

No. 863,421.

PATENTED AUG. 13, 1907.

I. P. NELSON, T. O. SHAPPELL & J. A. SMALLEY.

COMBINED LIFTING JACK AND TRUCK.

APPLICATION FILED NOV. 26, 1908.

2 SHEETS—SHEET 1.

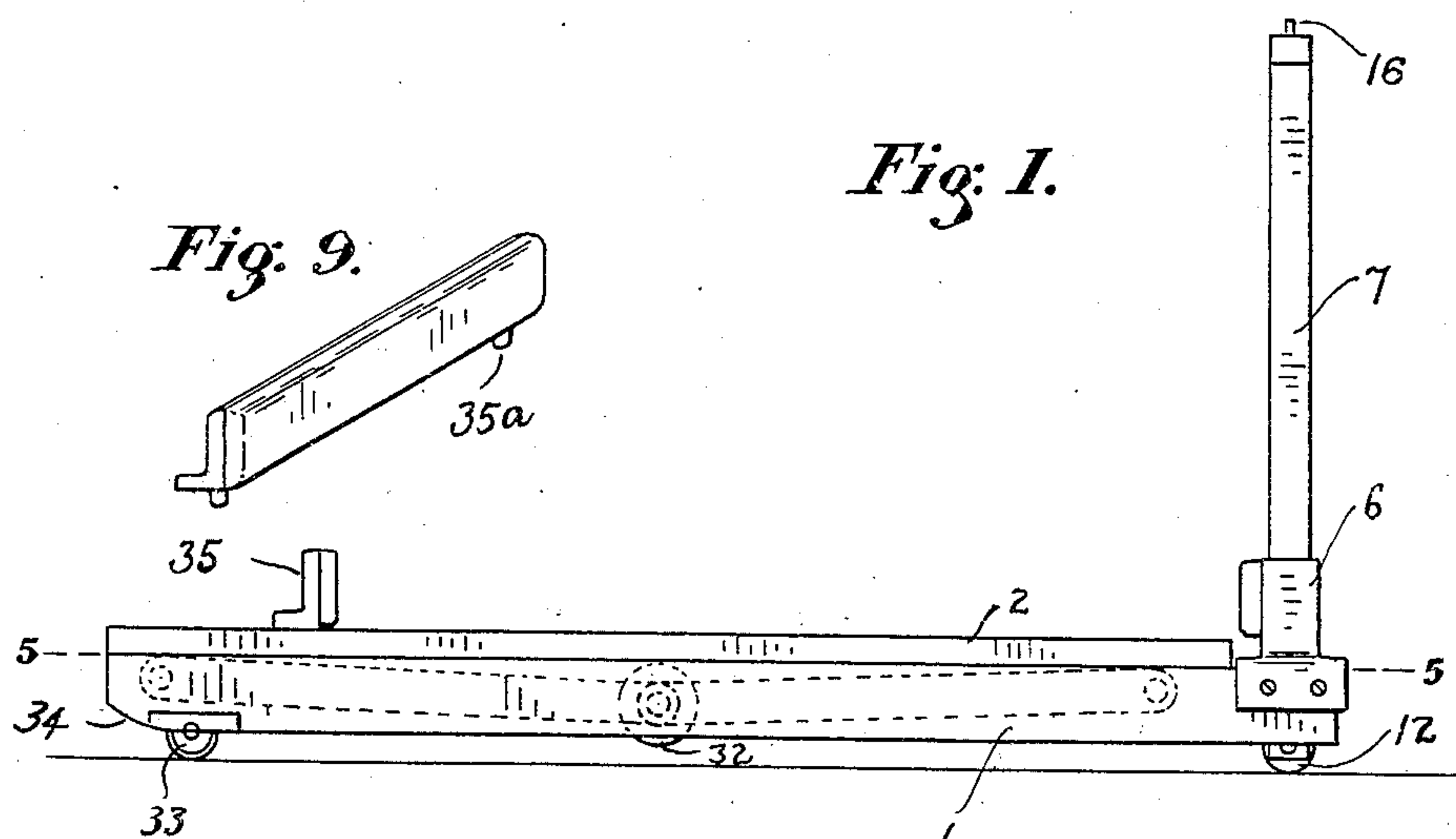


Fig. 1.

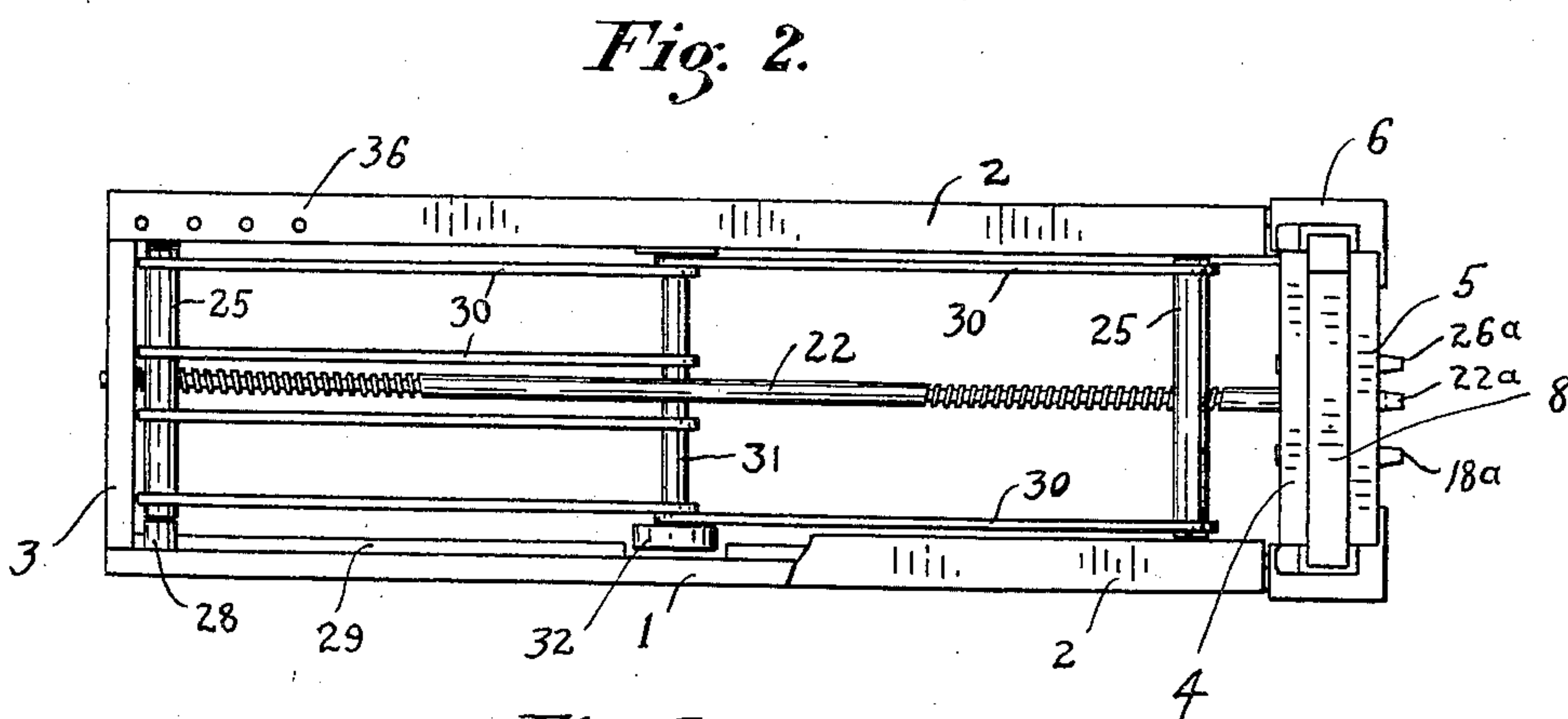


Fig. 2.

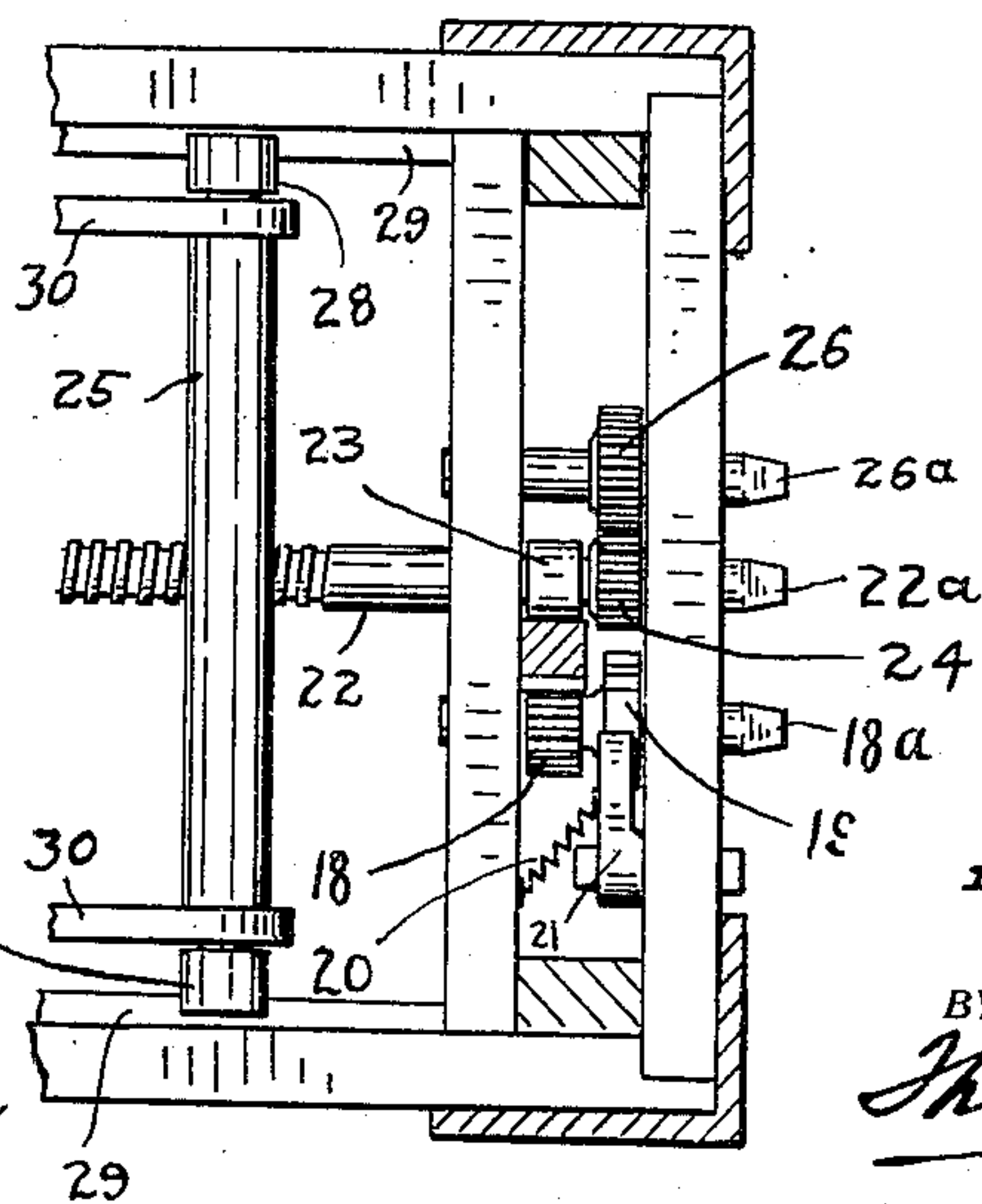


Fig. 8.

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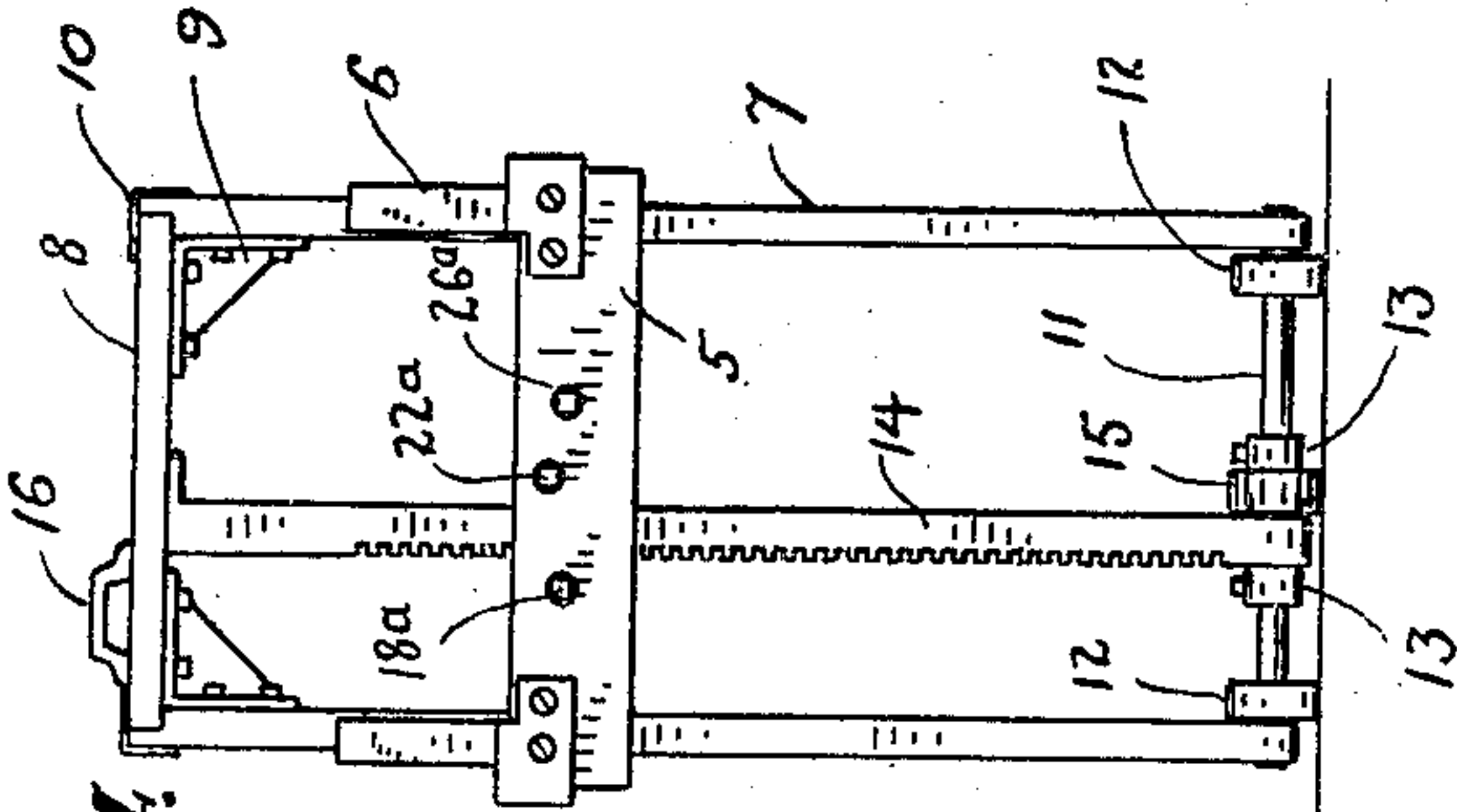


Fig. 4.

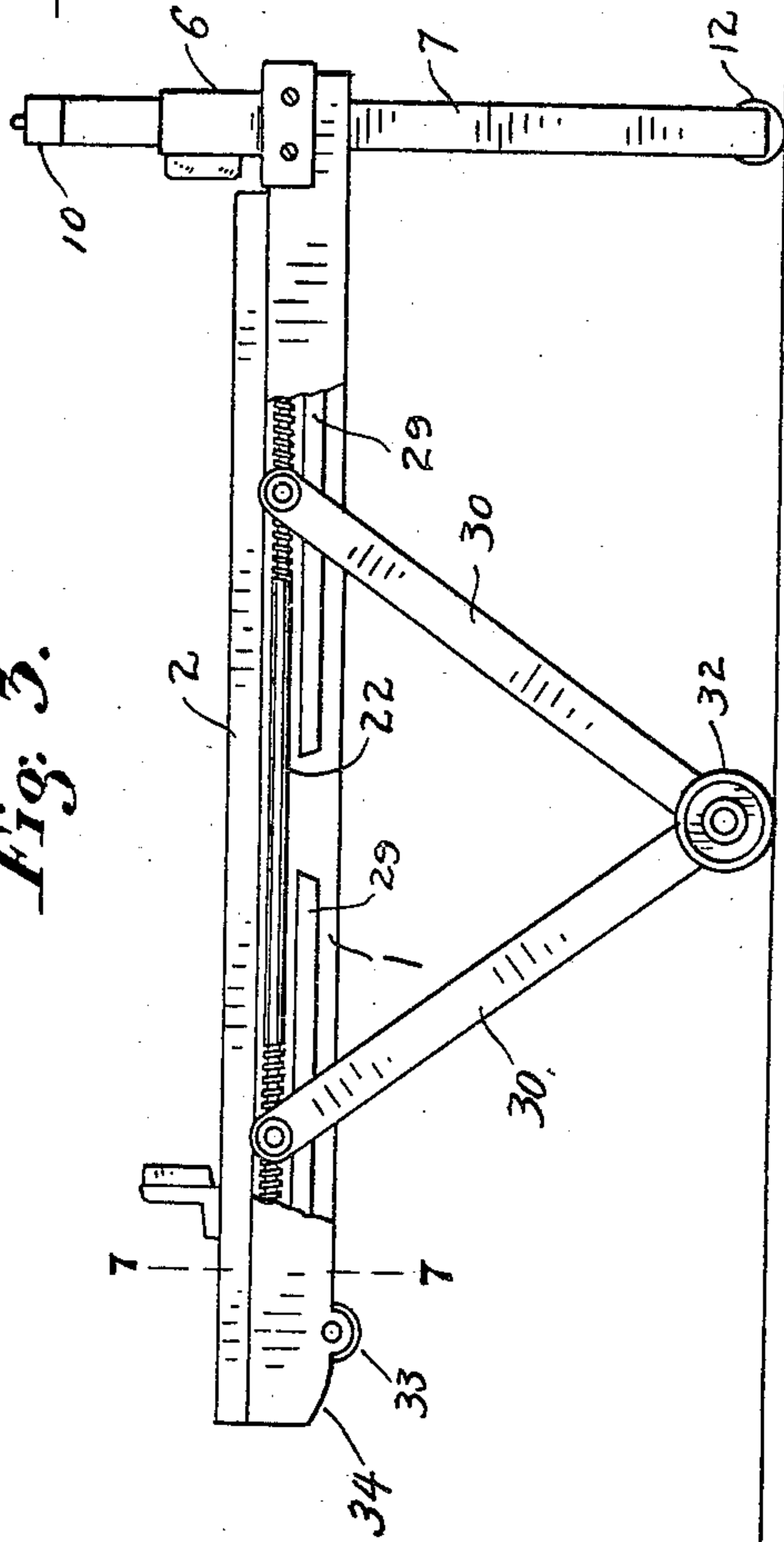


Fig. 3.

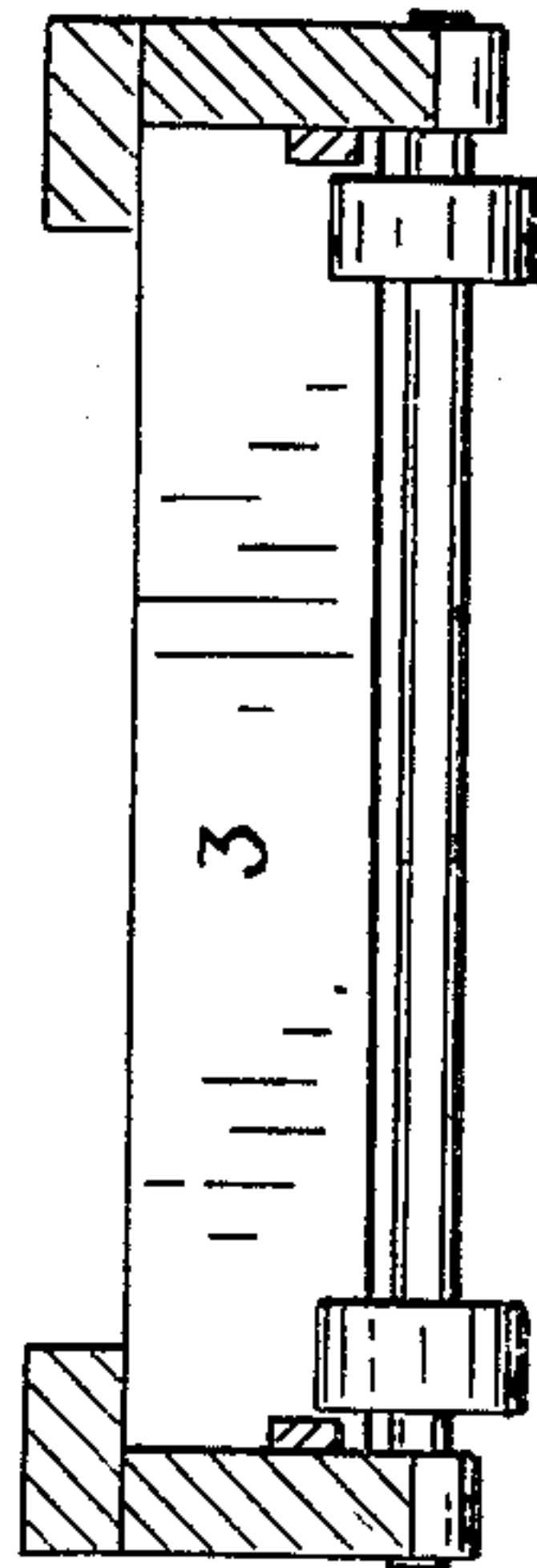


Fig. 7.

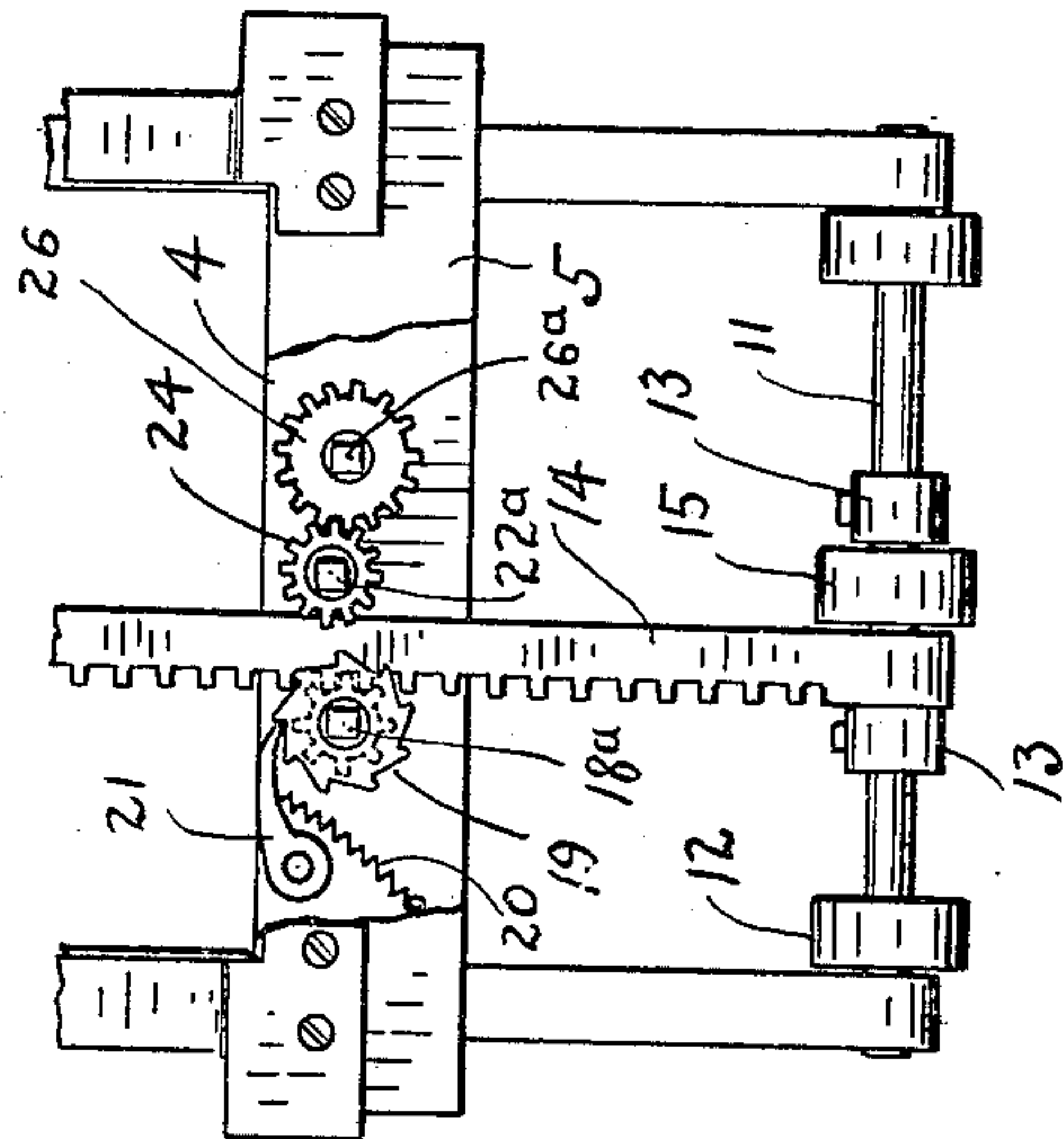


Fig. 6.

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UNITED STATES PATENT OFFICE.

IRA P. NELSON, TORENC E O. SHAPPELL, AND JAMES A. SMALLEY, OF MONTPELIER, INDIANA.

COMBINED LIFTING-JACK AND TRUCK.

No. 863,421.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed November 26, 1906, Serial No. 345,004.

To all whom it may concern:

Be it known that we, IRA P. NELSON, TORENC E O. SHAPPELL, and JAMES A. SMALLEY, citizens of the United States, residing at Montpelier, in the county of Blackford and State of Indiana, have invented a new and useful Combined Lifting-Jack and Truck, of which the following is a specification.

Our invention relates to improvements in apparatus for lifting and trucking objects of great weight and of unwieldy form and has reference especially to apparatus for elevating, shifting and the loading and unloading, for transportation, of pianos.

The purpose in our invention is to provide a combined lifting-jack and truck whereby the object to be handled may be easily and expeditiously elevated to a height suitable for loading on wagon, car, or platform, and easily shifted, either before or after being so elevated, and to afford facility whereby these purposes may be accomplished with the expenditure of a minimum amount of time and manual exertion.

A further object of our invention is to provide a device of this kind which will be portable, simple in construction, economical of manufacture, and not liable to get out of order or repair.

These and other objects which will become apparent as our invention is hereinafter disclosed, are accomplished by the novel construction, arrangement and combination of parts as shown in this specification, clearly pointed out in the claims and illustrated in the accompanying drawings, in which—

Figure 1 is a side view, and Fig. 2 is a top-plan view of our improved lifting-jack and truck as it appears in readiness for use, part of the flange of one of the side-rails being broken away. Fig. 3 is a side view, and Fig. 4 is an end view of the device, showing the frame in elevated position, a portion of the side-rail being broken away. Fig. 5 is a detached, enlarged horizontal sectional view of the rear end of the frame, taken on the line 5—5 Fig. 1. Fig. 6 is a detached enlarged view of the operating mechanism as shown in Fig. 4, the same being positioned nearer the bottom of the truss than appears in Fig. 4, and wherein a portion of the end-rail 5 is broken away. Fig. 7 is a transverse vertical sectional view of the frame taken on the line 7—7 Fig. 3; and Fig. 8 is a perspective view of the crank proper to be used in the manipulation of our improved device. Fig. 9 is a perspective view of the stop-block.

Similar numerals of reference refer to corresponding parts throughout the several views.

The oppositely positioned side-rails marked 1, having the flanges 2, the said rails being retained a suitable distance apart and secured rigidly by the end-rails 3, 4 and 5, constitute the frame of our device.

6 designates guide-blocks of such form that they constitute substantial binding means for the securing of the side-rails to the end rails 4 and 5, and a guide-way for the uprights 7 of the truss. The uprights of this truss are retained properly apart at their upper ends by the strut 8 and are secured and retained rigidly in place with reference to each other by suitable stiffening and connecting means such as the brackets 9 and the angle-clips 10. At their lower ends the uprights are provided with suitable boxing wherein are journaled the shaft 11, and are retained the correct distance apart by the wheels 12 rigidly secured to the shaft. Between the uprights is the vertically disposed rack 14, its upper end rigidly secured to the strut 8, its lower end pivotally secured to the shaft 11 and retained in its correct position by the collars 13 adjustable on the shaft.

15 designates a third wheel secured to the shaft 11, as shown in Fig. 6; its function, together with the wheels 12, is to form a roller-bearing for the rear-end of the complete device.

16 designates a suitable handle convenient to be grasped by the operator, in manipulating the device; and 17 denotes the crank adapted to be applied for the same purpose.

18 designates a pinion rigidly secured to a suitable shaft journaled in the end-rails 4 and 5, adapted to mesh with the rack 14. Also secured on this shaft which projects outside the end-rail 5 and has the suitable head 18^a for the application of the crank, is the ratchet 19. Strained against the ratchet by the spring 20 is the pawl 21, all as plainly shown in Fig. 5 and Fig. 6.

22 indicates a shaft extending longitudinally the entire length of the frame, equi-distance between the side-rails and journaled in the end-rail 3, and in the end-rails 4 and 5. On this shaft at its portion between the end-rails 4 and 5, is journaled the collar 23, and the rigidly secured gear-wheel 24. The portion of this shaft which protrudes outside the end-rail 5 is provided with the suitable head 22^a for the application of the crank. This shaft 22 is provided with threads, right and left, extending from its ends toward the center, as plainly shown in Fig. 2 and which threaded portions directly engage the transverse shafts 25 which will be hereinafter described.

The positions of the pinion 18 and the rack with reference to the revoluble collar 23 are such, that the rear face of the rack is always in contact with the collar whereby the rack is prevented from being sprung or strained out of true position when the pinion is in action and the frame is being raised or lowered as will be hereinafter described. Meshing with the gear-wheel 24 and rigidly secured to a suitable shaft journaled in the end-rails 4 and 5 provided with the suitable projecting head

26^a to receive the crank 17, is the gear-wheel 26. This gear wheel 26 is larger than the gear-wheel 24, and its function will be presently disclosed.

The shafts 25 disposed transversely between the side-rails have journaled at their ends the small wheels 28 of suitable diameter to move freely in the guides formed for them by the flanges 2 and the guide-bars 29 secured along the inner faces of the side-rails. Each of these shafts is perforated at its center and suitably threaded so that the threaded shaft 22 will be engaged and its revolution in either direction will cause the shafts 25 to approach toward or separate from each other as the case may be. Pivotaly secured to these shafts 25 are the two sets of parallel bars 30, all having the same length and their ends opposite the shafts pivotaly secured to the transverse shaft 31. Journaled on the ends of the shaft 31 are the wheels 32 the shaft being of such length that it may be retained, together with its wheels, between the side rails 1, all as plainly shown in Fig. 1 and Fig. 2.

It will be observed that the center-line between the shafts 25 is so located that its distance from the truss is slightly greater than its distance from the forward end of the frame;—the reason for this being that when the object to be transported is sustained upon the wheels 32, the balance of weight should be slightly toward rather than away from the truss, thus rendering the manipulation of our improved combined lifting-jack and truck, when loaded, always safe and easy.

Journaled on the under-side of the frame at its forward end are the oppositely disposed wheels 33, as shown in Fig. 1 and Fig. 7. These wheels constitute the roller bearing for the forward end of the frame when it is elevated and being pushed forward on the car, platform or wagon, and, together with the wheels 12 constitute the roller-bearings for the entire device before or after it has received its load. The forward end of the frame at its lower edge is curved as shown at 34 so that there are no projecting corners to interrupt the progress of the frame when the same is directed onto and over the surface upon which it is desired to be placed. 35 designates a stop-block adapted to be detachably secured to the flanges 2 by inserting in the holes 36 the studs 35^a; the function of these blocks is to form a check against any possible tendency of the load carried by the truck, to shift. The face of this stop-block, as well as the faces of the guides 6 may be provided with padded surfaces so that marring of the piano or other object being handled, may be prevented.

Although our newly invented combination lifting-jack and truck is especially intended for the lifting, shifting and transporting of pianos, by simply varying the general proportions of the frame and truss as to width and length it may be rendered adaptable to use for all classes of heavy objects such as stoves, safes, and furniture, and for large loads of merchandise of every description. When it may be desired to adapt our device for use in handling of merchandise in parcels the frame may be floored over the flanges 2, thus forming a suitable platform; this construction is in fact preferable for all the uses to which our device may be put, for the reason that all of the working parts between the side rails are thereby protected from injury.

It will be understood that we do not desire to limit

ourselves to the exact shape and form and details of construction as shown, as it is obvious the frame and the truss of our invention could be made entirely of metal and that minor changes might be made in the general construction and details of our invention, without departing from its nature or principles.

Our improved device when in readiness for operation, and while used simply as a truck, appears as shown in Fig. 1 and Fig. 2, the wheels 32 being snugly retained within the frame, and the end-rails 4 and 5 being in close contact with the peripheries of the wheels 12 and 15 whereby the truck is effectively "chocked". After the object to be handled has been properly placed on the frame, the operative then applies the crank 17 to the head 18^a and partially rotates the pinion 18 whereby the frame is lifted free from the wheels 12 and 15, and is retained in such lifted position by the pawl engaged in the ratchet 19. The device is then free to be moved simply as an ordinary truck with roller bearings at each end. If it may be then desired to render the load more easily shifted or directed, the operator applies the crank to the head 22^a and as the shaft 22 is revolved the shafts 25 are irresistibly drawn toward each other and the wheels 32 in like manner forced downwardly to the floor whereupon the frame is at once raised and the load may be then easily shifted on the wheels 32 and the truck-wheels at either end alternately as may be desired.

The next step in the operation of our invention is the elevation of the load. With the revolution of the pinion 18 the rear end of the frame is raised, reverse movement thereof being at all times prevented by the pawl 21 locking the ratchet 19; then the shaft 22 is revolved thereby raising the frame; alternately then, this pinion and shaft are revolved by the operator until the load has been elevated the desired height for shifting to platform, car, or wagon. The load being so placed on the frame that a slight excess of balance will be toward the truss, it may be as easily manipulated in its elevated position, as in its lower position. It will be observed that the height of the forward end of the frame may be at all times varied by simply the operation of the shaft 22 or the pinion, so that the placing of the end of the frame on the plane where it is desired to deposit the object to be handled, is easily accomplished. When this is done the entire device is pushed forward, resting on its wheels 32 and the wheels 33; in the mean-time the shaft 22 has been rapidly revolved by operating the crank on the gear-wheel 26 whereby the wheels 32 are brought back to suitable position whereby the load is supported on these wheels as it is pushed further forward. The further pushing forward of the load (now entirely resting on the elevated platform) renders the truss out of engagement. The pinion is then revolved in the opposite direction, the pawl having been easily swung free from the ratchet, whereby the truss is quickly returned to its initial position as shown in Fig. 1. Then the wheels 32 are raised into their position within the frame as shown in Fig. 1, the frame then settles on the wheels 12 and 15. The load may be permitted to remain on the truck, chocked as it is, or may be trucked thereon, or removed therefrom, as may be desired. When it may become desirable to lower the object

from its elevated plane, the truss is simply lowered to the lower plane, and all of the operations heretofore described are simply reversed.

What we claim as our invention, and desire to secure by Letters Patent is—

1. In a device of the kind described, the combination of a frame rollably mounted at one end and a vertically disposed rollably mounted truss slidingly secured at its opposite end, transverse shafts having wheels thereon adapted to move in suitable guides therefor on the inner sides of the frame, sets of bars pivotally secured to the said shafts their ends opposite the shafts being pivotally secured to a shaft upon which a pair of rollers are journaled, a device having connection with the said transverse shafts to force the shafts toward and from each other and to hold the shafts stationary, when stopped, at any stage of their travel, and a device to raise and lower and temporarily lock the end of the frame in said truss, at any stage of its raising or lowering, substantially as described.
2. In a device of the kind described, the combination with a horizontally disposed frame rollably mounted at its ends, of a longitudinally extending shaft threaded from its central portion to its ends, right and left, journaled in and having its end extending beyond the frame and having suitable head for application of crank, transverse shafts engaging said threaded shaft and having wheels thereon adapted to move in suitable guides therefor on the inner sides of the frame, sets of bars pivotally secured to said shafts and their ends opposite the shafts pivotally secured to a transverse shaft having wheels thereon, substantially as described.
3. In a device of the kind described, the combination with a horizontally disposed frame rollably mounted at its forward end, and slidingly secured at its rearward end to a vertically disposed truss rollably mounted, of a rack vertically positioned and secured in said truss, a pinion journaled on the frame its shaft having a suitable head for application of a crank, a ratchet rigidly secured to said pinion and a pawl secured to the frame and adapted to engage the said ratchet, substantially as described.
4. In a device of the kind described, the combination with a horizontally disposed frame rollably mounted at its forward end, and slidingly secured at its rearward end to

a vertically disposed truss rollably mounted, said frame having a longitudinally extending shaft threaded from its central portion to its ends, right and left, journaled in and having its end extending beyond the frame and having suitable head for application of crank, transverse shafts engaging said threaded shaft and having wheels thereon adapted to move in suitable guides therefor on the inner sides of the frame, sets of bars pivotally secured to said shafts their ends opposite the shafts being pivotally secured to a transverse shaft having wheels thereon, of a rack vertically positioned and secured in said truss, a pinion journaled on the frame its shaft having suitable head for application of crank, a ratchet rigidly secured to said pinion and a pawl secured to the frame and adapted to engage said ratchet, substantially as described.

5. In a device of the kind described, the combination with a horizontally disposed frame rollably mounted at its forward end, and slidingly secured at its rearward end to a vertically disposed truss rollably mounted, said frame having a longitudinally extending shaft threaded from its central portion to its ends, right and left, journaled in and having its end extending beyond the frame and having suitable head for the application of a crank, a gear-wheel journaled on the frame meshing a smaller gear-wheel rigidly secured on said longitudinal shaft the shaft of the larger gear-wheel having a suitable head for the application of a crank, transverse shafts engaging the said threaded shaft and having wheels thereon adapted to move in suitable guides therefor on the inner sides of the frame, sets of bars pivotally secured to the said shafts their ends opposite the shafts being pivotally secured to a transverse shaft having wheels thereon, of a rack vertically positioned and secured in said truss, a pinion journaled on the frame its shaft having a suitable head for the application of a crank, a ratchet rigidly secured to the said pinion and a pawl secured to the frame and adapted to engage the said ratchet, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

IRA P. NELSON.

TORRENCE O. SHAPPELL.

JAMES A. SMALLLEY.

Witnesses:

JOHN W. RYAN,

THOMAS L. RYAN.