

No. 775,164.

PATENTED NOV. 15, 1904.

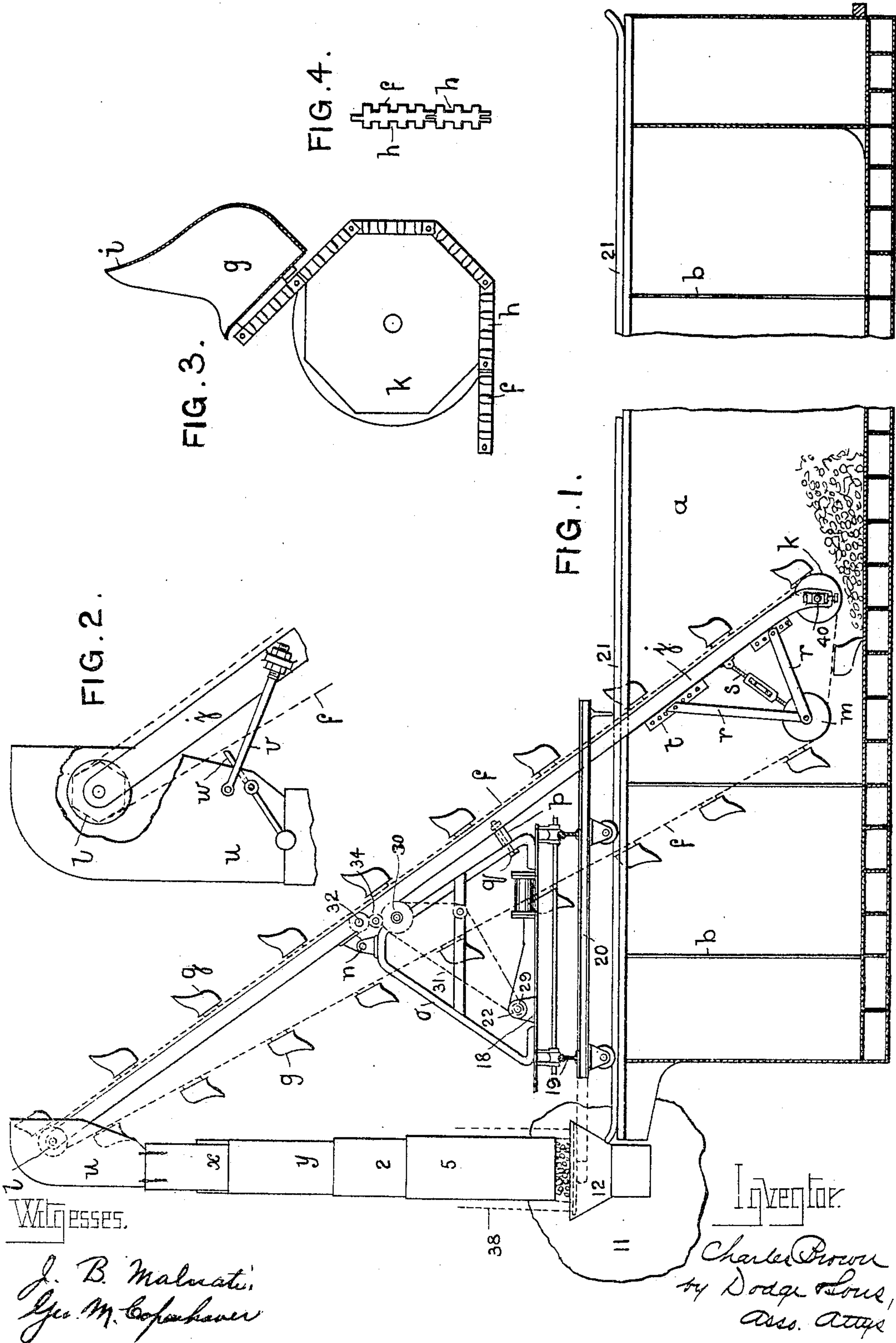
C. BROWN.

APPARATUS FOR LOADING VESSELS WITH COAL OR OTHER MATERIAL.

APPLICATION FILED AUG. 19, 1901.

NO MODEL.

4 SHEETS—SHEET 1.



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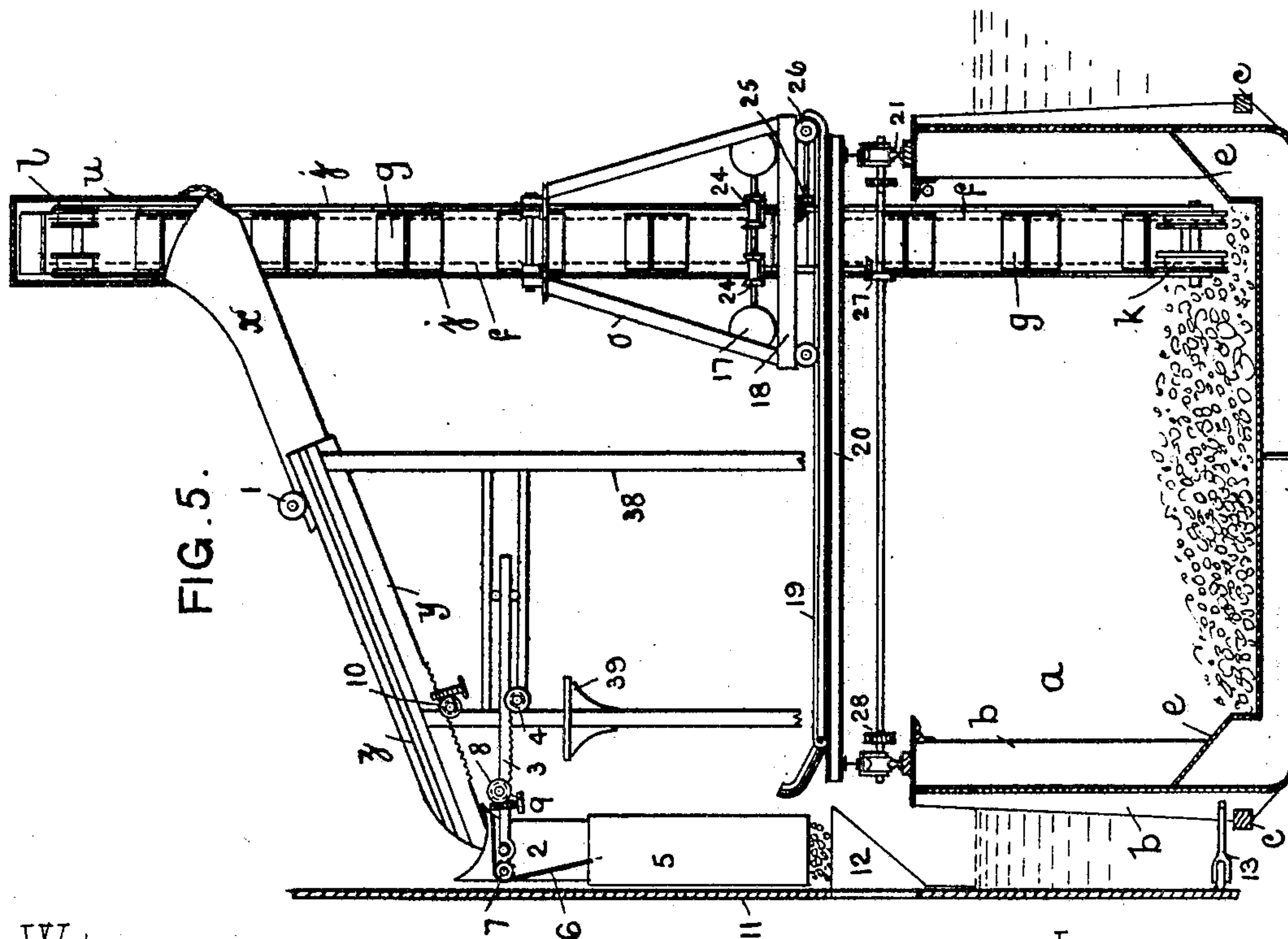
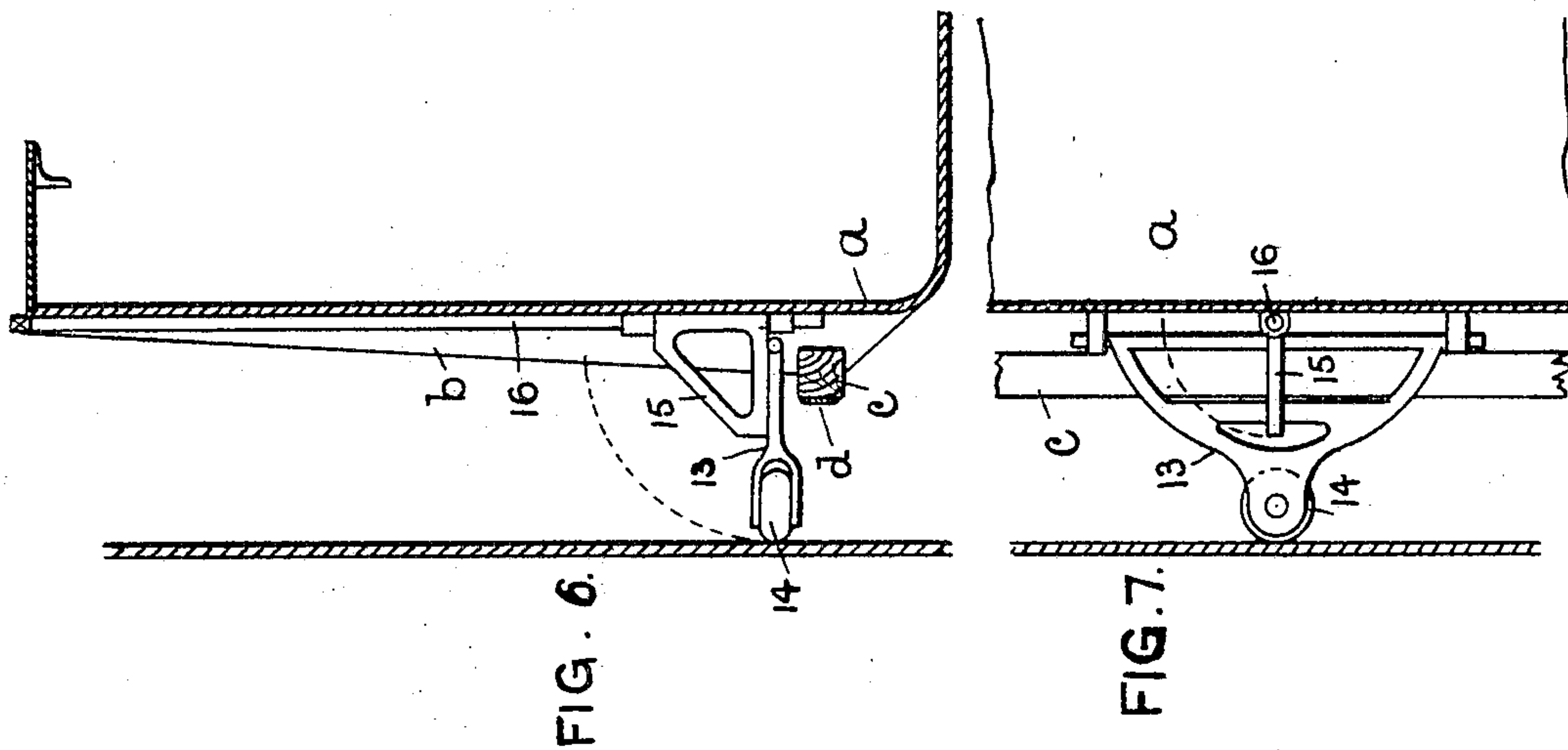
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APPARATUS FOR LOADING VESSELS WITH COAL OR OTHER MATERIAL.

APPLICATION FILED AUG. 19, 1901.

NO MODEL.

4 SHEETS—SHEET 2.



Witnesses.

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4 SHEETS—SHEET 3.

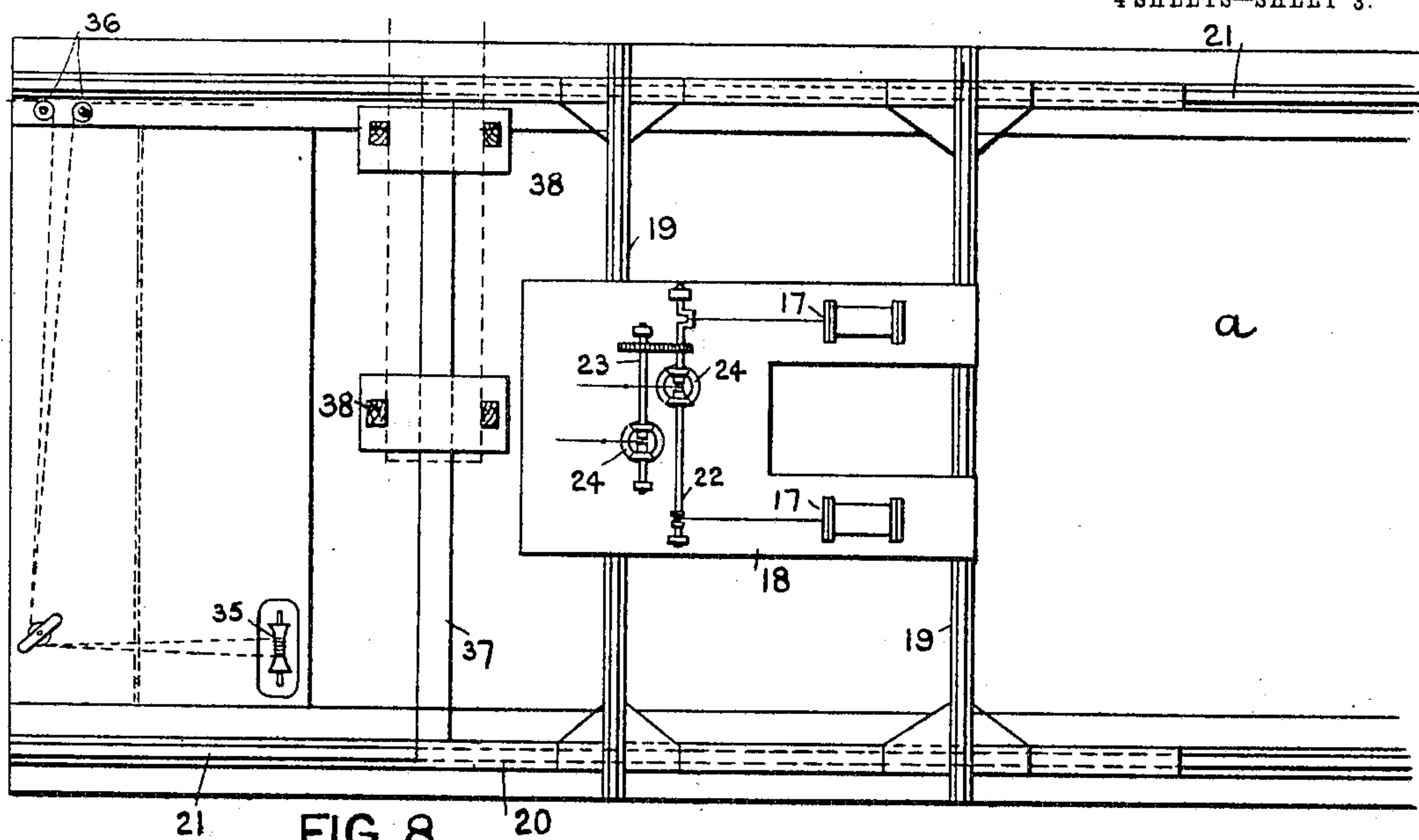


FIG. 8.

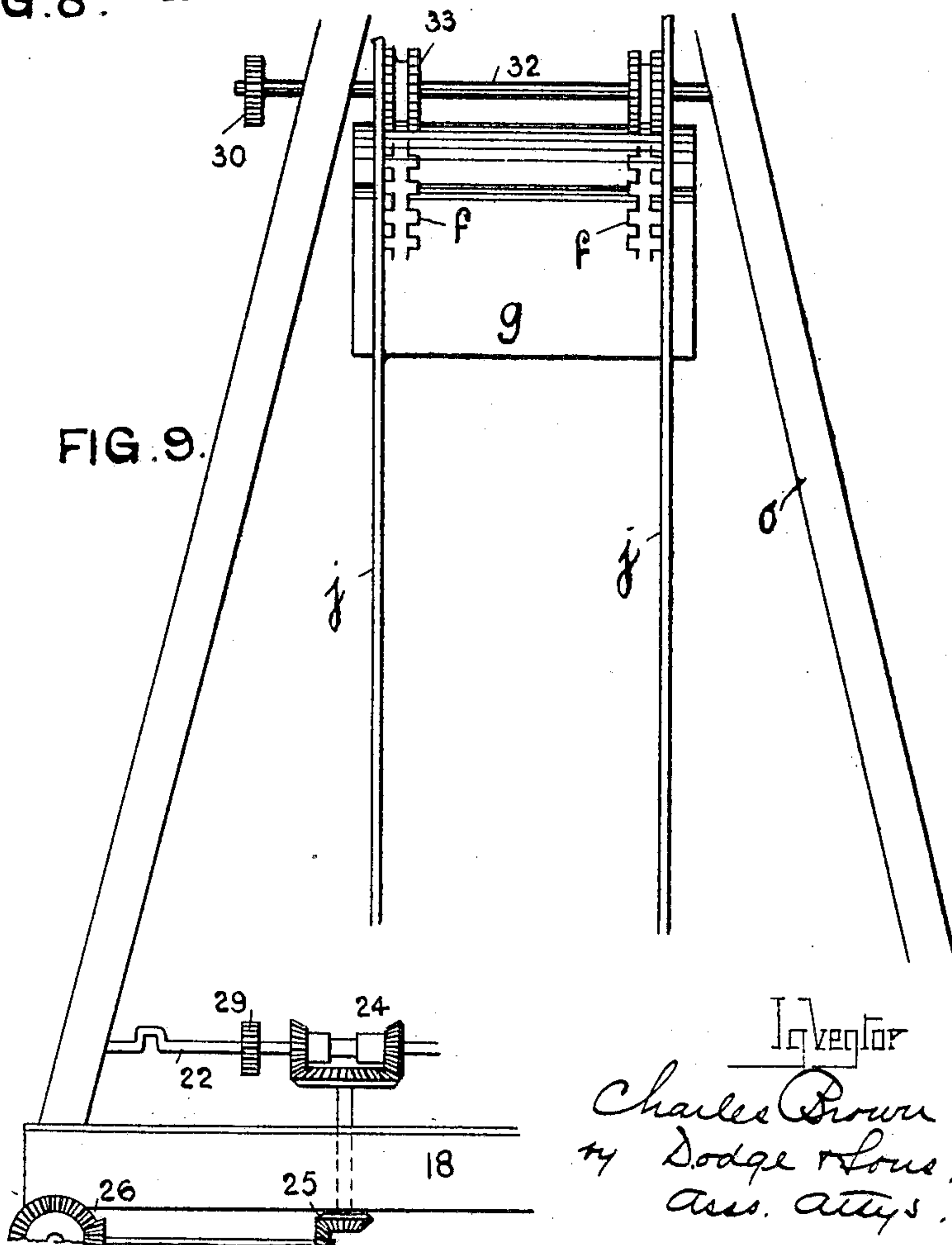


FIG. 9.

Witnesses

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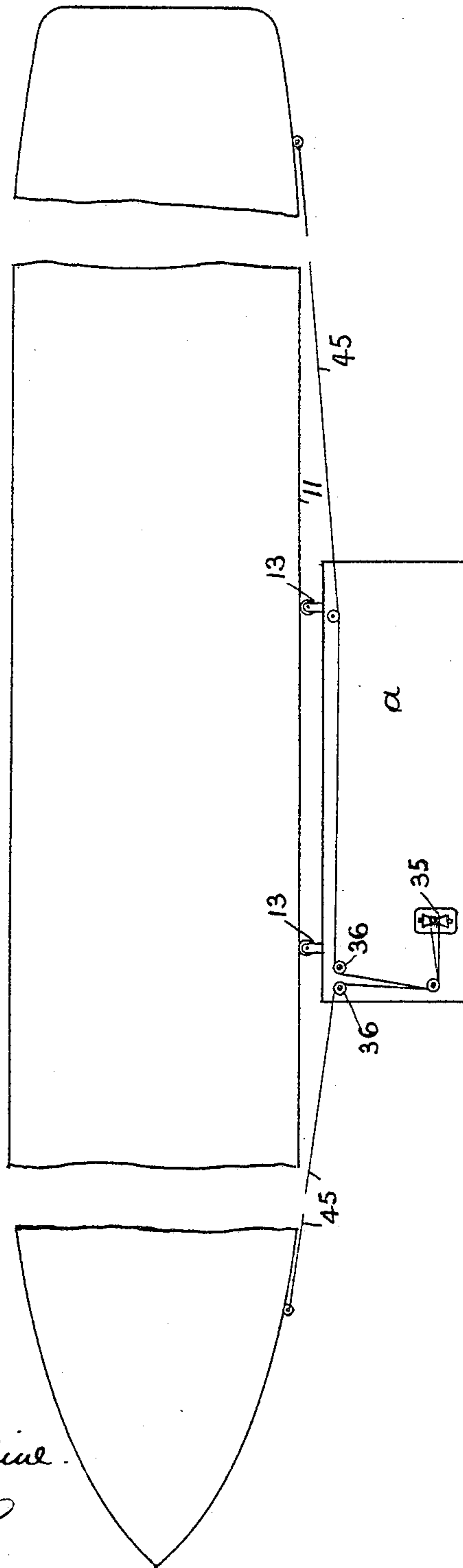
APPARATUS FOR LOADING VESSELS WITH COAL OR OTHER MATERIAL.

APPLICATION FILED AUG. 19, 1901.

NO MODEL.

4 SHEETS—SHEET 4.

FIG. 10.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES BROWN, OF LIVERPOOL, ENGLAND, ASSIGNOR OF ONE-THIRD
TO WILLIAM HAROLD WATSON, OF GREAT CROSBY, ENGLAND.

APPARATUS FOR LOADING VESSELS WITH COAL OR OTHER MATERIAL.

SPECIFICATION forming part of Letters Patent No. 775,164, dated November 15, 1904.

Application filed August 19, 1901. Serial No. 72,604. (No model.)

To all whom it may concern:

Be it known that I, CHARLES BROWN, a subject of the King of England, residing at Liverpool, in the county of Lancaster, England, (whose postal address is 23 Hero road, Bootle, near Liverpool, aforesaid,) have invented certain new and useful Improvements in Apparatus for Loading Vessels with Coal or other Material, (for which application for Letters Patent has been made in England under Provisional Protection No. 2,344, dated February 4, 1901,) of which the following is a specification.

This invention, which relates to apparatus for loading vessels with coal or other material, has for its object to provide a simpler, more efficient, and more easily worked apparatus than has hitherto been known, by means of which the material is transhipped direct from the barge to the vessel it is intended to load, and on account of the arrangement of which it is not necessary to employ any human labor beyond that needed to work the machinery and adjust the apparatus.

Referring to the accompanying drawings, Figure 1 is a side elevation, partly in section, of this improved apparatus; Figs. 2, 3, and 4, enlarged detail views of portions of the same; Fig. 5, an end view of the whole apparatus; Figs. 6 and 7, elevation and plan, respectively, of details hereinafter described; Fig. 8, a plan view of a portion of the apparatus; Fig. 9, an enlarged detail view showing the driving-gear, and Fig. 10 is a diagrammatic view of the means for securing the barge to the side of the vessel to be loaded and for moving the former lengthwise of the vessel.

In the figures, *a* represents a barge containing the coal or other material to be conveyed to the ship. This barge, it will be observed, has no beams athwartships, this being necessary for the proper working of the apparatus; but as a barge constructed in this way would be considerably weakened it is compensated for by strengthening the sides by means of strong trusses *b* inside and web frames *b* outside, as shown in Fig. 5. Furthermore, to the deepest and strongest portion of the out-

side ribs I fix a beam or belting *c*, extending the whole length of the barge and having preferably a metal face-plate *d*. Consequently this beam will be the first point of contact should the barge come against another vessel or against a quay-wall, thus protecting the gunwale, which, as before stated, is somewhat weak owing to the barge having no athwartship beams or supports. In order to facilitate the removal of the coal from the barge, inclined plates *e*, extending the whole length of the barge, are provided, being secured to the sides and to the bottom thereof, thereby cutting off the angles or corners formed by the junction of the bottom and the sides, and in view of the extra strain brought to bear on the bottom of the barge, owing to the point of contact being brought so low, the bottom is formed double, as shown. This barge is fitted with an elevator composed of an endless chain *f*, with a succession of buckets *g* thereon which dip into the hold of the barge. The chain I prefer to use consists of straight links, Figs. 3 and 4, hinged to each other and formed with recesses *h* into which the teeth of the driving-gear fit. The buckets also are specially shaped, having strong projecting beaks *i*. *j* is the frame carrying the chain-wheels, the lower one, *k*, of which is preferably shaped octagonal and the upper one, *l*, hexagonal. An additional chain-wheel *m* is also provided, which causes the buckets to travel horizontally for a short distance along the bottom of the barge, thus giving a shovel-like action to the buckets. This is an important feature when coal is the material being shipped. The frame *j* is pivoted at *n* to a traveling frame *o* and is capable of adjustment, both as regards the depth and the angle of inclination. This may be effected by placing blocks of wood *p* of varying sizes between the frame *o* and the frame *j*, such blocks being held in position by a bolt *q* passing through it and through the frames. The supplementary octagonal chain-wheel *m* is supported by links *r* and tie-rod *s*, the latter having a turnbuckle and the former having free ends capable of being secured in different positions to the fixed plates *t*, whereby

such wheel can be adjusted. 40 is a regulating-bush for varying the position of the chain-wheel *k*. *u* is a hood pivoted to the frame *j* and capable of being adjusted by a stay-rod *v*, one end of which is pivoted to the hood, as shown in Fig. 2. Its other end passing through a lug on the frame *j* is threaded to receive nuts in a well-known manner. To insure that all the material being conveyed by the buckets shall pass in the right direction, a counter-weighted baffle-plate *w* is pivoted to the hood, so that any material striking it will be deflected into the inclined chute *x*, such plate being pushed aside by each of the buckets as they pass, but resuming its normal position directly each bucket has passed, owing to its weighted arm.

x is an inclined hopper or chute suspended at one end from the hood *u*, preferably by chains, its other end resting in a second inclined chute *y* and capable of sliding therein, rails *z* being provided on the latter and wheels or rollers 1 on the former to facilitate this movement.

2 is a vertical chute supported by an arm 3 and adjusted by a rack and pinion 4; 5, a second vertical chute, telescoping with chute 2 and being supported by chains 6 passing over pulley 7 and round a wheel 8, rotated by a worm and wheel 9.

10 is a worm and wheel and rack for adjusting the inclined chute *y*.

11 represents the side of the ship, and 12 a removable hopper mounted on the side of the ship. In order to keep the barge parallel to and at a constant distance from the vessel when loading, two or more brackets 13, Figs. 6 and 7, are hinged to the side of the barge and are provided with rollers 14, which when in use bear against the side of the ship, the brackets being held in the horizontal position by an arm 15, projecting from a vertical rod 16. This latter is mounted in bearings on the side of the barge and extends upward to a little above the top of the barge, being preferably formed square at the top to receive a key or spanner. When not in use, the arm 15 can be turned clear of the bracket 13, as shown by dotted lines, Fig. 7, the latter being then turned up so as to lie flat against the side of the barge, as shown by dotted lines in Fig. 6. The elevator is worked by a steam-engine 17 through the intervention of gearing. The engine is mounted on a framework or truck 18, with wheels which travel on rails 19 arranged crosswise of the barge. These rails are fixed to a lower frame or truck 20, which is provided with wheels adapted to run on rails 21, fixed on the gunwale of the barge, the lower truck therefore traveling at right angles to the upper one. The elevator can be traveled both longitudinally and transversely without putting the machinery out of gear and can be moved to any position required without stopping the

buckets. The gear can be the ordinary overhead crane-gear. On the drawings the engine 17 drives a shaft 22, which is geared to a second shaft 23, both having reversing-gear 24. The shaft 22 effects the transverse movement of the upper frame by gearing 25 and 26, Fig. 5, and the shaft 23 the lower frame by gearing 27 and 28, and the chain carrying the buckets is driven, preferably, from shaft 22 by means of sprocket-wheels 29 and 30 and chain 31, the latter wheel being mounted on shaft 32, on which the toothed wheels 33 are mounted. The chain is driven by the teeth of these wheels, Fig. 9, engaging in the recesses of the chain, as before mentioned. The shaft 32 can either be driven direct or reducing-gear 34, as shown in Fig. 1, can be interposed.

One part of the barge is provided with a capstan 35, Fig. 8, having a rope 45, the bight of which passes round the drum of the windlass, the ends of such ropes after passing over pulleys 36 and other suitable guides being fastened to opposite ends of the vessel. These ropes keep the barge moored to the vessel, and by turning the capstan one rope is wound thereon and the other unwound, thereby moving the barge in either direction, so as to bring the chutes opposite each coal-port of the ship. To support the inclined chute *y*, the girders of the lower truck are extended, as shown in dotted lines Fig. 1 and in full lines Fig. 8, and are joined by a cross-bar 37. On this cross-bar are fixed plates to which the uprights 38 are attached.

39, Fig. 5, is a platform.

The mode of action is as follows: The buckets being set in motion they scoop or shovel up the coal or other material from the hold of the barge and deliver it into the chutes, from whence it is conveyed into the vessel being loaded. The man in charge actuates the gearing so as to cause the elevator to travel to and fro both transversely and longitudinally, thus keeping the buckets always fed up to the coal until the whole width and length of the barge is completely emptied. The man standing on the platform 39 operates the worm-gear and racks and pinions before described of the telescopic chutes and hoppers to correspond with the different positions of the elevator and the varying heights of the ship and barge. The apparatus may be fitted with a derrick and tackle to shift the hopper 12, attached to the coal-ports of the ship to the next port.

I claim as my invention—

1. In an apparatus for loading vessels, the combination of a barge for holding the material to be loaded; means on the barge for holding it at a given distance from and in rolling contact with the vessel which is being loaded; an elevator adapted to raise the material; chutes adapted to guide said material from the elevator; a vertically-adjustable hopper de-

signed to receive the material from the chutes; and means for feeding the elevator-buckets up to the material in the barge.

2. In an apparatus for loading vessels, the combination of a barge; fenders hinged on the barge for holding it at a given distance from the vessel to be loaded; means for locking said fenders when in use; means for turning said fenders to a vertical position when not in use; an elevator on said barge adapted to raise the material to be loaded; chutes adapted to guide said material from the elevator; a vertically-adjustable hopper designed to receive the material from said chutes; and means for feeding the elevator-buckets up to the material in the barge.

3. In an apparatus for loading vessels, a barge; an elevator on said barge; means for moving said elevator to any position thereon; a vessel to be loaded; hoppers on the side of said vessel; chutes leading from said elevator; means on the barge and vessel to be loaded for altering the position of said barge lengthwise of the vessel, whereby the chutes may be brought in turn opposite the various hoppers.

4. In an apparatus for loading vessels, a barge; an elevator on said barge; means for moving said elevator to any position thereon; a vessel to be loaded; hoppers on the side of said vessel; chutes leading from said elevator; a rope secured fore and aft on said vessel; and a capstan on said barge adapted to be turned and to support a plurality of windings of said rope, whereby the barge is moved lengthwise of the vessel and the chutes are brought in turn opposite the various hoppers.

5. In an apparatus for loading vessels, a barge; an elevator on said barge; means for moving said elevator to any position thereon;

means for adjusting said elevator in regard to both depth and inclination; in combination with an elevator-chain; buckets on said chain; and a third and adjustable wheel on said elevator, whereby a scooping motion is given to the buckets and the travel of the same adjusted relatively to the bottom of the barge.

6. In an apparatus for loading vessels, the combination of a barge; an elevator; an inclined chute; and a counterweighted, pivoted baffle fixed to the top of said chute, said baffle being adapted to guide the material into the chute and also to turn on its pivot so as to allow the passage of the buckets of the elevator inside the same.

7. In an apparatus for loading vessels, the combination of a barge for the material to be loaded; an elevator capable of travel longitudinally and laterally on said barge; means for moving said elevator; a third adjustable wheel near the lower extremity of the elevator adapted to adjust the travel of elevator-buckets situated on said elevator, in relation to the bottom of the barge; an inclined adjustable chute situated near the upper end of the elevator; means for adjusting said chute; a counterweighted, pivoted baffle at the top of said chute; a vertical hopper adjustable as to length and horizontally as to position; and means for so adjusting said hopper, substantially as and for the purpose described.

In witness whereof I have hereunto signed my name, this 27th day of July, 1901, in the presence of two subscribing witnesses.

CHARLES BROWN.

Witnesses:

G. C. DYMOND,
SIDNEY W. DOD.