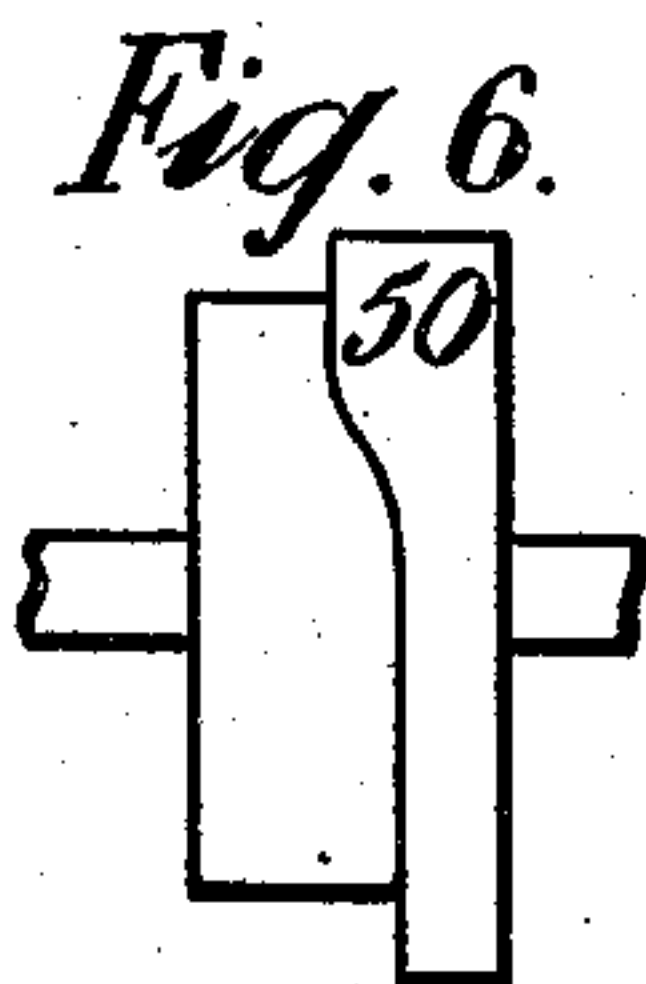
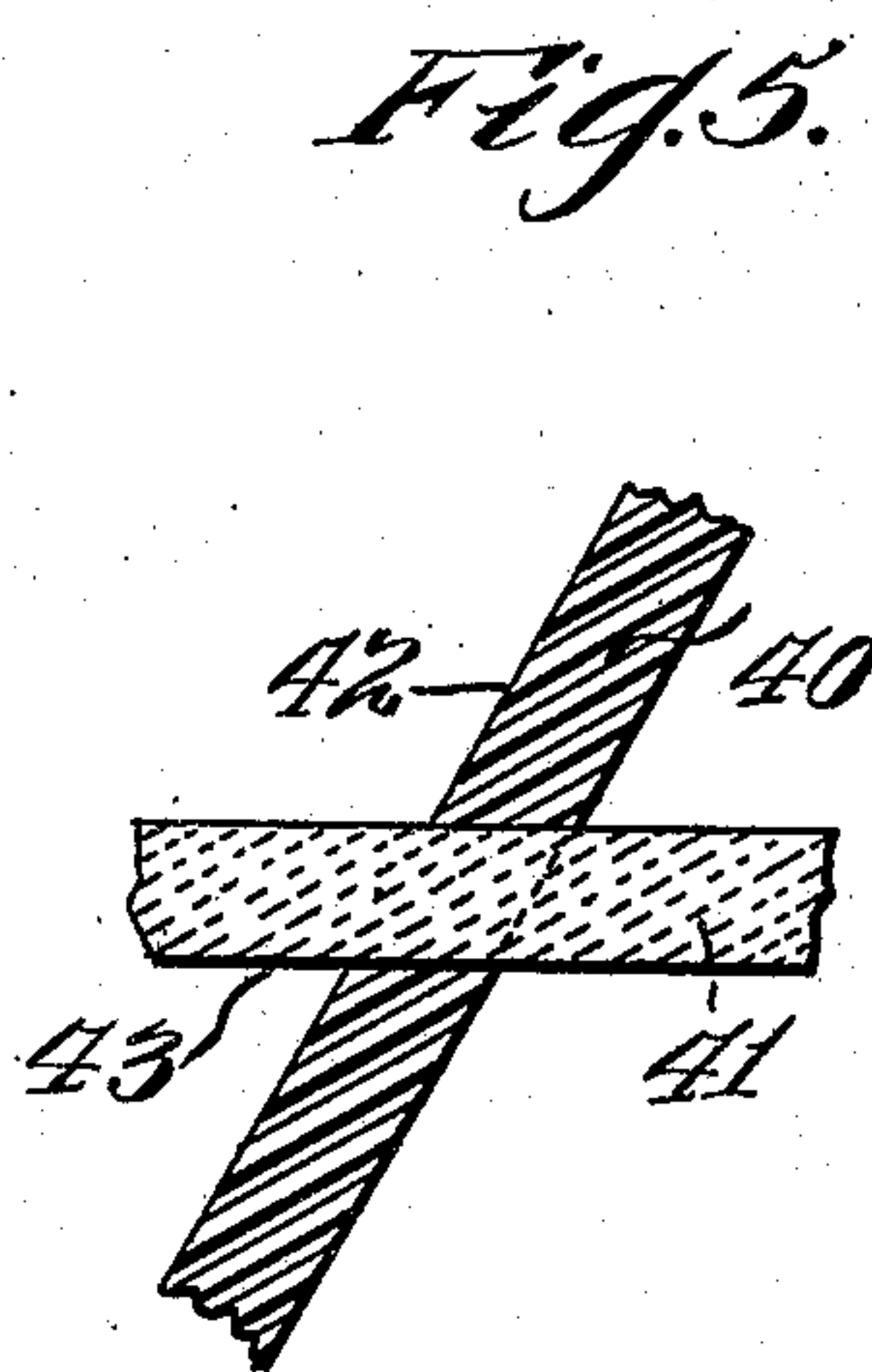
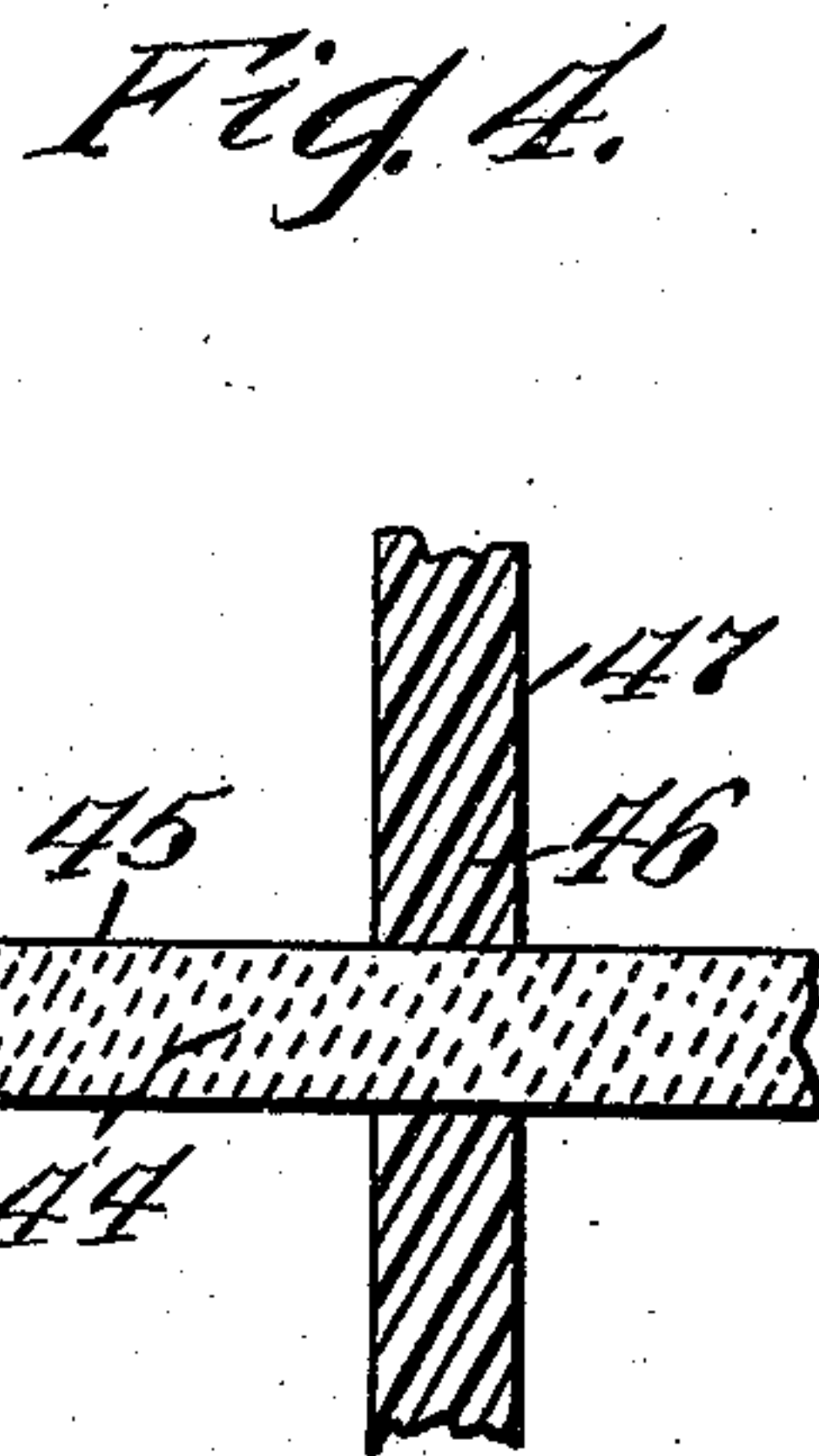
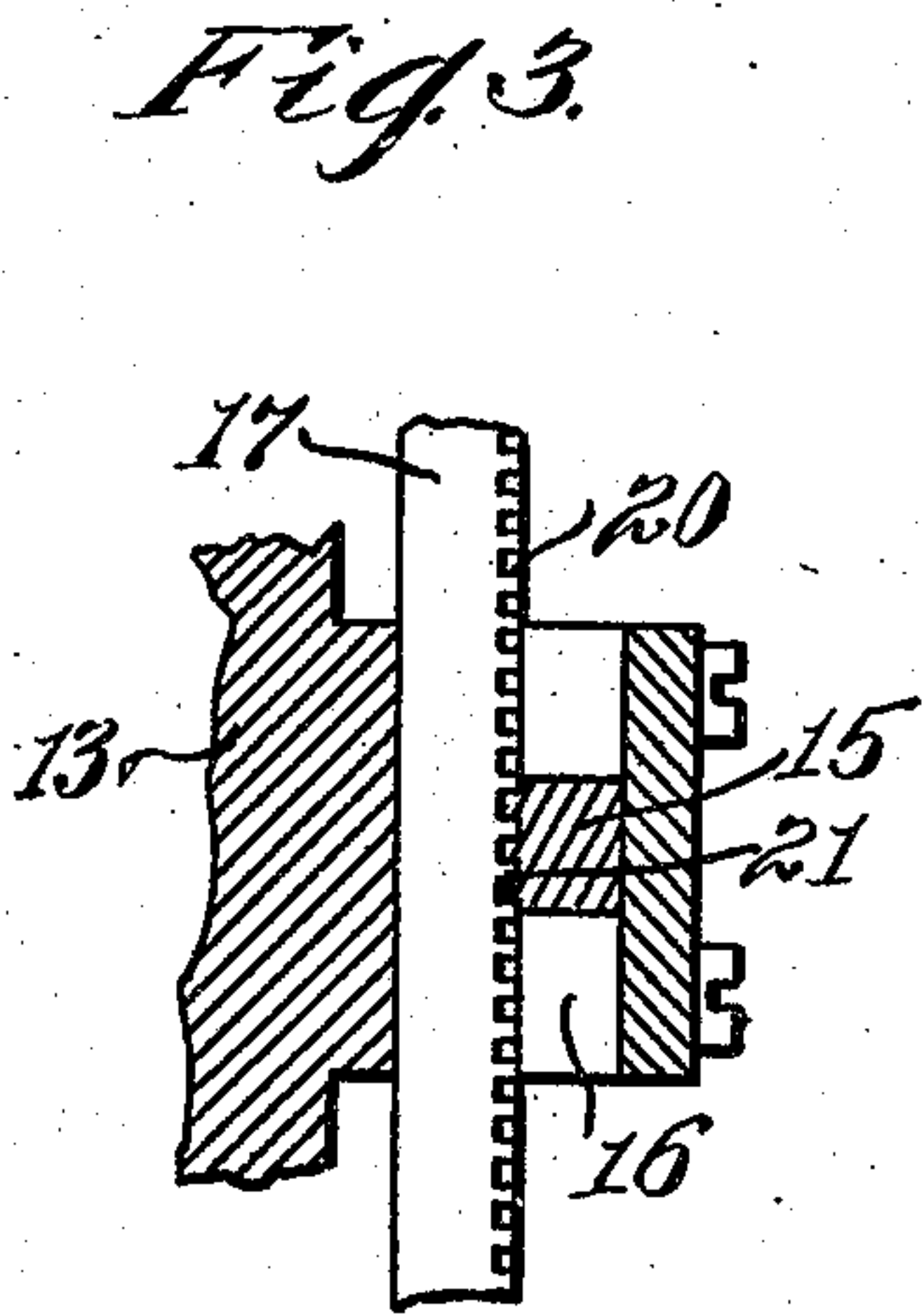
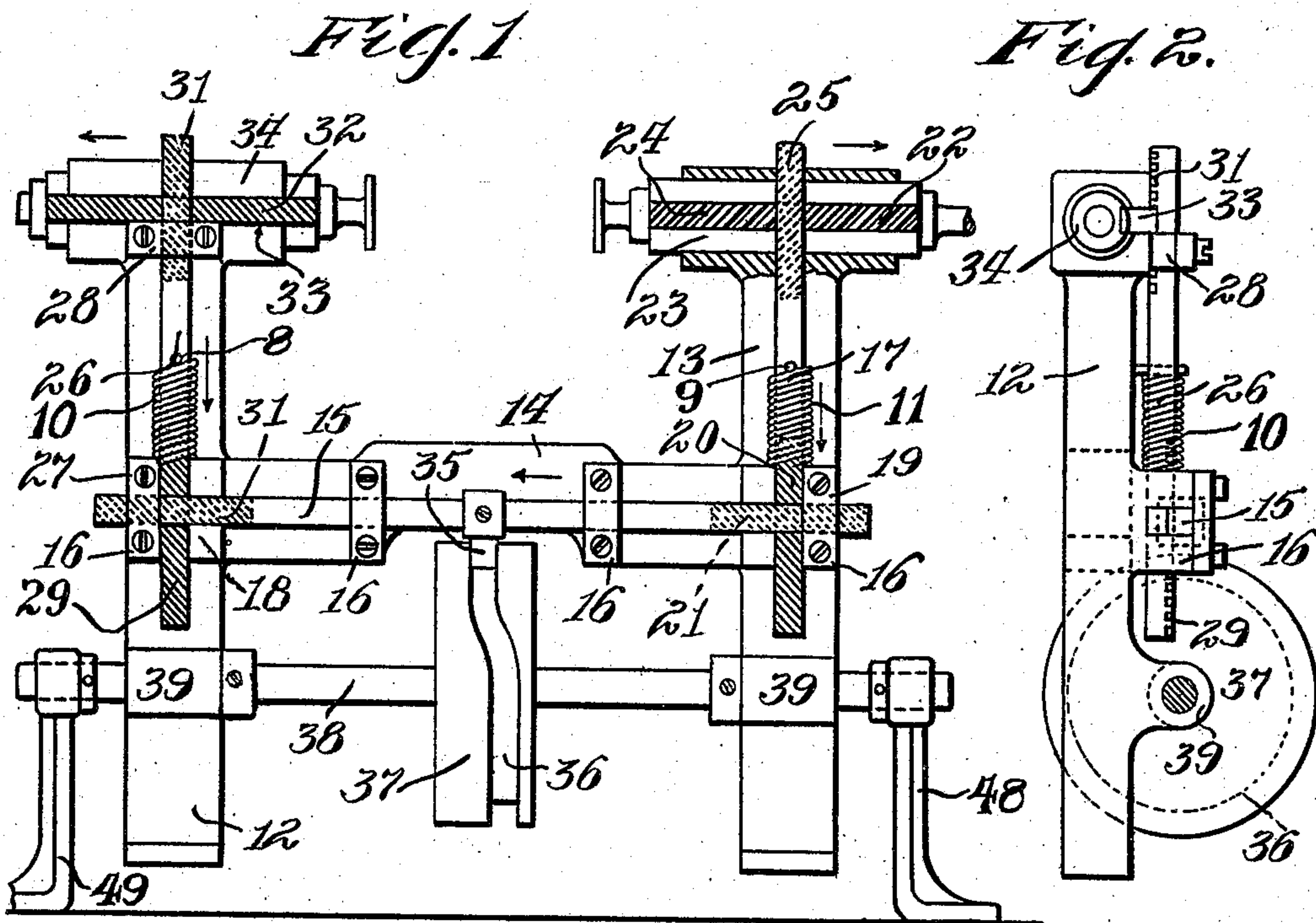


No. 847,858.

PATENTED MAR. 19, 1907.

R. B. WARE.  
MECHANICAL MOVEMENT.  
APPLICATION FILED MAR. 9, 1906.



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# UNITED STATES PATENT OFFICE.

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## MECHANICAL MOVEMENT.

No. 847,858.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed March 9, 1906. Serial No. 305,024.

*To all whom it may concern:*

Be it known that I, RODNEY B. WARE, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention relates to a mechanical movement, and is particularly directed to means for producing a movement of members guided to reciprocate.

The invention may be used in a large variety of arts, in fact anywhere where it is desired to impart reciprocating movement to a plurality of members from the reciprocation of a single member.

One of the objects of the invention is to provide an improved means for causing a reciprocation of one member guided to move in a certain path by the reciprocation of another member guided to move in a different path through the medium of abutment portions on such members organized to have a sliding engagement.

A further object of the invention is to provide mechanism for effecting the mutual approach and recession of two members guided to move in alining paths from the reciprocation of a single member, the two members being caused to approach when the actuating member moves in one direction and being caused to recede upon the reverse movement of the actuating member.

A further object of the invention is to provide means wherein a continuously-rotating member is operably connected with two members guided to move in alining paths, whereby the two alining members will be caused to approach, then held stationary, then caused to recede, and then again held stationary in the latter position during each complete revolution.

In the accompanying drawing, illustrating certain embodiments of my invention, Figure 1 is a front elevation, partly in section. Fig. 2 represents the same mechanism in end elevation. Fig. 3 is a fragmentary sectional view showing two engaging reciprocating members. Fig. 4 is a fragmentary view showing the engaging portions of two reciprocating members that operate at right angles to each other. Fig. 5 is a view similar to Fig. 4, but with the members inclined to each other; and Fig. 6 shows a modified form of cam for operating the slides.

The invention is shown as particularly adapted for use in operating a pair of jaw members or clamps, especially such as used in coin-wrapping machines where a pair of alining jaw members are caused to approach to engage and clamp a pile of coins and hold them while being wrapped and thereupon recede to permit removal of the package.

In the structure shown in Figs. 1 to 3 the mechanism is shown as comprising two standards or uprights 12 and 13, connected by a cross-piece 14. A bar is guided by the cross-piece and two uprights for horizontal reciprocating movement. The bar 15 is shown as operating in bearings 16 in the said members. A second bar 17 is supported for movement on the upright 13 by means of bearings 18 and 19, which bar reciprocates adjacent the horizontal bar 15. Suitable abutment portions are provided on the bars 15 and 17, whereby the reciprocation of the bar 15 will cause the reciprocation of the upright bar 17. The bar 17 is shown as provided with a series of parallel abutments 20, that engage successively with corresponding abutments 21 with the adjacent face of the horizontal bar 15, these abutments being in the nature of rack-teeth, but are inclined to the path of movement of the bars instead of transverse thereto. Upon movement of the bar 15 the engaging inclined faces of the abutments will operate on the principle of the wedge and advance the other bar. If the abutments are arranged at an angle of forty-five degrees and the two reciprocated members guided for the movement in the paths substantially at right angles, the speed of movement of the actuated bar will be equal to that of the actuating-bar; but by varying these angles, which must obviously be complementary, the speed of the actuated bar can be increased or decreased relative to the moving bar. If the angle of the abutment-faces of the driven bar relative to its path of movement is less than the angle of the abutment-faces of the driving-bar relative to its path of movement, then the driven bar will move at an inversely proportional greater speed. For example, if the angle of the abutment-faces 44 of a driving-bar 45 be sixty degrees and the angle of the abutment-faces 46 of a driven bar 47 be the complement of said angle—that is, thirty degrees—then the bar 47 will travel at a greater speed than that of the driving-bar 45. When the bar 45 moves in the opposite direction, the bar



47 by the engagement of the opposite faces of the abutments will move in the opposite direction at the same speed as before. A third bar 22 is slidable in a bearing 23 at the top of the upright 13, the bar 22 being movable in a path at a right angle with that of the bar 17 and adjacent thereto. The bar 22 is shown as provided with abutment portions 24, that have a sliding engagement with similarly-inclined abutment portions 25 on the adjacent face of the upright bar 17. At the opposite end of the horizontal driving-bar 15 is arranged a bar 26, vertically movable in suitable guides 27 and 28, carried by the upright 12. This bar 26 is movable adjacent the bar 15 and is provided with inclined abutments 29, whose opposite faces engage the opposite faces of similarly-inclined abutments 30 on the adjacent face of the driving member 15. At its upper end the vertical bar 26 carries inclined abutments 31, whose opposite faces engage the opposite faces of similar abutments 32, carried by the adjacent face of a bar 33. The latter bar is supported to reciprocate in a box 34, carried at the top of the upright 12. The bar 33 is shown as arranged to reciprocate in alinement with the bar 22, horizontally movable at the top of the other upright 13. By this arrangement the movement of the horizontal bar 15 in one direction will operate each of the horizontal bars 33 and 22 in one direction, and the reverse movement of the bar 15 will produce reverse movements of the bars 33 and 22. The four sets of inclined abutments producing such reciprocation are shown as organized to cause the mutual approach of the alining bars upon movement of the bar 15 in one direction and to cause the mutual recession of said two bars upon reverse movement of the bar 15. By arranging said four sets of abutments each at an angle of forty-five degrees the two alining bars will move at the same speed as the actuating-bar 15; but by varying the angularity of the engaging abutments of any one or more of the four sets any desired variation in the speeds or the direction of movement within certain ranges can be produced.

While the four sets of engaging portions are shown in Figs. 1 to 4 as arranged at a right angle, the bars may be inclined, as shown in Fig. 5. In such instance if the abutments 40 and 41 of the two bars 42 and 43 have the same angle with the path of movement of their respective bars then the speed of the driven bar will be equal to that of the driving-bar; but by changing this angle various relative speeds can be produced.

In Fig. 1 the bar 15 is shown as intermittently reciprocated by means of a detent 35, secured to such bar and engaging the walls of a cam-groove 36 in the periphery of a drum 37, that is revolved by a shaft 38, driven by any suitable means and operating

in bearings 39 in the two upright members. By means of the cam and dwell groove 36 the bar 15 will be intermittently shifted, and the two alining bars 32 and 22 will cause to alternately approach and recede and will be retained in said two positions for a certain length of time by dwells in the groove between the cams.

If desired, spiral springs 10 and 11 may be placed around the vertical bars 31 and 25, respectively pressing on the bearings 19 and 27 by one end and against pins 8 and 9 by their other ends. These springs are put under tension when the bars move in the direction indicated by the arrows in Fig. 1, and when the bars are released the springs tend to advance them in the opposite direction, causing mutual approach of the bars 24 and 32. Where such springs are used, a single cam, such as the cam 50, (shown in Fig. 6,) can be used instead of the grooved cam 37. (Shown in Fig. 1.) This cam 50 will operate to move the bar 15 in one direction only; but, the springs being compressed during such movement, when the cam advances to leave the lug 35 the springs will move the several bars in the opposite direction, which will retain the detent 35 in engagement with the cam-wheel 50.

The invention is also especially adapted for use in operating multiple-bolt locks—such, for instance, as used on the doors of safes and vaults where bolts are caused to move inward and outward simultaneously on each of the four walls of a safe-door. The bar 15 is shown as operating two other bars 17 and 26; but obviously three, four, or a greater number of such bars can be operated from any one bar, and in the same manner the upright bars 17 and 26, that each actuate one bar, can also actuate additional bars in the same manner.

Having thus described my invention, I claim—

1. In a mechanical movement, the combination of a member guided for rectilinear movement, a second member guided for rectilinear movement adjacent said member, a series of parallel abutments on each of said members arranged for successive engagement one or both of said series of abutments being inclined to the path of movement of its carrying member, whereby the reciprocation of the first member will reciprocate the second member, a third member supported for rectilinear movement adjacent the second member, said latter members being provided with a series of parallel abutments arranged for successive engagement, the series of abutments on one or both of such members being inclined to the path of movement of the member whereby the reciprocation of the second member will reciprocate the third member, a fourth member guided for rectilinear movement adjacent said first member, said first and fourth members being each pro-



vided with a series of parallel abutments arranged for successive engagement whereby the reciprocation of the first member will reciprocate the fourth member also, and a fifth member guided for rectilinear movement adjacent said fourth member, said fourth and fifth members being each provided with a series of parallel abutments, one or both of which latter series of abutments is inclined to the path of movement of its carrying member.

2. In a mechanical movement, the combination of a member guided for rectilinear movement, a second member guided for rectilinear movement adjacent said member, a series of parallel abutments on each of said members arranged for successive engagement, one or both of said series of abutments being inclined to the path of movement of its carrying member, whereby the reciprocation of the first member will reciprocate the second member, a third member supported for rectilinear movement adjacent the second member, said latter members being provided with a series of parallel abutments arranged for successive engagement, the series of abutments on one or both of such members being inclined to the path of movement of the member whereby the reciprocation of the second member will reciprocate the third member, a fourth member guided for rectilinear movement adjacent said first member, said first and fourth members being each provided with a series of parallel abutments arranged for successive engagement whereby the reciprocation of the first member will reciprocate the fourth member also, and a fifth member guided for rectilinear movement adjacent said fourth member, said fourth and fifth members being each provided with a series of parallel abutments, one or both of which latter series of abutments is inclined to the path of movement of its carrying member, said third and fifth members being disposed in alinement, and said several engagement abutments being organized to cause approach of the third and fifth members upon movement of said first member in one direction, and to cause recession of said alining members upon movement of said first member in the opposite direction.

3. In a mechanical movement, the combination of a member guided for rectilinear movement, a second member guided for rectilinear movement adjacent said member, a series of parallel abutments on each of said members arranged for successive engagement, one or both of said series of abutments being inclined to the path of movement of its carrying member, whereby the reciprocation of the first member will reciprocate the second member, a third member supported for rectilinear movement adjacent the second member, said latter members being provided with a series of parallel abutments arranged

for successive engagement, the series of abutments on one or both of such members being inclined to the path of movement of the member whereby the reciprocation of the second member will reciprocate the third member, a fourth member guided for rectilinear movement adjacent said first member, above said first and fourth members being each provided with a series of parallel abutments arranged for successive engagement whereby the reciprocation of the first member will reciprocate the fourth member, and a fifth member guided for rectilinear movement adjacent said fourth member also, said fourth and fifth members being each provided with a series of parallel abutments, one or both of which latter series of abutments is inclined to the path of movement of its carrying member, and means for intermittently moving said first member in opposite directions.

4. In a mechanical movement, the combination of a member guided for rectilinear movement, a second member guided for rectilinear movement adjacent said member, a series of parallel abutments on each of said members arranged for successive engagement, one or both of said series of abutments being inclined to the path of movement of its carrying member, whereby the reciprocation of the first member will reciprocate the second member, a third member supported for rectilinear movement adjacent the second member, said latter members being provided with a series of parallel abutments arranged for successive engagement, the series of abutments on one or both of such members being inclined to the path of movement of the member whereby the reciprocation of the second member will reciprocate the third member, a fourth member guided for rectilinear movement adjacent said first member, said first and fourth members being each provided with a series of parallel abutments arranged for successive engagement whereby the reciprocation of the first member will reciprocate the fourth member also, and a fifth member guided for rectilinear movement adjacent said fourth member, said fourth and fifth members being each provided with a series of parallel abutments, one or both of which latter series of abutments is inclined to the path of movement of its carrying member, said third and fifth members being disposed in alinement, and said several engagement abutments being organized to cause approach of the third and fifth members upon movement of said first member in one direction, and to cause recession of said alining members upon movement of said first member in the opposite direction, and means for intermittently moving said first member in opposite directions.

5. In a mechanical movement, the combination of a member guided for rectilinear



movement, a second member guided for rectilinear movement adjacent said member, a series of abutments on each of said members arranged for successive engagement, one or  
 5 both of said series of abutments being inclined to the path of movement of its carrying member, whereby the movement of the first member in one direction will move the second member in one direction, a third  
 10 member supported for rectilinear movement adjacent the second member, said latter members being provided with a series of abutments arranged for successive engagement, the series of abutments on one or both  
 15 of such members being inclined to the path of movement of the member whereby the movement of the second member in one direction will move the third member in one direction, a fourth member guided for rectilinear  
 20 movement adjacent said first member, said first and fourth members being each provided with a series of abutments arranged for successive engagement whereby the movement of the first member in one direction will  
 25 move the fourth member in one direction, and a fifth member guided for rectilinear movement adjacent said fourth member, said fourth and fifth members being each provided with a series of abutments, one or both  
 30 of which latter series of abutments is inclined to the path of movement of its carrying member, whereby the movement of the fourth member in one direction will move the fifth member in one direction, and means  
 35 for moving all said members in the opposite direction.

6. In a mechanical movement, the combination of a member guided for rectilinear movement and provided with a plurality of

sets of parallel abutments, a plurality of 40 members each provided with a series of parallel abutments each member arranged to engage respectively by said abutments with the respective sets of abutments on said first-mentioned member, whereby the re- 45 ciprocation of the first member will reciprocate the other said members, said plurality of members being provided with sets of parallel abutments, and members provided with parallel abutments arranged to engage with the 50 parallel abutments on said latter members, whereby such members will be reciprocated from the reciprocation of their engaging members.

7. In a mechanical movement, the combination of a member guided for rectilinear 55 movement and provided with a plurality of sets of parallel abutments, a plurality of members each provided with a series of parallel abutments each member arranged to en- 60 gage respectively by said abutments, with the respective sets of abutments on said first-mentioned member, whereby the reciprocation of the first member will reciprocate the other said members, said plurality of mem- 65 bers being provided with sets of parallel abutments, members provided with parallel abutments arranged to engage with the parallel abutments on said latter members, whereby such members will be reciprocated 70 from the reciprocation of their engaging members, and means for reciprocating said first-mentioned member.

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