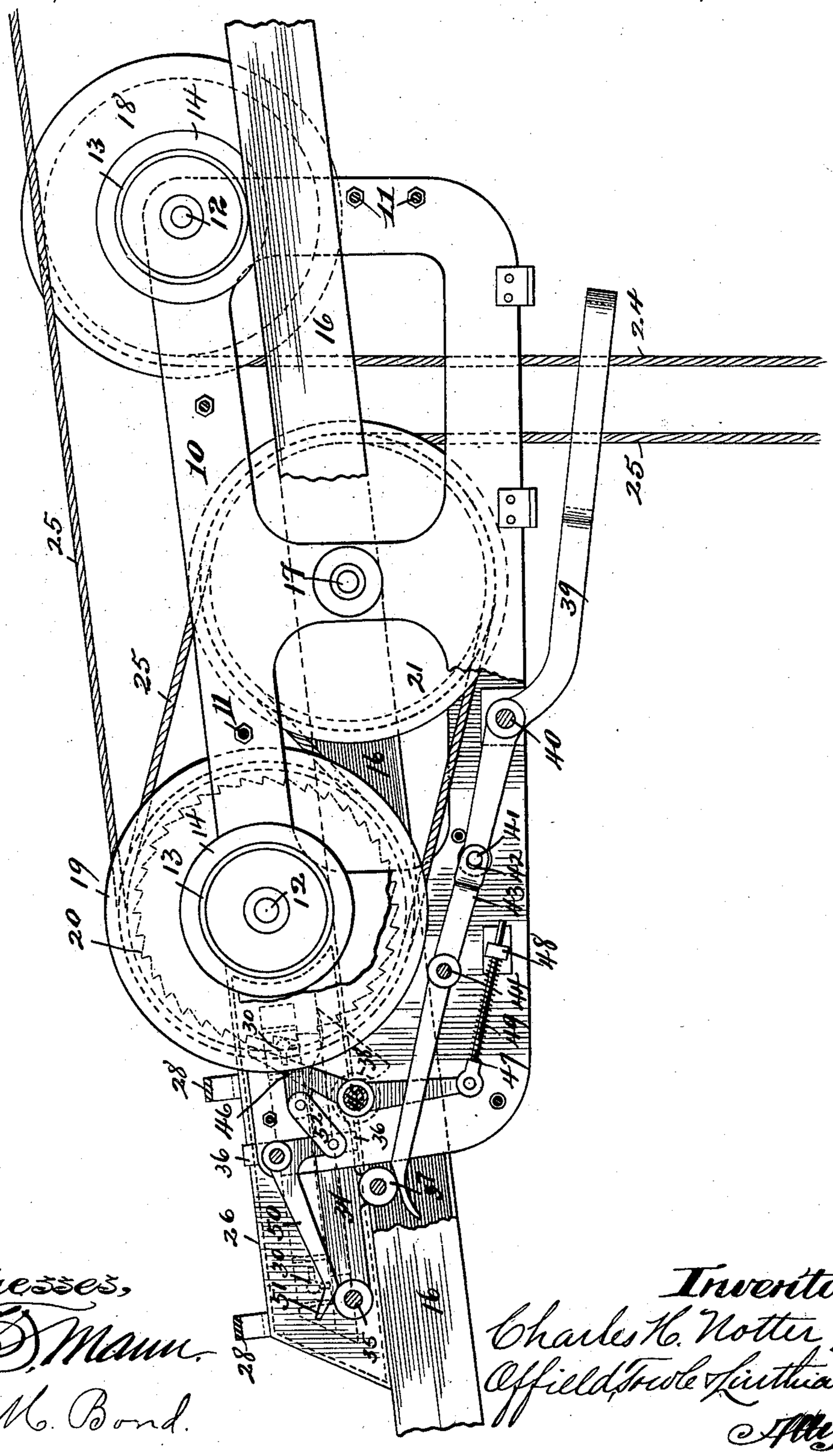

Fig. 1.

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Fig. 2.

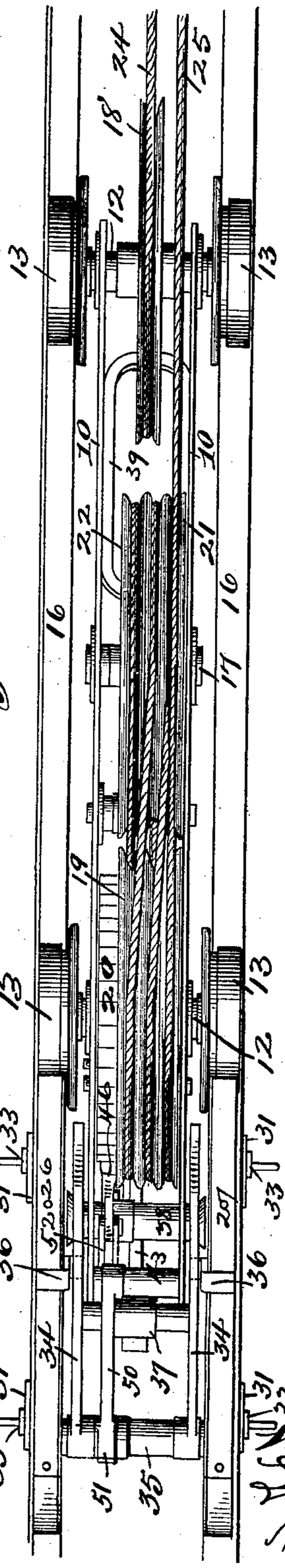


Fig. 7.

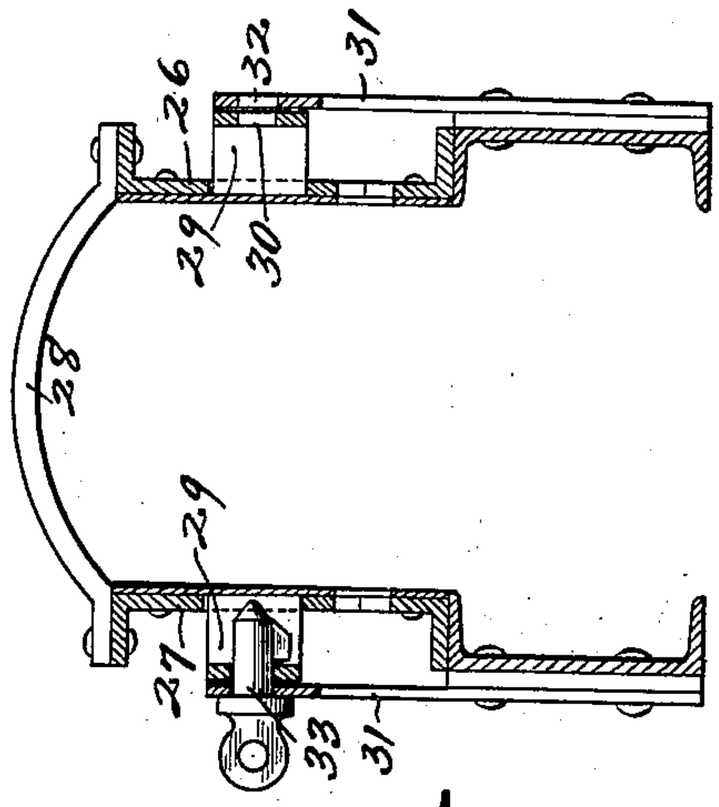
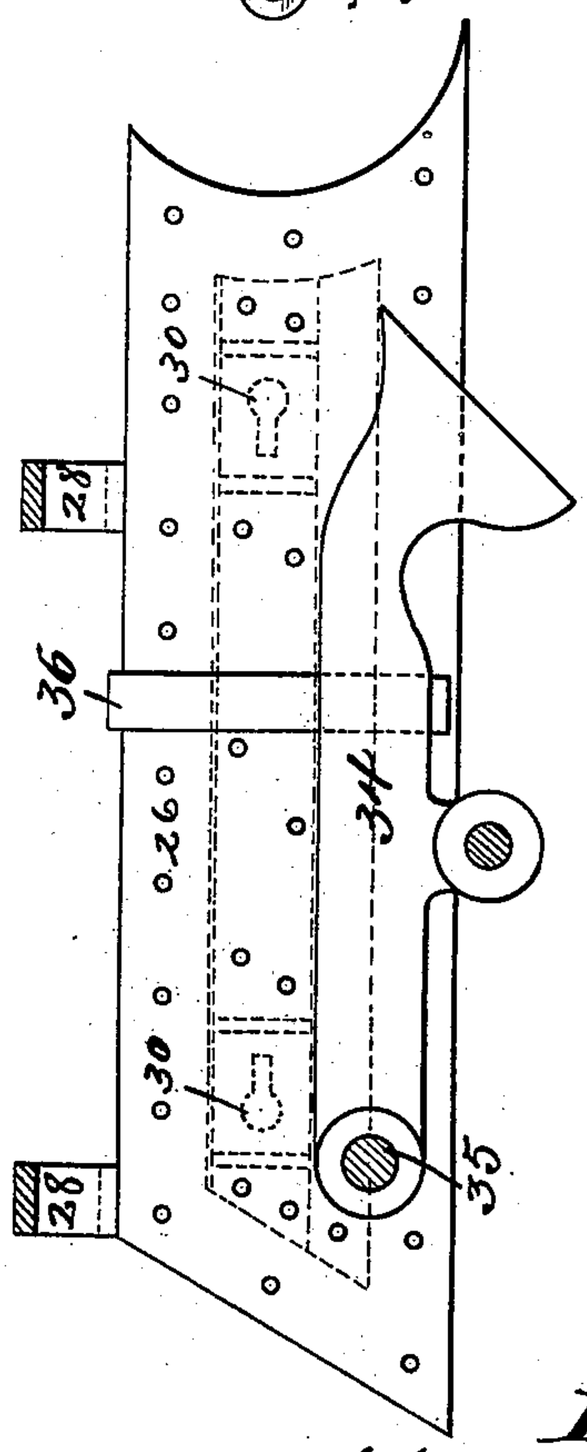


Fig. 6.



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6 Sheets—Sheet 3.

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TRANSFER CARRIAGE FOR ELEVATED WAYS.

No. 599,973. Patented Mar. 1, 1898.

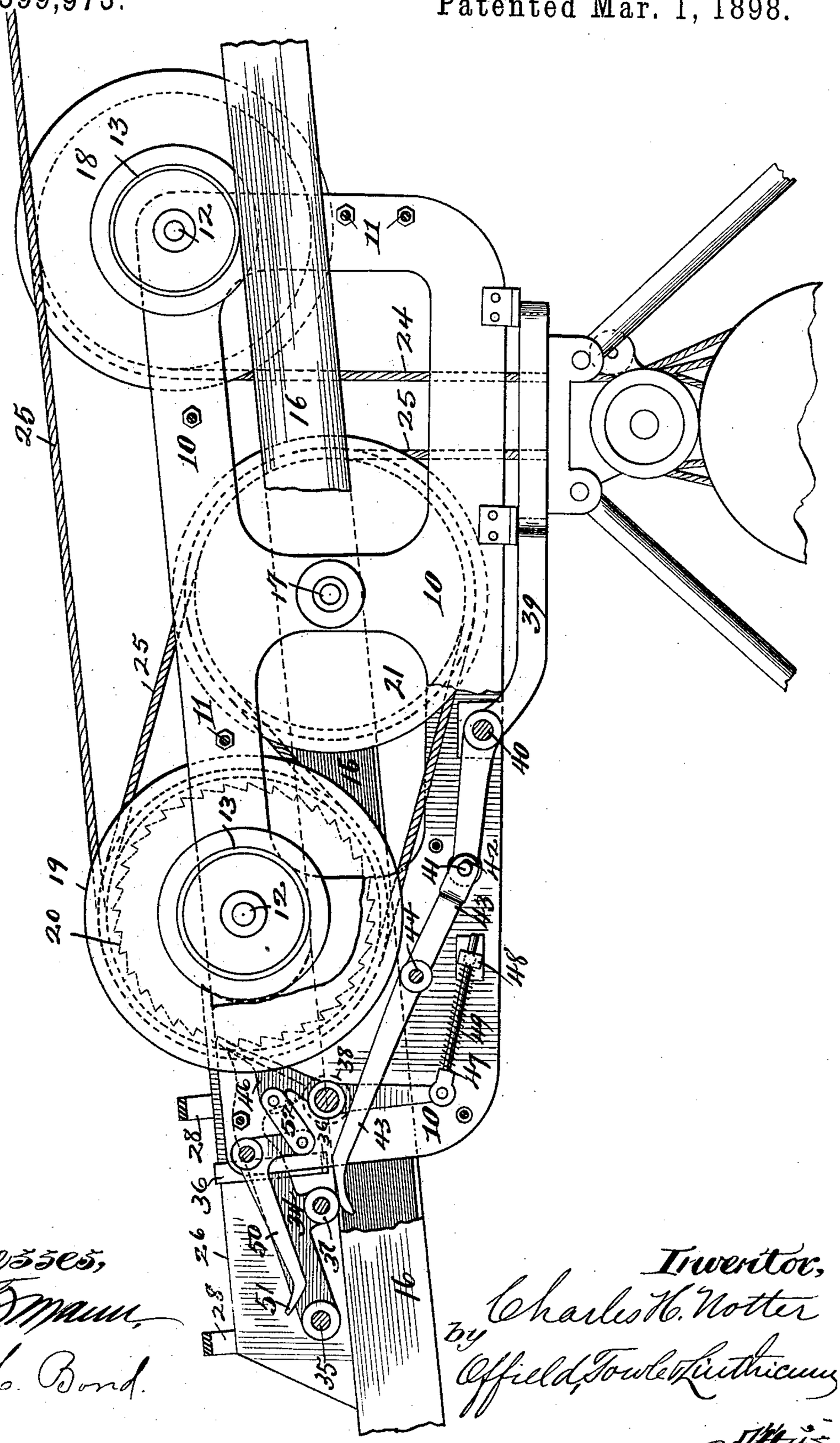

Fig. 3.

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TRANSFER CARRIAGE FOR ELEVATED WAYS.

No. 599,973. Patented Mar. 1, 1898.

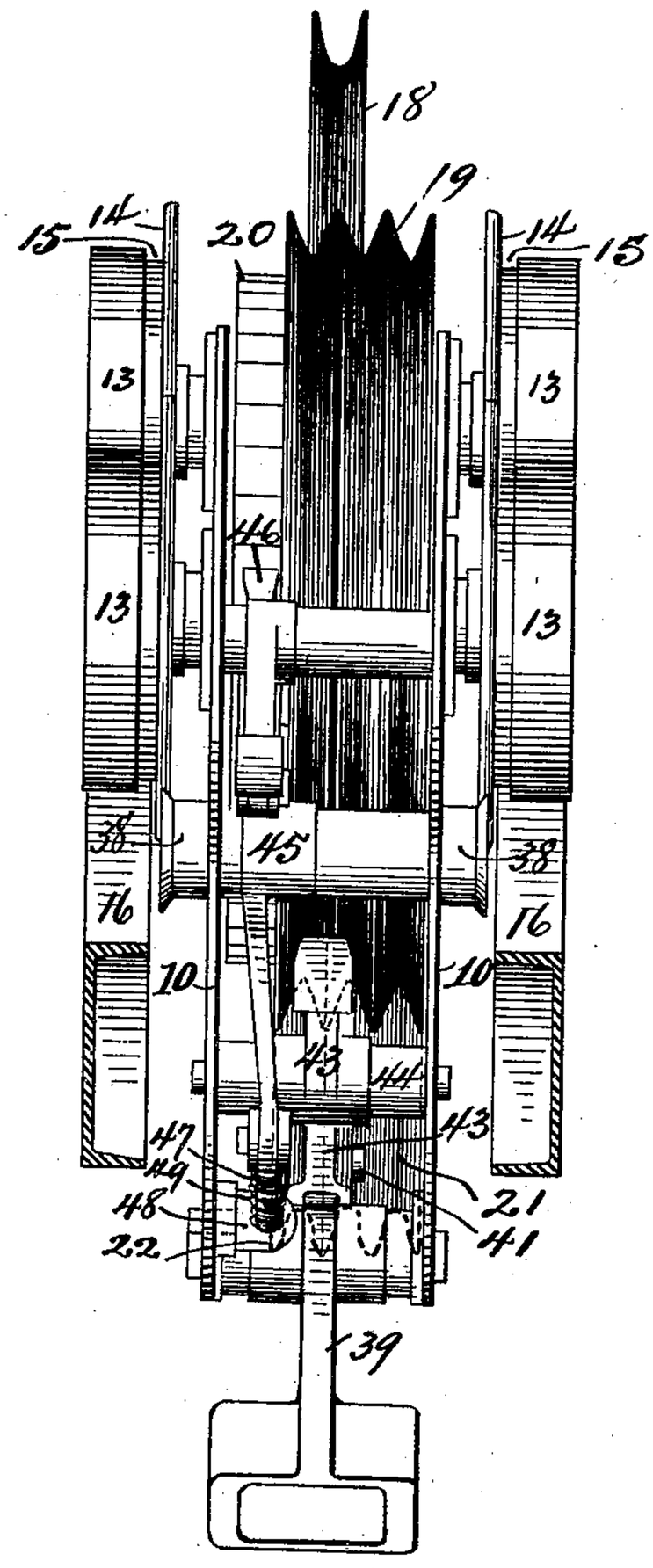

Fig. 4.

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(No Model.)

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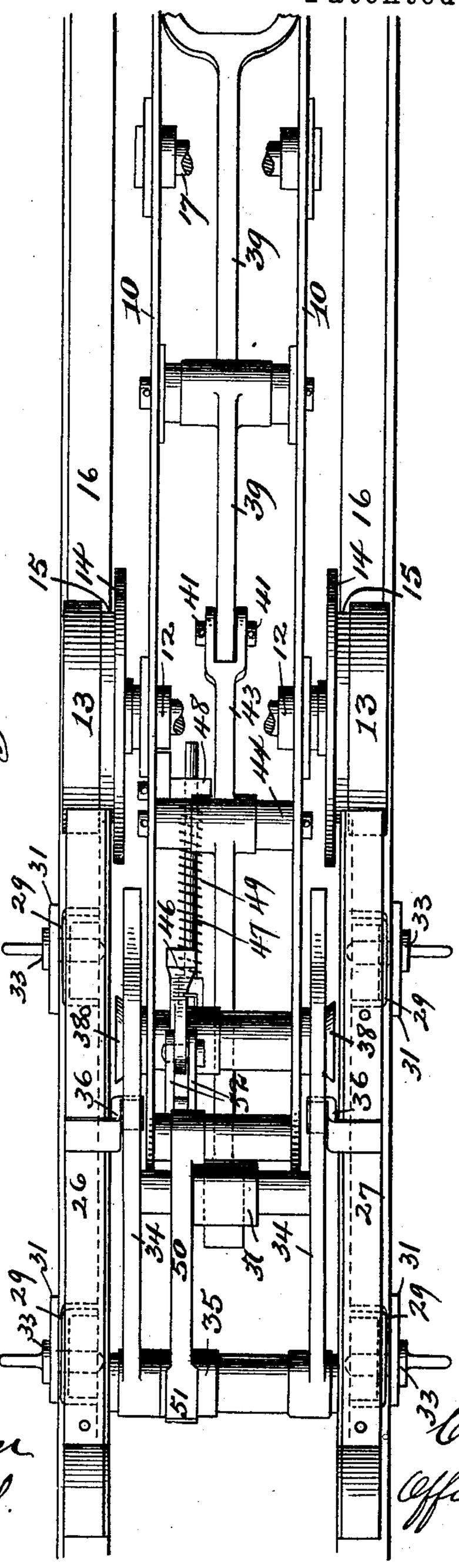
TRANSFER CARRIAGE FOR ELEVATED WAYS.

No. 599,973. Patented Mar. 1, 1898.

Fig. 5.



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TRANSFER CARRIAGE FOR ELEVATED WAYS.

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Fig. 8.

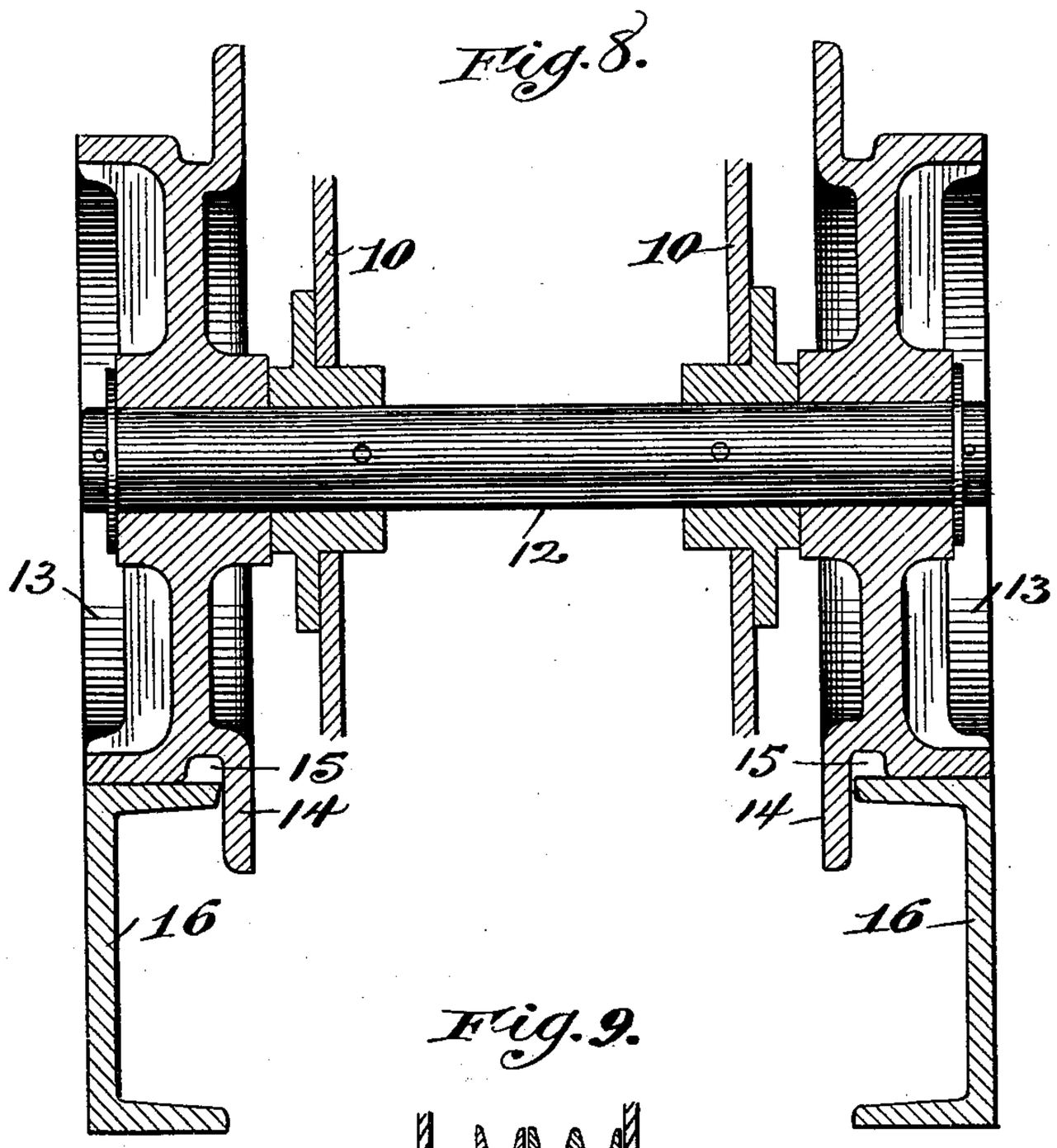
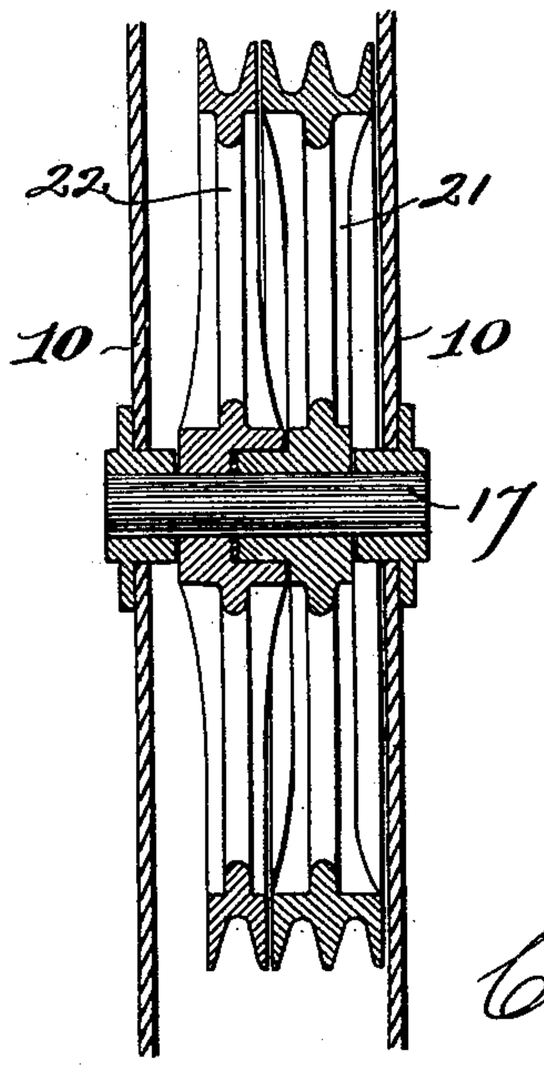


Fig. 9.



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UNITED STATES PATENT OFFICE.

CHARLES H. NOTTER, OF CHICAGO, ILLINOIS.

TRANSFER-CARRIAGE FOR ELEVATED WAYS.

SPECIFICATION forming part of Letters Patent No. 599,973, dated March 1, 1898.

Application filed November 5, 1895. Serial No. 567,990. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. NOTTER, of Chicago, Illinois, have invented certain new and useful Improvements in Transfer-Carriages for Elevated Ways, of which the following is a specification.

This invention relates to a transfer-carriage such as is used for transferring coal, ore, &c., in buckets or tubs upon elevated ways from one point to another in a dock or yard.

In this class of devices the elevated track or way may be either inclined or horizontal between distant points—as, for example, from a pile of coal or ore in a dock or yard to a hopper, vessel, or car. Usually these transfer-carriages are so arranged that they run in one direction by gravity, and the track is provided with a movable chuck or stop-block, to which the carriage becomes automatically locked when such chuck or stop-block is encountered, and thereby the carriage is held stationary while the bucket is being filled or emptied, as the case may be. Cables are usually employed running over sheaves journaled upon the carriage, and these cables are connected with the bucket or tub, so that the latter may be lowered and raised, and the carriage then moved along the track by the pull on the cable, which latter is operated by the drum of a hoisting-engine.

My invention is particularly adapted to that class of transfer-carriages which are intended to be used with clam-shell buckets and in which two cables are employed, one for closing the clam-shell sections and the other for holding them closed, while both cables are employed for hoisting the load and drawing the carriers along the track.

My invention consists in certain features in the construction of the chuck-blocks, in a novel construction and arrangement of the cable-sheaves and the manner of running the cables thereover, in means for locking the cable-sheaves and thereby the bucket in the elevated position, and in improvements in the construction of the tripping device, whereby the carriage is connected to and released from the chuck-block.

In the drawings, Figure 1 is a side elevation of a section of the track, the chuck-block, and the carriage mounted thereon, some of the parts being broken away. Fig. 2 is a plan view of the carriage, chuck-block, and a track-section, the cables shown broken away. Fig. 3 is a view similar to Fig. 1, showing the position of the parts when the bucket is raised. Fig. 4 is an end elevation of the carriage, showing the track-rails in section, the cables omitted. Fig. 5 is a broken plan view of the carriage-frame with the sheaves removed and the sheave-shafts broken away. Fig. 6 is a longitudinal sectional elevation of the chuck-block. Fig. 7 is a transverse sectional elevation of the chuck-block and track with parts omitted. Fig. 8 is a transverse sectional elevation through the track-rails and one pair of the carriage-wheels, their axle showing in elevation; and Fig. 9 is a similar view through a pair of cable-sheaves.

In the drawings, 10 represents the side frames of the carriage, which may be made of steel plates connected together by transverse through-bolts, the heads of which show at 11 in Fig. 1. These side frames also furnish bearings for the wheel-axles 12, on which are mounted the truck-wheels 13. The latter have the usual flanges 14; but in order to prevent the formation of a bur and the exfoliation of the track-rails the tread of the wheel is provided adjacent to the flange with a peripheral groove 15, Fig. 8. If a bur forms upon the upper surface of the track-rail at the edge of the bearing-face adjacent to the groove, such groove will provide space therefor and prevent the wedging of the bur against the flange and the consequent interference with the free movement of the carriage as in the common construction. This special construction of wheel I have found important, and it forms one feature of the invention hereinafter claimed.

The track-rails shown are of the channel-bar type, being marked 16, and they may be supported in any usual or convenient manner. The carriage-frame also has a stationary axle 17, on which are mounted two independently-revoluble intermediate sheaves, as shown in Fig. 9. At the upper angle of the frame a single sheave 18 is mounted upon the axle of one pair of the truck-wheels, and at the opposite end of the carriage the axle of the other pair of truck-wheels carries a three-grooved sheave 19, and said sheave has inte-

grally formed or rigidly secured therewith the ratchet-wheel 20. The intermediate sheaves (shown in Fig. 9) are marked 21 22, the former having two grooves and the latter a single groove. The sheave 22 may have a chambered hub sleeved over the hub of the sheave 21 in order to give it a broader bearing.

Two cables are employed, one of which (marked 24) is the closing-cable and which leads from the hoisting apparatus over the sheave 18 and thence downwardly to the clam-shell bucket, the upper portion of the frame of such bucket being indicated in Fig. 3. It will be understood that this cable is to be so connected with the bucket mechanism that by a pull thereon the sections of the clam-shell are closed in order to fill the bucket. The other cable (marked 25) leads from the hoisting mechanism over the carriage parallel to the cable 24 and is first carried around over the sheave 19 in one of the outer grooves thereof, thence half around the sheave 21 from the lower side, thence around the middle groove of the sheave 19, thence back under the sheave 21 in the other groove thereof, thence across to the third groove of the sheave 19, thence back and over the sheave 22, and down to its connection with the hoisting-bucket. The grooves in the sheave 19 are preferably V-shaped, while the grooves in the sheaves 21 and 22 are broader on their bottoms, it being the intention that the cables shall be wedged into the V-shaped grooves under strain, while it runs freely or rests loosely in the bottom of the broader grooves of the sheaves 21 and 22.

In order to lock the carriage to the track, I make use of what is designated a "chuck-block." The chuck-block is shown in Figs. 6 and 7 and may be composed of the flanged side plates 26 27, the lower flange whereof rests on the top of the track-rails and the upper flanges being connected by the two arched cross-pieces 28. On the side plates are secured stirrups 29, whose outer faces are in the plane of the outer sides of the track-rails, said faces having key-openings 30, as shown in Fig. 6.

In order to secure the chuck-block to the track-rails the latter have standards 31 secured thereto at suitable intervals and provided with key-openings 32, registering with the key-openings 30, and through which openings keys 33 may be inserted to secure the chuck-block fixedly to the track. The forward ends of the side frames 26 are cut out to receive the peripheries of the front pair of carriage-wheels. The chuck-block is provided also with a pair of hooked locking-levers 34, which are pivotally mounted upon a stud 35, the forward ends of these levers being sustained in their lowest position by the stirrup 36. Between their pivots and the stirrup said locking-levers have a roller 37 connecting them and furnishing an antifriction-surface, against which a tilting-lever impinges to release and raise said levers. The forward hooked ends of said levers are adapted to engage over a cross-bar or roller 38, which is mounted in the frame members 10 of the carriage. Upon the carriage is pivoted a tripping-lever 39, its pivot being marked 40. One end of said lever is bifurcated to embrace the cables 24 25 and is in the path of the bucket-frame, so as to be engaged and rocked thereby when the bucket is raised, as shown in Fig. 3. The forward end of said lever 39 has a pin 41 working in a slot 42 in a lever 43, which is pivoted to the side frame 10, as at 44, and has an end thereof adapted to engage beneath the roller 37 on the hooked locking-arms 34. From the arrangement of the pivots it is obvious that when the lever 39 is rocked by the engagement of the bucket-frame the lever 43 will also be rocked into engagement with the roller 37 and lift the locking-lever 34, disengaging them from the roller 38 on the carriage. This will operate to release the carriage from the chuck-block, it being presupposed that as the carriage runs down and against the chuck-block the hooked locking-levers 34 will have encountered the roller 38, have been tilted on their pivots, and, dropping down so as to embrace said roller, will have locked the carriage to the block. When the load is raised to its highest position and has released the carriage from the chuck-block, then the means for locking the sheaves against further rotation becomes operative. Said means comprise a pivoted pawl and its actuating mechanism. Said pawl is pivoted between its ends, as at 45. One of its ends 46 is adapted to engage with the ratchet-teeth of the ratchet 20, while its opposite end or arm is pivotally connected with a rod 47, passing freely through a pivoted lug 48, said rod having a spring 49 coiled around it and bearing at one end upon the lug and upon the other end upon the head of said rod, so as to throw the pawl into action. The means for withdrawing the pawl consists of the elbow-lever 50, pivoted on the frame of the carriage and having one of its arms terminating in a shoe 51, which rides over the roller 35, upon which the locking-levers 34 are mounted. The other end of said bell-crank is connected by a link 52 with the pawl 46, and therefore when the carriage runs down and is arrested by the chuck-block the shoe 51, riding upon said roller, holds the pawl out of contact with the ratchet against the action of the spring and permits the rotation of the sheave under the action of the hoisting apparatus.

In this carriage it will be observed that no means are provided for positively locking the bucket-frame to the carriage. The pawl prevents the rotation of the sheave to which it is secured, but the load is held in the elevated position by the friction of the cable in the grooves of the sheaves. The friction holding power must bear some definite relation therefore to the maximum load which is to be carried. For the uses to which my in-

vention is designed the load could not be held in the elevated position by the employment of a single pulley nor by the use of two pulleys journaled parallel to each other. The mounting of two sheaves upon the same axle is of course to enable the direction of the cable to be reversed and the provision of one of the sheaves with V-shaped grooves further increases the frictional holding power. By the employment of the intermediate sheaves also the depending strand of the holding and hoisting cable may be brought close to the depending strand of the closing-cable and therefore in proper position for attachment to the load.

I claim—

1. In a transfer-carriage, a rotatable sheave mounted thereon, a cable turned about said sheave, a ratchet-wheel secured to and rotating with the sheave, a spring-actuated pawl normally held in engagement with the ratchet, a bell-crank pivoted upon the carriage, a link connecting one member of said bell-crank with the pawl and the opposite arm of said bell-crank being adapted to engage a stop or releasing device secured upon the track, substantially as described.

2. A chuck-block for a transfer-carriage having side frames adapted to rest upon the track-rails, stirrups having keyholes therein, standards secured to the track-rails and their upper ends projecting above the track-rails and provided with key-openings adapted to register with the openings in the stirrups and keys whereby the chuck-block may be removably secured to said standards, substantially as described.

3. In a transfer-carriage, the combination with a pair of sheaves mounted to rotate about the same axis but in opposite directions, of a sheave mounted to rotate upon an axis parallel to that of the pair and having a plurality of cable-grooves, and a cable turned in said grooves of the single sheave and strands thereof passing around the pair of pulleys but in opposite directions and depending for attachment to the load, substantially as described.

4. In a transfer-carriage, the combination with a sheave having a plurality of V-shaped grooves, of a pair of sheaves having broader grooves therein and mounted upon a common axis, a cable turned over the plural-grooved sheave, thence over one of the members of the pair, thence back to the single sheave, thence again around the sheave of the pair, thence around the third groove of the single sheave and thence over the second sheave of the pair and depending for attachment to the load, substantially as described.

5. In a transfer-carriage, the combination with a wheeled frame, of sheaves mounted toward opposite ends thereof, and one of said sheaves having a plurality of grooves, a pair of sheaves having a common axis mounted intermediate said first-named sheaves, a closing-cable passed over the single sheave and a holding and hoisting cable turned over the plural-grooved sheave and over said intermediate sheaves and depending in proximity to the closing-cable, substantially as described.

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