

(No Model.)

3 Sheets—Sheet 1.

A. L. LE GRAND.
CONVEYING APPARATUS.

No. 570,876.

Patented Nov. 3. 1896.

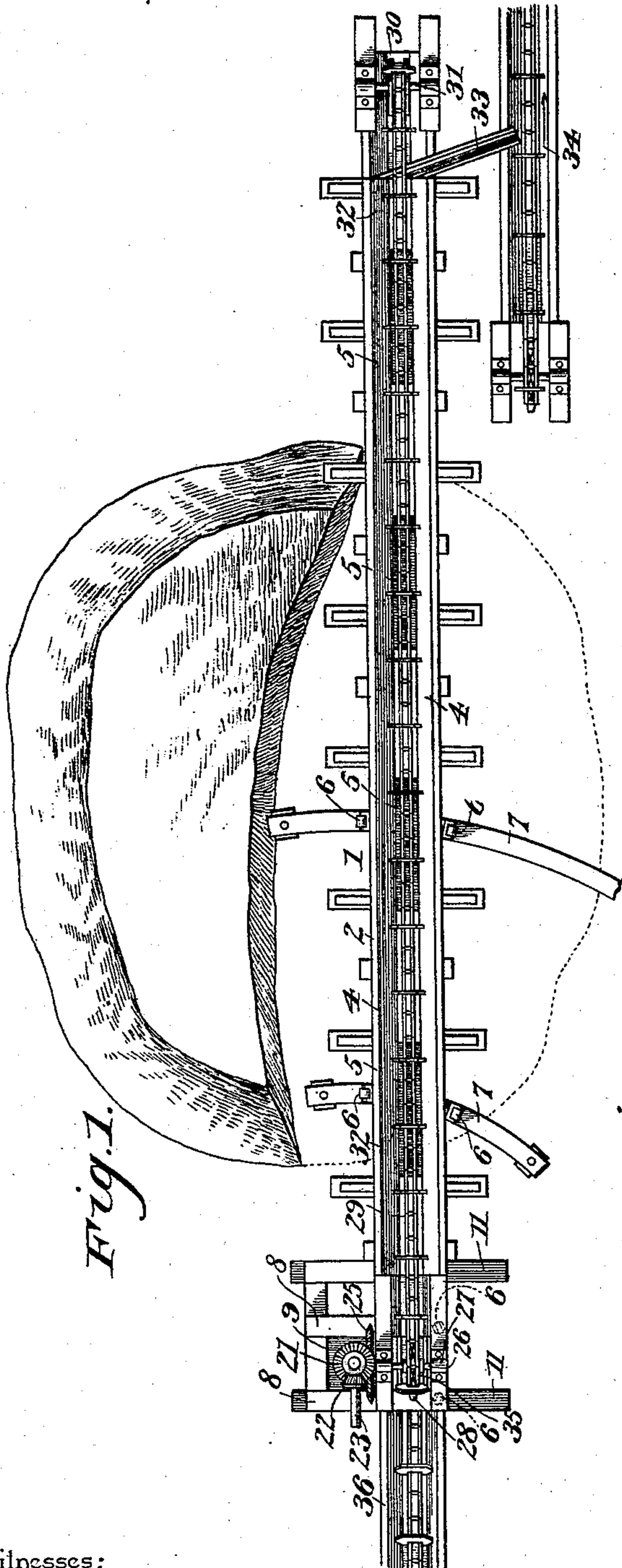


Fig. 1.

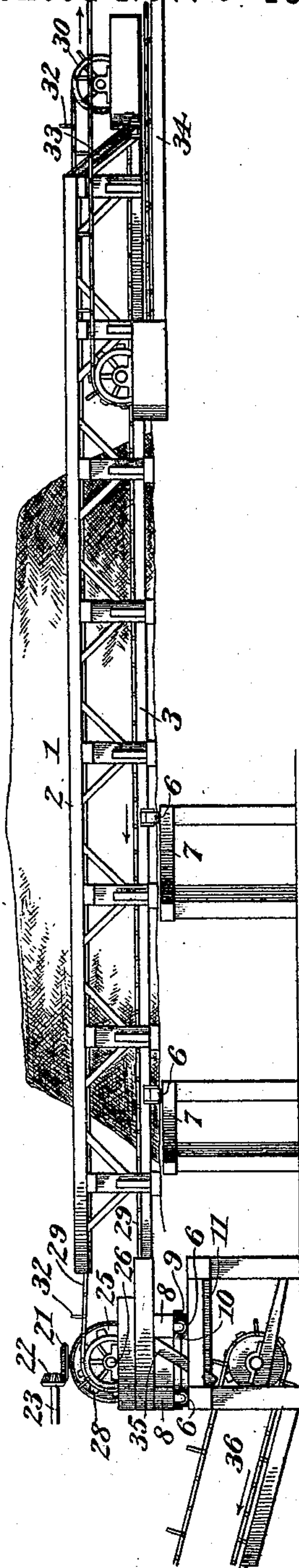


Fig. 2.

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Witnesses;

J. M. Withrow
S. C. Haupt

By *his* Attorneys.

A. L. LeGrand,

Charles

(No Model.)

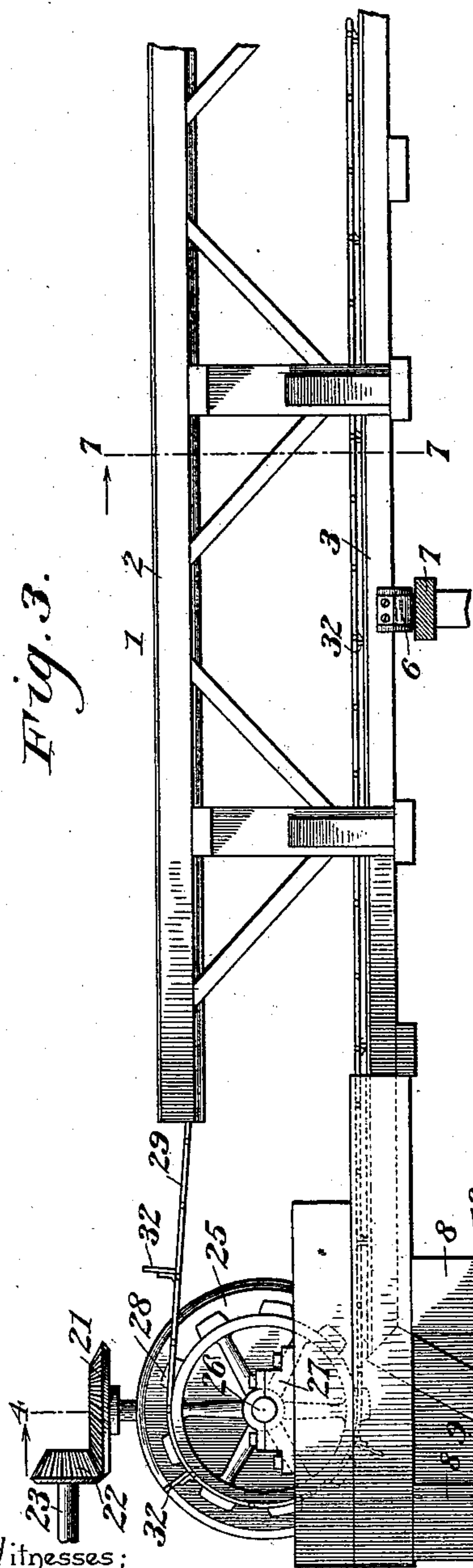
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Fig. 3.



Witnesses;

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By his Attorneys.

Fig. 5.

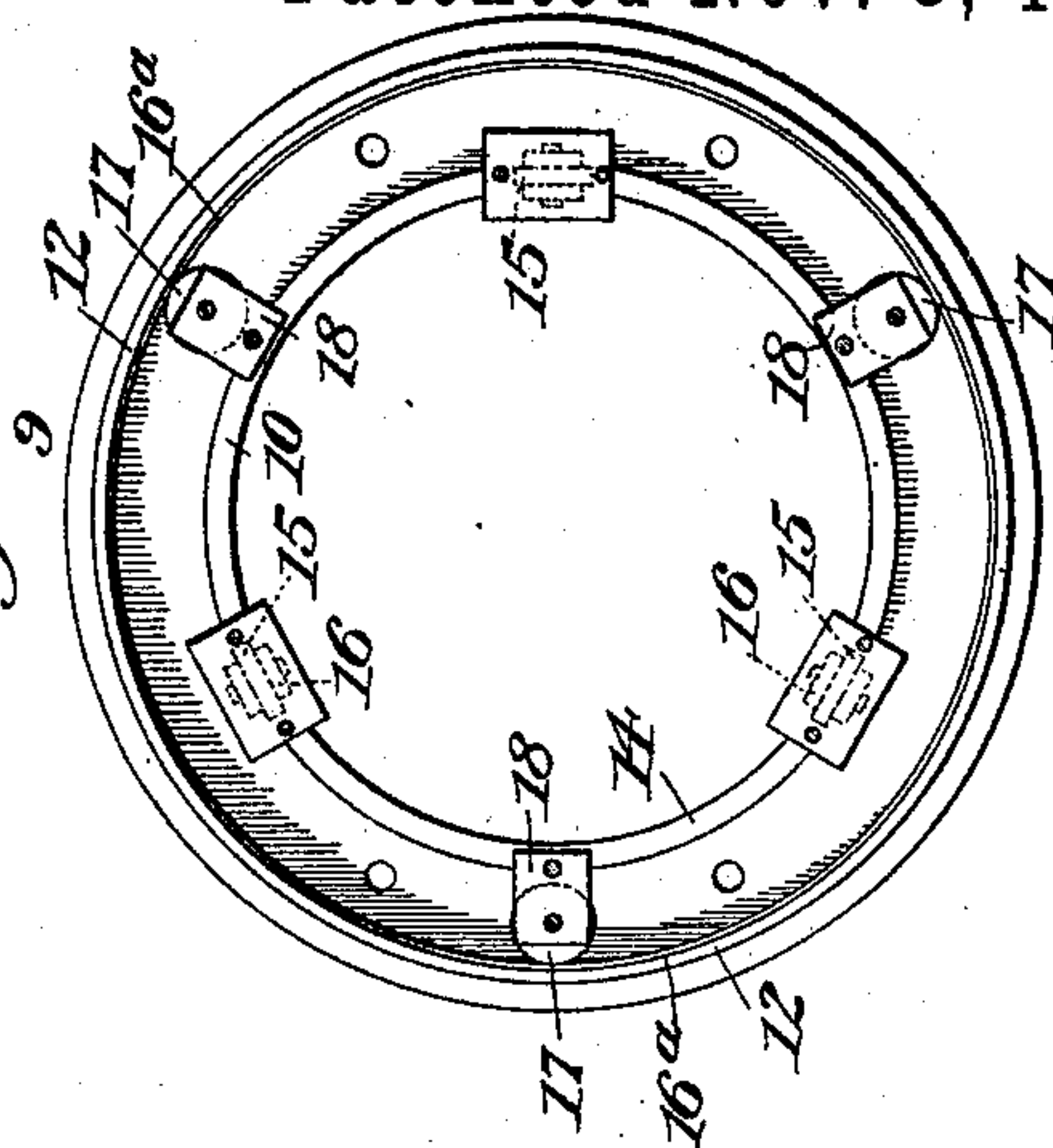


Fig. 4.

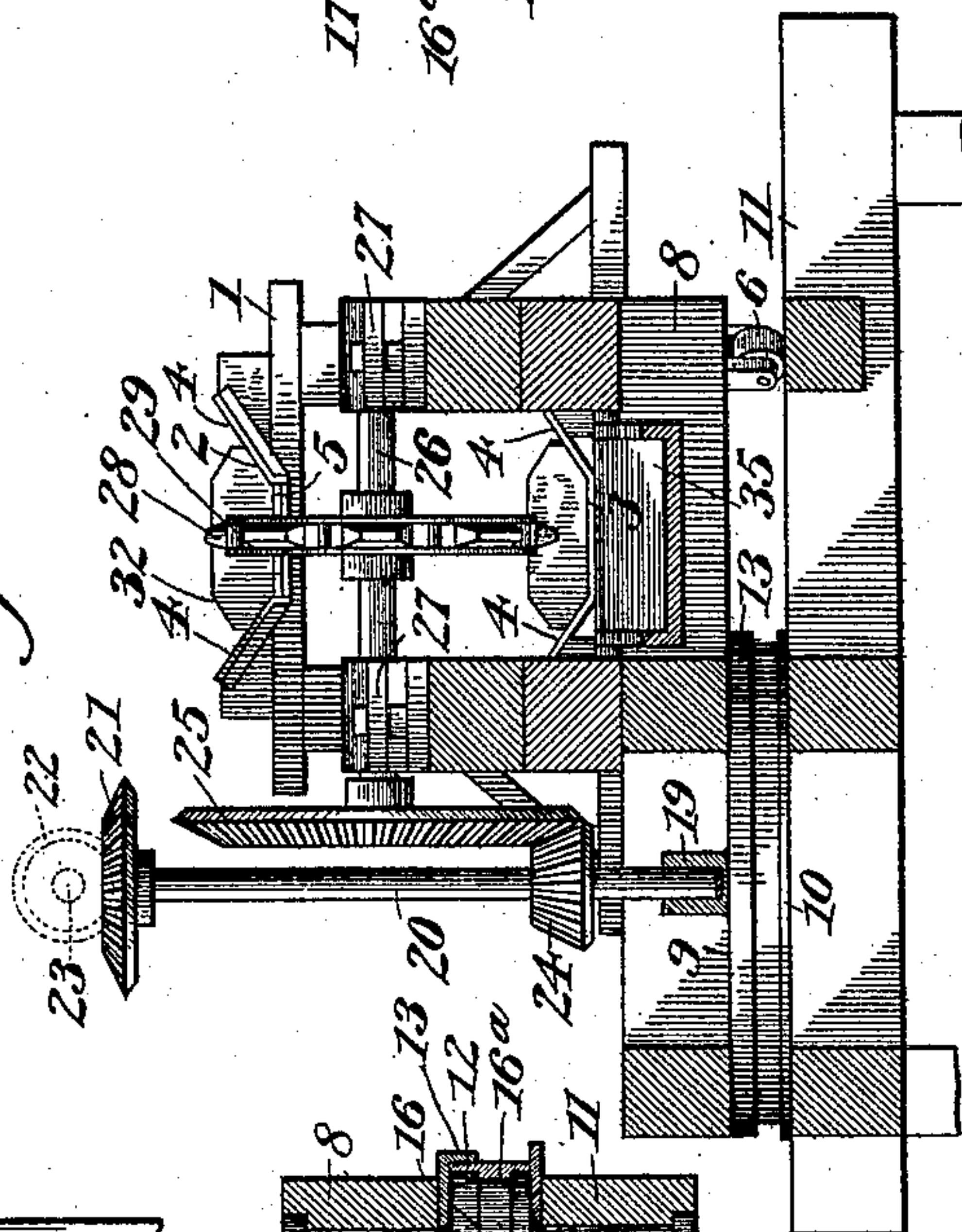
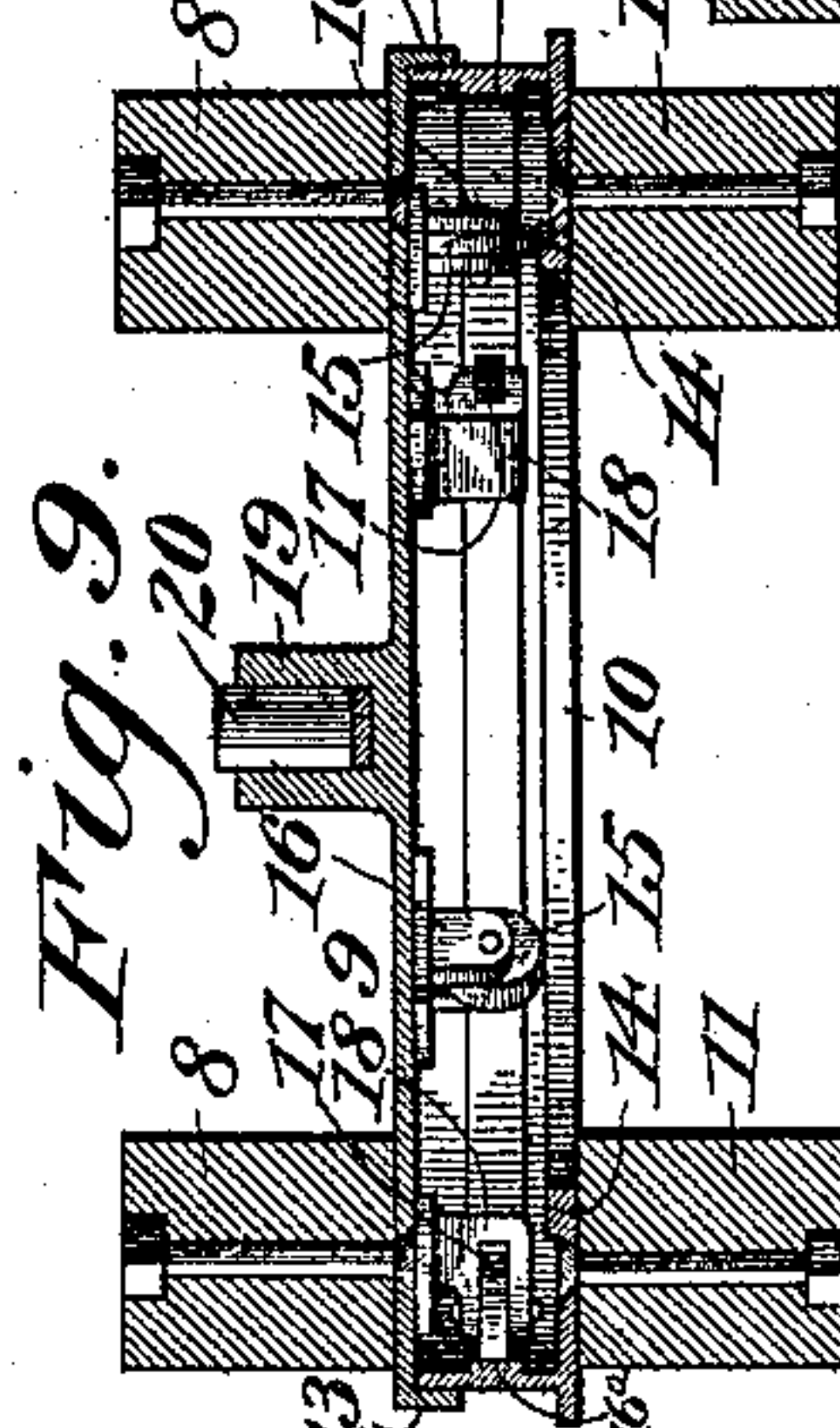


Fig. 9.



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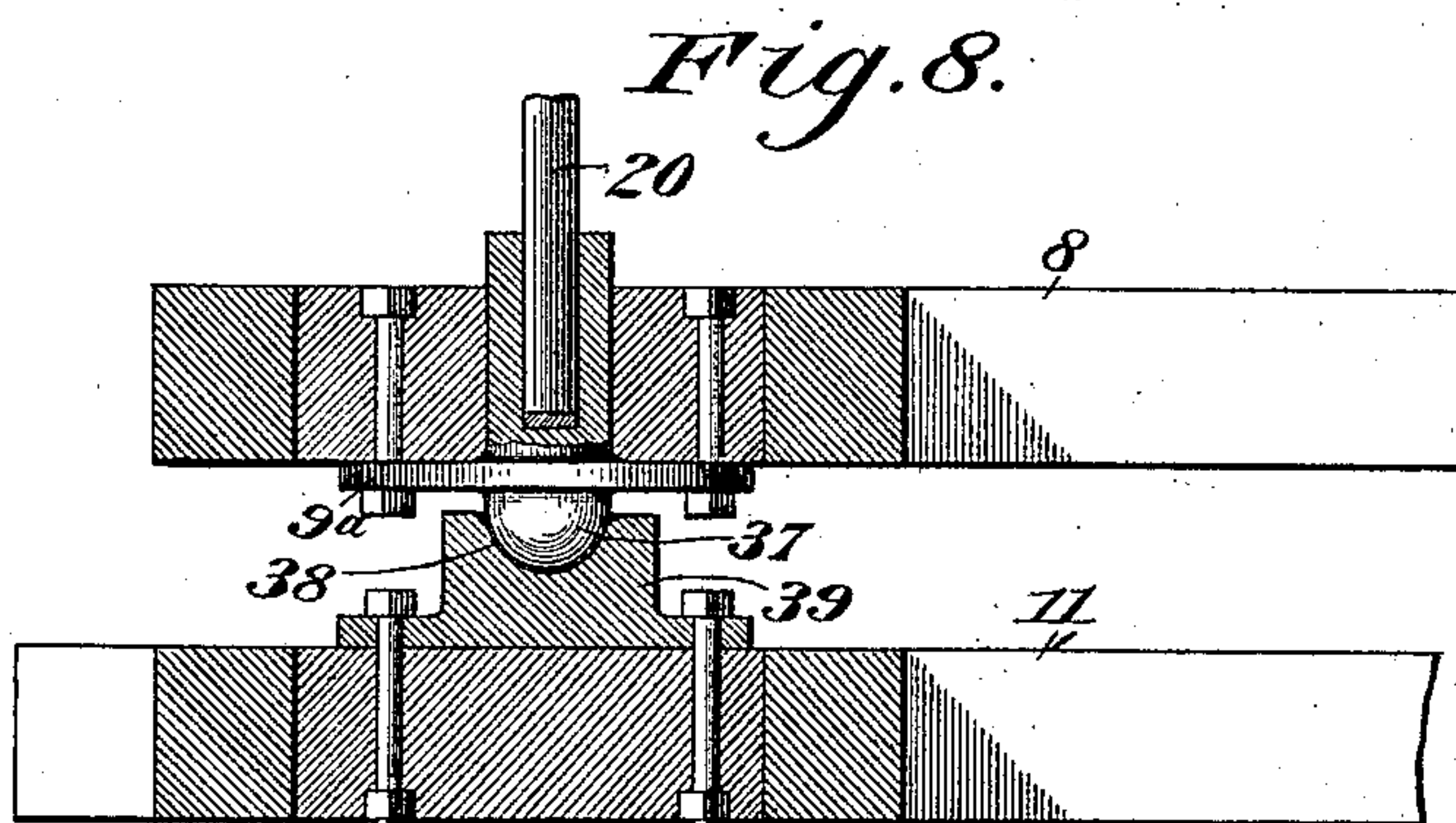
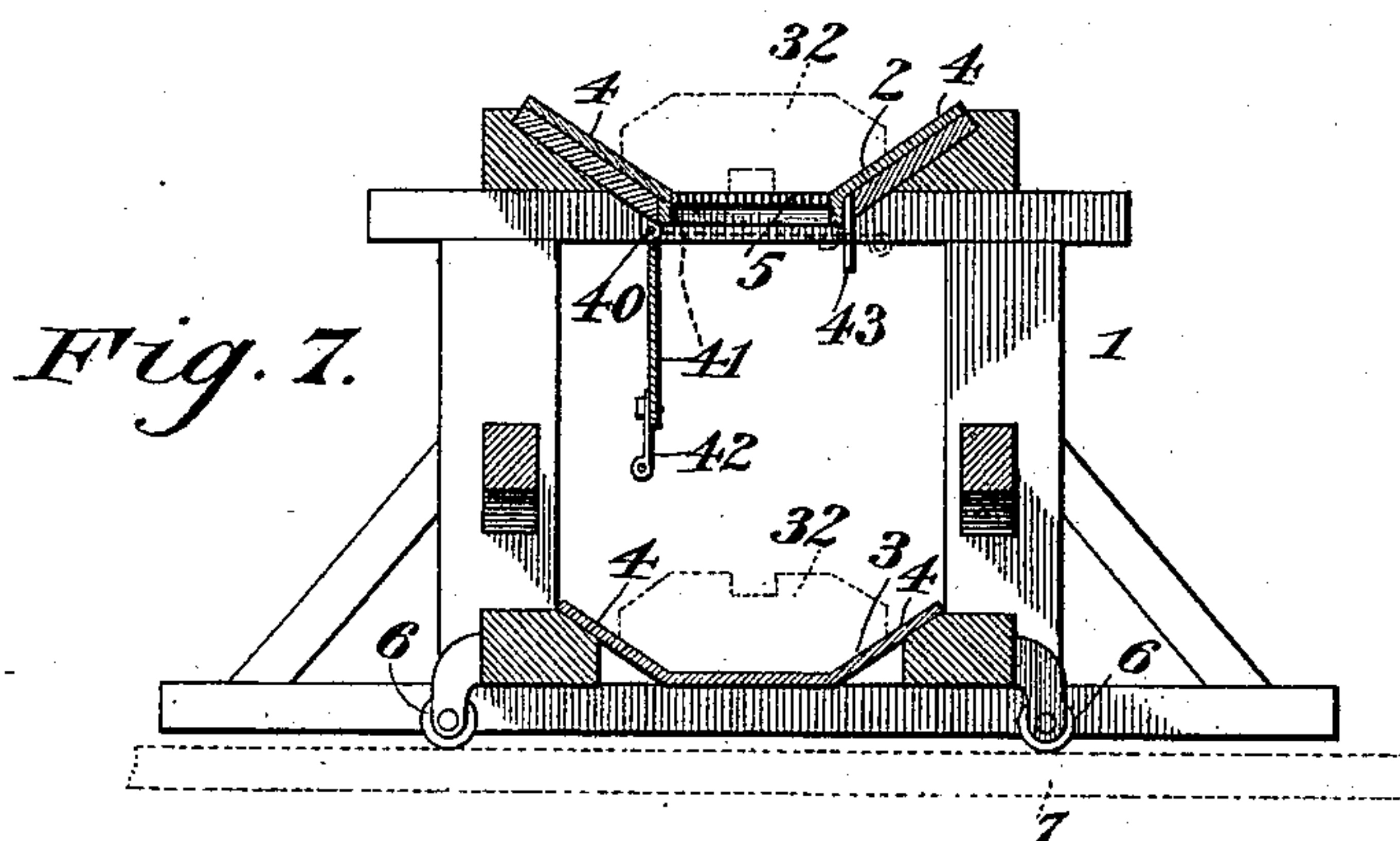
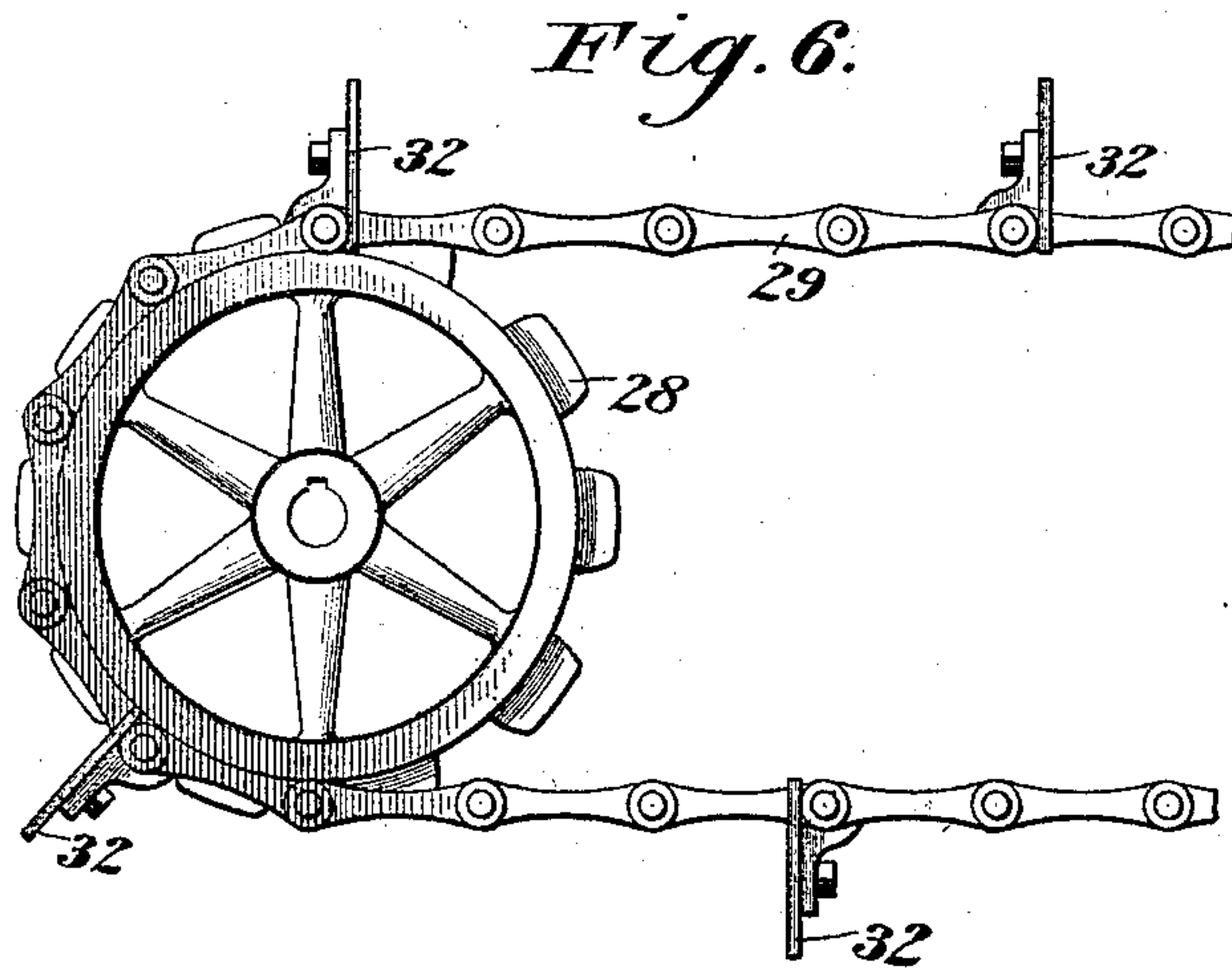
(No Model.)

3 Sheets—Sheet 3.

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No. 570,876.

Patented Nov. 3, 1896.



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UNITED STATES PATENT OFFICE.

AUGUSTUS L. LE GRAND, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO
THE EXETER MACHINE WORKS, OF SAME PLACE.

CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 570,876, dated November 3, 1896.

Application filed July 9, 1895. Serial No. 555,385. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS L. LE GRAND, a citizen of the United States, residing at Pittsburgh, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Conveying Apparatus, of which the following is a specification.

This invention relates to conveying apparatus; and it has for its object to provide an improved swinging or laterally-adjustable apparatus of this character designed for removing and screening material from culm-banks, sand-banks, and the like, and, as the banks are removed, to be adjusted toward the embankment without disarranging the driving or operating mechanism for the conveyer.

The invention also contemplates, as a special feature thereof, means for screening the material, so that the fine and coarse material will be conveyed in different directions or to different points of deposit, and in this adaptation of the apparatus the same is especially useful in connection with sand-banks to screen the sand from the gravel and in connection with anthracite-culm banks to screen the rock, slate, and larger particles from the finer particles of the bank.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a top plan view of a conveying apparatus constructed in accordance with this invention, shown as arranged in operative relation to a culm or sand bank. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged detail side elevation, partly in section, of a portion of the apparatus. Fig. 4 is an enlarged detail vertical sectional view on the line 4 4 of Fig. 3. Fig. 5 is a plan view of the turn-table. Fig. 6 is an enlarged detail elevation of a short section of the flighted conveyer and the sprocket-wheel for driving the same. Fig. 7 is an enlarged detail transverse sectional view on the line 7 7 of Fig. 3. Fig. 8 is an enlarged detail sectional view showing a modified construction of pivotal support for one end of

the conveyer-frame. Fig. 9 is an enlarged detail sectional view of the turn-table.

Referring to the accompanying drawings, 1 designates a laterally or horizontally swinging horizontal conveyer-frame built in any suitable length, according to the size of embankment in connection with which the same is designed to be employed. The frame 1 is referred to as being a horizontal frame and adapted to swing in a horizontal direction, and in this connection it will be understood that when the apparatus is used on perfectly level ground or on a level surface the same will then be truly horizontal and will swing horizontally toward the embankment from which the material is being taken, but in use the apparatus will necessarily be employed at times on uneven surfaces and even on declivities. In such cases the conveyer-frame 1 and the movement thereof laterally will be approximately horizontal, and therefore the term "horizontal" is to be understood, in a relative way, with reference to the use of the apparatus as working directly over the surface of the ground irrespective of the level thereof. The said laterally or horizontally swinging conveyer-frame 1 supports therein a pair of horizontal upper and lower conveyer-troughs 2 and 3, respectively, which extend from end to end of the conveyer-frame.

The upper and lower conveyer-troughs 2 and 3 are arranged one directly above the other and extend in parallel planes, so as to operate in conjunction with each other for the purpose of receiving different portions of the material to be conveyed to a point of deposit, as will be particularly referred to. Both of the conveyer-troughs, which extend the entire length of the swinging conveyer-frame, are open at the top and are provided with opposite inclined sides 4, and the upper of said conveyer-troughs, 2, is provided throughout the length thereof with screen-sections or a series of screen-bars 5, which allow the finer portions of the material, which is shoveled into the upper trough, to screen or sieve through the said upper trough and into the lower trough 3, which is provided with a closed bottom, so that the finer portions of the material may be conveyed through the

lower trough 3 in one direction, while the coarser portion of the material is conveyed through the upper trough 2 in an opposite direction to a separate point of deposit.

5 The horizontally or laterally swinging conveyer-frame 1 has fitted to the lower side thereof at suitable points supporting-rollers 6, which are arranged to travel on the track-rails 7, arranged below the conveyer-frame, 10 and providing means, in conjunction with the supporting-rollers, to permit the conveyer-frame to be freely swung toward the embankment as the same decreases in size. The frame 1 is also provided at one extremity 15 with the lateral extensions or timbers 8, that are rigidly fastened on top of the rotary turn-table plate 9. The rotary turn-table plate 9 is supported for a fixed rotation on the stationary bearing-plate 10, which is mounted 20 on a stationary supporting base-frame 11, which base-frame provides a firm support for the pivoted end of the conveyer-frame. The said stationary bearing-plate 10 is provided with a circular bearing-flange 12, which fits 25 at its upper edge inside of the short depending rim or flange 13, formed at the periphery of the rotary turn-table plate 9, and providing means to assist in holding the plate 9 perfectly steady in its rotation. The 30 bearing-plate 10 is provided on its upper side with a circular bottom track 14, on which travel the vertically - arranged supporting wheels or rollers 15, mounted in the bearing-brackets 16, fastened to the under side of the 35 rotary turn-table plate 9, and on the inner side of its upwardly-disposed flange 12 the plate 10 is also provided with a circular side track 16^a, against which travel the horizontally - disposed side wheels or rollers 17, 40 mounted in the bearing-brackets 18, secured to the under side of the plate 9, near its edge. The rollers 15 and 17 provide for the free pivotal support of the plate 9, and also for the firm bracing thereof, so that the plate will 45 freely rotate in a fixed circular plane.

The rotary turn-table plate 9 is provided centrally on its upper side with a bearing-step 19, in which rotates the lower end of the vertical pivot-shaft 20. The vertical pivot-shaft 50 20 has fitted on the upper end thereof the horizontal beveled gear-wheel 21, which meshes with a beveled gear-pinion 22, mounted on one end of the drive-shaft 23, which is driven by means of suitable belting to provide for 55 transmitting motion to the vertical pivot-shaft 20. The said vertical pivot-shaft 20 has fitted thereon directly above the bearing-step 19 a horizontal beveled gear-pinion 24, with which meshes a vertically-disposed beveled 60 gear-wheel 25, fitted on one end of the horizontal head-shaft 26. The horizontal head-shaft 26 is mounted in suitable bearings 27 on the conveyer-frame 1, at the pivoted end thereof, so that as said conveyer-frame is swung 65 laterally the beveled gear-wheel 25 will always maintain its engagement with the pinion 24, which transmits motion thereto, and

the said head-shaft 26 has mounted centrally thereon a vertically-disposed sprocket-wheel 28, over which passes an ordinary link belt 70 or conveyer-chain 29. The conveyer-chain 29 extends the entire length of the conveyer-frame 1, and at the end of the frame 1, opposite the wheel 28, the said chain passes over an idler chain or foot wheel 30, fitted on the 75 foot-shaft 31, mounted in suitable bearings at the unpivoted or swinging end of the conveyer-frame 1. The upper horizontal portion of the conveyer-chain 29 runs in one direction in the upper trough 2, and the lower horizontal 80 portion of the conveyer-chain runs in an opposite direction in the lower trough 3, and fitted on the conveyer-chain 29 at regularly-spaced intervals are a series of conveyer-flights 32, which travel directly on the bottom 85 of the troughs 2 and 3 and provide means for pushing or conveying the material in the troughs to one end thereof.

Through the medium of the gearing described motion is transmitted to the endless 90 conveyer consisting of the chain 29 and the flights 32, and in operating the apparatus the conveyer-troughs are swung to a position directly adjacent to the bank of material, and the material is then shoveled into the upper 95 trough. The screen-sections of the upper trough allow the finer portion of the material to fall into the lower trough, so that the coarse material will be conveyed through the upper trough in one direction and the finer material 100 will be conveyed through the lower trough in an opposite direction. The coarse material which remains in the upper trough 2 is carried toward the foot-wheel 30, and when it reaches a point directly adjacent to said wheel 105 it discharges through a laterally-extending chute 33, communicating with the upper trough 2 and extending to a point over a supplemental conveyer 34. This supplemental conveyer 34 is arranged at one side of the 110 swinging end of the conveyer-frame 1 and may be of any suitable construction for conveying away the material discharged from the upper trough 2. When a culm-bank is being removed through the medium of the 115 herein-described apparatus, the coarse material discharged from the trough 2 is carried by the supplemental conveyer 34 to a breaker, where it is crushed, washed, and the coal 120 separated from the slate, while the fine portion of the material which falls into the lower trough 3 is conveyed through the lower trough toward the pivoted or fulcrumed end of the conveyer-frame, at which point the said 125 lower trough has leading off from the bottom thereof a downwardly-inclined chute 35, which extends over the lower end of a supplemental inclined conveyer 36. The conveyer 36 is arranged to extend at an inclination beyond the pivoted or fulcrumed end of 130 the conveyer-frame, and when the apparatus is employed for conveying culm the fine portions of material discharged from the trough 3 onto the conveyer 36 are carried by such

conveyer to the boiler-house, where it is used for fuel, and it will therefore be seen that the purpose of the conveyers 34 and 36 is to convey the separate portions of the material to separate points of deposit.

The apparatus herein described is susceptible of modification, such as illustrated in Fig. 8 of the drawings, in which figure the rotary turn-table plate 9^a is illustrated as being provided centrally on its under side with a rounded pivot-stud 37, turning in a bearing-socket 38, formed in the upper side of the step-block 39, suitably secured on a stationary supporting base-frame 11. At this point attention is directed to the fact that under each screen-section 5 the upper conveyer-trough 2 has hinged thereto at one side of said screen-sections, as at 40, a swinging drop-door 41. The swinging drop-doors 41, which are arranged to work under and below the screen-sections 5, are provided at their free edges with latches 42, that are adapted to be engaged with fixed catches 43, secured to the bottom of the trough in which the screen sections or bars are fitted. By engaging the latches 42 with the catches 43 the drop-doors 41 will be supported in their closed position, so as to prevent the material from screening through the screen-sections into the lower trough 3, in order that all the material can be conveyed through the upper trough in the direction traveled by the upper flights of the conveyer. When it is desired to use both troughs, as described, the doors 41 are unlocked and allowed to drop down to uncover the openings in which the screen sections or bars 5 are fitted, and in the event of it being desired to convey all the material in the direction traveled by the lower flights of the conveyer the material is all shoveled or otherwise mechanically placed into the lower trough, as will be readily understood.

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

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a conveying apparatus for removing banked material, a pair of horizontal horizontally-swinging upper and lower conveyer-troughs, the upper of said troughs being provided in its bottom with screens whereby part of the material introduced therein at any point will be screened into the lower trough, and a flighted conveyer having the upper and lower portions thereof traveling respectively in the upper and lower troughs, substantially as set forth.

2. In a conveying apparatus for removing banked material, a pair of horizontal horizontally-swinging upper and lower conveyer-troughs pivoted or fulcrumed at one end, the upper of said troughs being provided with

screen-sections at points along its entire length, whereby part of the material introduced therein at any point will be screened into the lower trough, and a conveyer arranged to work in each of said troughs, substantially as set forth.

3. In a conveying apparatus for banked material, a horizontal horizontally-swinging conveyer-frame carrying conveying mechanism having means for separating different grades of the material removed from the embankment, and adapted to respectively convey to different points of deposit the different graded portions of the material, substantially as set forth.

4. In a conveying apparatus for removing banked material, a pair of horizontal horizontally-swinging upper and lower conveyer-troughs pivoted or fulcrumed at one end and open at their top sides throughout their lengths to receive material therein at any point, the upper of said troughs being provided with screen-sections at points along its entire length to provide for the separation of the material introduced therein at any point, and a flighted conveyer having the upper and lower portions thereof traveling respectively in the upper and lower troughs, substantially as set forth.

5. In a conveying apparatus for removing banked material, a turn-table, a horizontal horizontally-swinging conveyer-frame provided at one end with a lateral extension fastened to the turn-table said frame also carrying a pair of upper and lower conveyer-troughs, the upper of said troughs being provided with screen-sections at points along its entire length, a horizontally-disposed head-shaft mounted at the turn-table end of the frame and carrying a vertically-disposed sprocket-wheel, a vertically-disposed foot-wheel mounted at the swinging end of the frame, a flighted conveyer passing over the sprocket and foot wheels and through the conveyer-troughs, and a driving-gear connection with said head-shaft, substantially as set forth.

6. In a conveying apparatus, a turn-table provided centrally on its upper side with a bearing-step, a swinging conveyer-frame provided at one end with a lateral extension fastened to the turn-table said frame also carrying a conveyer-trough, a chain conveyer traveling in said trough, a shaft mounted at one end of the conveyer-frame and carrying a sprocket-wheel engaging with the chain of the conveyer, and a suitably-rotated vertical pivot-shaft stepped at its lower end in said bearing-step and suitably geared with said shaft at one end of the conveyer-frame, substantially as set forth.

7. In a conveying apparatus, the combination with the swinging conveyer-trough, of the turn-table for said trough consisting of a stationary bearing-plate provided with an upwardly-disposed circular bearing-flange, a circular bottom track on its upper side, and

a circular side track on the inner side of the bearing-flange, and a rotary turn-table plate having a short depending rim loosely embracing the upper edge of said bearing-flange
5 said rotary plate carrying a series of vertically-disposed supporting-wheels traveling on said bottom track and a series of horizontally-disposed side wheels or rollers traveling on said circular side track, substantially as
10 set forth.

8. In a conveying apparatus for removing banked material, a pair of horizontal horizontally-swinging upper and lower conveyer-troughs, the upper of which troughs is provided with screen-sections at points along its
15 entire length, a hinged drop-door fastened to the bottom of the upper trough under each of the screen-sections thereof, and a conveyer working in each of said troughs, substantially as set forth.
20

9. In a conveying apparatus, the combination with a swinging conveyer-trough, of the turn-table for said trough consisting of a stationary bearing-plate provided with an upwardly-disposed circular bearing-flange, and
25 a rotary turn-table plate inclosing the space within the circular bearing-flange and carrying a series of vertically-disposed wheels traveling on top of the stationary bearing-plate, and a series of horizontally-disposed
30 wheels traveling against the inner side of the circular bearing-flange, substantially as set forth.

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

AUGUSTUS L. LE GRAND.

Witnesses:

J. MCD. GREENE,
J. R. EHRET.