

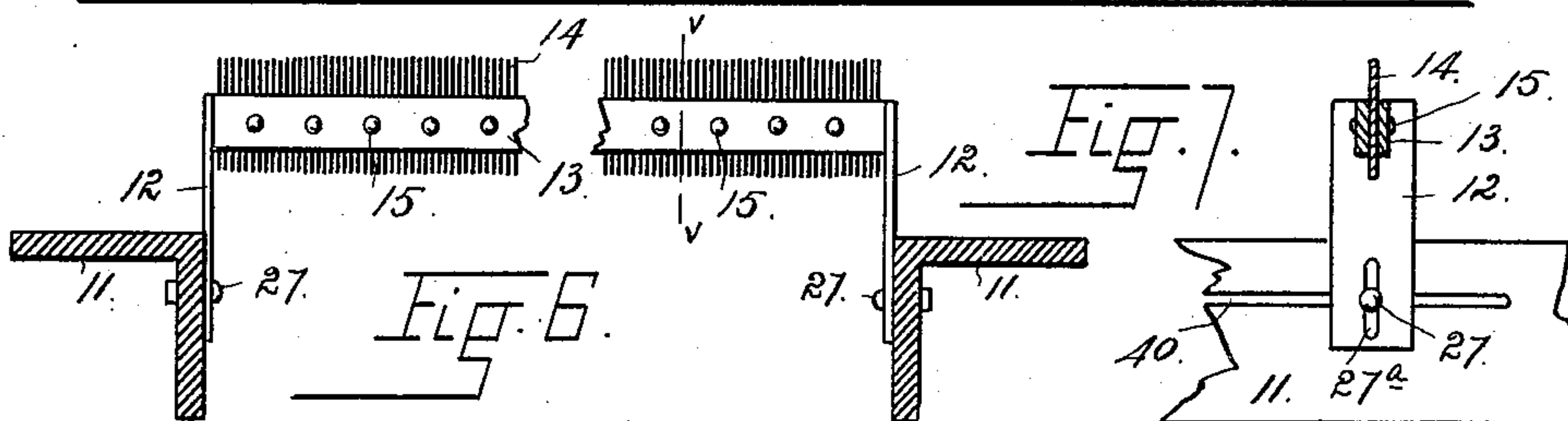
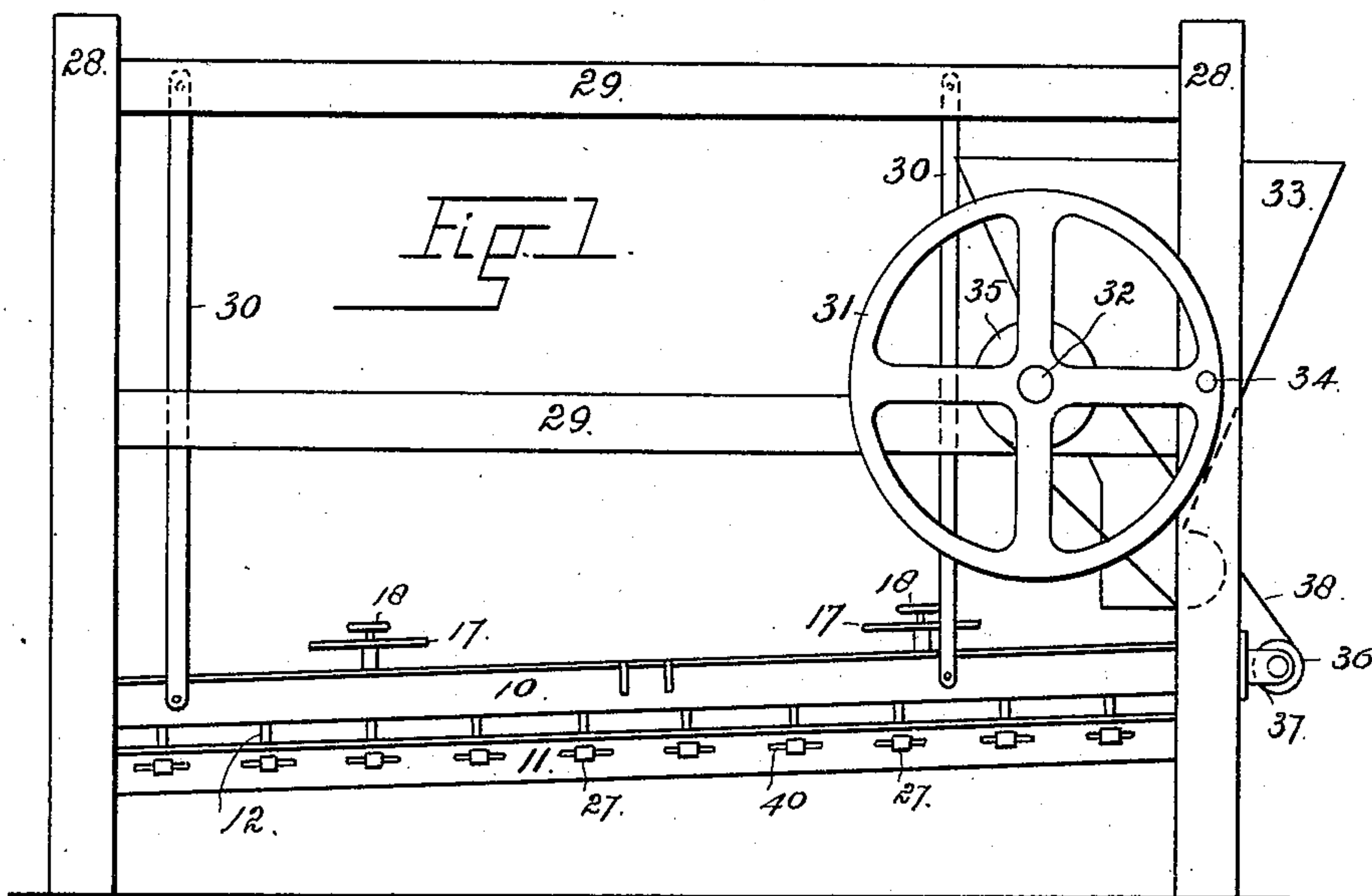
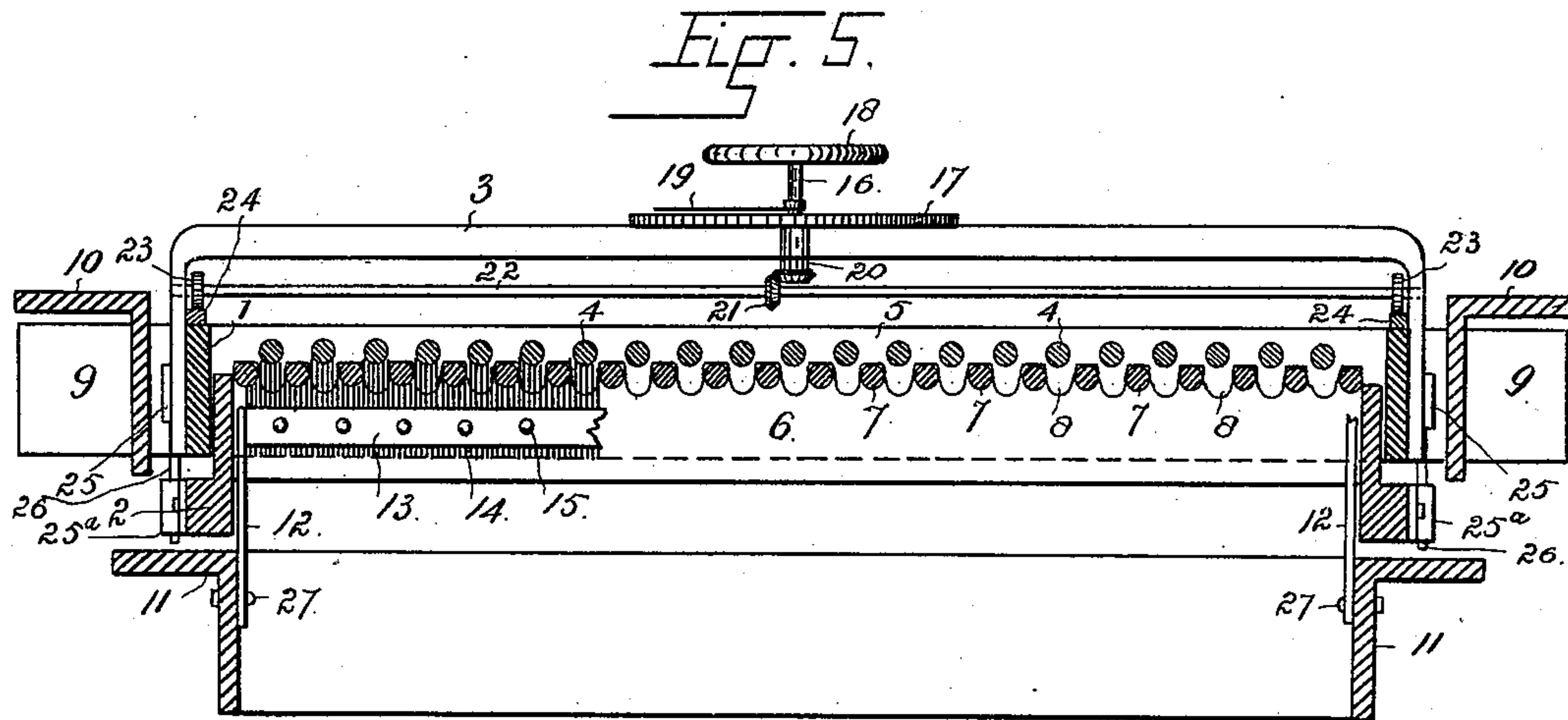
(No Model.)

3 Sheets—Sheet 1.

J. ARELI.
SIFTING SCREEN, &c.

No. 564,179.

Patented July 21, 1896.



WITNESSES:

G. J. Rollandet.
John Rollandet.

INVENTOR

Joseph Areli

BY

J. E. Carstarphen
ATTORNEY.

(No Model.)

3 Sheets—Sheet 2.

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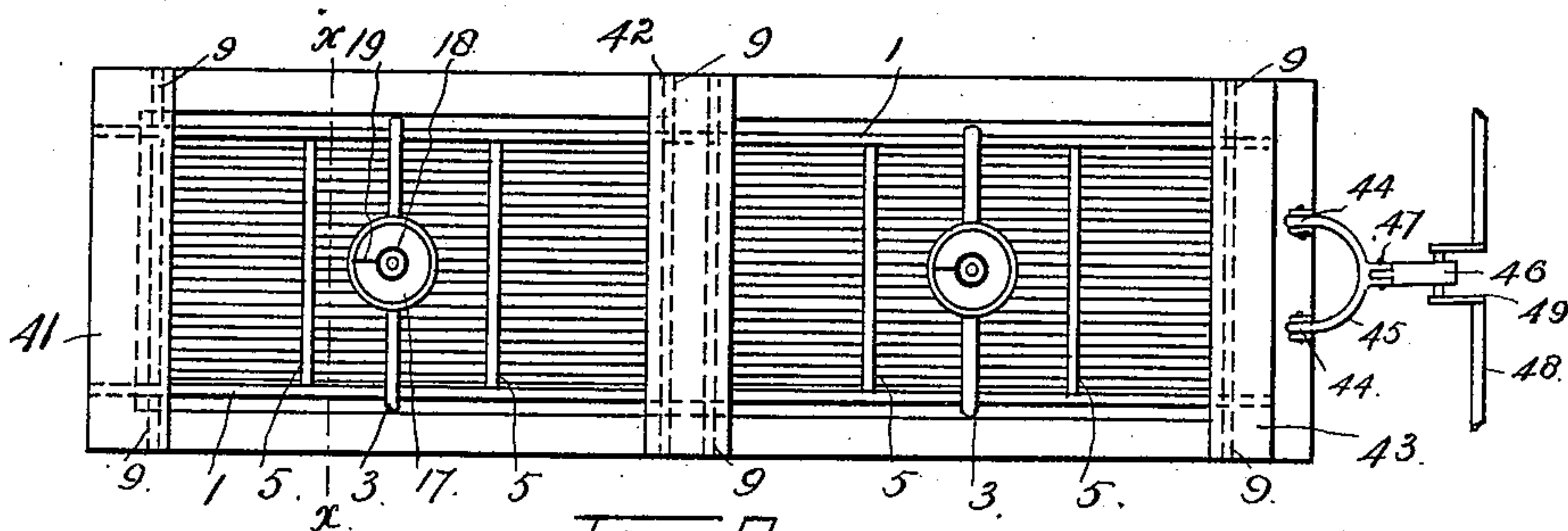


Fig. 2.

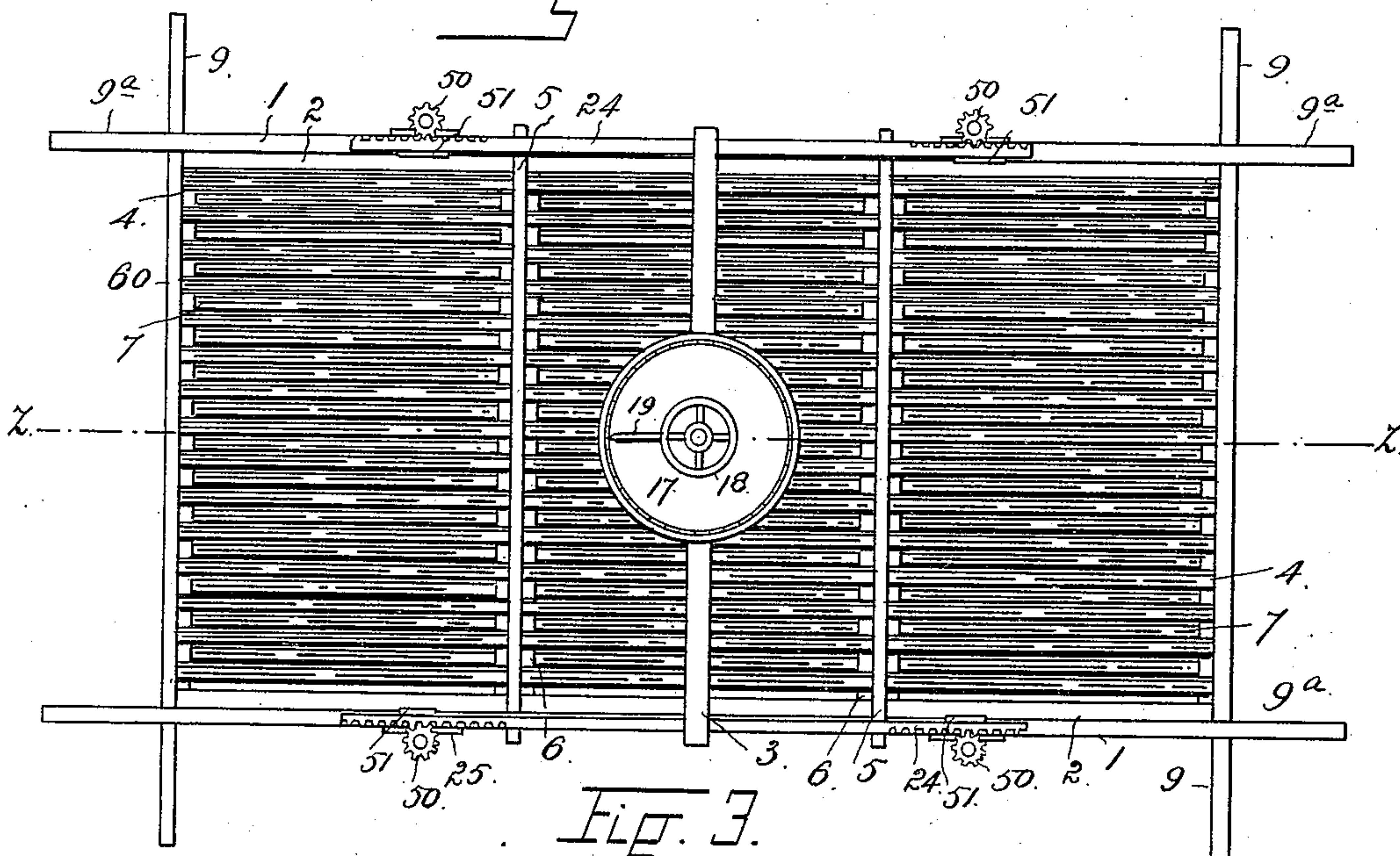


Fig. 3.

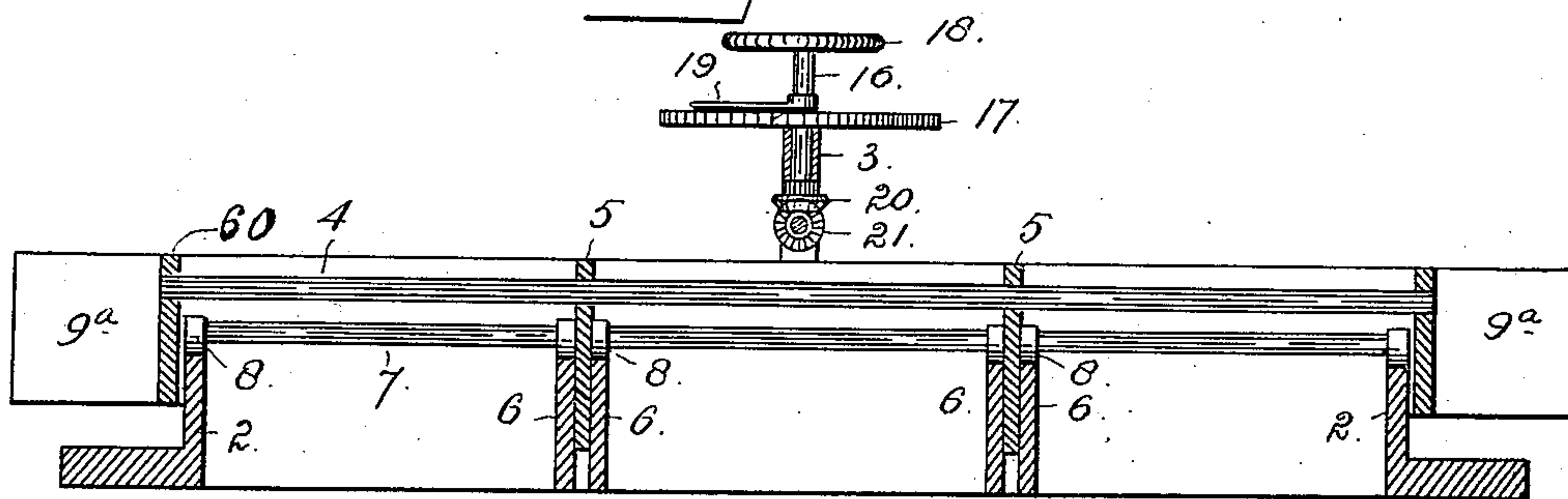


Fig. 4.

WITNESSES:

G. J. Rollandit.
John Rollandit.

INVENTOR

Joseph Areli
BY
J. E. Carstarphen
ATTORNEY.

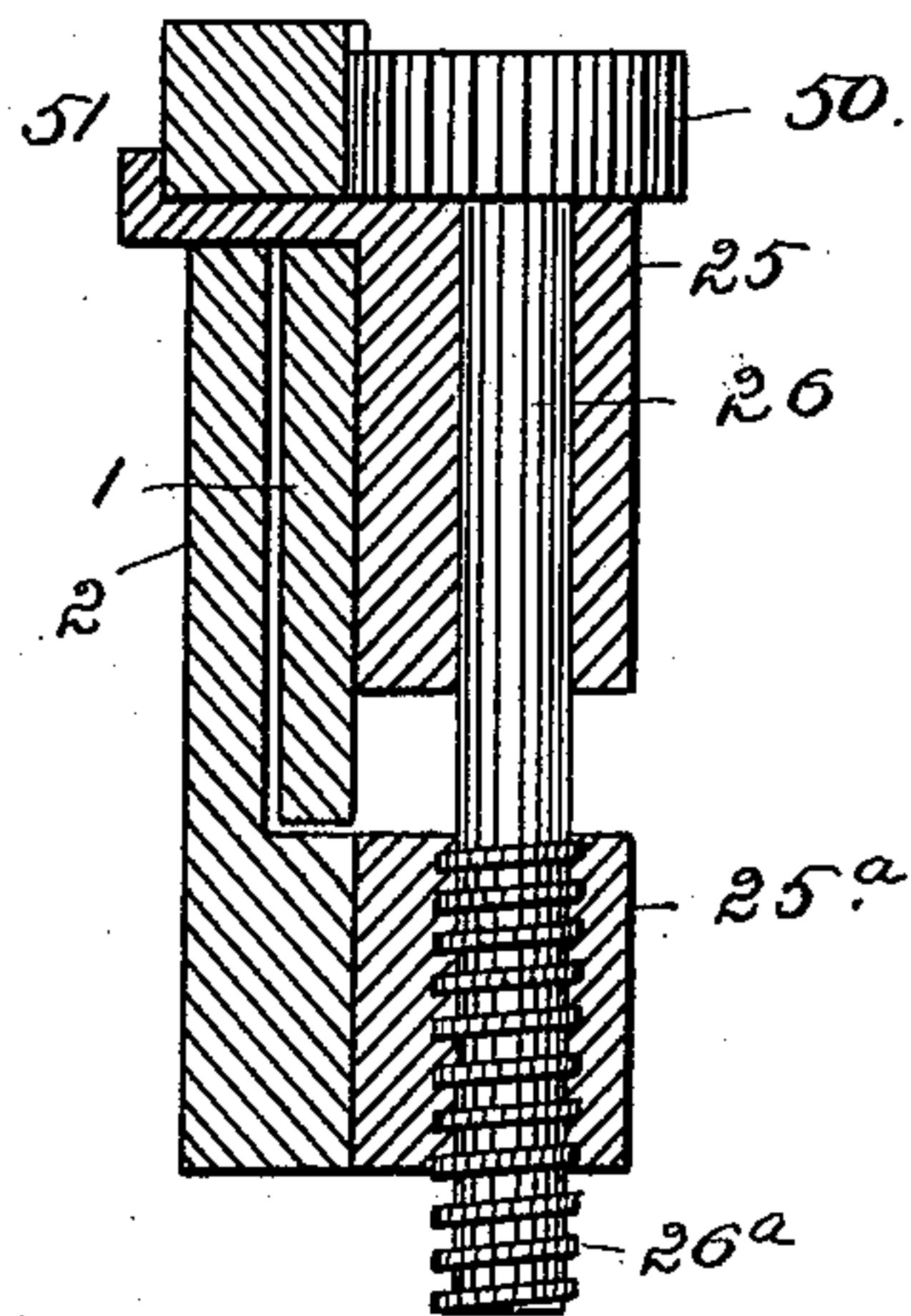
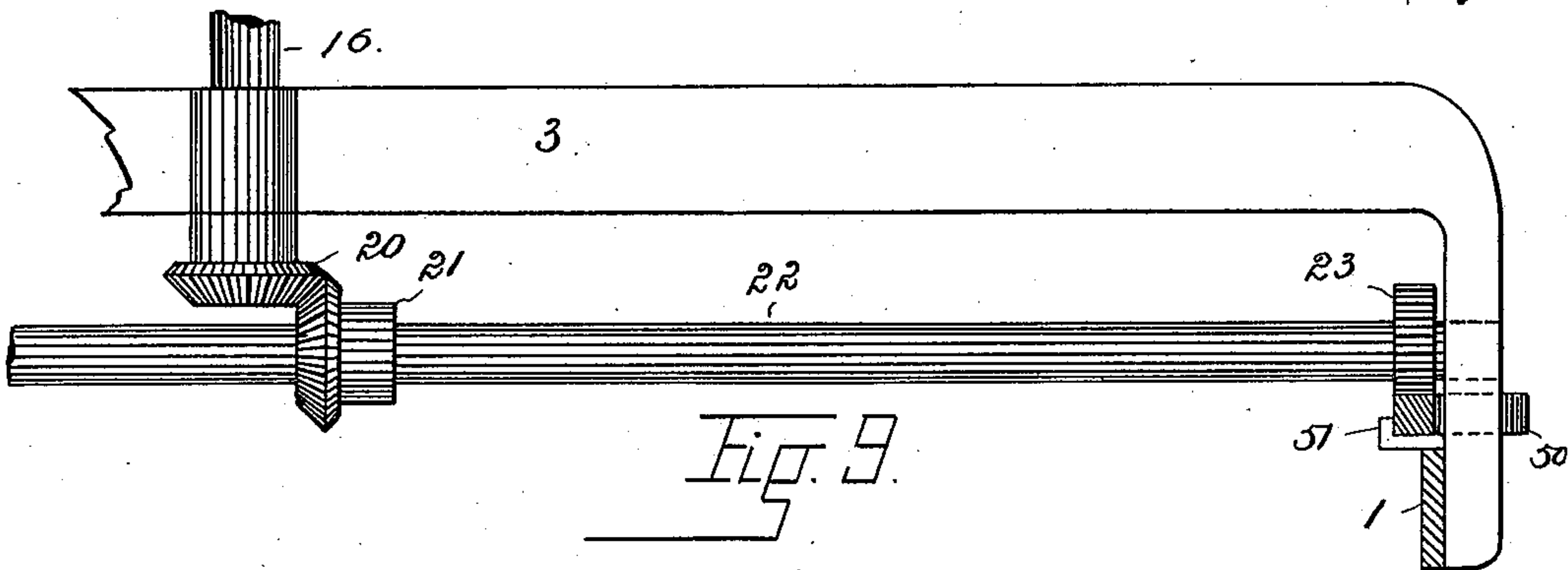
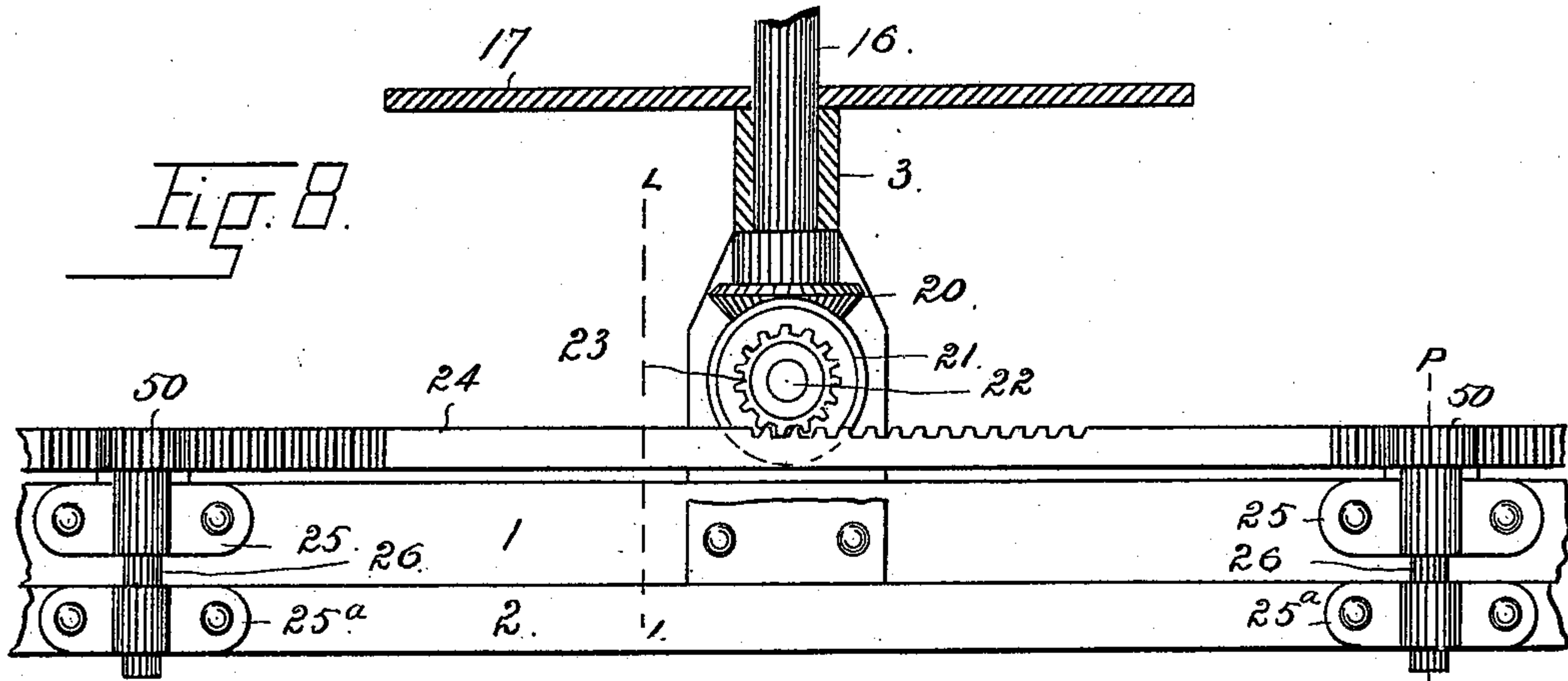
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G. J. Rollandet.

John Rollandet.

INVENTOR

Joseph Arel.

BY

J. E. Carstarphen

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOSEPH ARELI, OF DENVER, COLORADO.

SIFTING-SCREEN, &c.

SPECIFICATION forming part of Letters Patent No. 564,179, dated July 21, 1896.

Application filed May 12, 1893. Serial No. 473,967. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ARELI, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Screens for Sifting and Separating Grain, Ores, Coal, Minerals, Rocks, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to that class of screens in which the material to be sifted or separated is placed upon the screen, through the meshes of which the smaller pieces or grains pass, while the larger portions remain in top of and run down the screen.

The objects of my improvements are, first, to afford facilities for the proper adjustment of the size of the openings or meshes of the screen, so as to suit the various materials to be screened; second, to provide a device for indicating the various sizes of the mesh, so that the screen may be accurately and readily adjusted to any desired size of mesh; third, to provide suitable means for automatically keeping the meshes clean and free of clogging up while in use, and, fourth, to provide a screen which, though simple in construction and inexpensive in cost, is easily operated and adjusted, and comprises various details of construction and arrangements of parts, all as hereinafter described, and particularly pointed out in the appended claims. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevational view of my entire machine, comprising my improved screen and its supporting framework. Fig. 2 is a plan view of the oscillating frame, comprising two screens mortised therein. Fig. 3 is a similar view, on an enlarged scale, of a screen separate from its supporting framework. Fig. 4 is a longitudinal sectional view taken on the lines Z Z, Fig. 3. Fig. 5 is a cross-sectional view on an enlarged scale, taken on the line X X, Fig. 2, part being broken away to better show the cleaning-brushes. Fig. 6

is a detail elevational view of the brush. Fig. 7 is a similar view taken on the line X X, Fig. 6. Fig. 8 is a partial side elevation showing lifting apparatus. Fig. 9 is a section taken along the line L L, Fig. 8. Fig. 10 is an enlarged section taken along the line P P, Fig. 8.

Similar figures refer to similar parts throughout the several views.

The upright framework for supporting the oscillating frame is composed of the standards 28 28 and the side and end connecting beams 29 29. From the upper side beams 29 29 hangers 30 30 depend, the lower ends of which are pivotally connected to the oscillating frame 10. This frame is rectangular in form and is made of right-angled rails, either iron or wood, and is adapted to support from one to four or more screens, preferably two, as shown in Fig. 2. The rails of the frame 10 are provided near the corners and near the centers of the side rails with mortises, within which the ends 9 9^a of the outside screen-frame 1 are fitted.

The screens proper comprise two sets of parallel rods 4 and 7, made of wire or any other suitable material. The ends of the upper set 4 are mortised in the end rails 60 of the rectangular frame 1, while the ends of the lower set 7 are similarly connected to the rectangular frame 2, which is slightly smaller and fits within the frame 1. The spaces between the parallel rods of each set are practically the same size as the diameter of the rods. The rods 4 of the upper set are arranged directly above the spaces between the rods 7 of the lower set, so that when the two sets of rods are adjusted to occupy the same horizontal plane the spaces between the rods are entirely closed.

The side rails of frame 2 are provided at their lower edges with outwardly-projecting flanges, which extend slightly beyond the vertical plane of the outer faces of the side rails of frame 1.

In the middle of each screen, and connecting the two sides of frame 1, a beam 3 is placed, the ends of which are turned down at right angles and are securely fastened by bolts or other suitable means to the sides of frame 1. The center of this beam 3 is provided with a bearing through which passes a

vertical shaft 16, provided at its upper extremity with a hand-wheel 18 and at its lower end with a beveled gear-wheel 20, which engages a beveled gear-wheel 21 placed on a horizontal shaft 22, the ends of which bear on the turned-down parts of beam 3. Shaft 22 is provided near its ends and directly over the sides of frame 1 with gear-wheels 23 23, which mesh with teeth cut in the upper side of bars or racks 24 24, which are placed above the sides of frame 1, resting on and made to slide in projections 51 of boxes 25 25, two of which are fastened to each side of frame 1 by means of bolts passing through flanges on said boxes and at equal distances from the center of beam 3. Directly under these boxes and in line with them, boxes 25^a are located, fastened to flanges on the sides of frame 2 by means of bolts passing through flanges on said boxes. On the inside of boxes 25^a thread is cut to receive the threaded part of bolts 26, the upper part of which passes through boxes 25, and which are provided on top with gear-wheels 50 which engage teeth cut in the sides of bars or racks 24 24. It will thus be readily seen that by turning shaft 16 shaft 22, with gear-wheel 23, will revolve, which will cause racks 24 to slide in the projections 51 of boxes 25, which racks 24 in their turn will cause gear-wheels 50 to revolve and with them shafts 26 26, which, as they are screwed in boxes 25^a of frame 2 and pass freely through boxes 25 of frame 1, will separate frames 1 and 2. This relative movement of frames 1 and 2 regulates the distance between the two sets of parallel rods, and thus determines the mesh of the screen.

Parallel braces 6 6 extend transversely across the screen and are connected at their ends to the side rails of frame 2. These braces are provided with recesses 8 on their upper edges, within which are supported the rods 7 of the lower frame 2. Similar cross-braces 5 extend across and are connected to the side rails of frame 1 and support the rods 4. These braces 5 are provided with slots to fit over the rods 4. The braces 6 are arranged in pairs between which a brace 5 plays, which arrangement aids in keeping the frames 1 and 2 in proper relative location during their adjustment.

A dial or graduated disk 17 is attached to beam 3 and is so located that bolt 16 passes through its center. A pointer 19 is rigidly secured to bolt 16, lying close to the dial so as to accurately indicate the degrees marked thereon.

A frame 11 composed of angle rails is connected to the upright posts 28 28 a short distance below the frame 10. A series of brushes 14 are adjustably connected to the side rails of frame 11. These brushes are made preferably of peassava-root bristle and are firmly held between two metal plates 13 13 riveted together by rivets 15. Uprights 12 support at their upper ends the brushes 14 and are provided at their lower ends with slots 27^a

through which pass bolts 27, which also pass through slots 40 in the side rails of frame 11. Nuts engage the screw-threaded ends of these bolts 27 and bind the arms 12 to the rails. This slot and bolt connection enables the brushes to be adjusted vertically so as to be in contact with the rods 4 and 7, and as the screen oscillates these brushes keep the meshes clean and clear by dislodging any particles or grains which may become fastened between the rods.

While any suitable means may be used for oscillating the frame 10, I preferably employ the construction illustrated in Fig. 1 of the drawings, comprising a fly-wheel 31 revolvably mounted on a shaft supported by the cross-bars 29, a handle 34 and pulley 35 fixed thereto, a pulley 36 journaled in bearings secured to one of the uprights 28, and belt 38 passing around the pulleys.

The particular force of connection between the frame 10 and pulley 36 for imparting motion to the frame is not material, but some such construction as shown in Fig. 2 is found preferable. This construction embraces a crank-shaft 48 with crank 49, to one end of which the pulley 36 is fixed, the other end being journaled in a bracket supported by the opposite upright 28; a pitman 46, connected to the shaft 48 and hinged at 47 to the curved arm 45, which is hinged at each end 44 44 to the end rail of frame 10.

Strips of sheet metal 43 may be placed over the places where the ends 9 and 9^a of the screen-frames 1 are mortised to the frame 10, while a strip 42 is placed over the place where the ends of two screens come together, and a strip 41 is placed where the screen-frame 1 is mortised in the lower end of frame 10 for the purpose of forming an even surface for the material to pass over.

In the frame of my invention illustrated in Fig. 2 two separate screens are mortised in the frame 10. The mesh of the two screens may differ in size, so that the material sifted may be sorted in three grades, one passing through the mesh of the first screen, another through the larger mesh of the second screen, and a third grade, being too large to pass through either mesh, remains on top and runs down the screen.

While I have shown my screen-frame as adapted to be oscillated, I do not wish to limit myself to such form, as my improved means for adjusting the mesh and indicating the size thereof may be used equally as well on a stationary screen.

The operation is as follows: The bolt 16 is turned until the mesh of the screen is approximately the size desired for the particular material to be sifted, whether grain, ore, or coal, or any other material whatsoever. The pointer is then turned to that degree in the dial which has been previously found to indicate the proper-sized mesh for the particular material. The brushes 14 are then, if

necessary, adjusted to bear against the screen. This adjustment is rendered necessary by the movement of the frame 2 and rods 7 toward and away from the brushes in the adjustment of the mesh of the screen. The ore, grain, or whatever material is to be sifted is then placed in the hopper 33 and the screen set in motion by the revolution of the fly-wheel 31. The agitation of the screen will cause the smaller grain or pieces to fall through the meshes into a receptacle, while the larger grain or pieces will run down the screen, and may be received in a receptacle placed below the end of the screen.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a screen or sifter, the combination of an upper frame, a lower frame, parallel rods supported in each frame, bolts passing through the upper frame and engaging at their lower threaded ends in threaded openings in the lower frame, bars engaging the heads of such bolts, and means for simultaneously horizontally reciprocating such bars, whereby the lower frame may be raised or lowered and the mesh of the screen adjusted, substantially as described.

2. In a screen or sifter, the combination of an upper frame, a lower frame, parallel rods supported in each frame, means for adjustably connecting said frames, horizontally-reciprocating bars engaging such connecting means, and a horizontal shaft engaging and simultaneously reciprocating such bars, whereby the frames are relatively adjusted and the mesh of the sifter or screen regulated, substantially as described.

3. The combination in a sieve, sifter or screen of the rectangular frame 1, parallel rods 4 supported thereby, the rectangular frame 2 with frame 1 supporting parallel rods 7 below rods 4, outwardly-extending flanges around the bottom of frame 2 extending beyond the outer faces of frame 1, a beam 3 fastened to the sides of frame 1, a bolt 16 passing through the center of said beam, having on its upper extremity hand-wheel 18 and on its lower extremity a beveled gear-wheel 20, a horizontal shaft 22 bearing in the turned-down ends of beam 3, provided with a beveled gear-wheel 21 which engages gear-wheel 20 on shaft 16, and with two gear-wheels 22 22, racks or bars 24 with teeth cut in their upper side to engage gear-wheel 23 of the shaft 22 and with teeth cut in the side on each end, and sliding over and held in place by projections 51 of boxes 25, threaded bolts 26 26 passing freely through boxes 25 which are fastened to the sides of frame 1 and screwed into threaded boxes 25^a, fastened to the sides of frame 2, and provided on their upper extremity with gear-wheels 50

50 which engage vertical teeth of racks 24, substantially as shown and described.

4. In a screen or sifter, the combination of an upper frame, a lower frame, parallel rods supported in each frame, means for adjustably connecting said frames, horizontally-reciprocating bars engaging such connecting means, a horizontal rotating shaft engaging and simultaneously reciprocating such bars, and a vertical bolt or shaft for rotating said horizontal shaft, substantially as described.

5. A screen or sifter, composed of two rectangular frames, parallel rods supported in each frame, means for adjustably connecting such frames, a vertical shaft for operating such means, a pointer connected to such shaft and a dial surrounding the shaft whereby the relative positions of the frames are indicated, substantially as set forth.

6. In an adjustable sieve, or sifter, means for effecting the adjustment of the mesh, a vertical rotating shaft for operating such means, a horizontal dial surrounding the shaft, and a pointer attached to the shaft, whereby the size of the mesh is indicated, substantially as described.

7. In a screen or sifter, the combination of an upper frame, a lower frame, parallel rods supported in each frame, bolts passing through the upper frame and engaging at their lower threaded ends in threaded openings in the lower frame, means for simultaneously rotating said bolts, and an automatic indicator connected with such means for indicating the relative positions of the frames, substantially as described.

8. In a screen or sifter, the combination of an upper frame, a lower frame, parallel rods supported in each frame, means for adjustably connecting said frames, horizontally-reciprocating bars engaging such connecting means, a horizontal rotating shaft engaging and simultaneously reciprocating such bars, a vertical shaft for rotating said horizontal shaft, and a pointer attached to such vertical shaft for indicating the relative positions of the frames and the size of the screen-mesh, substantially as set forth.

9. The combination of the oscillating frame 10; the upright supporting-frame, rails 11 having a series of slots 40, brushes 14, supporting-arms 12 having slots 27^a at their lower ends, and bolts 27 passing through slots 27^a and 40 whereby the brushes are adjustably attached to the rails 11, substantially as described and set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH ARELI.

Witnesses:

HARRY RAB,

FRANK. E. CARSTARPHEN.