

**No. 627,539.**

**Patented June 27, 1899.**

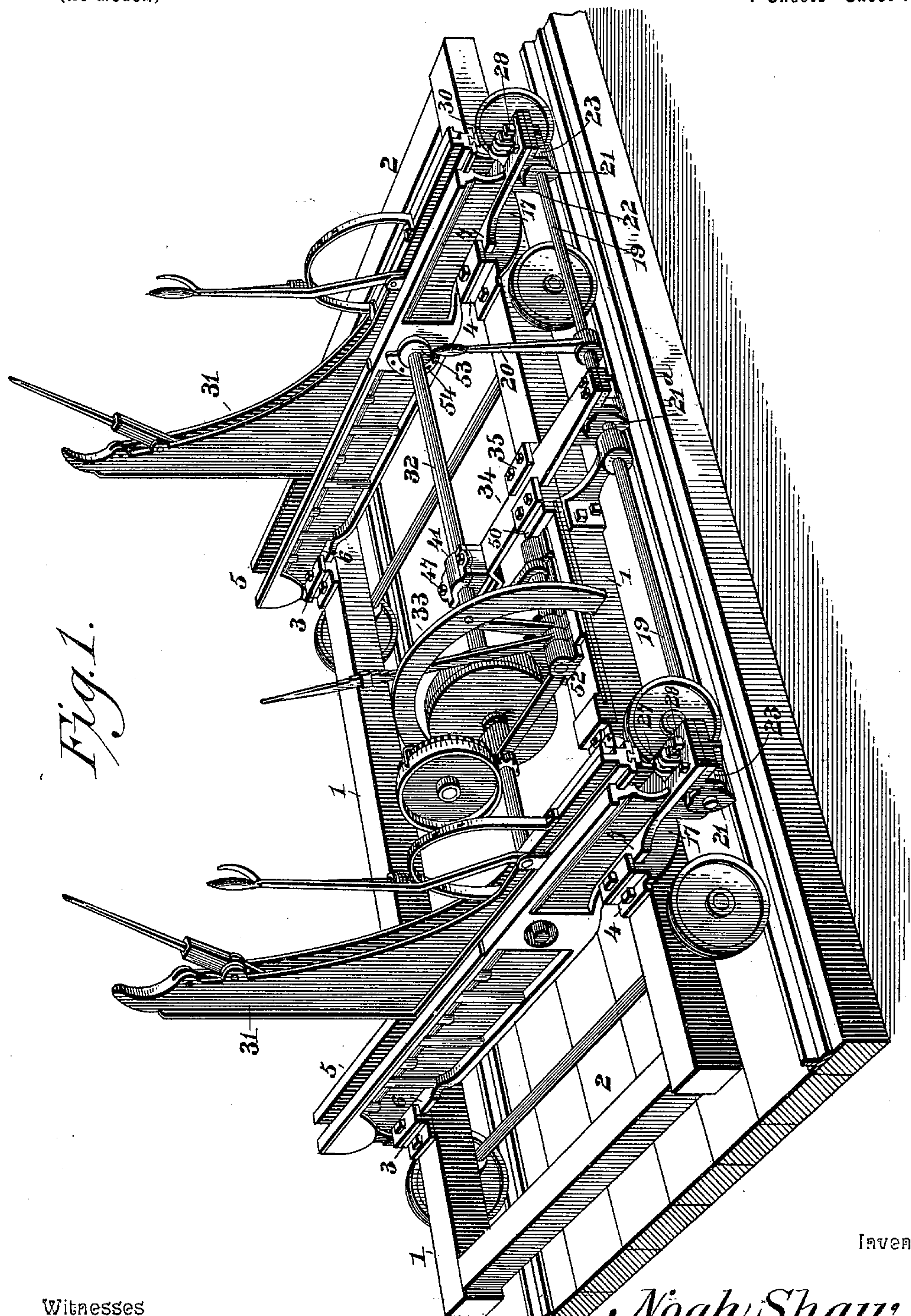
**N. SHAW.**

**SAWMILL CARRIAGE.**

(Application filed Oct. 16, 1896.)

(No Model.)

**4 Sheets—Sheet 1.**



Inventor

Witnesses

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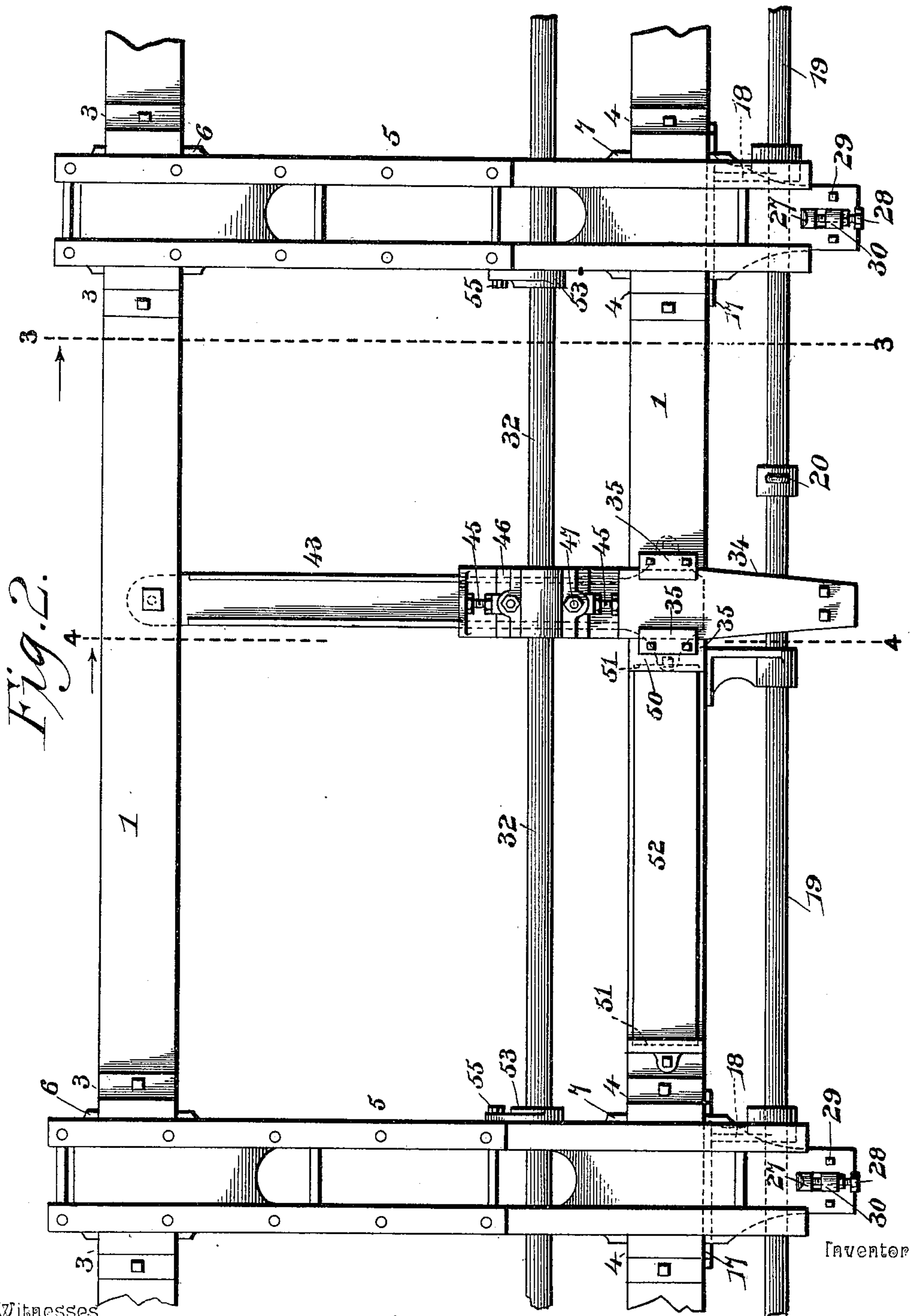
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4 Sheets—Sheet 2.



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Fig. 3.

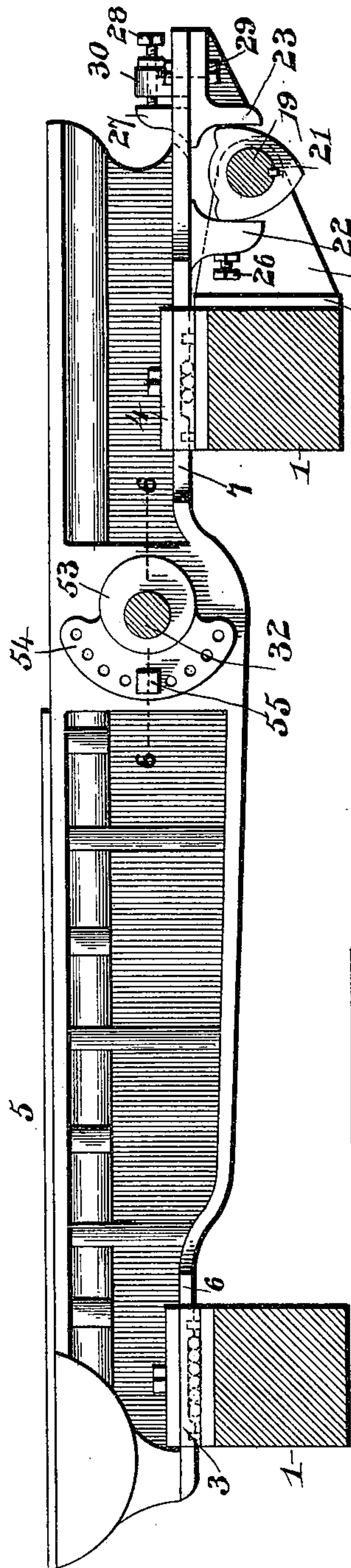


Fig. 6.

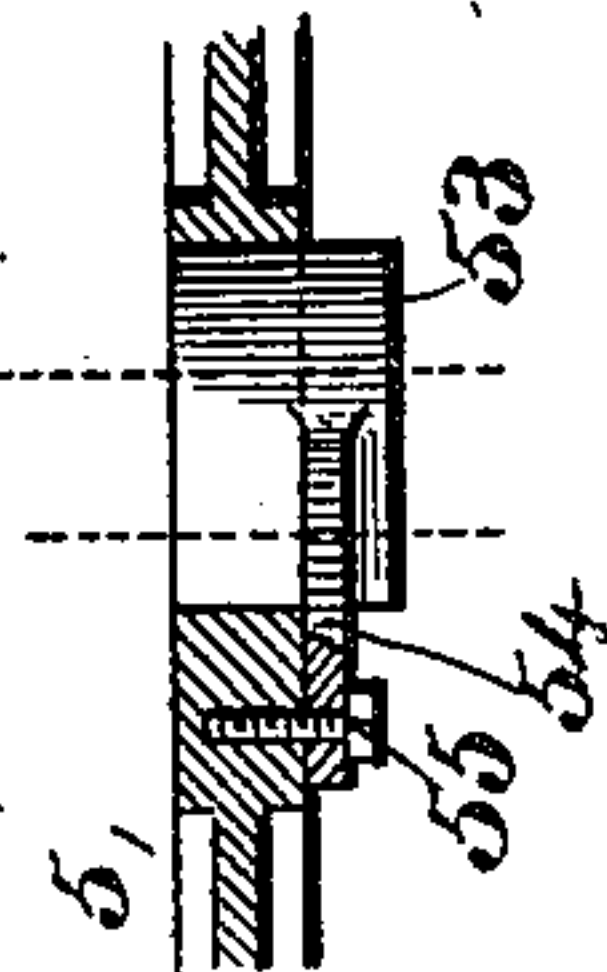


Fig. 4.

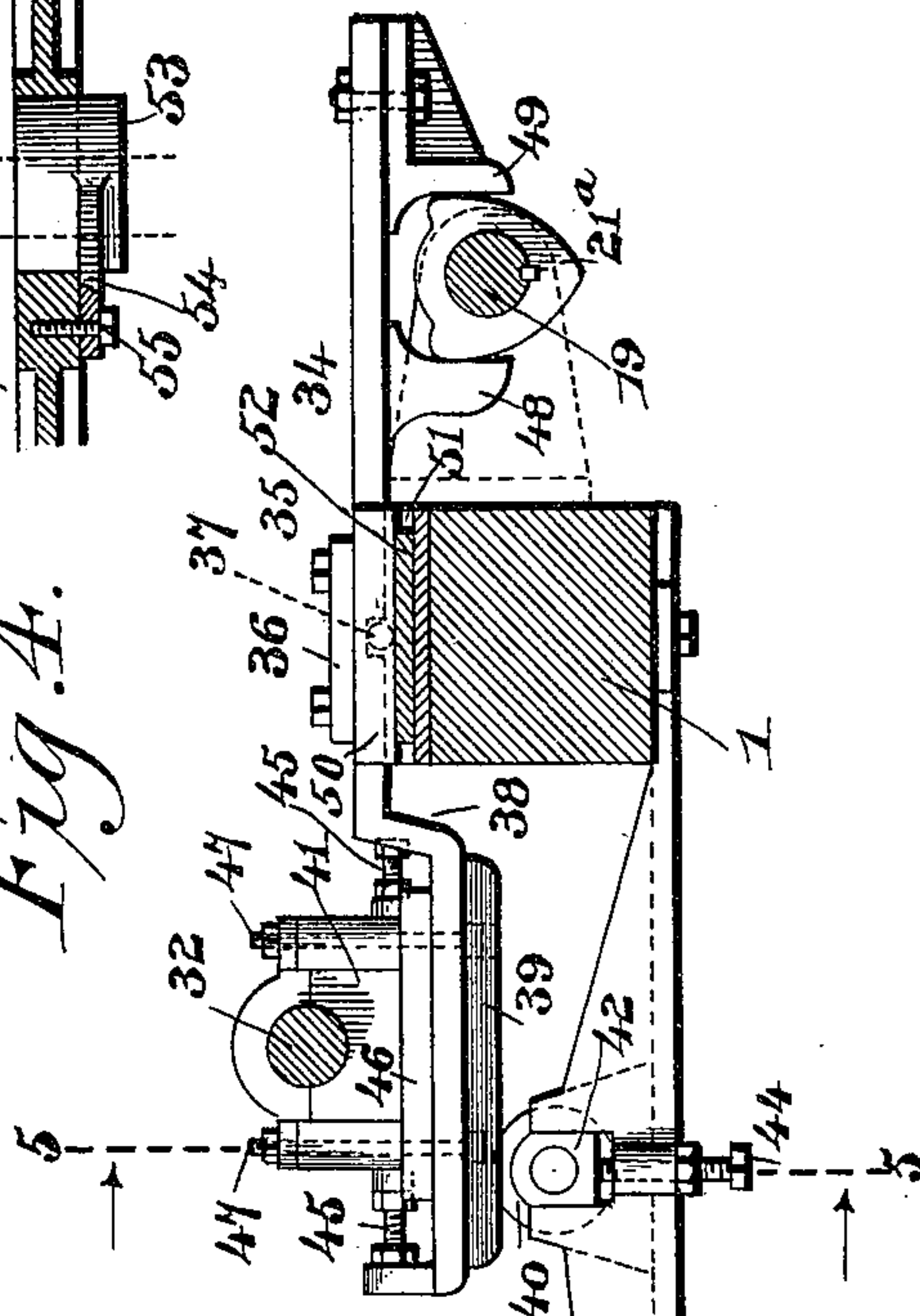
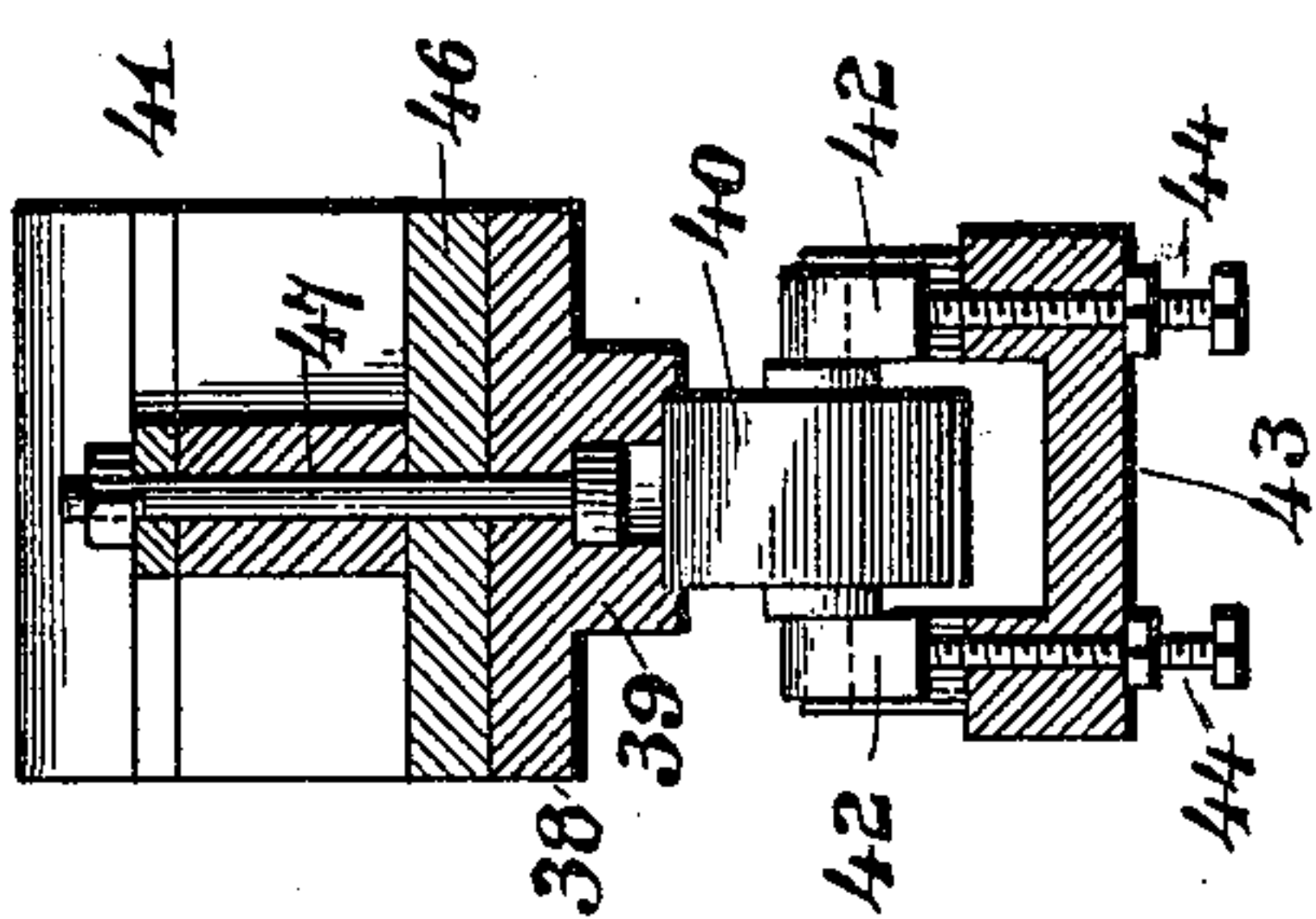


Fig. 5.



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4 Sheets—Sheet 4.

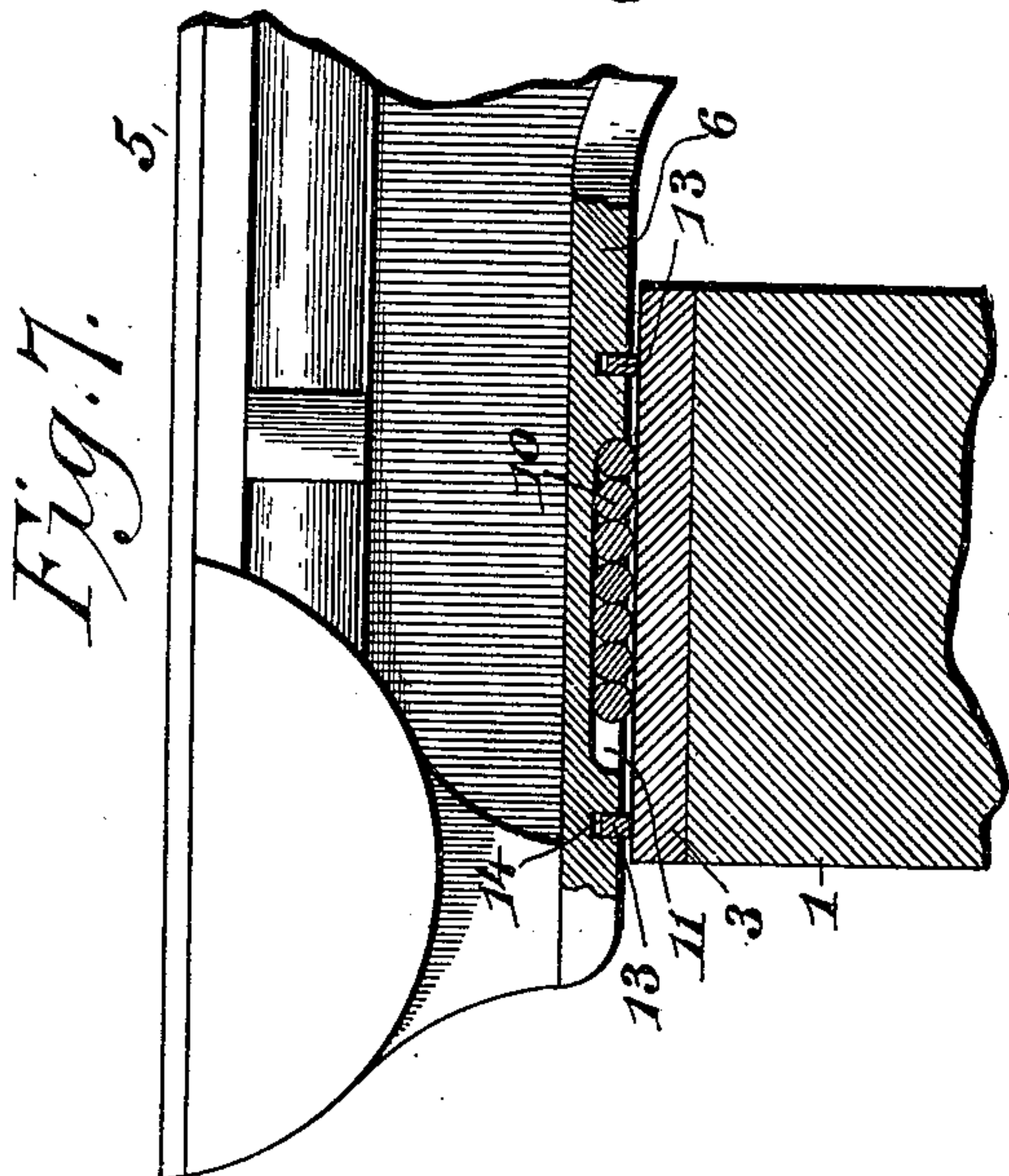


Fig. 7.

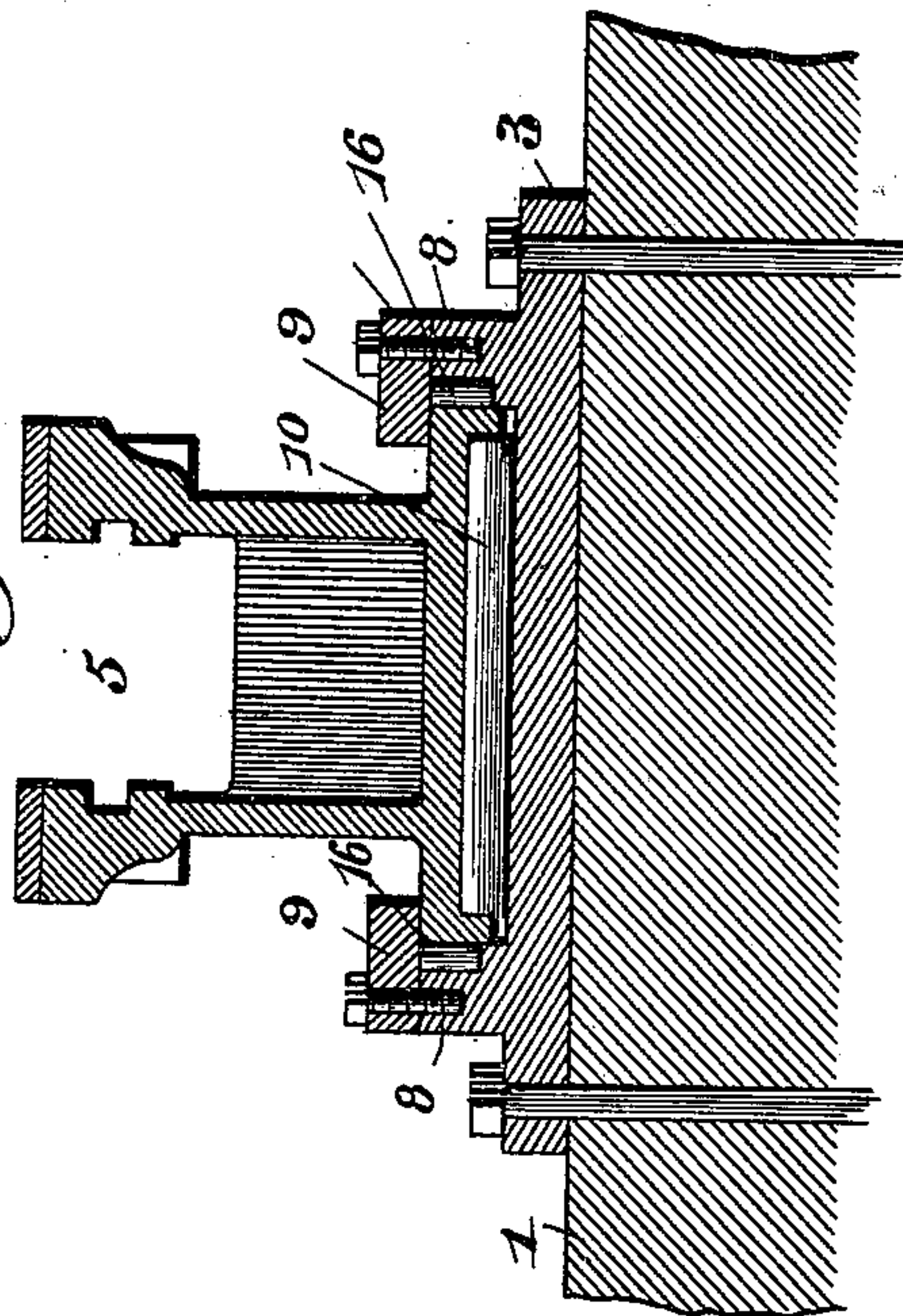
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Fig. 9.



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Fig. 10.

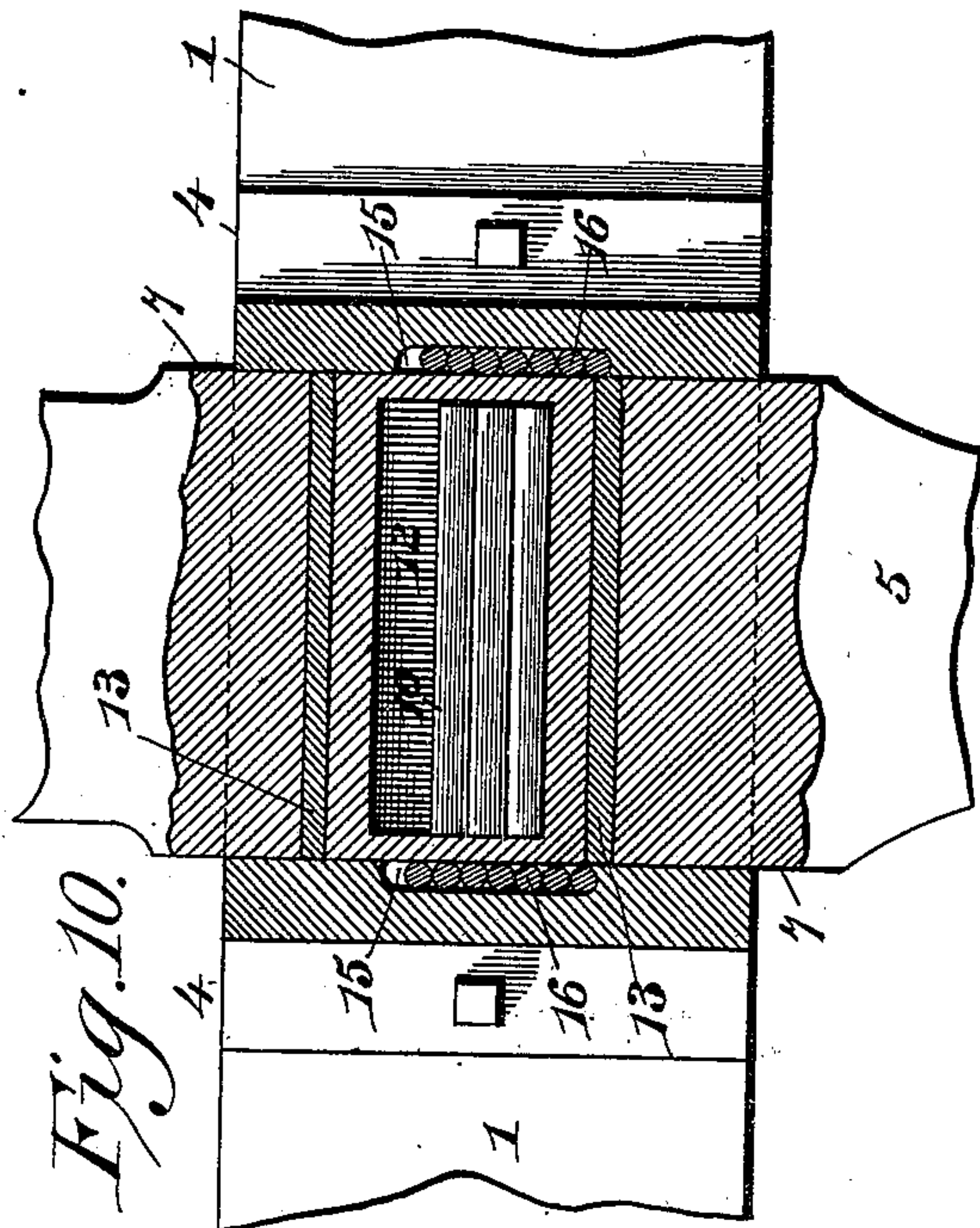
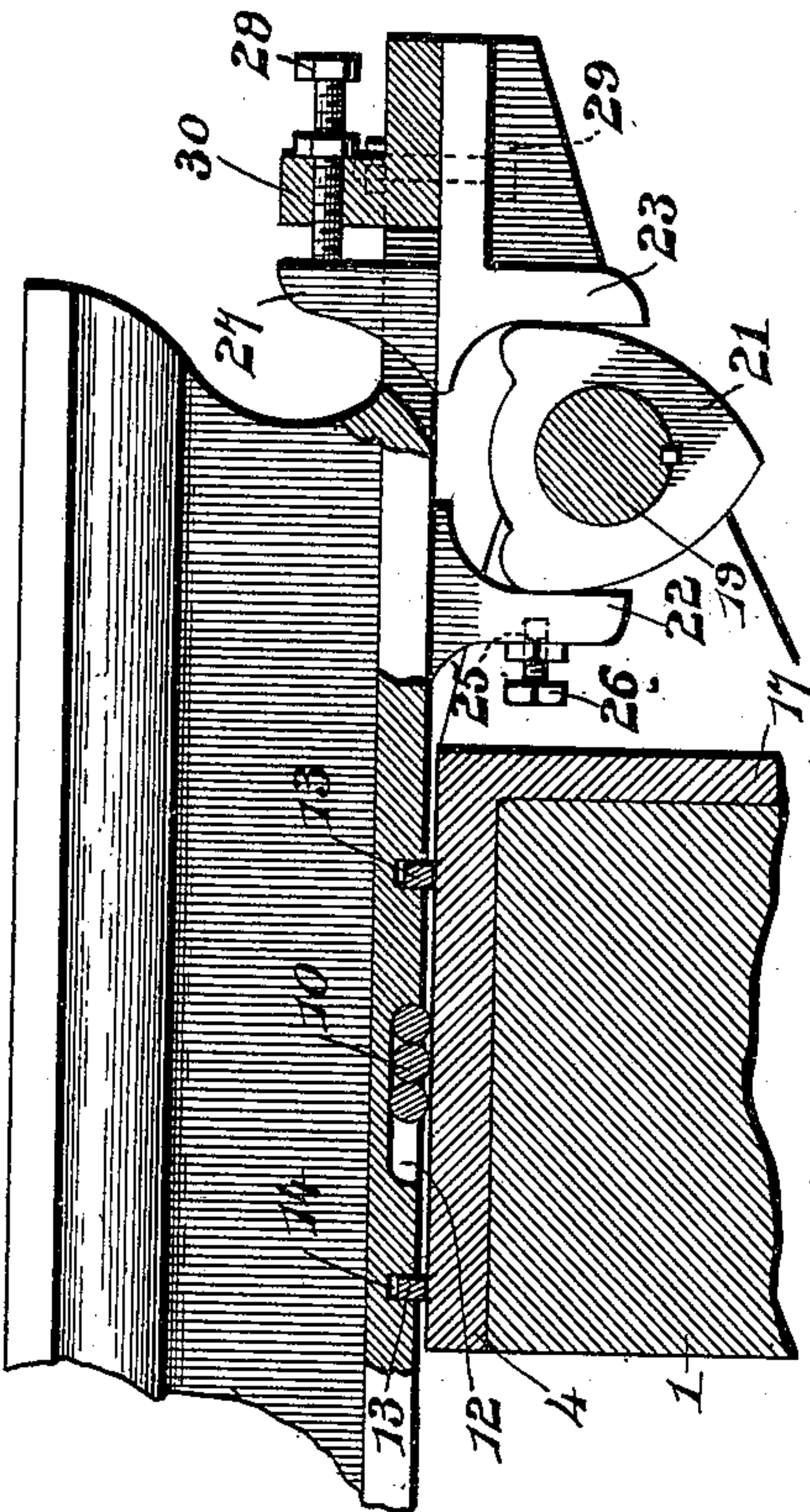


Fig. 8.





# UNITED STATES PATENT OFFICE.

NOAH SHAW, OF EAU CLAIRE, WISCONSIN.

## SAWMILL-CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 627,539, dated June 27, 1899.

Application filed October 16, 1896. Serial No. 609,089. (No model.)

*To all whom it may concern:*

Be it known that I, NOAH SHAW, a citizen of the United States, residing at Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented a new and useful Sawmill-Carriage, of which the following is a specification.

The invention relates to improvements in sawmill-carriages.

The object of the present invention is to improve the construction of sawmill-carriages, more especially the mechanism for offsetting and onsetting the head-blocks, and to provide simple, inexpensive, and efficient offsetting and onsetting mechanism which will be accessible without removing the decking of a carriage and which may be readily applied to sawmill-carriages now in use.

A further object of the invention is to improve the construction for supporting the set-works in sawmill-carriages where the head-blocks are slidingly mounted and are moved transversely of the carriage in offsetting and onsetting a log and to provide a support which will be positive in its movement and reciprocate with the head-blocks and hold the set-shaft in its proper position relative to the head-blocks in order to prevent any liability of the lumber varying in thickness.

Another object of the invention is to enable the set-shaft to be readily adjusted to bring its pinions in proper mesh with the racks in order to enable these improvements to be applied to different constructions of sawmill-carriages and set-works.

Furthermore, the invention has for its object to reduce the friction of the head-blocks to a minimum and to enable them to move readily, even when the chairs, in which the head-blocks are mounted, are subjected to the greatest pressure, as in the backward or offsetting movement, which is made at a time when the forward movement of the carriage is stopped, and a rapid movement, of about two thousand feet per minute, is made backward for another cut, and the head-blocks and the set-works together with a log resting upon the head-blocks are heavy and exert a heavy pressure on the forward side of the head-blocks, and when the rapid movement

backward is checked, pressure is brought on the other side of the head-blocks.

The invention consists in the construction and novel combination and arrangements of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of a sawmill-carriage constructed in accordance with this invention. Fig. 2 is a plan view of my improvements, the knees, the set-up mechanism for the same, and the set-works being removed. Fig. 3 is a transverse sectional view on line 3 3 of Fig. 2. Fig. 4 is a similar view on line 4 4 of Fig. 2. Fig. 5 is a detail vertical sectional view on line 5 5 of Fig. 4, illustrating the manner of supporting the inner end of the auxiliary support. Fig. 6 is a detail sectional view on line 6 6 of Fig. 3, illustrating the construction of the eccentric bushing for adjusting the set-shaft. Figs. 7 and 8 are enlarged detail sectional views of the inner and outer ends of the head-blocks, illustrating the manner of mounting the anti-friction-rolls. Fig. 9 is a transverse sectional view of one of the head-blocks, illustrating the construction of the chairs and showing the arrangement of the vertical and horizontal anti-friction-rolls. Fig. 10 is a horizontal sectional view of the same.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 1 designate longitudinal bars of a sawmill-carriage frame 2, provided at their upper faces with front and rear chairs 3 and 4, forming ways for head-blocks 5, which are disposed transversely of the sawmill-carriage frame 2, and which are designed to be arranged at the ends of the same in the usual manner, as illustrated in Figs. 1 and 2 of the accompanying drawings. The head-blocks are provided at opposite sides with front and rear flanges 6 and 7, which are arranged in the ways or recesses of the chairs 3 and 4, and the latter are constructed substantially the same, each consisting of a plate provided with opposite vertical flanges 8, arranged at opposite sides of the adjacent head-blocks and having their upper faces flush with the



upper faces of the head-block flanges, and cap-plates 9, detachably secured to the upper faces of the flanges 8 and extending inward over the flanges of the head-blocks to retain the latter in the ways of the chairs.

Horizontally-disposed antifriction-rolls 10 are interposed between the head-block and the bottoms of the chairs to render the offsetting and onsetting movement frictionless, and the rolls 10 are preferably arranged in recesses 11 and 12 at the front and rear of the head-blocks, the front recess 11 being longer than the rear recess 12 and receiving a greater number of rolls than the rear recess, as there is greater pressure directly beneath a log than at the back of the sawmill-carriage. The recesses 11 and 12 are slightly longer than the series of rolls, as clearly illustrated in Figs. 7 and 8 of the accompanying drawings, to facilitate a free movement of the head-blocks, and, with the exception of the difference in the number of the rolls 10, the front and rear chairs are the same. In order to render the bearing seats or recesses 11 and 12 of the antifriction-rolls dust-proof, strips 13 are employed and are loosely arranged in recesses 14, which extend transversely of the head-blocks entirely across the bottom flanges thereof. These strips 13, which form a dust-guard, rest loosely upon the bottom of the chairs and exclude the fine dust from the bearings.

While the antifriction-rolls serve to render the offsetting and onsetting movements easy and frictionless, the utility of these rolls is greatly increased by the use of the strips 13 or equivalent dust-guards arranged beyond the ends of the bearing seats or recesses, as it is well understood that in the operation of a sawmill-carriage a cloud of fine dust envelops the lower portions of the carriage and would very quickly penetrate to and clog up the bearings unless provision were made to effectually exclude the same. Therefore an important feature of the antifriction-bearings for the sliding head-blocks is the arrangement of the dust-guards.

It has been explained that the length of the roll-recesses is greater than the combined diameters of the rolls placed therein to facilitate a free movement of the rolls; but an essential feature with respect to the length of the roll-recesses is that such recesses be of a length less than the throw of the head-blocks, and in the practical construction of the machine the length of the recesses is one-half the throw of the head-blocks. By reason of having the roll-recesses of a greater length than the combined diameter of the rolls and also of a less length than the throw of the head-blocks the rolls are not only permitted to have a free movement, but are also maintained in a perfectly straight position cross-wise of the head-blocks and parallel with the carriage. In this connection it will be observed that at the limit of each movement

the rolls will be carried against the shoulders formed at the ends of the recesses and any angularity thereof thereby corrected. This is quite important in order that the rolls shall always remain in proper working positions.

The backward or offsetting movement is made at a time when the forward movement of the carriage is stopped and a rapid movement of about two thousand feet per minute is made backward for another cut. The head-blocks and the set-works, together with a log resting on the head-blocks, are heavy, and the result is that a heavy pressure is brought on the edge of the forward flanges 6 and 7, and when the rapid backward movement is checked the pressure is brought on the flanges at the other side of the head-blocks. This heavy pressure causes the head-blocks to bind and requires a strong pull to offset and onset the head-blocks. In order to relieve the head-blocks of this pressure and prevent them from binding against the vertical flanges 8 of the chairs, the latter are provided at the inner side edges of the vertical flanges 8 with recesses 15, in which are arranged vertically-disposed antifriction-rolls 16. The vertically-disposed antifriction-rolls 16 bear against the edges of the flanges 6 and 7 and combine with the antifriction-rolls 10 to reduce the friction incident to offsetting and onsetting the head-blocks to a minimum. The recesses 15 are constructed similar to the recesses 11 and 12, and each recess is of greater length than the combined diameters of the rolls placed therein to permit a free movement of the rolls from one end of the recess to the other and facilitate a free movement of the head-blocks. The cap-plates 9 cover the upper ends of the vertical rolls 16 and serve to exclude dust from the recesses 15.

The rear chairs 4 are provided with depending flanges 17, arranged on the outer face of the rear longitudinal beam and provided with laterally-projecting arms 18, which form bearings for the longitudinally-disposed offset-shaft 19. The offset-shaft, which is operated by a hand-lever 20, carries cams 21, located between and adapted to engage depending projections or brackets 22 and 23 of the head-blocks. The cam 21, which is heart-shaped, has one end tapering to a point, and its other end is enlarged and curved, as shown, to form a pair of oppositely-disposed lobes 21<sup>b</sup>. It is adapted to engage the outer bracket or projection 23 to offset the head-blocks and move the same backward from a saw to prevent a log from coming in contact with the latter in gigging back and injuring the same or the lumber, as will be readily understood by those skilled in the art to which this invention appertains, and the cam 21 engages the inner bracket or projection 22 to onset the head-block.

While the cams 21 have been described as being of a heart shape, it will be observed that the essential feature in the construction



of these cams is to provide the same with opposite curved bearing-surfaces located at opposite sides of the vertical center of the cams and converging in a downward direction.

5 These opposite curved surfaces of the heart-shaped cams have been referred to as forming the lobes 21<sup>b</sup>, and by reason of having the particular form described the cams are of exactly the same shape on both sides of the  
10 offset-shaft and occupy the same space at all times. A distinct advantage to note in connection with the cams 21 is that such cams provide for a much more rapid adjustment or movement of the head-blocks than is possible by the use of ordinary eccentrics, while  
15 at the same time requiring less turn than an eccentric, and consequently a less throw or movement of the hand-lever 20, which is a very important feature in sawmill-carriages where the adjusting-lever of the offsetting  
20 and onsetting shaft is being constantly manipulated by the operator.

The inner bracket or projection 22, which is preferably formed integral with the head-  
25 block, is provided at its inner side with a horizontally-disposed threaded socket 25, receiving an adjustable stop-screw 26 to limit the movement of the head-block.

The outer bracket 23, which is slidably  
30 mounted on the lower face of the rear end of the head-block, is provided with an upwardly-extending arm or projection 27, arranged in a longitudinal slot of the head-block and engaged by an adjusting-screw 28, which is  
35 adapted to advance the outer bracket 23 toward the cam to take up the wear and prevent any lost motion. The bolts 29, which connect the outer bracket 23 to the head-  
40 block, are arranged in slots of the former, and the screw 28 is mounted in a threaded opening of an arm 30 of the same. The arm 30 projects upward from a horizontal extension of the bottom of the head-block. The  
45 cam is adapted to be readily lifted out of the recess or space between the depending projections or brackets without disturbing the latter, and owing to its particular form it  
50 will last for a long time without any material wear and gives the necessary throw to the head-block with a slight movement of the operating-lever 20.

The head-blocks 5 carry knees 31, constructed in the ordinary manner, and which are provided with suitable set-up mechanism to en-  
55 able them to be adjusted separately with relation to the head-blocks on which they are mounted in order that they may conform to any irregularity in or the natural taper of a log. The knees are also provided with any  
60 suitable dogging mechanism.

In order to support the set-shaft 32 at a point between the head-blocks and render the reciprocation of a set-up mechanism 33 positive and maintain the set-shaft in proper po-  
65 sition relative to the head-blocks, an auxiliary support 34 is employed and is slidably mounted in a chair 35. The chair 35, which

has a way for the auxiliary support similar to the ways of the front and rear chairs 3 and 4, is provided with cap-plates 36, which retain  
70 the auxiliary support in the chair. An anti-friction-roll 37 is interposed between the auxiliary support and the chair 35 and is arranged in the recess of the former. The auxiliary support extends in advance and in rear of the  
75 rear beam 1 of the sawmill-carriage, and it preferably terminates short of the center of the sawmill-carriage, as clearly illustrated in Fig. 4 of the accompanying drawings, in order to arrange it entirely out of the way of  
80 logs and to prevent any knots of the same coming in contact with it. The inner portion of the auxiliary support is provided with a rectangular bend or depression 38 and has a longitudinal rib or flange 39 on the lower face  
85 thereof. The lower face of the rear of the flange is provided with a longitudinal groove to receive the antifriction roller or wheel 40, and a bearing 41 for the set-shaft 32 is adjustably mounted in the rectangular bend or de-  
90 pression 38. The antifriction roller or wheel 40 is journaled in vertically-adjustable bearing-boxes 42, mounted in recesses of a horizontal bar 43, which extends across the sawmill-carriage and is bolted or otherwise secured to  
95 the lower longitudinal beams 1. The bar 43 is provided beneath its recesses with threaded openings receiving adjusting-screws 44, supporting the journal-boxes 42 and maintaining the antifriction wheel or roller 40 at the proper  
100 elevation. The adjusting-screws 44 and the screws 26 and 28 are provided with jam-nuts, which lock them at the desired adjustment.

The bearing 41, which may be of any suitable construction, is adjusted transversely of  
105 the sawmill-carriage frame by oppositely-disposed horizontal adjusting-screws 45, interposed between the opposite sides of the bearing 41 and the sides of the bend or depression 38, mounted in suitable threaded openings of  
110 the latter and provided with jam-nuts. The vertical adjustment of the bearing 41 is obtained by means of a block 46, upon which the bearing 41 is mounted, and the block is adapted to be varied in thickness in order to posi-  
115 tion properly the bearing 41, and the latter is secured to the auxiliary support by means of vertical bolts 47 passing through it, the block 46, and the support and having their  
120 heads arranged in recesses of the flange or rib 39.

An important feature to note in connection with the auxiliary support 34 for the set-shaft is that the front or inner end of this support terminates short of the front beam of the car-  
125 riage, so as to be arranged entirely out of the way of the logs and to leave an open space between the opposite head-blocks. Otherwise, if the auxiliary support extended entirely across the sawmill-carriage on the up-  
130 per side of the side beam 1 the log would have three points of bearing on the carriage—namely, on the two head-blocks and the auxiliary support. This would be very objec-



tionable, as the log in most cases, on account of knots and unevennesses, would not rest steady on the carriage; but the particular arrangement of the auxiliary support 34 obviates this objection. While the present invention contemplates the use of an auxiliary support arranged in the manner above specified, yet it is necessary to brace the front or inner end of the support, which is accomplished in the present case by the use of the brace-bar 43. However, the essential feature of the auxiliary support and the bracing thereof may be stated to be to arrange the auxiliary support on the upper side of the rear side beam 1 of the carriage-frame and to have a brace connection extended from the front or inner end of the support to the under side of the opposite or front side beam 1 of the carriage. This feature is also disclosed in a modification of the auxiliary support embodied in a concurrently-pending application filed by me December 31, 1897, Serial No. 665,152, and patented May 9, 1899, No. 624,554.

The outer portion of the auxiliary support is provided with depending projections or brackets 48 and 49, arranged similar to the projections or brackets 22 and 23 and located at the inner and outer sides of a cam 21<sup>a</sup>, which is substantially heart-shaped, similar to the cams 21. The inner bracket or projection 48 is preferably formed integral with the auxiliary support, and the outer projection or bracket 49 is adjustably connected with the support by means of bolts passing through the parts and arranged in suitable slots of the bracket or projection 49 to enable the latter to be adjusted to take up the wear and prevent any lost motion. The chair 35 of the auxiliary support is provided with a longitudinal extension 50, consisting of a plate and provided at its ends with ways 51, receiving the sliding plate 52, which cooperate with the set-shaft 32 in supporting the set-works 33, as illustrated in Fig. 1 of the accompanying drawings. The set-works are of the ordinary construction, and a detail description thereof is unnecessary. It will be seen that the auxiliary support is moved transversely of the sawmill-carriage simultaneously with the main head-block and the set-works are simultaneously reciprocated, and the set-shaft is firmly supported and is maintained at all times in proper position relative to the head-blocks to prevent any liability of the lumber varying in thickness.

In applying these improvements to sawmill-carriages and set-works of different constructions it is necessary to adjust the set-works so that the pinions which are carried by the same and which vary in diameter with different manufacturers may be made to mesh accurately with the racks of the head-blocks, and to accomplish this result eccentric bushings 53 are employed. The eccentric bushings 53 consist of cylindrical sleeves arranged in circular bearing-openings of the head-blocks and provided with eccentric bearing-

openings for the reception of the set-shaft, and a substantially segmental attachment-flange 54 is formed integral with the cylindrical portion or sleeve of the eccentric bushing and is provided with a series of perforations adapted to receive a bolt 55 to secure the eccentric bushing at the desired adjustment. The openings of the head-blocks for the eccentric bushings are preferably five inches in diameter at both sides, being a little larger than the largest pinion employed on set-shafts, and the eccentric bushings, which accurately fit in the openings of the head-blocks, are adapted to be mounted on either side thereof to make the head-block either right or left hand, but are preferably mounted at the inner sides of the head-blocks, as shown in the drawings. The length of the bushing is such that only one is required for each head-block, and in assembling the parts the bushings are placed on the shaft with the attachment-flanges inward, as illustrated in Figs. 1 and 2 of the accompanying drawings. The shaft is then placed in the openings of the head-blocks, and the latter are then mounted in the chairs. The pinions (not shown) are keyed to the shaft and pass through the openings of the head-blocks, and the eccentric bushings are then rotated until the pinions mesh properly with the racks. The pinions and racks for communicating motion from the set-shaft to the knees are not shown, and as this construction is well known in the art illustration thereof is unnecessary. The eccentrically-arranged bearing-opening of the bushing is preferably located about one-quarter of an inch out of center, which gives an adjustment of one-half an inch vertically and horizontally, and this adjustment is ample for the adjustment of the pinions.

The feature of providing the head-blocks with circular openings of a greater diameter than the diameter of the ordinary sizes of knee-adjusting pinions to permit of the latter being passed therethrough is of especial importance in connection with head-blocks which are made in one piece, and the present invention preferably contemplates the use of head-blocks of this character as distinguished from head-blocks which are made of two members or bars. In sawmill-carriages having head-blocks made of two members or bars access can only be gained to the knee-adjusting pinions when assembling and taking apart the machine by separating said members or bars; but in the present invention, where the head-blocks are made of one piece, this cannot be done, and therefore the special utility of the large-size openings in connection with the eccentric bushings will be apparent. A further advantage of the construction referred to is that by arranging the eccentric bushings 53 at the inner sides of the head-blocks these bushings may be slid back on the said shaft and the knee-adjusting pinions removed through the openings at the outer sides of the head-blocks by means of a "drift" without



disturbing the position of the head-blocks in their supporting-chairs. The manner of placing the knee-adjusting pinions within the head-blocks has already been referred to, and it will therefore be understood that the construction just described greatly facilitates the assembling and taking apart of the machine.

It will be seen that the manner of mounting the head-blocks reduces friction incident to offsetting and onsetting to a minimum and prevents the pressure resulting from the end thrust of a log and the weight of the head-blocks and the operating mechanism interfering with the offsetting and onsetting movement of the head-blocks, that the set-works and the set-shaft are supported and are caused to reciprocate positively with the head-blocks to preserve the set-shaft in proper position at all times relative to the head-blocks, and thereby prevent any variation in the thickness of the lumber incident to the springing of the set-shaft or the supports of the set-works, and that simple and efficient means are provided for enabling the set-shaft to be adjusted, so that its pinions will mesh accurately with the racks of the knees.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

What I claim is—

1. In a sawmill-carriage, the combination of a sawmill-carriage frame, a head-block slidably mounted thereon, a pair of depending brackets or projections mounted on the head-block at one end thereof, located outside of the frame and forming a cam-receiving recess between them, one of the brackets or projections being adjustable to take up the wear, an offset shaft located outside of the sawmill-carriage frame, and a cam mounted on the offset shaft and partially fitting in the said cam-receiving recess and engaging the brackets or projections but having no positive connection therewith, whereby it is adapted to be readily removed from the recess without detaching the brackets or projections, substantially as described.

2. In a sawmill-carriage, the combination of a sawmill-carriage frame, a head-block slidably mounted thereon and provided at one end with a longitudinal slot, the brackets depending from the head-block at one end thereof and located outside of the frame, one of the brackets being adjustable to take up the wear, and provided with an upwardly-extending arm arranged in the slot of the head-block and projecting upward therefrom, an adjusting-screw mounted on the head-block and engaging said arm, an offset shaft, and a cam mounted on the offset shaft and arranged between and contacting with the brackets but having no positive connection therewith, whereby it is adapted to be readily lifted out of the recess or space between the same, substantially as described.

3. In a sawmill-carriage, the carriage-frame, a head-block slidably mounted on the frame, a pair of pendent brackets or projections projected from the head-block at one end thereof, an adjusting-screw mounted on the inner bracket or projection and arranged to engage the sawmill-carriage frame to limit the movement of the head-block, an offset shaft located outside of the sawmill-carriage frame and disposed longitudinally thereof, and a cam mounted on the offset shaft and partially fitting in the recess formed between said brackets or projections, said cam contacting at its edges with the brackets or projections, but having no positive connection therewith, whereby it is adapted to be readily removable without detaching the brackets or projections, substantially as set forth.

4. In a sawmill-carriage, the combination of a sawmill-carriage frame, a head-block slidably mounted thereon and capable of movement transversely thereof to offset and onset a log, and loose antifriction-rolls interposed between the head-block and the sawmill-carriage frame, one of the parts being recessed to receive the rolls, the length of the recess being greater than the combined diameters of the rolls placed therein to permit a free movement of the said rolls from one end of the recess to the other, said recess being also of a length less than the throw of the head-blocks, substantially as and for the purpose described.

5. In a sawmill-carriage, the combination of a sawmill-carriage frame, chairs mounted thereon, a head-block slidably arranged in the chairs, and the vertical and the horizontal antifriction-rolls interposed between the head-block and the chairs and supporting the former, the head-block or the chairs being recessed to receive the antifriction-rolls, the length of each recess being greater than the combined diameters of the rolls placed therein to permit a free movement of the rolls from one end of the recess to the other, said recess being also of a length less than the throw of the head-blocks, substantially as and for the purpose described.

6. In a sawmill-carriage, the combination of a sawmill-carriage frame, a sliding head-block mounted thereon and provided at its lower face with transverse grooves, horizontal antifriction-rolls supporting the head-blocks, and the strips disposed transversely of the head-block, loosely arranged in the grooves thereof and forming dust-guards, substantially as described.

7. In a sawmill-carriage, the combination of a sawmill-carriage frame, a chair provided at opposite sides with vertical flanges having recesses, a head-block arranged in the chair, and provided at its lower face with a recess, cap-plates mounted on the vertical flanges of the chairs and engaging the head-block, and the vertical and horizontal antifriction-rolls located in the recesses of the head-block and the chair, each recess being of greater length



than the combined diameters of the rolls placed therein, substantially as and for the purpose described.

8. In a sawmill-carriage, the combination of a sawmill-carriage frame, sliding head-blocks mounted thereon and provided with bearings, a set-shaft journaled in said bearings, an auxiliary support for the set-shaft disposed transversely of the sawmill-carriage frame and located at a point between the head-blocks and extending from one side of the frame to the set-shaft, said support being slidably mounted on the frame, and means for reciprocating the head-blocks and the support simultaneously, substantially as described.

9. In a sawmill-carriage, the combination of a sawmill-carriage frame, sliding head-blocks provided with bearings, a set-shaft journaled in the bearings, a sliding auxiliary support for the set-shaft located between the head-blocks, a sliding plate mounted on the sawmill-carriage frame adjacent to the auxiliary support, and set-works mounted on the set-shaft and the sliding plate, substantially as described.

10. In a sawmill-carriage, the combination of a sawmill-carriage frame, head-blocks mounted thereon and adapted to slide transversely thereof, a sliding auxiliary support mounted on the sawmill-carriage frame at the rear side thereof and terminating short of the other side, a set-shaft journaled on the head-blocks and the auxiliary support, projections or brackets depending from the head-blocks and the support, an offset shaft, and cams carried by the offset shafts and located between the depending brackets or projections and adapted to offset and onset the head-blocks and the support simultaneously, substantially as described.

11. In a sawmill-carriage, the combination of a sawmill-carriage frame, head-blocks mounted thereon and capable of movement transversely thereof, a chair mounted on the sawmill-carriage frame and provided with an extension having ways, a sliding plate mounted in the ways, a sliding auxiliary support arranged in said chair, an adjustable bearing mounted on the inner portion of the auxiliary support and capable of vertical and horizontal movement, a set-shaft journaled in the said bearing and on the main head-blocks, set-works mounted on the sliding plate and on the set-shaft, and an antifriction roller or wheel supporting the inner end of the auxiliary support, substantially as described.

12. In a sawmill-carriage, the combination of a sawmill-carriage frame, a bar disposed transversely of the sawmill-carriage frame, an antifriction roller or wheel journaled on the bar, an auxiliary support mounted on the rear side of the sawmill-carriage frame, terminating short of the front side thereof and supported at its inner end by the antifriction roller or wheel, a set-shaft bearing arranged at the inner end of the auxiliary support, and means for reciprocating the latter simultane-

ously with the head-blocks of the sawmill-carriage, substantially as described.

13. In a sawmill-carriage, the combination of a sawmill-carriage frame, the transverse bar secured thereto, provided with recesses and having threaded openings beneath the same, adjusting-screws mounted in the threaded openings, vertically-movable journal-boxes mounted in the recesses of the bearing, and supported by the adjusting-screws, an antifriction roller or wheel journaled in said boxes, a sliding auxiliary support mounted on the rear side of the sawmill-carriage frame, terminating short of the front side and provided at its inner end with a longitudinal rib arranged on the antifriction roller or wheel, said auxiliary support having a set-shaft bearing, and means for reciprocating the auxiliary support simultaneously with the head-blocks of the sawmill-carriage, substantially as described.

14. In a sawmill-carriage, the combination of a sawmill-carriage frame, a set-shaft, a sliding auxiliary support, an adjustable set-shaft bearing mounted on the auxiliary support, a block interposed between the bearing and the auxiliary support, and adjusting-screws mounted on the auxiliary support and engaging with a bearing at opposite sides thereof, and means for reciprocating the auxiliary support simultaneously with the head-blocks of the sawmill-carriage, substantially as described.

15. In a sawmill-carriage, the combination of a sawmill-carriage frame, a bar disposed transversely of the sawmill-carriage frame and provided at a point between the sides thereof with an adjustable bearing, an auxiliary set-shaft support slidably mounted on one side of the sawmill-carriage frame and extending inward therefrom to the adjustable bearing of the transverse bar and supported by the same, said auxiliary support being provided with a set-shaft bearing, and means for reciprocating the auxiliary support simultaneously with the head-blocks of the sawmill-carriage, substantially as described.

16. In a sawmill-carriage, the combination of a sawmill-carriage frame, a head-block slidably mounted on the sawmill-carriage frame and the vertical and horizontal antifriction-rolls interposed between the head-blocks and the sawmill-carriage frame and arranged in suitable recesses, each recess being of greater length than the combined diameters of the rolls, and each recess being also of a length less than the throw of the head-blocks, substantially as and for the purpose described.

17. In a sawmill-carriage, the combination of a sawmill-carriage frame, sliding head-blocks mounted thereon and provided with bearings, a set-shaft journaled in said bearings, an auxiliary support disposed transversely of the sawmill-carriage frame and extending from one side thereof to the set-shaft and terminating at the latter, said auxiliary



support being provided with a bearing receiving the set-shaft, a lower bearing-bar extending across and mounted on the sawmill-carriage frame and sustaining the under side of the auxiliary support, and means for reciprocating the head-blocks and the auxiliary support simultaneously, substantially as and for the purpose described.

18. In a sawmill-carriage, the carriage-frame, a head-block slidably mounted on the frame, a pair of pendent brackets or projections projected from the head-block at one end thereof, an offset shaft located outside of the sawmill-carriage frame, and a cam mounted on the offset shaft and partially fitting in the recess formed between said brackets or projections, said cam contacting at its edges with the brackets or projections but having no positive connection therewith, whereby it is adapted to be readily removed without detaching the brackets or projections, substantially as set forth.

19. In a sawmill-carriage, the carriage-frame, a head-block slidably mounted on the frame, a pair of spaced vertically-disposed brackets or projections depending from the underside of the head-block at one end thereof, an adjustable stop projection carried by the head-block below its under side and arranged to engage one of the carriage-frame beams to limit the movement of the head-block, an offset shaft arranged longitudinally and outside of the frame beneath the head-block, and a cam mounted on said shaft and lying in the space between said brackets or projections, substantially as specified.

20. In a sawmill-carriage, the combination of the carriage-frame, a head-block slidably mounted on the frame, loose antifriction-rolls interposed between the head-block and the frame-beams, one of the parts being recessed to receive the rolls, and dust-guards extending across the space between the head-block and the frame-beams beyond the ends of the recesses for the groups of rolls, substantially as described.

21. In a sawmill-carriage, the carriage-frame, the head-block slidably mounted on the frame, loose antifriction-rolls interposed between the head-block and the frame-beams, one of the parts being recessed to receive the rolls, and dust-guard strips loosely arranged in the space between the head-block and the frame-beams beyond the ends of the recesses for the rolls, substantially as set forth.

22. In a sawmill-carriage, the carriage-frame, head-blocks slidably mounted on the frame and provided with bearings, a set-shaft journaled in said bearings, an auxiliary support for the set-shaft located at a point be-

tween the head-blocks, said auxiliary support being arranged to slide on the upper side of the rear side beam of the carriage-frame and having a brace for its front or inner end extending beneath the front side beam of the carriage-frame, and means for reciprocating the head-blocks and the auxiliary support simultaneously, substantially as set forth.

23. In a sawmill-carriage, the carriage-frame, a head-block slidably mounted on the frame and having a pair of vertically-disposed pendent brackets or projections at one end thereof, an offset shaft arranged outside of the frame and longitudinally thereof, and a cam mounted on said shaft and arranged between said brackets or projections, said cam being provided at opposite sides of its vertical center with curved bearing-surfaces which converge in a downward direction and make the cam of a uniform tapering width, substantially as set forth.

24. In a sawmill-carriage, the carriage-frame, a head-block slidably mounted on the frame and having a pair of vertically-disposed pendent brackets or projections at one end, an offset shaft arranged outside of the frame and longitudinally thereof, and a cam mounted on said shaft and filling the space between the brackets or projections, but having no positive connection therewith, said cam being provided at opposite sides of the vertical center with downwardly-convergent surfaces of equal curvature, thereby making the cam of a uniform tapering form with its greatest width above the plane of the offset shaft, substantially as set forth.

25. In a sawmill-carriage, the carriage-frame, head-blocks slidably mounted on the frame and provided in their inner and outer sides with circular openings of a greater diameter than the diameter of ordinary sizes of knee-adjusting pinions, to permit of the latter being passed therethrough, a set-shaft within the frame, an auxiliary support for the set-shaft located at a point between the head-blocks and movable therewith, eccentric bushings fitted within the openings at the inner sides of the head-blocks and forming bearings for the set-shaft, and means for fastening the bushings to the head-blocks in their adjusted positions, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

NOAH SHAW.

Witnesses:

WILLIAM H. ALLEN,  
J. D. HILLS.