

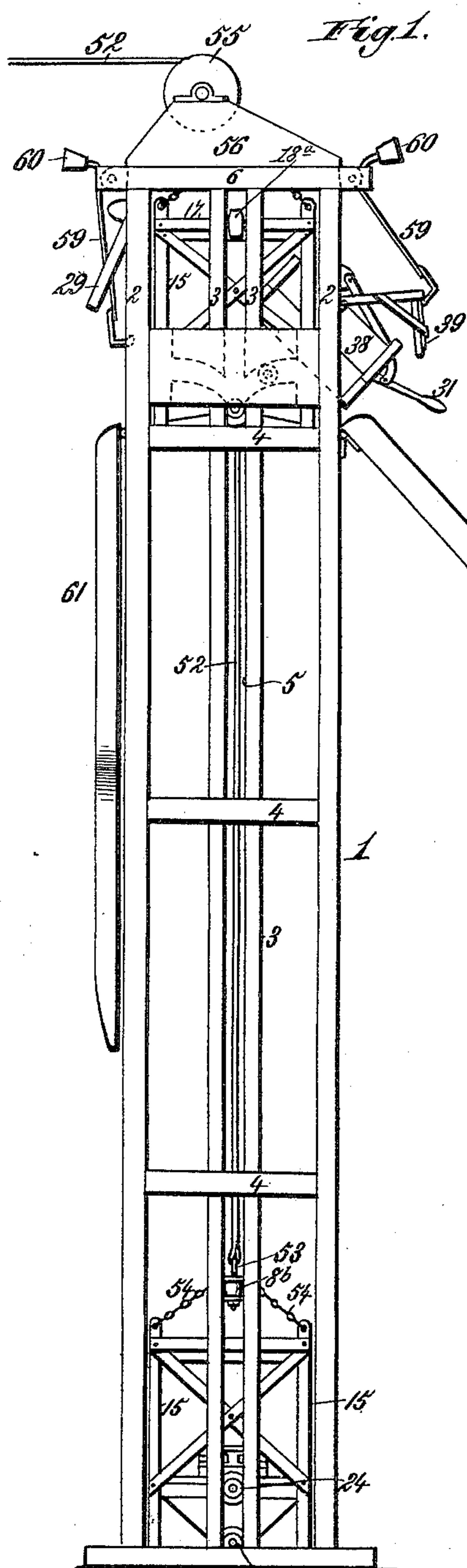
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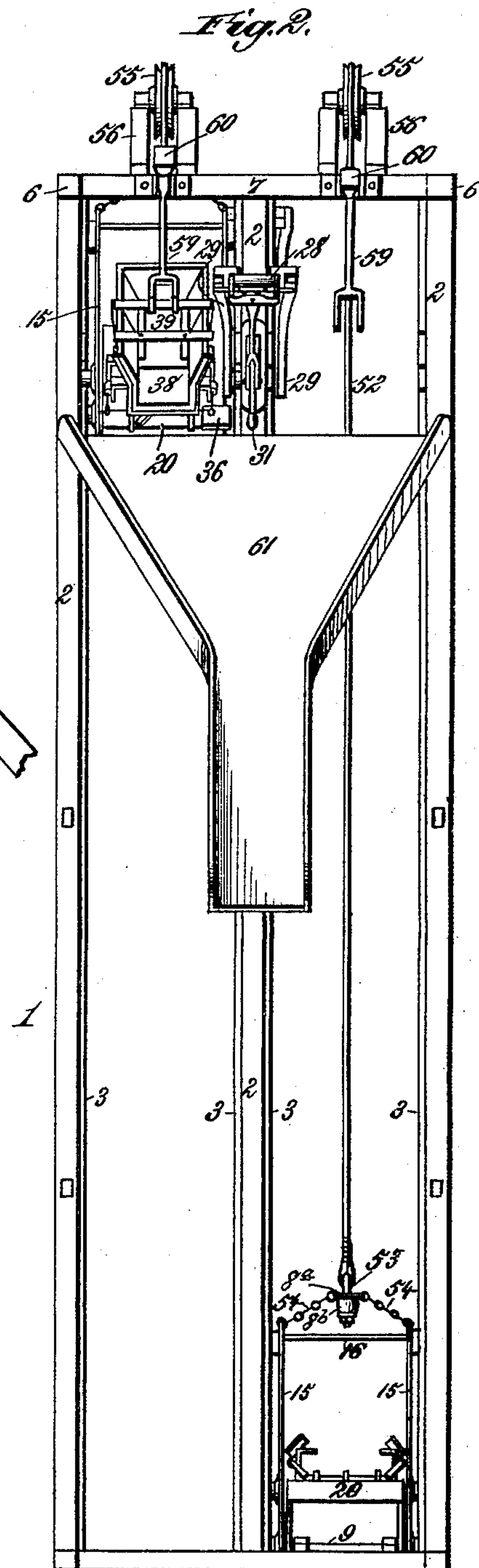
J. JOPLING.
COAL HOIST.

No. 442,442.

Patented Dec. 9, 1890.



Witnesses.
Robert Gruett.
Linnis Lumbly.



Inventor.
James Jopling.
By *James L. Norris.* Atty.

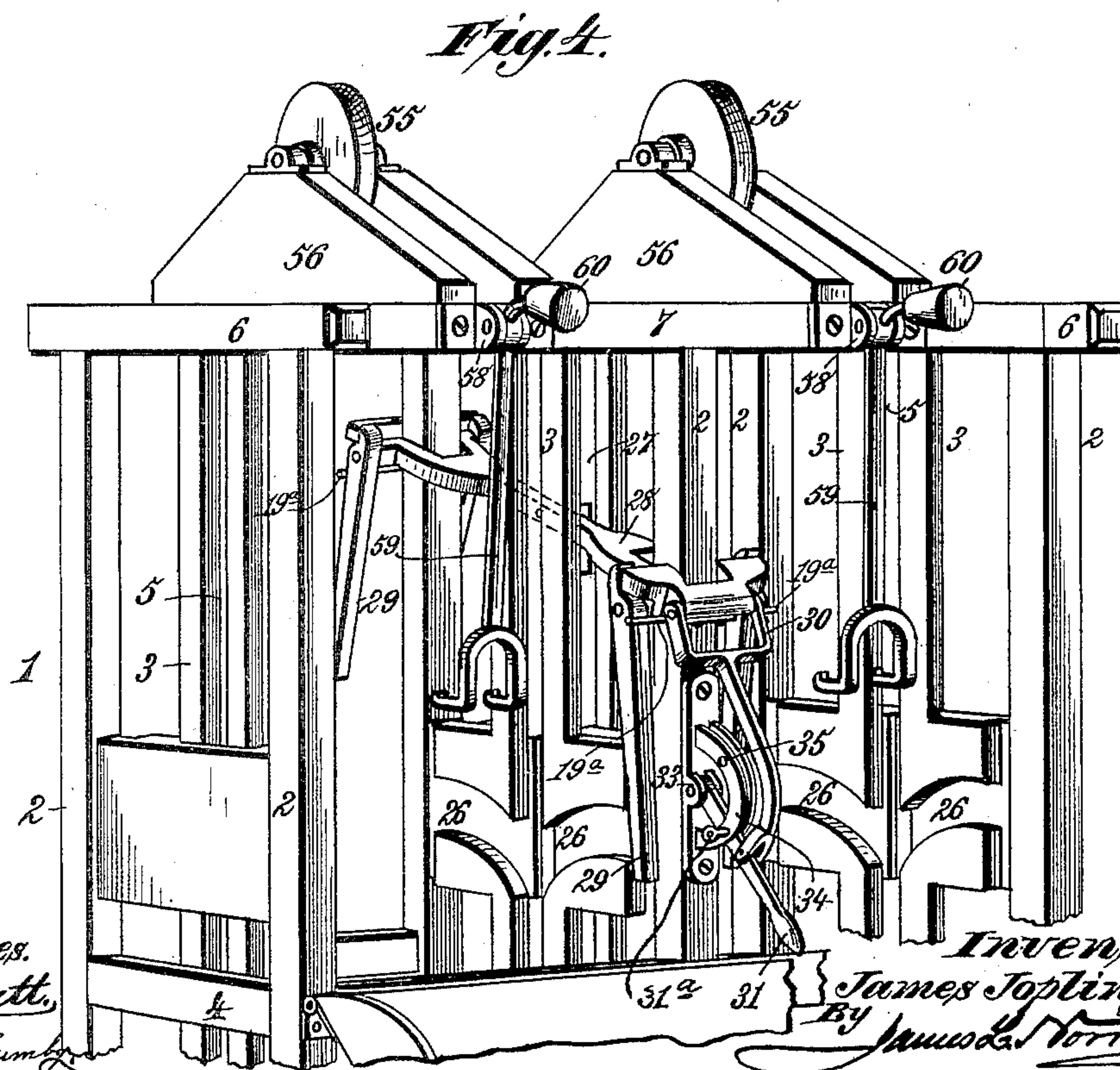
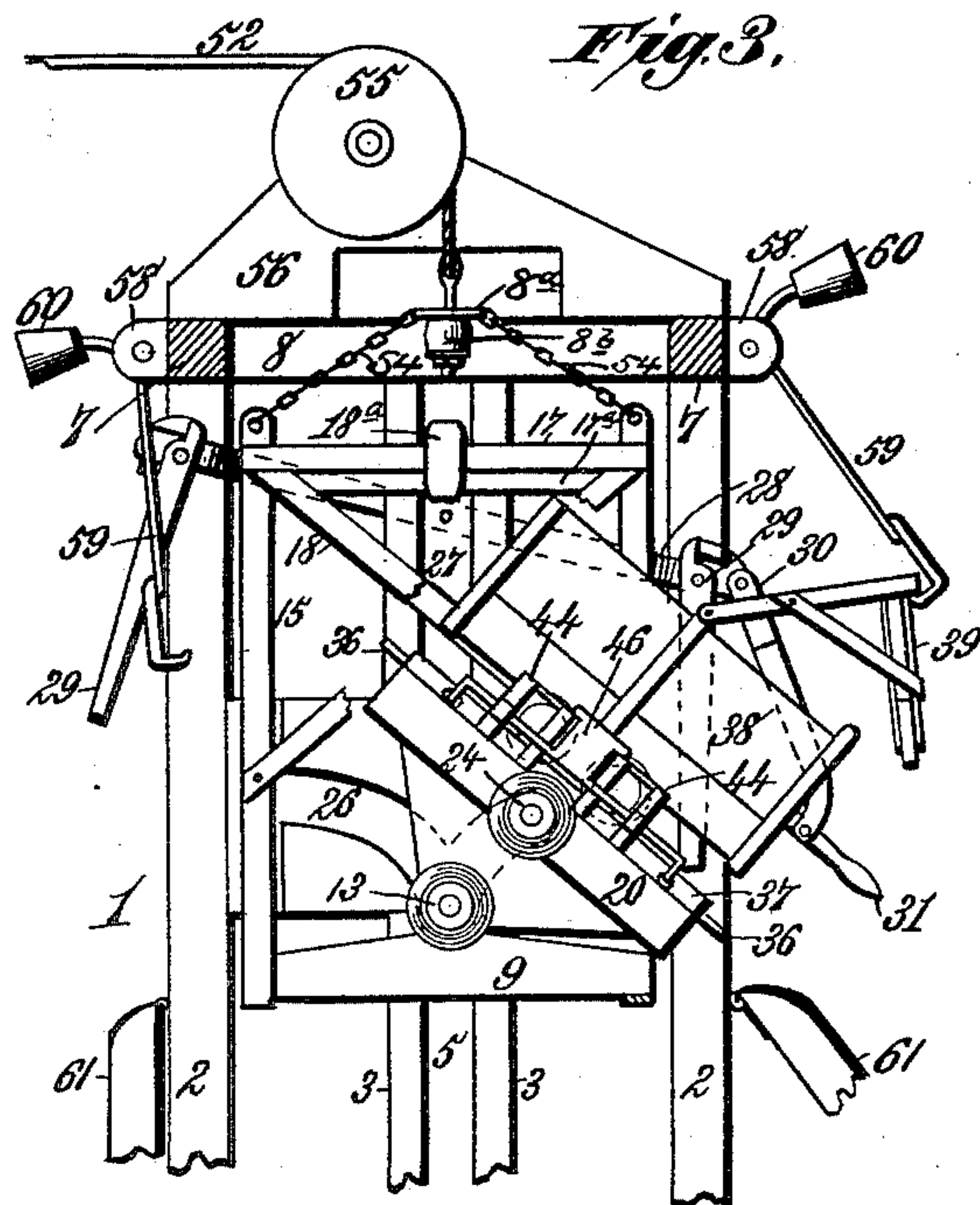
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J. JOPLING.
COAL HOIST.

No. 442,442.

Patented Dec. 9, 1890.



Witnesses.
Robert Smith,
James L. Smith.

Inventor.
James Jopling.
By James L. Smith.

(No Model.)

3 Sheets—Sheet 3.

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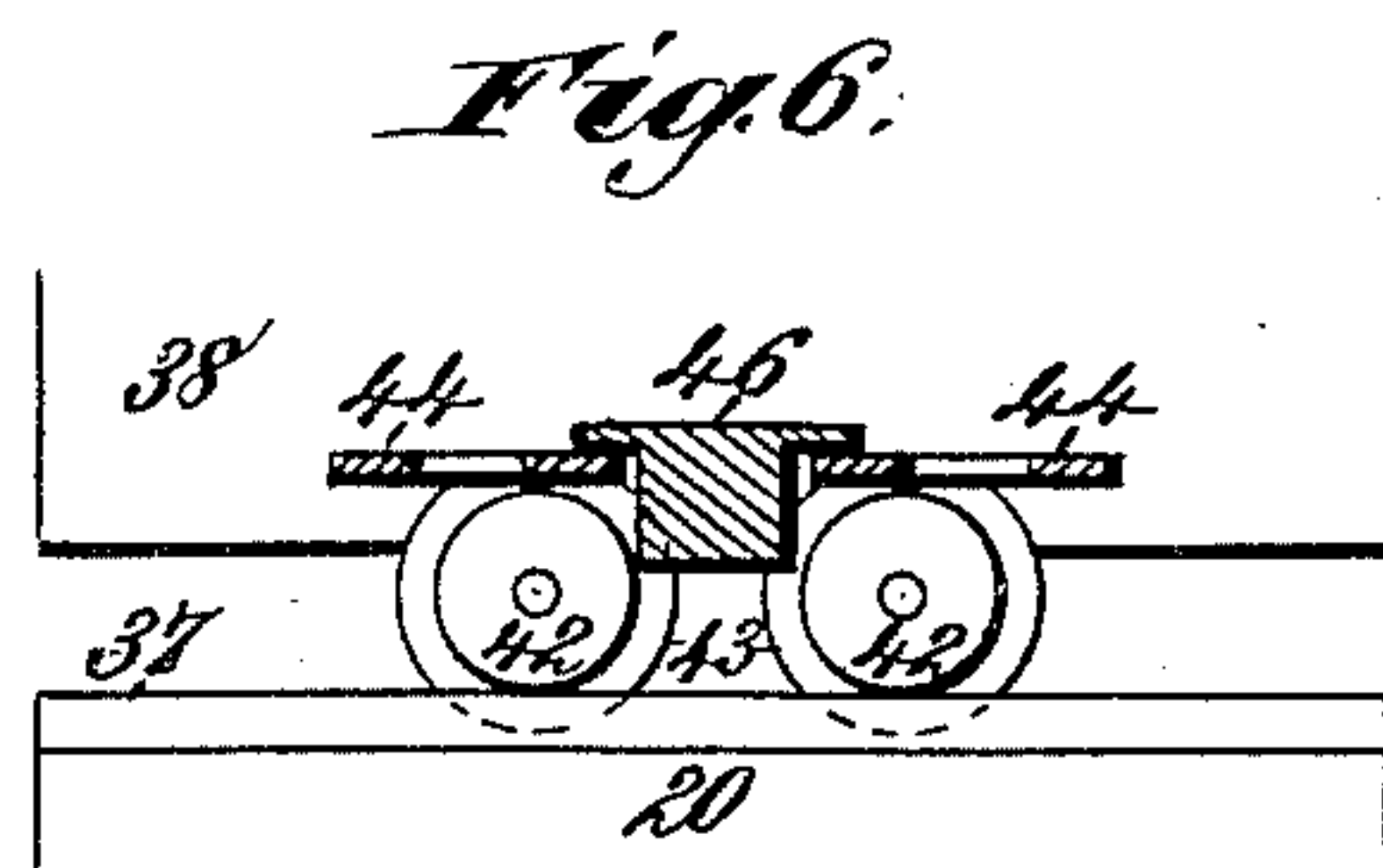
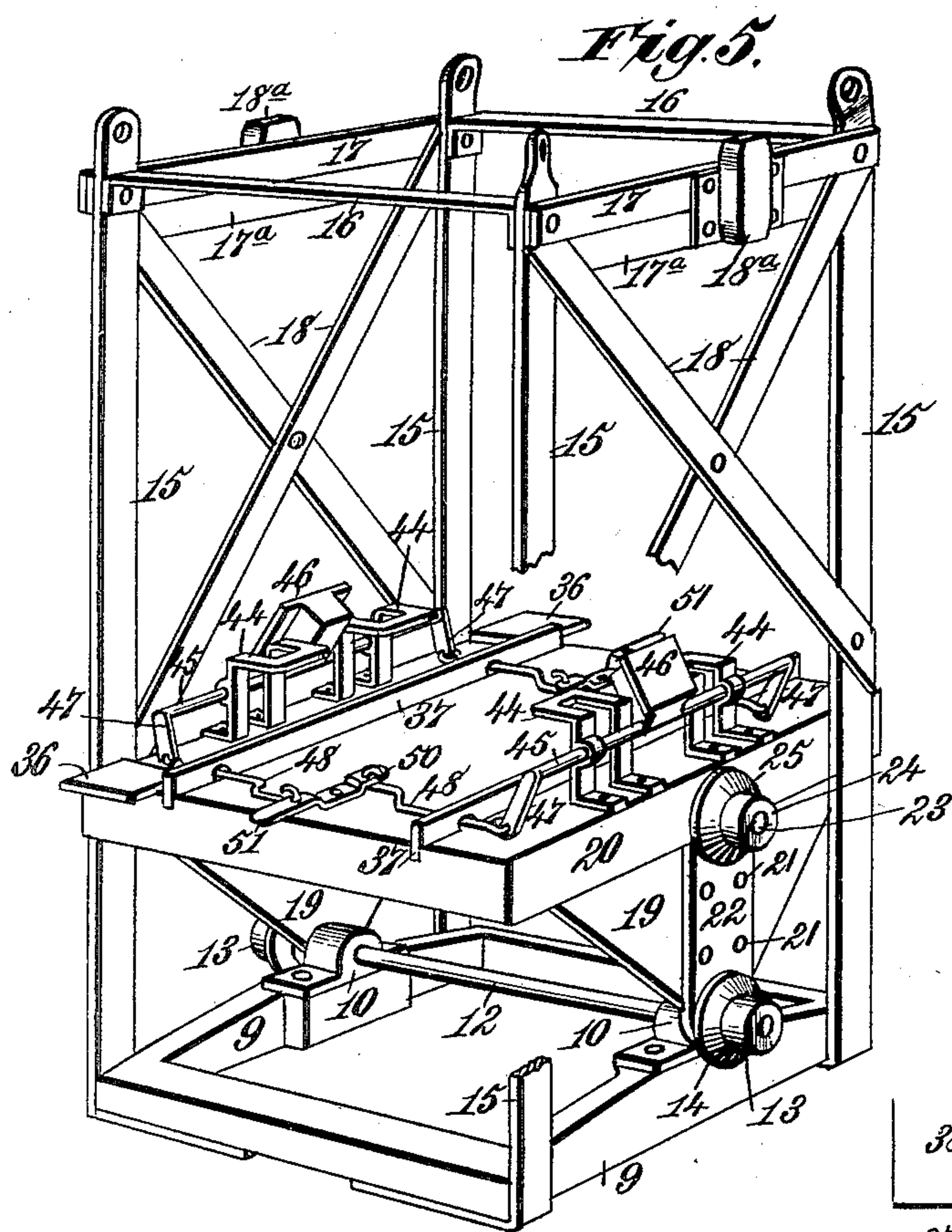
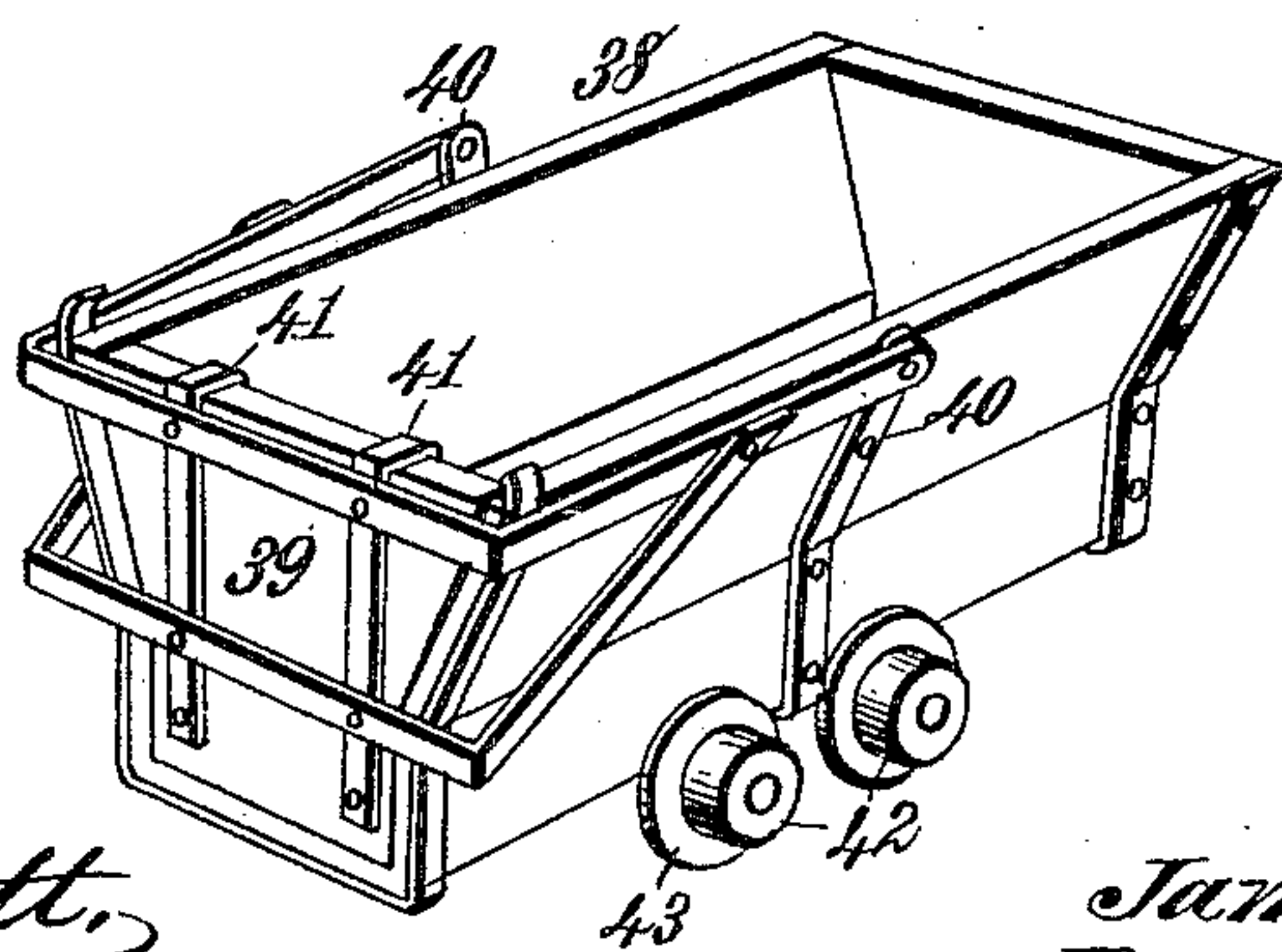


Fig. 7.



Witnesses.

Robert Garrett.

Dennis Sumbly.

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Atty.

UNITED STATES PATENT OFFICE.

JAMES JOPLING, OF WHAT CHEER, IOWA.

COAL-HOIST.

SPECIFICATION forming part of Letters Patent No. 442,442, dated December 9, 1890.

Application filed August 9, 1890. Serial No. 361,542. (No model.)

To all whom it may concern:

Be it known that I, JAMES JOPLING, a citizen of the United States, residing at What Cheer, in the county of Keokuk and State of Iowa, have invented new and useful Improvements in Coal-Hoists, of which the following is a specification.

My invention relates to that class of mechanism commonly known as "coal-hoists," adapted for use in mines for elevating the coal from the bottom of the shaft and transferring it to a suitable place or places of deposit or for elevating it to any suitable point or points where it may be discharged from the coal-dumps.

It is the purpose of my invention to provide novel and simple means whereby the dumping-cars may be locked upon the platform of the hoist, and whereby the railed platform supporting said car may be dumped or tilted, together with the latter, when the point of discharge is reached, means being provided for automatically raising the end-gate of the car and lowering the same as said car is tilted and restored to its normal position.

It is my purpose, also, to provide and combine with a coal-hoist a dumping-platform provided with means for locking a car thereon and for dumping said car upon either one of the two oppositely-arranged inclined chutes hinged or pivoted upon opposite sides of the cage or guiding structure within which the elevators move.

It is my further purpose to provide a simple, novel, and improved construction or organization of parts whereby the dumping cars may be locked upon and unlocked from the dumping-platforms of the hoist, for guiding and supporting said hoists in their vertical movements, for initiating and completing their dumping or tilting movement, and for controlling the position of the platform during its rise and fall and retaining the same in a level position until the proper point is reached without regard to the distribution of the load.

The invention consists to these ends in the several novel features of construction and new combinations of parts hereinafter fully described, and then definitely pointed out in the claims which follow this specification.

To enable others skilled in the art to prac-

tice my said invention, I will describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation showing the invention. Fig. 2 is a front elevation of the parts shown in Fig. 1. Fig. 3 is a sectional elevation of the upper portion of the frame-work or tower in which the hoisting-cages move, showing the car tilted or dumped. Fig. 4 is a perspective view of the upper portion of the frame-work or tower, the hoisting-cages being removed. Fig. 5 is a perspective view of one of the hoisting-cages, the car being removed, showing the devices for locking and releasing the latter and the construction and arrangement of the tilting or dumping platform. Fig. 6 is a sectional detail showing the manner of locking the car upon the platform. Fig. 7 is a perspective view of one of the cars.

In the said drawings the reference-numeral 1 designates the frame-work or tower for the support and guidance of the hoists. In a double hoist of the type shown in the drawings this frame-work is composed of uprights 2, between which are arranged vertical guides 3, supported by transverse braces 4 and arranged within such proximity to each other as to have a narrow raceway 5. These vertical guides extend to the top of the frame-work or tower, the uprights 2 being connected at that point by braces 6 and 7 and by a central transverse brace 8. These uprights may be arranged and braced in any suitable manner, according to the size and shape of the hoists.

The hoists are duplicates in construction, each consisting of the following parts: Within the frame-work 2 is arranged a rectangular and horizontal frame 9, provided upon the opposite and parallel sides with journal-boxes 10. These boxes receive the ends of the shaft 12, which projects at its ends beyond the journal-bearings, its extremities receiving friction-pulleys 13, which run within the raceways 5 and are provided with broad flanges 14, which rest against the inner faces of the vertical guides 3. To the four corners of the rectangular frame 9 are connected uprights 15, preferably of metal, which extend upward for a suitable distance, being braced and rigidly connected by flat horizontal bars 16, the ends whereof are bent downward at right an-

gles to receive the rivets which connect said braces with the uprights. The same rivets also connect the flat braces 17, which are arranged in vertical planes with the uprights of the hoisting-cage, the latter being further braced by diagonal bars 18, also united at their upper ends by the same rivets fastening the uprights to the horizontal bars 16 and flat braces 17. At their lower ends these diagonal braces connect with the uprights 15 of the cage at a point some distance above the rectangular frame of the hoist. Immediately beneath the bars 17 I arrange flat braces 17^a, riveted upon the diagonal braces 18, and upon these bars 17 and 17^a are mounted central guide-blocks 18^a, which lie and move in the raceways 5 to guide the hoisting-cage and preserve it in its upright position.

Upon the ends of the shaft 12 just outside the journal-boxes supporting said shaft are mounted brackets 19, which support a platform 20. To the brackets 19 are rigidly connected by bolts 21 central plates 22, provided upon their upper ends with outwardly-projecting studs 23, lying in or substantially in the plane of the platform 20. These studs give support to friction-rolls 24, similar to those mounted upon the ends of the shaft 12, and having flanges 25, which lie against the inner faces of the vertical guides, between which in the raceway 5 the said friction-rolls have movement. It will be readily apparent that the platform will tilt upon the journals or extremities of the shaft 12, provided ways or channels are provided whereby the rolls 24 may have a lateral movement after passing out of the raceways 5. For this purpose I provide at the upper portions of the raceways 5 laterally-curved channels 26, communicating with said raceways, but curving upward and outward therefrom in opposite directions or upon opposite sides of the raceways.

In order to throw the friction-rolls 24 into the curved channels 26 and enable the platform to be tilted in either direction, as circumstances may require, I mount between the vertical guides upon one side of the framework a hanger 27, upon which is pivoted a yoke 28, having forked ends which straddle the central uprights 2, the extremities of each forked arm being provided with a yielding downwardly-projecting bar 29, normally thrown inward by a spring-yoke 19^a until arrested by the end of the bar striking the cross-head of the fork. This outward yield of the bar is for the purpose of permitting the slight outward movement of the tilting platform necessary in order to carry the rolls 24 into the channels 26 and avoid all binding at the point of contact. One of the cross-heads of this yoke is provided with a yoke-connection 30, and to this connection is pivotally attached a lever 31. This lever is fulcrumed upon a bracket 33, mounted on one of the uprights 2, and turns between two curved or semicircular bars 34, having apertures 35 at

such points that the lever 31 may be locked in two different positions. By drawing the lever downward into one position the bars 29 upon the ends of the yoke adjacent to the lever are drawn downward and their ends are brought into such position that as the hoists rise the ends of the platforms 20, which are provided with wear-plates 36, impinge upon the ends of said bars, thereby giving an initial tilt to said platforms and throwing the friction-rolls 24 out of the raceways 5 and into the curved channels communicating with said raceways and leading toward the shifting-lever 31. The instant these rolls pass into the curved channels the tilting of the platforms will be completed by the said rolls following said channels. Moreover, by simply raising said lever to incline the yoke in the opposite direction the bars 29 upon the opposite end of the yoke will swing downward into position to engage the opposite ends of the platforms 20 and tilt them in the other direction.

Upon each platform 20 is arranged a section of railway 37, adapted to receive a dumping-car 38, having any ordinary construction in its essential features, but provided with an end-gate 39, which is carried by arms pivotally mounted upon supports 40, connected to the sides of the car at or about its center. These arms are carried across the outer face of the end-gate over braces 41, which are lapped upon the inner and outer faces of said end-gate. Each car is mounted upon wheels 42, having broad flanges 43, said wheels being placed, as is usual in coal-cars, not far from the center of the car-body. Upon each side of the track upon the platform are arranged brackets 44, which are rigidly mounted thereon in such manner that they overhang the tread of the wheels when the car is rolled upon the platform and placed centrally, or substantially so, thereon. In rear of these brackets on each side is arranged a rock-shaft 45, upon which is mounted a block 46, which rises and falls, as the rock-shaft is operated, between the brackets 44. Upon each end of each rock-shaft is a crank-arm 47, to which is connected an arm 48, passing through an aperture in the rail and pivotally connected to a lever 50, fulcrumed centrally between the rails upon the platform. The arm connected to the crank of one shaft is pivoted upon one side of the fulcrum of this lever, and the like arm connected to the other shaft is pivoted to the same lever upon the opposite side of its fulcrum, a like arrangement being adapted at the other end of the platform, and each lever being provided with an extension 51, whereby both rock-shafts may be operated from either end of the platform 20. By turning the lever in one direction the blocks 46 are dropped between the wheels of the car on each side, and as the brackets 44 rigidly overhang the said wheels the car is locked firmly upon the platform.

Each hoist is raised and lowered by a rope,

chain, or wire cable 52, connected to an eye 53, which has attachment to the hoisting-frame by chains 54. The cable 52 runs over a pulley 55, journaled upon brackets 56 upon the upper end of the tower or frame-work. Each hoist is operated by its own cable, which may be operated by any suitable power. Upon the upper portion of the frame-work are pivoted between lugs 58 balanced hooks 59, having forked depending ends, which are turned inward toward the ascending car. The hook-bar is bent outwardly above the pivotal point, and upon its end is mounted a weight 60, by which the hook is normally thrown inward toward the end of the car as it rises on the hoist, the arrangement being such, however, that the inwardly-turned forked ends of the hook shall clear the end of the car so long as the platform 20 is not tilted.

The operation of the parts described is as follows: As the drum is revolved upon which the hoisting-cables are reversely wound one of said hoists is raised, while the other is lowered. The rising hoist is supplied with a car more or less completely filled with coal and locked upon the tilting platform 20 by the means already described. As the hoist rises to the point where the tilting platform engages the depending end of the tilting-bar 20 the friction-rolls 24, carried by the brackets supporting said platform, are brought opposite the curved lateral slots or channels 26, which communicate with the raceways 5, within which channels they enter and as the hoist rises farther effect a tilting movement of the platform 20. As this movement takes place the forked end of the hook 59 engages the end-gate of the car and holds the same as the end of the car tilts downward, whereby an unobstructed exit is allowed for the contents of said car, which may pass into a chute 61, mounted upon the tower in any suitable manner, or capable of being raised and lowered by blocks and pulleys or by struts, and in such manner as to bring its discharge end at any point desired.

The four chains 54 are connected to the four corner posts or plates 15 of the rectangular cage and at their other ends to a square plate 8^a, resting upon a rubber cushion 8^b, which is sustained by a burr slipped upon the swivel or eyebolt which is connected to the cable and provided beneath the burr with a nut turned upon the eyebolt.

It will be seen that the rolls 13 and 24 not only prevent the platform from dumping in the cage, but they also take nearly all the friction off the vertical guides 5 should the load of men or coal be more on one side of the center than upon the other. In this case one of said rolls will turn or ride upon one of the vertical guides and the other upon the opposite guide, while the broad flanges will give steadiness to the movement.

The adjusting-lever 31 is held in either position to which it is moved by means of a pin or similar fastening 31^a, inserted through

openings 35 in the segmental plates 34, in which openings the pin or bolt may be inserted, passing through an aperture in the lever.

What I claim is—

1. In a coal-hoist, the combination, with a frame-work or tower having vertical guides, of a hoisting-frame provided with a shaft having broadly-flanged friction-wheels running in raceways between said guides and having the flanges bearing upon the inner faces of said guides, a platform supported by brackets mounted upon said shaft and provided with friction-wheels running in the raceways and having flanges bearing against the inner faces of the vertical guides, the said raceways having communication at or near their upper ends with laterally-curved channels, and a tilting reversible yoke having bars mounted upon its ends and adapted to engage the end of the rising platform to tilt the same and throw the friction-rolls on the platform-brackets into the laterally-curved channels communicating with the raceways, substantially as described.

2. In a coal-hoist, the combination, with a frame-work or tower having two or more pairs of vertical guides, of a hoisting-frame having rolls moving in the raceways between said guides and provided with broad flanges bearing upon the inner faces of the latter, a tilting platform supported by brackets pivotally mounted on the shaft carrying the friction-rolls on the hoisting-frame, said brackets having flanged rolls moving in said raceways with their flanges bearing against the vertical guides, a yoke pivoted centrally upon the frame-work and having depending bars yieldingly mounted upon its ends, a lever to tilt said yoke, whereby its bars may be alternately brought into the path of the opposite ends of the ascending platform, and means for locking said lever in two positions, the raceways between the vertical guides having communication with laterally-curved channels adapted to receive the rolls upon the brackets supporting the platform, substantially as described.

3. In a coal-hoist, the combination, with a frame-work or tower, of a hoisting-frame having a central shaft provided at its ends with rolls moving between vertical guides in said frame-work and having broad flanges lying against said guides, a platform supported by brackets pivotally mounted upon the ends of said shaft, said brackets being provided with supports for flanged rolls having their axes in substantially the plane of said platform, means for raising and lowering said platform, which is provided with rails to receive the wheels of the car and with rigid brackets arranged outside said rails to overhang the car-wheels, rock-shafts having blocks which are adapted to drop between the car-wheels, levers connected by links with said rock-shafts, and a yoke having depending bars, whereby the end of the platform is arrested upon its

ascent and the rolls upon the supporting-brackets carried into laterally-curved channels communicating with raceways between the vertical guides, substantially as described.

5 4. In a coal-hoist, the combination, with a hoisting-frame, of a pivotally-mounted platform carried thereby and having rails adapted to receive the wheels of the car, rock-shafts mounted in bearings outside said rails and
10 having blocks rigid upon said rock-shafts, so arranged as to drop between the wheels of the car, and levers pivoted upon the platform and connected by links with crank-arms on said rock-shafts, substantially as described.

15 5. In a coal-hoist, the combination of a frame-work having parallel vertical guides, a hoisting-frame having a shaft provided with friction-wheels that run in raceways between said guides, a tilting platform pivotally mounted on said shaft and having friction-wheels
20 movable in said raceways, a car detachably mounted on said platform, rock-shafts provided with blocks that are adapted to be dropped between the wheels of the car to lock
25 the same from movement, and levers pivoted to the platform and connected with said rock-shafts, substantially as described.

30 6. In a coal-hoist, the combination, with a hoisting-cage, of a tilting or dumping platform having rolls which pass from the raceways, guiding the said cage into curved lateral channels, and a reversing-yoke centrally pivoted and having means for tilting the same, yield-

ing bars being mounted upon the ends of said yoke, whereby the tilting platform may be
35 turned or directed to discharge the car upon opposite sides of the tower alternately, substantially as described.

7. In a coal-hoist, the combination, with a square elevator-frame, of a tilting platform
40 arranged inside said frame, the latter having rolls at or near its lower portion moving between vertical guides and being provided at or near its upper end with guide-blocks moving also between said guides, and rolls mounted
45 on the tilting platform and having a like engagement with said guides and with lateral channels at the upper end of the hoist, substantially as described.

8. In a coal-hoist, the combination, with a
50 hoisting-frame, of a tilting platform pivotally mounted on said frame, a yoke centrally pivoted on the frame-work within which the hoisting-frame moves, said yoke having one
55 or more depending tripping-bars at each end, and a lever tilting said yoke and fastened by a bolt passing through openings in a double segmental frame and through an aperture in the lever lying between the parallel members
60 of said frame, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

JAMES JOPLING.

Witnesses:

ASHER HEADLE,
SAML. GILLFOY.