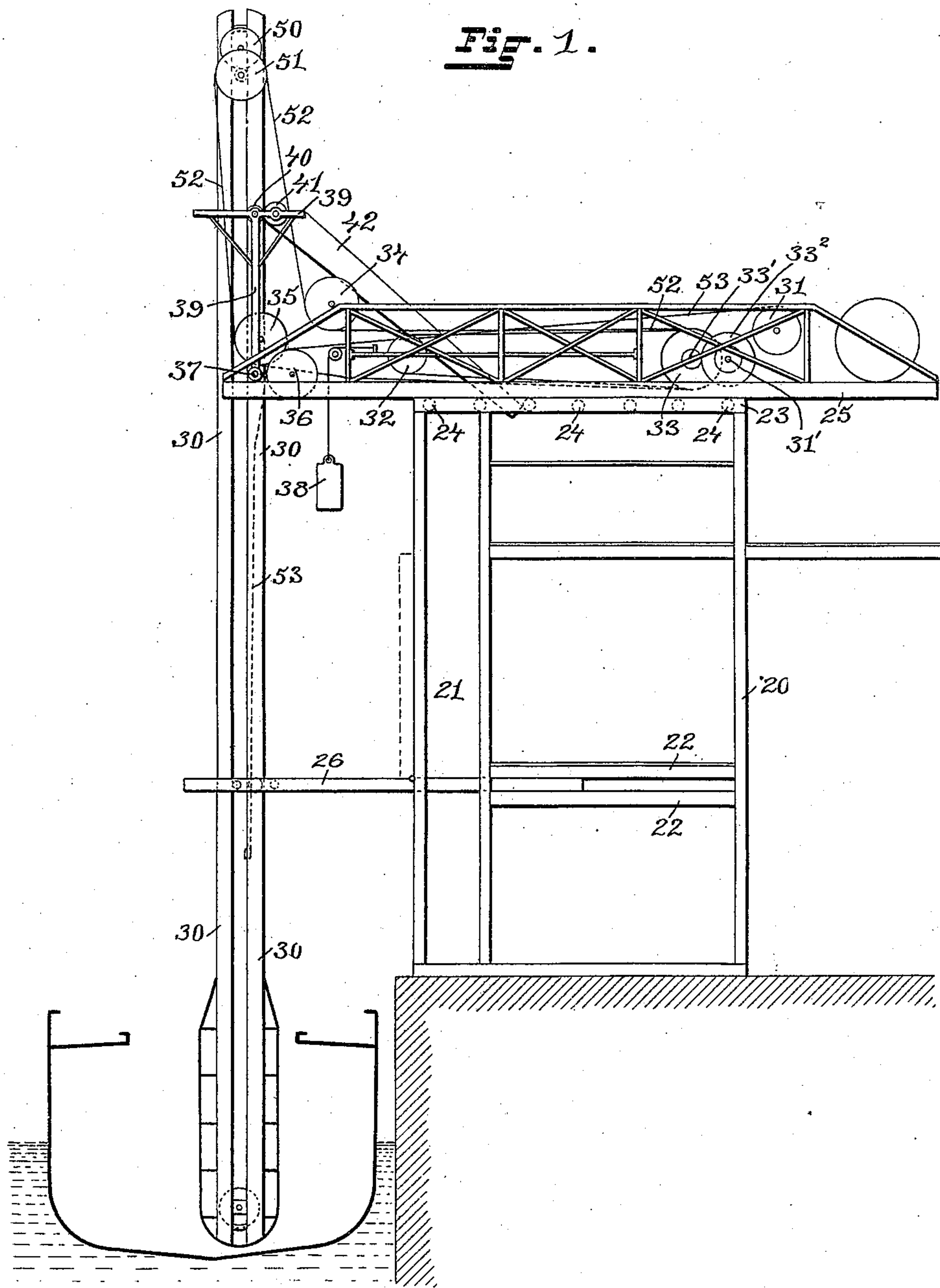


4 Sheets—Sheet 1.

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Patented Jan. 5, 1897.



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4 Sheets—Sheet 2.

CONVEYER.

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**Fig. 4.**



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P. ANDERSSON & A. C. SEYMOUR  
CONVEYER.

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Fig. 8.

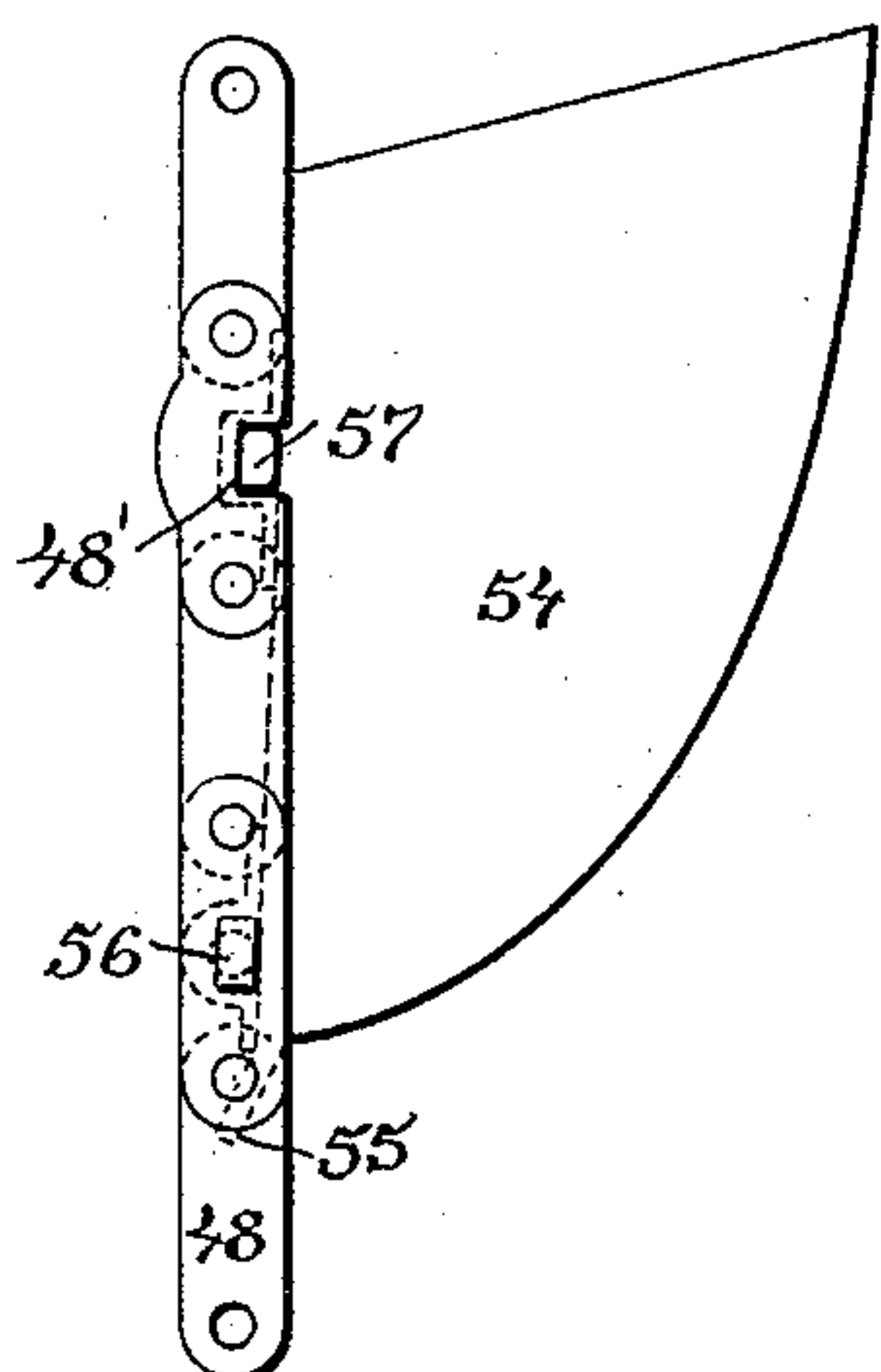


Fig. 9.

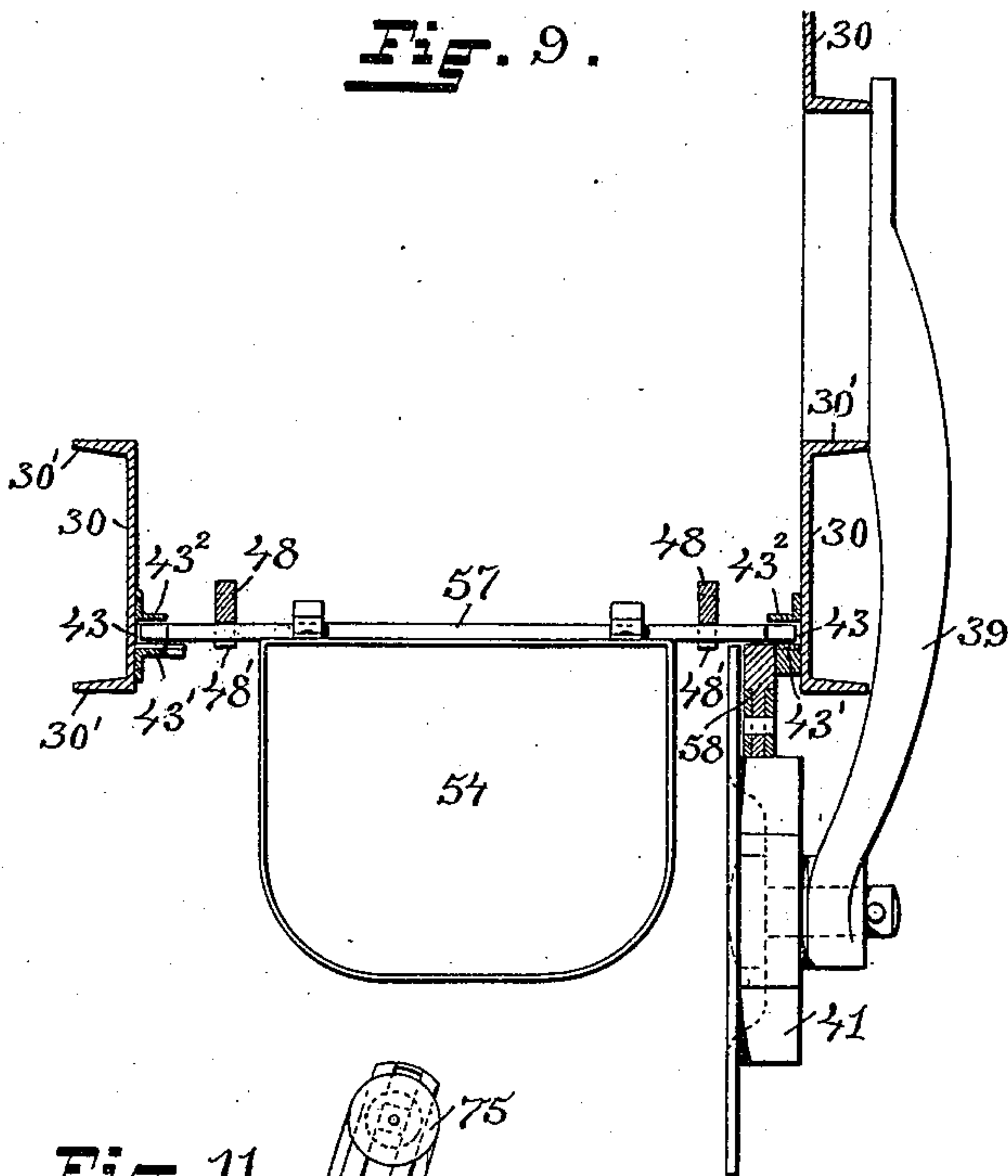


Fig. 10.

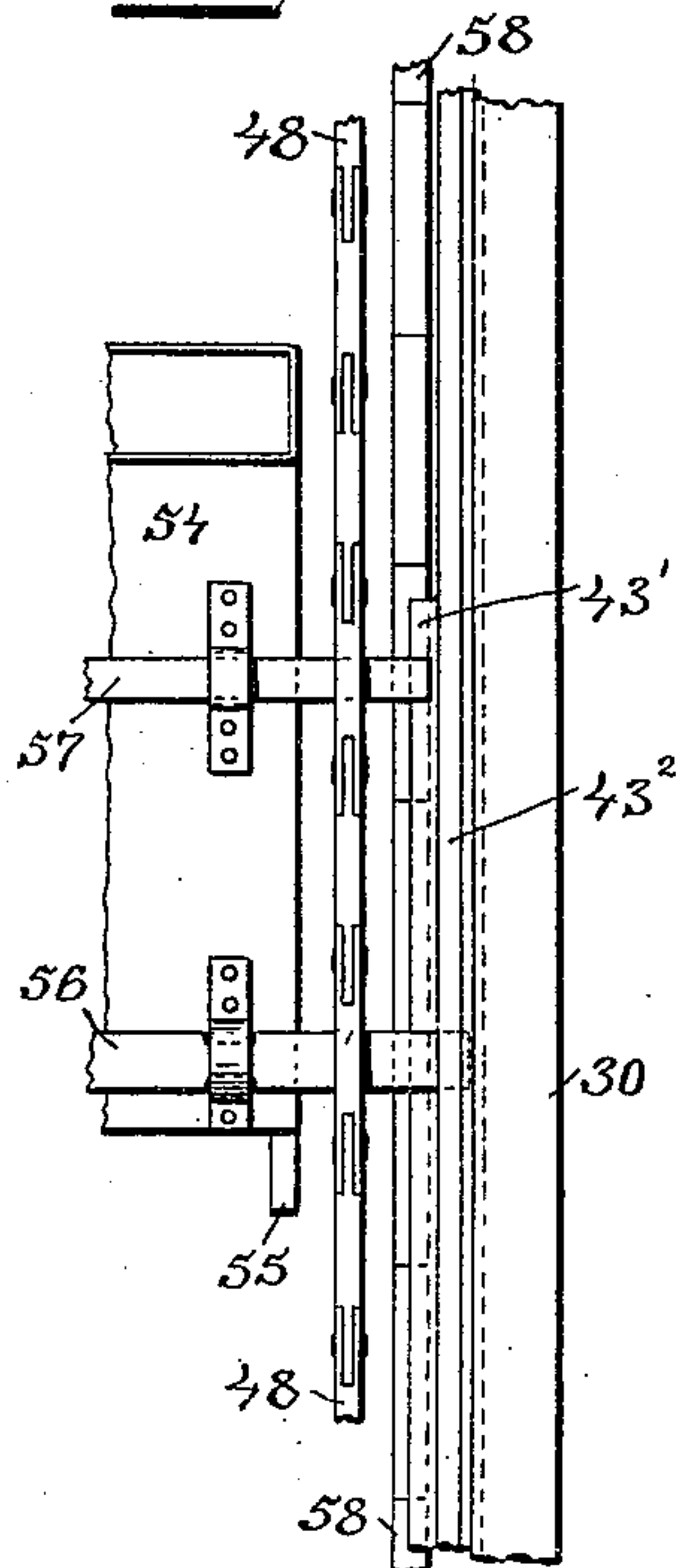
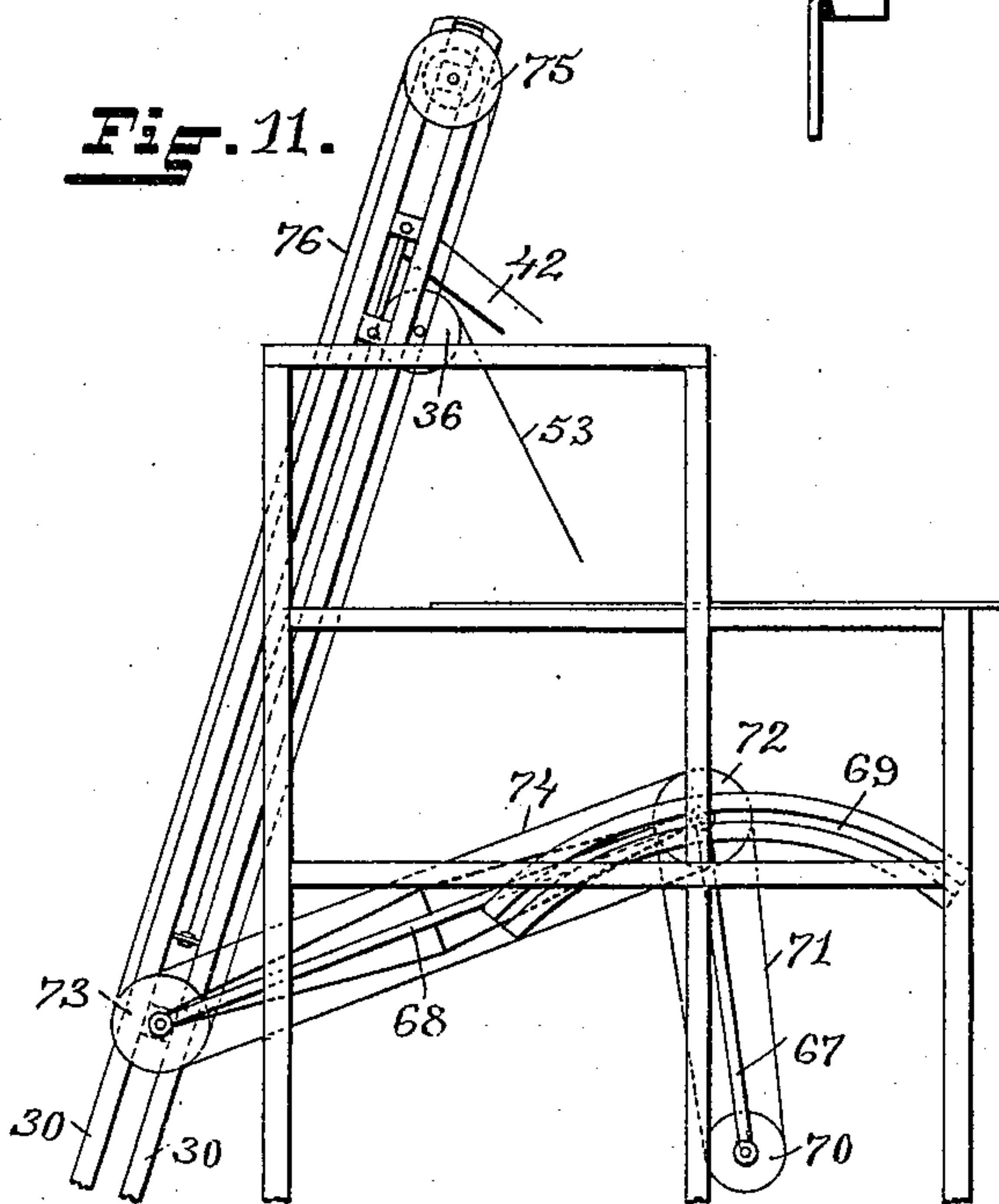


Fig. 11.



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(No Model.)

4 Sheets—Sheet 4.

P. ANDERSSON & A. C. SEYMOUR.  
CONVEYER.

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Fig. 12.

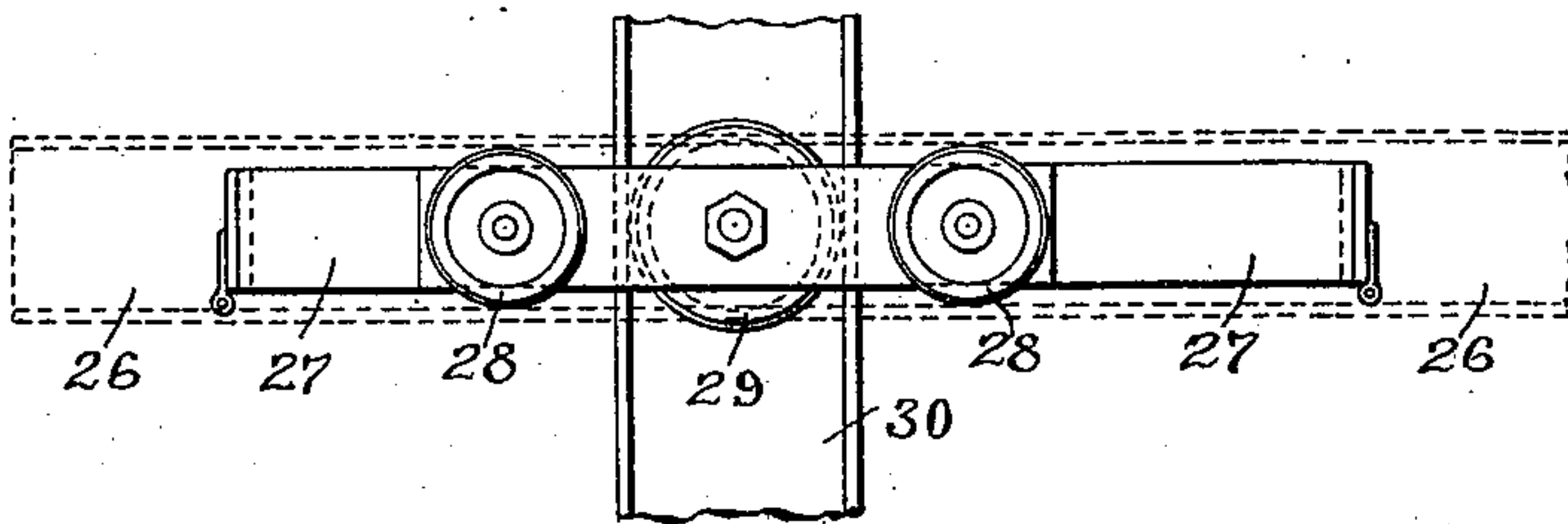


Fig. 13.

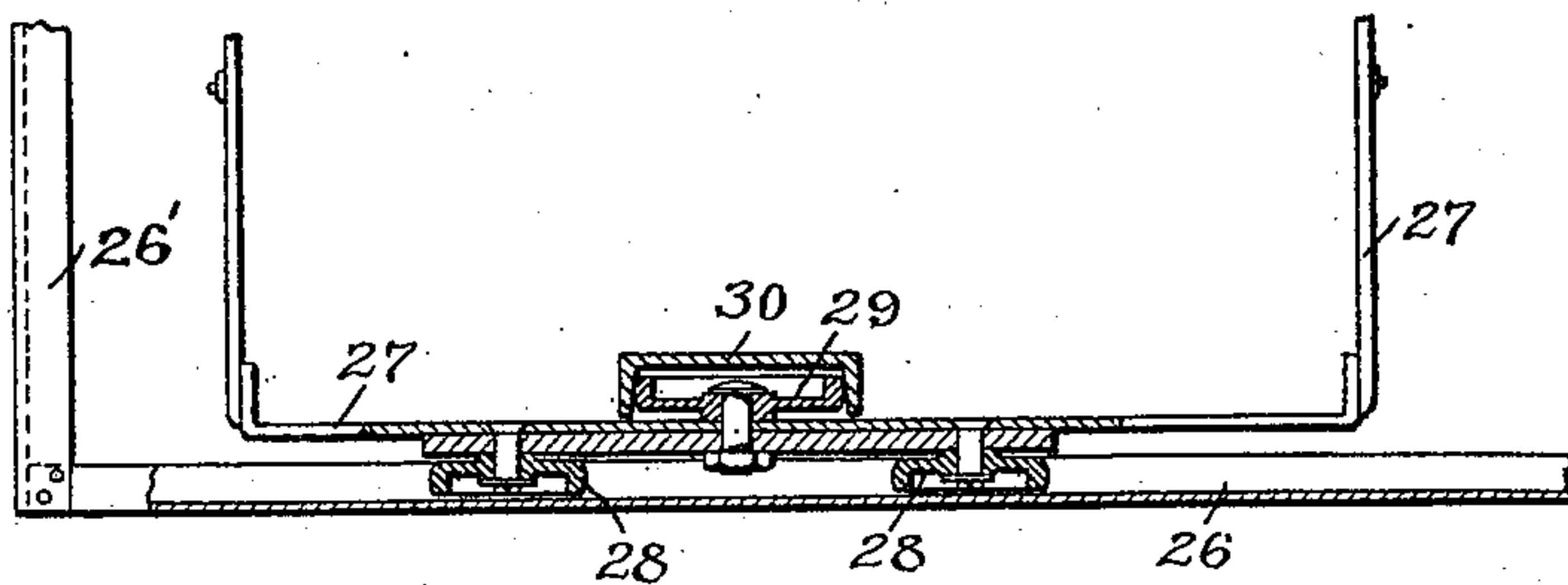


Fig. 14.

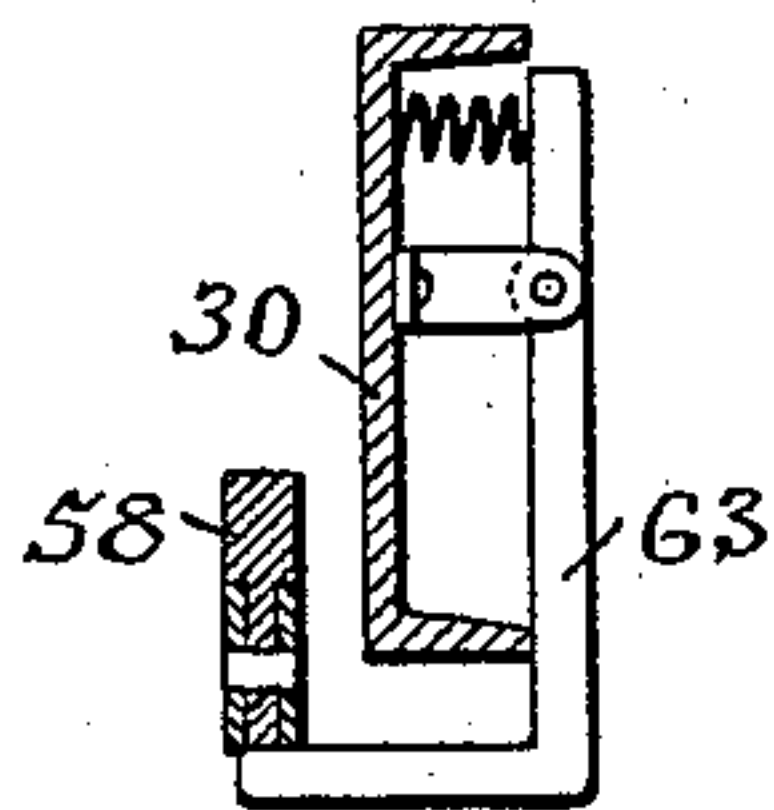
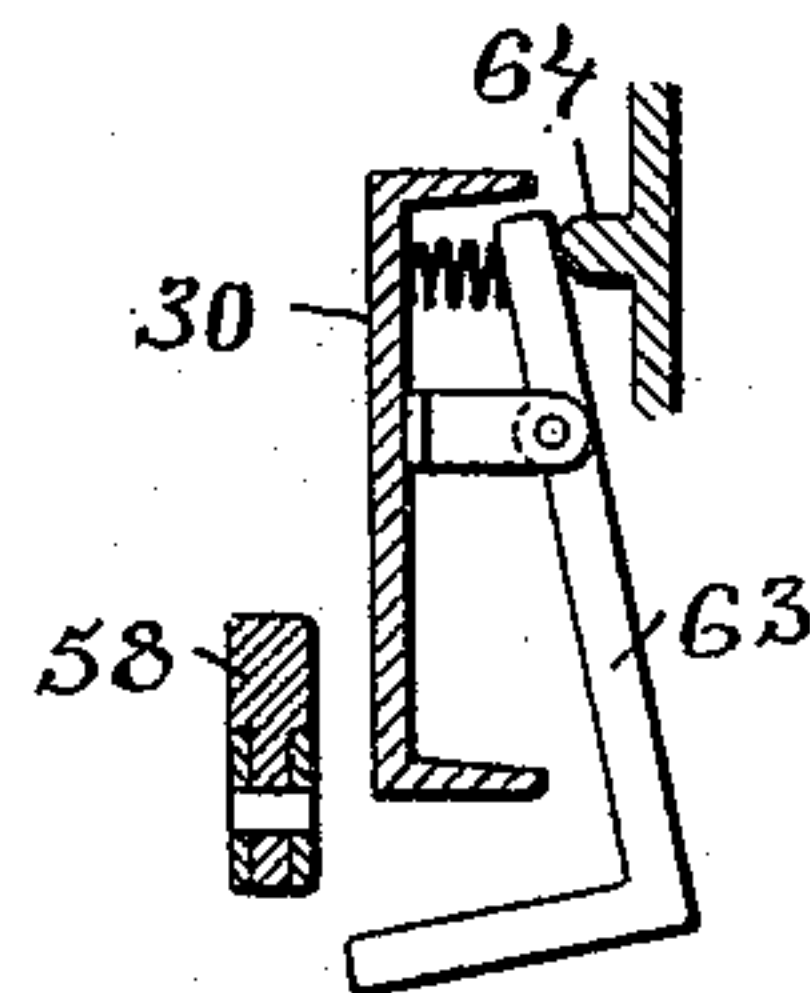


Fig. 15.



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# UNITED STATES PATENT OFFICE.

PELLE ANDERSSON, OF PHILADELPHIA, PENNSYLVANIA, AND ALVIN C. SEYMOUR, OF WARREN, RHODE ISLAND.

## CONVEYER.

SPECIFICATION forming part of Letters Patent No. 574,652, dated January 5, 1897.

Application filed January 27, 1896. Serial No. 576,969. (No model.)

*To all whom it may concern:*

Be it known that we, PELLE ANDERSSON, a subject of the King of Sweden and Norway, residing in Philadelphia, in the county of Philadelphia and State of Pennsylvania, and ALVIN C. SEYMOUR, a citizen of the United States, residing in Warren, in the county of Bristol and State of Rhode Island, have invented certain new and useful Improvements in Conveyers; and we hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to improvements in elevators designed to elevate material by means of buckets or cars and to deposit the material in chutes or receptacles.

One object of the invention is to drive the bucket-carrying gear from the upper end of the movable elevator frame or leg.

Another object of the invention is to so control the cars or buckets that they may be dumped at a fixed point without reference to the rising or lowering of the elevator frame or leg.

Another object of the invention is to so construct and mount the elevator frame or leg that the lower portion thereof may be brought inward to direct the scoops, buckets, &c., toward the shore side of a vessel.

The further object of the invention is to improve the details of construction whereby the operation of the elevator mechanism is rendered more simple and effective.

The invention consists in the means for supporting the elevator-leg, including the staging, the movable platform carrying the driving mechanism, and the boom for the lower portion of the elevator leg or frame, and their novel combination.

The invention also consists in the combination of the elevator-leg, the horizontally-movable platform, by which the elevator-leg is supported so as to move vertically and to be swung, the driving mechanism on said platform, the pulley at the upper end of the elevator-leg for operating the bucket-chains, and the driving-gear connecting this pulley with the driving mechanism and including a take-

up mechanism for taking up the slack in the belts of the driving-gear.

The invention also consists in the elevator-leg and the boom connected therewith, constructed to allow the lower end of the elevator-leg to swing.

The invention also consists in a bucket-guide constructed to yield in one direction.

The invention also consists in a bucket-guide automatically adjustable from the dumping-point.

The invention also consists in the flexible dumping-guide and means for directing the movement of the upper portion of the car or bucket to overbalance the car.

The invention likewise consists in the novel manner of mounting the cars or buckets on the elevator-chains.

The invention also consists in the latch for holding the dumping-chain.

The invention still further consists in such other peculiar features of construction and combination of parts as may hereinafter be more fully described, and pointed out in the claims.

Figure 1 represents a side elevation of the elevator, its supporting-framework, and driving-gear as seen when in operation. Fig. 2 represents a vertical section of the elevator-leg, in which the buckets or cars are shown in combination with the dumping-guide and with the chute. Fig. 3 represents a similar view of portions of the same on an enlarged scale. Fig. 4 represents a vertical section of a modified form of the elevator-leg for use when it is desired to hoist on the outer portion of the leg and to dump between the arms of the same, also showing the manner of directing the movement of the buckets at the dumping point. Fig. 5 represents a similar view of portions of the same. Figs. 6 and 7 represent detail views of portions of the dumping guide-chain. Fig. 8 represents a side view of one of the buckets or cars and a portion of the elevating-chain, to which the same is attached. Fig. 9 represents a cross-sectional view of a portion of the elevator-leg with the bucket, the elevating-chain, the rigid guides, the flexible dumping-guide, and the sprocket-wheel, over which the same may be taken up or let



out. Fig. 10 represents a vertical elevation of portions of the elevator-leg, the bucket, the elevator-chain, and the rigid guide, showing the end of this rigid guide and the dumping-guide chain in the background, adapted to prevent the tipping out of the bucket. Fig. 11 represents a side elevation of portions of the elevator, showing a modified form of driving connection between the driving mechanism and the upper end of the elevator-leg. Fig. 12 represents a side view, on an enlarged scale, of portions of the elevator-leg and of the boom. Fig. 13 represents a cross-sectional view of the same, more clearly showing the connection between the elevator-leg and the boom. Figs. 14 and 15 represent detail views of the latch for holding the dumping-guide chain in the locked and unlocked positions.

Similar numbers of reference designate corresponding parts throughout.

In elevators of this nature, in which a series of buckets, scoops, or cars are connected with and driven by chains passing over pulleys at the upper and lower ends of the elevator frame or leg, it is necessary that the elevator-leg be free to move vertically and to swing sidewise to accommodate itself to the rise and fall of the vessel in which it is operating and to reach the material in the vessel at both sides of the keelson. At the same time it is important that the elevator be connected with a fixed driving mechanism and that the material be delivered at a fixed point without the waste of power by first unduly elevating the material above this point and then allowing it to pass downward by gravity.

When coal or other material of a lumpy nature is to be elevated, it is desirable in some cases that the filled buckets or cars pass upward on the outer member of the elevator-leg, so that any lumps falling therefrom will fall outward, and where the lumps of material are sufficiently large to overbalance the weight of the bucket when located at the outer portion of the bucket it is advisable to positively direct the movement of the bucket at the dumping-point. It is also important that the elevator-leg be so constructed that a chute may be partially located between the members of the same to receive the material.

In carrying our invention into practice we construct a staging 20 adjacent to the face of the wharf and having the vertical recess 21, a double set of the guide-timbers 22 22 for the boom, and at the upper portion tracks or ways, as 23, furnished with wheel or roller bearings 24 24, on which the platform 25 is horizontally movable.

The boom is reciprocally mounted between the sets of guide-timbers 22 22, and consists of side members 26, connected by the cross-tie 26'.

On the members 26 is movable a carriage comprising a framework 27, embracing the elevator-leg and provided with the wheels 28 28 free to move on the boom members, and

antifriction-wheels, as 29, which are free to rotate between the flanges of one of the elevator members 30, so that if the upper end of the elevator be pivotally supported that portion embraced by the carriage may be readily swung inward or outward on the boom by means of a suitable tackle-fall secured to one end of the carriage without preventing its vertical movement, while the boom may also be adjusted horizontally.

Mounted on the platform 25 is the driving mechanism for controlling and operating the elevator. This includes the winch-drum 31, the driving-pulley 33, the belt-pulleys 34 and 35, and the take-up pulley 32, all mounted to rotate, the pulley 33 being driven from the engine through the gears 33' 33<sup>2</sup>, the gear 33<sup>2</sup> being mounted on the engine-shaft 31', while the bearings for the take-up pulley 32 are mounted to slide in guides and are connected with a tension-weight 38, which exerts a pull on the same to draw the bearings and this pulley 32 away from the pulley 33. At the outer end of the platform 25 are pivot-wheels 37, bearing on the flanges of the member 30 of the elevator-leg to serve as pivots. These wheels allow of free vertical play of the elevator. The pivot-wheels 37 are mounted on bearings on the platform 25. Through these bearings extend shafts for the said pivot-wheels 37 to revolve on. On these bearings are also pivotally mounted the brackets 39 for the dumping-chain wheels 41, chute 42, and the guide-wheels 40. The wheels 40 bearing on the flanges of the member 30 will always keep the dumping-chain wheel 41 and the chute 42 the same distance from the elevator-leg, the chute 42 being supported between the two brackets 39.

The elevator-leg is constructed of one or more pairs of oppositely-disposed members 30, having flanges 30' 30' connected by suitable braces and supporting a pair of continuous guide frames or ways 43 43, a portion of the outer lip 43' of which on the dumping side and for a distance above and below the dumping-point is cut away, as shown in Figs 2, 3, 4, 9, and 10, while above the dumping-point the inner lip 43<sup>2</sup> is provided with inclined guide-plates 44 and the upper end of the open portion of the guide 43' is provided with the oppositely-inclined guides 45.

At the upper and lower portions of the elevator-leg are rotatably mounted the double chain-pulleys 46 and 47, and on these pulleys are mounted continuous bucket-chains 48 of the construction shown in Fig. 8. These chains may be driven through the well-known driving-box 49, located between the members 30 and fixed in relation to the driving mechanism, by which a continuous chain is driven in the box, having fingers which engage the bucket-chain 48 and drive the same. We, however, prefer to drive the bucket-chain from the pulleys 47 at the upper end of the elevator-leg. For this purpose we provide the



shaft of the pulleys 47 with a gear 50, in which meshes the teeth of a gear mounted on the shaft of the pulley 51, suitably mounted at the upper end of the elevator-leg. The driving-belt 52 passes over the pulley 51, thence under the pulleys 34 and 35, and finally in a loop over the pulley 33 and the take-up pulley 32, which as the elevator-leg is raised, lowered, or swung takes up or lets out the driving-belt, the raising of the elevator-leg being effected by means of the cable 53, secured to the elevator-leg and passing over the pulley 36 to the winch-drum 31.

The buckets or cars 54 may be of any desired shape or construction which is adapted for use with this mechanism. They are furnished with the downwardly-extending arms 55 and with the cross-bars 56 and 57, the ends of which are free to move in the closed portions of the guideways 43 and to sustain the buckets in the upright position when moving vertically. The manner of securing the buckets to the chain 48 is peculiar. The lower cross-bar 56, being pivotally secured to the bucket, is rigidly secured through opposite links of the chains 48, while the upper bar 57 is rigidly fastened to the bucket and its end portions are seated in recesses 48', formed in opposite links of the two bucket-chains. It will thus be seen that the weight of the bucket when in an upright position will be sustained by the connection of both bars with the chain, but that there is a tendency for the weight of the bucket to draw the bar 57 out of the recesses 48' in the chain-link.

Secured to the portion of the guideway flange or lip 43', immediately below the cut-away portion, is a dumping-chain guide 58, consisting of links having the rear square shoulders 59, the double upper perforated ears 60 60, and the depending tongue 61, the ears of one link being pivotally connected with the tongue of the next link by a pin passing through the perforations in the same. This chain passes over the pulley 41, and is furnished at its free end with a weight 62 for taking up slack and keeping a tension on the chain. The chain forms a guide for the bars 57 of the bucket from the cut-away portion of the guideway 43 to the chute 42, which is located slightly below the upper portion of the pulley 41. As the elevator-leg moves vertically for any reason this chain is let out or taken up against the action of the weight 62. The chain is therefore always stretched taut and the pressure against the back of the same simply brings the square shoulders 59 of the links together, and these bearing on each other prevent the yielding of the chain outward.

When the elevator is to be used in places in which the rise and fall of the tide is excessive or for very deep vessels, we sometimes provide a chain-catch which consists of a pivoted latch-arm 63, mounted on the elevator-leg and operated to engage the outer edge of

the chain 58 by a spring. At the dumping-point is a finger 64, which operates the latch 63 against the spring-pressure when the elevator-leg is raised sufficiently.

When the loaded buckets in ascending reach the cut-away portion of the guideway 43, the ends of the bars 57 come in contact with the back edge of the dumping-chain guide 58, which prevents these arms from being drawn out of the recesses in the links of the chains 48 until the buckets reach a point opposite the axis of the pulley 41, where the chain-guide begins to extend outward in its curve over this pulley. The overbalanced weight of the bucket now draws the bars 57 from the recesses 48' in the bucket-chain links and the bucket tips sufficiently to deposit its load in the chute. A stop 77 is attached to and extends out from the chain 48, the stop 77 being attached to the chain 48 in such a position that when the bucket is tipped enough to let the contents drop out the bucket 54 will rest on the stop, thus preventing the bucket swinging so low that the catch 55 would not be brought into contact with the guide 44. The buckets are now carried along by the chains 48 until the arms 55 on the buckets strike the guide 44 on the guideways, and the buckets are thrown sufficiently toward the vertical position for the ends of the bars 57 to be engaged by the inclined guides 45 and directed into the guideways 43 and seated in the recesses 48' of the bucket-chain links. The buckets now pass over the pulleys 47 and down the outer member 30 of the elevator-leg to secure another load.

The nature of this elevator construction may be readily adapted to elevating on the outer member and depositing between the upward and downward bucket-guideways, as is shown in Figs. 4 and 5. The buckets or cars 54 or 54' may be modified in shape or size to adapt them to the material to be elevated and the recovering-guides 44 and 45 or 44' and 45' varied in form without changing the mechanical principle thereof.

The construction shown in Figs. 4 and 5 is particularly adapted for elevating soft coal, and when it is desired to elevate on the outer member of the elevator-leg, this material often being in large lumps, which overbalance the bucket, to prevent its tipping into the chute 42', we sometimes locate a rotatable sprocket-wheel 66 adjacent to the dumping-point and overlapping the upward guideway sufficiently to engage one end of the upper cross-rod on the bucket, which by following the radius of this sprocket-wheel is directed sufficiently out of the vertical to throw the bucket over toward the dumping-point.

Where it is found desirable, we modify the driving-gear as is shown in Fig. 11, in which the swinging arms 67 and 68 are pivotally connected together, the upper ends of the arms 67 being adjustable in the curved guides 69, while the outer ends of arms 68 are pivoted



to the elevator-leg. From the drive-pulley 70 the belt 71 passes over the pulley 72 at the upper ends of the arms 67, the pulleys 72 and 73 being connected by the belt 74, and the pulley 73 being in turn connected with the bucket-chain pulley 75 by the belt 76.

As the strain comes mainly on that portion of the elevator-leg in which the loaded buckets move, only one pair of members 30 are necessary.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In an elevating device, the combination with an elevator-leg having side members forming channels, of a horizontally-adjustable boom having ways or tracks, a carriage, consisting of a frame embracing the elevator-leg, traversable on said ways, and a wheel-bearing secured in such carriage and working in the channel of the elevator-leg.

2. In an elevating device of the nature described, the combination with a bucket-guide-way having cut-away portions, and a supplemental take-up guide for partially closing these portions, of a bucket having members moving in the guides and adapted to be released therefrom at the cut-away portions, and means for operating the bucket.

3. In an elevating device of the nature described, a bucket-guide flexible in one direction and adapted to present a rigid surface to the weight of the bucket, in combination with means for taking up and letting out the same.

4. In an elevating device of the nature described, a take-up and let-out bucket-guide chain in combination with a latching device

for holding a portion of the chain from outward movement.

5. In an elevating device of the nature described, the combination with bucket-chains having recesses in the edges of corresponding links, of a bucket pivotally connected at its lower end to the chains and having means near its upper end adapted to be engaged in the recesses of the chain-links.

6. In an elevating device of the nature described, the combination with a supporting-staging, a boom horizontally adjustable therein, a carriage traversable on the boom and comprising a framework carrying bearing-wheels, a platform traversably mounted at the upper portion of the staging, a driving mechanism mounted thereon, brackets at the outer end of the platform, and guide-wheels mounted on the brackets, of an elevator-leg having channeled side members movable on the guide-wheels of the bracket and of the boom-carriage, chain-carrying pulleys rotatable at the upper portions of the elevator-leg, and driving-gear including a belt-take-up mechanism connecting said pulleys with the driving mechanism on the platform.

In witness whereof we have hereunto set our hands.

PELLE ANDERSSON.  
ALVIN C. SEYMOUR.

Witnesses as to signature of Pelle Andersson:

JOSEPH ENTWISLE,  
JOSEPH A. MILLER, Jr.

Witnesses as to signature of Alvin C. Seymour:

BENJ. B. MARTIN,  
JOSEPH A. MILLER, Jr.