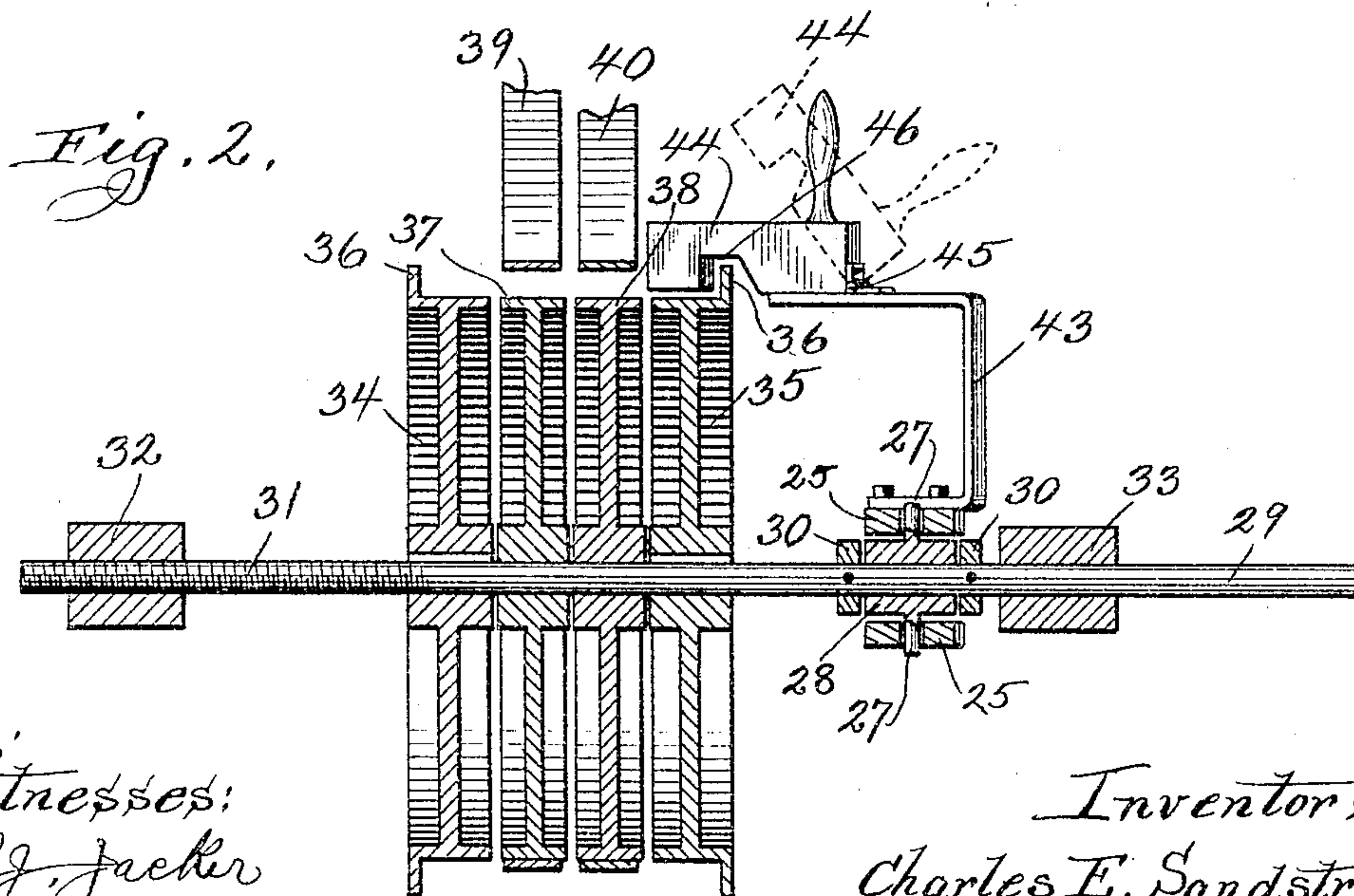
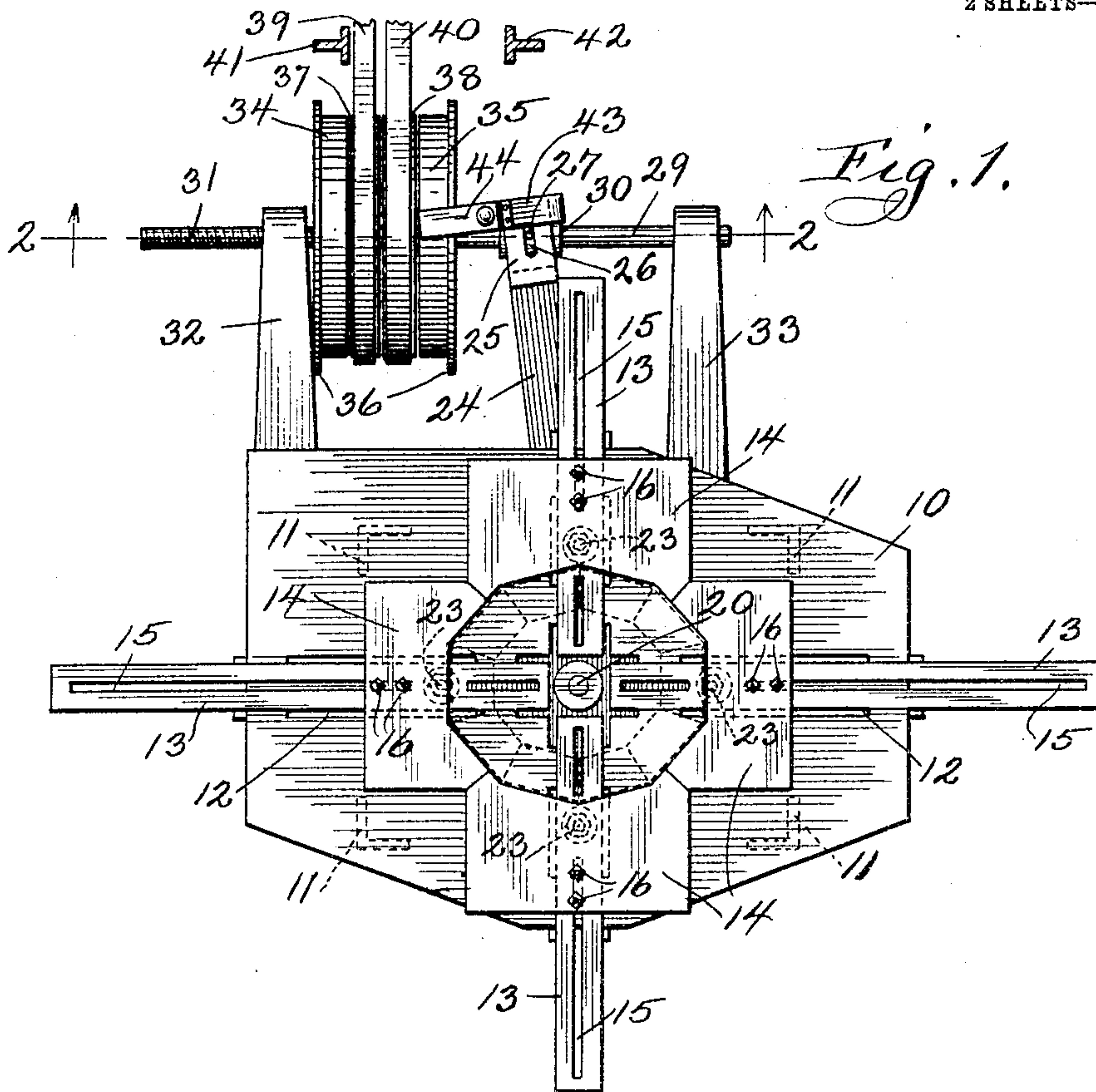


No. 778,802.

PATENTED DEC. 27, 1904.

C. E. SANDSTROM.
MECHANICAL MOVEMENT.
APPLICATION FILED SEPT. 14, 1903.

2 SHEETS—SHEET 1.



Witnesses:
R. J. Jaeger
Arthur B. Seibald.

Inventor:
Charles E. Sandstrom
By Coburn & McRoberts
Attys.

C. E. SANDSTROM.
MECHANICAL MOVEMENT.
APPLICATION FILED SEPT. 14, 1903.

2 SHEETS—SHEET 2.

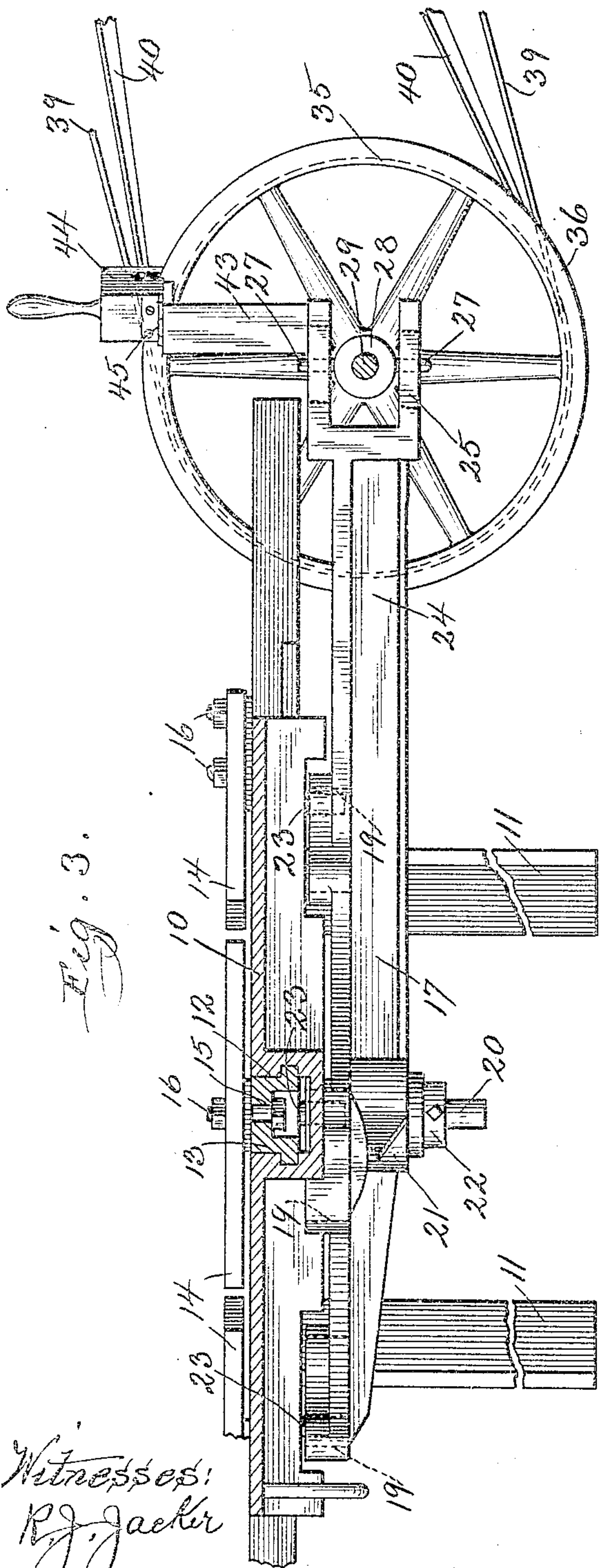


Fig. 3.

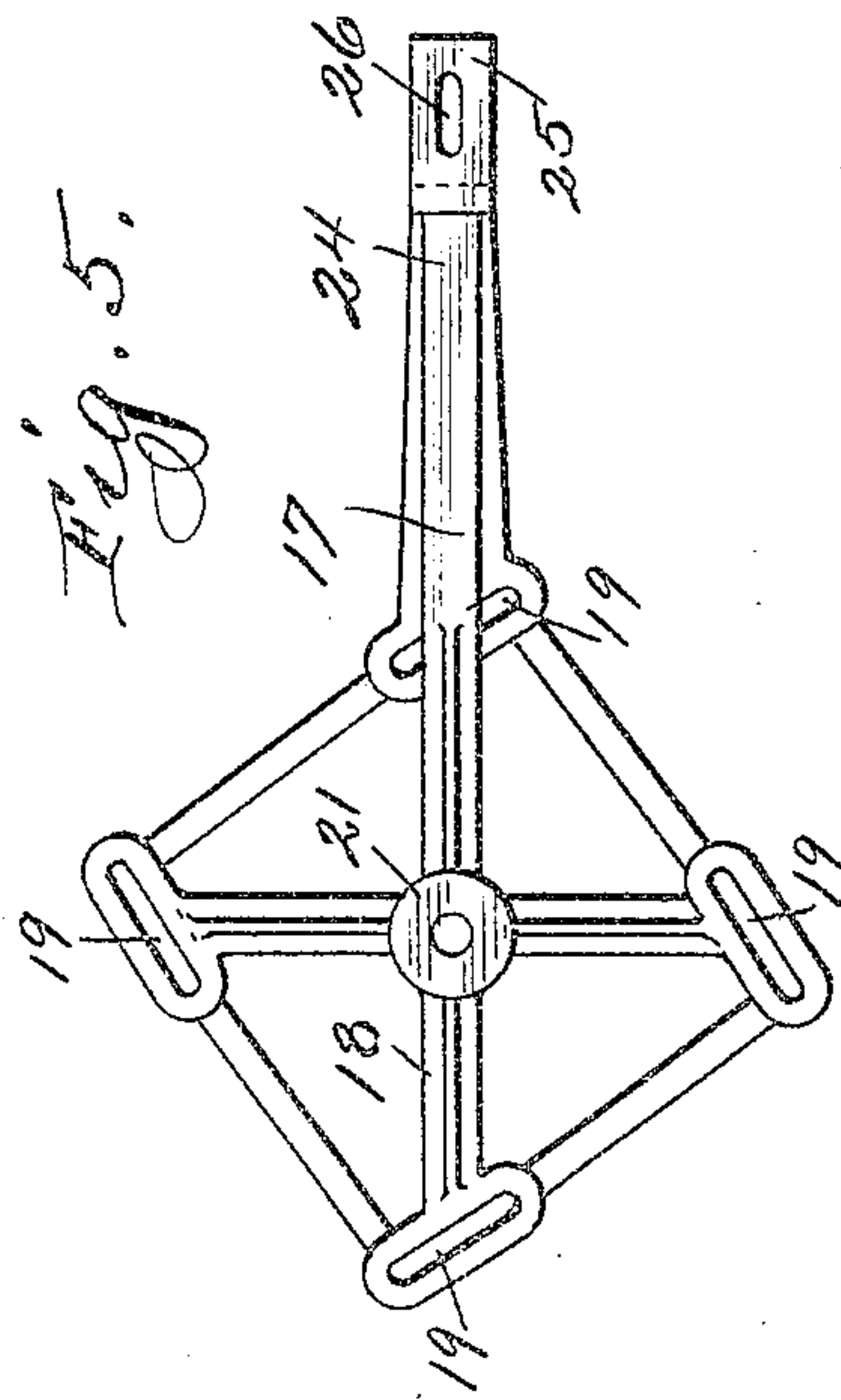


Fig. 5.

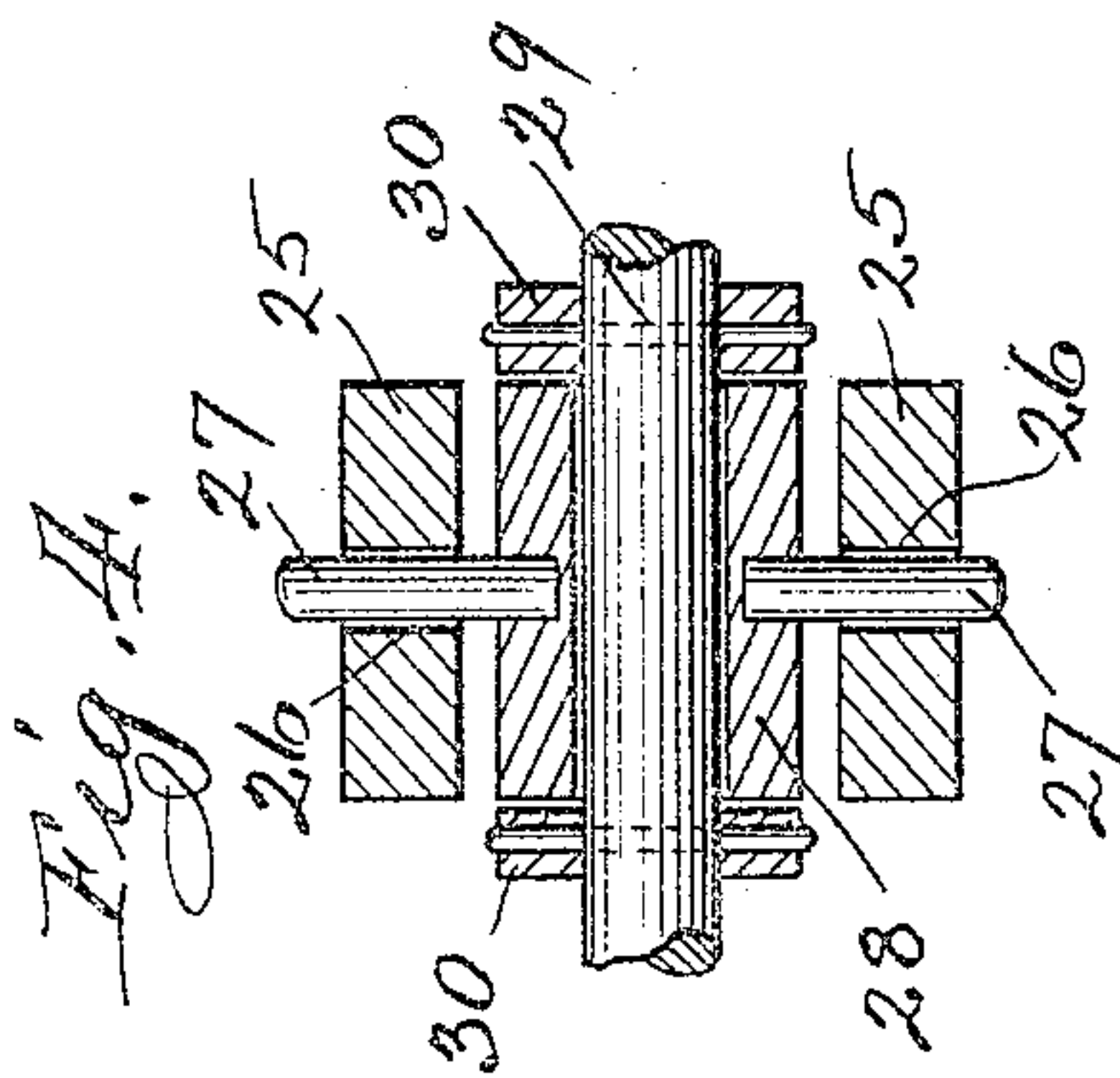


Fig. 4.

Witnesses:
R. J. Jaeger
Arthur B. Seibald.

Inventor
Charles E. Sandstrom
By *Colburn McKelvey*
Attys.

UNITED STATES PATENT OFFICE.

CHARLES E. SANDSTROM, OF CHICAGO, ILLINOIS.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 778,802, dated December 27, 1904.

Original application filed January 2, 1902, Serial No. 88,099. Divided and this application filed September 14, 1903. Serial No. 173,041.

To all whom it may concern:

Be it known that I, CHARLES E. SANDSTROM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention relates to improvements in mechanical movements, and particularly to means for transforming rotary into reciprocating motion.

The invention consists of the combination and arrangement of parts hereinafter particularly described, specifically designated in the appended claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a machine for assembling picture-frame sections, showing my invention applied thereto and illustrating the pulleys and shaft in one of their positions and the jaws of the picture-frame-assembling machine closed. Fig. 2 is a section, on an enlarged scale, on the line 2 2 of Fig. 1 and showing the pulley and shaft in their other position. Fig. 3 is a longitudinal section, on an enlarged scale, of the complete machine illustrated in Fig. 1 with the jaws of the picture-frame-assembling apparatus expanded. Fig. 4 is a sectional view through the yoke forming one end of the lever, illustrating its connection with the operating screw-shaft; and Fig. 5 is an inverted plan view of the lever actuated by the shaft.

My invention for transforming rotary into reciprocating movement is illustrated in the present instance in connection with an apparatus for assembling and forcing together the sections which are used to make up the body of a picture-frame or other similar article, as more fully shown and described in an application for patent filed by me January 2, 1902, Serial No. 88,099, of which the present case is a division; but it is to be understood that the invention is not restricted in its use to such purpose, but may be readily adapted to other machines or mechanisms where it is desired to convert rotary into reciprocating movement. Briefly described, the apparatus for assembling picture-frame sections set forth in the said application comprises a bed-

plate 10 of the machine, as best shown in Figs. 1 and 3, which is preferably supported by the four legs or standards 11, projecting downwardly from and secured to the under side thereof. The bed-plate has formed therein or secured thereto a series of radial or substantially radial channels 12, in which sliding bars 13, to which jaws 14 are secured, may be moved back and forth. The bars 13 have the slots 15 therein, so that the jaws may be adjusted thereon in any position that may be necessary by means of the bolts 16. Pivoted at the converging point of these channels 12 is the cam-lever 17, which consists of the central spider 18, having the eccentric cam slots or grooves 19, one for each slide therein. The cam-lever 17 is pivoted on a pin 20, secured to and projecting downward from the bed-plate at the converging point of the channels. A bearing-hub 21 is provided in the spider 18, through which the pin 20 passes, and a collar 22, held in place by a set-screw, holds the cam-lever 17 in its operative position. Each of the slides 13 is provided with a pin 23, projecting downward from the under surface and into its cooperating cam-slot 19. Under the present invention motion is imparted to the lever through the medium of the mechanism now to be described and by means of which the motion of a wheel or other rotating element is converted into a reciprocatory movement to ultimately actuate the slides 13. To this end the power-arm 24 of the cam-lever is provided at its outer end with a yoke 25, which has a pair of vertical elongated slots 26 therein, through which pass the pins 27, rigid with and projecting upward and downward from a sleeve 28, mounted upon and held from longitudinal movement on the operating-shaft 29 by means of the collars 30, pinned or otherwise secured to said shaft. The operating-shaft 29, as best seen in Figs. 1 and 2, has one of its ends screw-threaded, as at 31, and such end passes through a cooperating threaded aperture in an arm 32, projecting rearwardly from the bed-plate 10 or supported in any other convenient manner, while its other end may slide freely and rotate in a smooth-faced bearing in the companion arm or support 33. Splined upon or

otherwise rigidly secured to the operating screw-shaft 29 is a pair of pulley-wheels 34 and 35, which are preferably provided with flanges 36 on the outer edges of their periph-
 5 eries. Interposed between these fixed pulleys and of substantially the same width are the loose pulleys 37 and 38. Driven from the same line-shafting, preferably by pulleys of different diameters, so that the jaws will be
 10 opened rapidly and closed slowly, are a pair of belts 39 and 40, designed to coöperate with the pulleys 34 and 35, respectively, and one of them being crossed, so that they will drive the screw-shaft in opposite directions. A pair of
 15 guide stops or standards 41 and 42 are provided and secured in any convenient manner to project into the plane of the belts 39 and 40 to coöperate therewith under the circumstances to be set out. Conveniently secured
 20 upon the outer side of the yoke 25 is a bracket 43, which has hinged thereon, as at 45, a block 44, which is provided with a groove 46 to receive the flange of the adjacent pulley 35 and permit the end of the said block to be moved
 25 or adjusted so as to extend over and adjacent to the periphery of the pulley-wheel 35 when it is desired to hold the belt 40 off of the pulley-wheel 35.

The jaws of the apparatus being expanded
 30 and the sections of the frame having been placed in position between the jaws, as set forth in the application for patent hereinbefore referred to, the belt-shifter is moved to throw the belts 39 and 40 from the idle pulleys
 35 37 and 38, (their normal position,) as shown in Fig. 2, onto the fixed pulley 34 and the idle pulley 37, respectively. This causes the shaft 29 to rotate, and the action of its screw-threaded end with the screw-threaded aper-
 40 ture through which it passes in the arm 32 causes the shaft 29 to be moved longitudinally and into the position shown in Fig. 1, during which movement the action of the cam-slots 19 on the pins 23 serves to draw the slides
 45 13 and the jaws 14, carried thereby, into their closed position, in which the sections of the frame or other article are brought together. Just before the limit of the movement of the shaft is reached the belt 39 strikes
 50 the stop 41 and the belts 39 and 40 are run onto the idle pulleys 37 and 38, respectively, so as to stop the movement when the frame is assembled. To reverse the operation, the block 44 is swung back to the position shown
 55 in dotted lines in Fig. 2, and the belts 39 and 40 may be swung either by the belt-shifter or a tension caused by their abnormal displacement onto the idle pulley 38 and the fixed pulley 35, respectively, when the move-
 60 ment of the parts will be reversed until they reach their first position, as shown in Fig. 2, in which the stop 42 forces the belts 40 and 39 from the fixed pulley 35 and the idle pulley 38, respectively, onto the idle pulleys 38
 65 and 37, when the machine comes to a stop in

its original position, when the assembled frame can be removed and a new set of blocks or sections put in place and the operation repeated.

Having described my invention, I claim— 70

1. In a device for transforming rotary motion into reciprocating motion, the combination with the operating-shaft, of a screw-threaded bearing in which said shaft is mounted to rotate and which is in threaded engagement
 75 therewith, a driving-pulley secured to the shaft for moving the latter in one direction, an idle pulley journaled on the shaft, a belt shiftable from one pulley to the other, and means to move the shaft in the opposite direc-
 80 tion. 80

2. In a device for transforming rotary motion into reciprocating motion, the combination with the operating-shaft, of a screw-threaded bearing in which the shaft is mounted
 85 to rotate and which is in threaded engagement therewith, the driving-pulleys secured to the shaft, the idle pulleys journaled on the shaft, and a pair of belts moving in opposite directions and passing over the pulleys. 90

3. In a device for transforming rotary motion into reciprocating motion, the combination with the shaft, of a screw-threaded bearing in which said shaft is mounted to rotate and which is in threaded engagement there-
 95 with, the driving-wheels secured to the shaft, means for driving said wheels in alternation and in opposite directions, a slide, and a lever pivotally connected to the shaft and provided with means for moving the slide. 100

4. In a device for transforming rotary motion into reciprocating motion, the combination with the rotating shaft, of means for reciprocating the shaft, means for automatically arresting the movement of the shaft in
 105 either direction, a support, a slide mounted on the support, and a lever pivotally connected to the shaft and provided with a cam engaging the slide. 110

5. In a device for transforming rotary motion into a reciprocating motion, the combination with the operating screw-shaft, of bearings in which said shaft is mounted to rotate, one of said bearings being screw-threaded to cause the shaft to advance therein as it is ro-
 115 tated, the driving-pulleys secured to said shaft, the idle pulleys journaled on said shaft between the driving-pulleys, and a pair of driving-belts moving in opposite directions while passing over the pulleys. 120

6. In a device for transforming rotary motion into reciprocating motion, the combination with the operating screw-shaft, of bearings in which said shaft is mounted to rotate, one of said bearings being threaded so that
 125 the shaft will be advanced therein as it is rotated, the driving-pulleys secured to said shaft, the idle pulleys journaled on said shaft between the driving-pulleys, a pair of belts moving in opposite directions while passing over 130

the pulleys, and stops in position to contact with said belts at the limit of their movement in either direction and force them from the driving-pulleys onto the idle pulleys.

5 7. In a device for transforming rotary motion into reciprocating motion, the combination with the operating screw-shaft, of bearings in which said shaft is mounted to rotate, one of said bearings being threaded so that
10 the shaft will be advanced therein as it is rotated, the driving-pulleys secured to said shaft, the idle pulleys journaled on said shaft between the driving-pulleys, a pair of belts moving in opposite directions while passing over
15 the pulleys, and means for automatically shifting the driving-belt from the driving-pulley to the adjacent idle pulley as the limit of movement of the shaft in that direction is reached.

20 8. In a device for transforming rotary motion into reciprocating motion, the combination with the operating screw-shaft, of the bearings in which said shaft is mounted to rotate, one of said bearings being threaded so
25 that the shaft will be advanced as it is rotated

therein, the driving-pulleys secured to said shaft, the idle pulleys journaled on said shaft between the driving-pulleys, a pair of driving-belts moving in opposite directions while passing over the pulleys, and a movable stop
30 mounted in position to be moved upon one of said driving-pulleys and hold its cooperating belt off of said pulley.

9. In a device for transforming rotary motion into reciprocating motion, the combination with the shaft, of driving connections for rotating the shaft in opposite directions, means for moving the shaft longitudinally continuously and in a direction depending on
35 the direction of rotation, stops for throwing out of operation the driving connections to arrest the movement of the shaft in either direction, a lever pivotally connected to the shaft, and mechanism operated by the lever.

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

CHARLES E. SANDSTROM.

Witnesses:

ARTHER B. SEIBOLD,
ELIZABETH MOLITOR.