

No. 733,177.

PATENTED JULY 7, 1903.

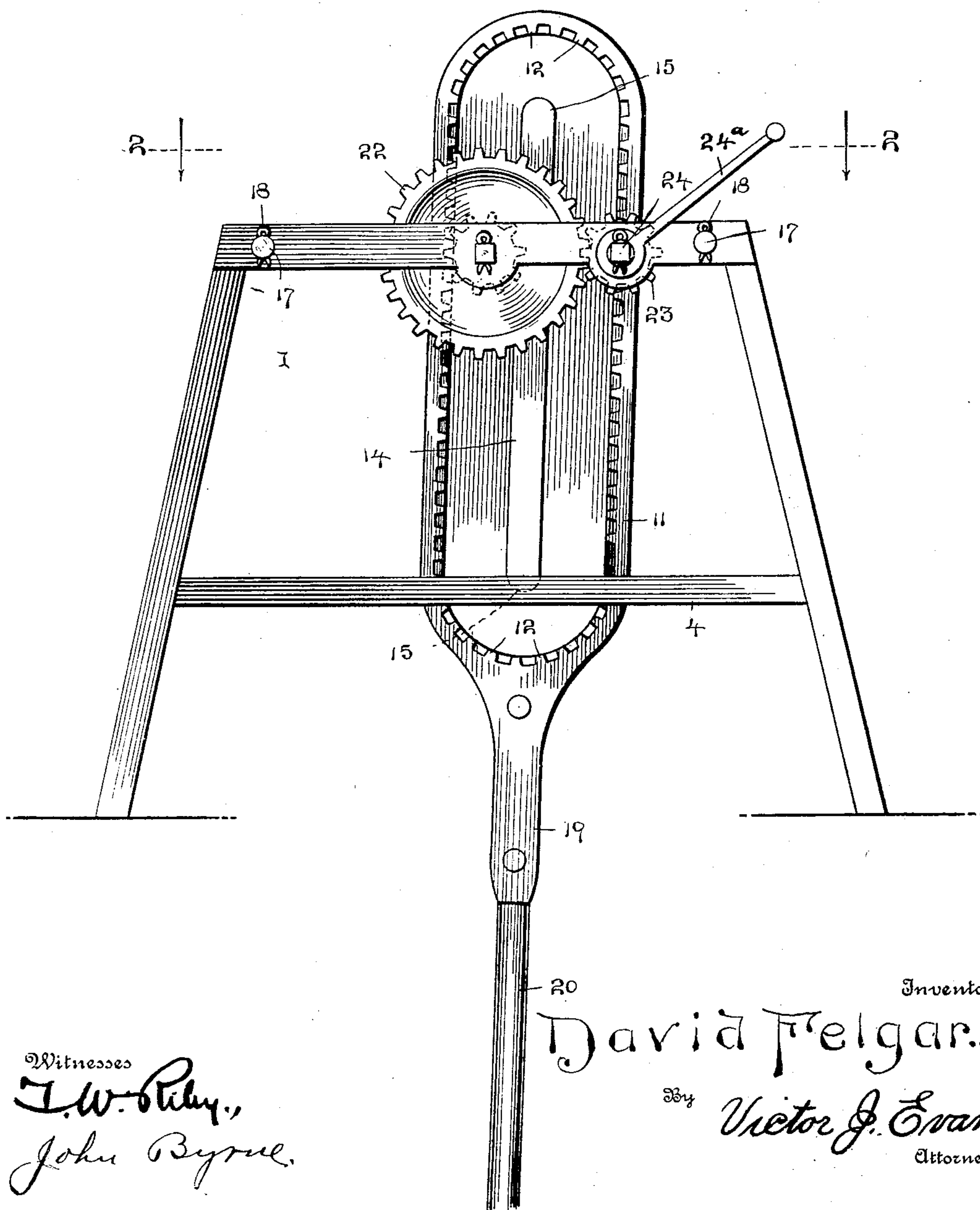
D. FELGAR.  
MECHANICAL MOVEMENT.

APPLICATION FILED MAY 3, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



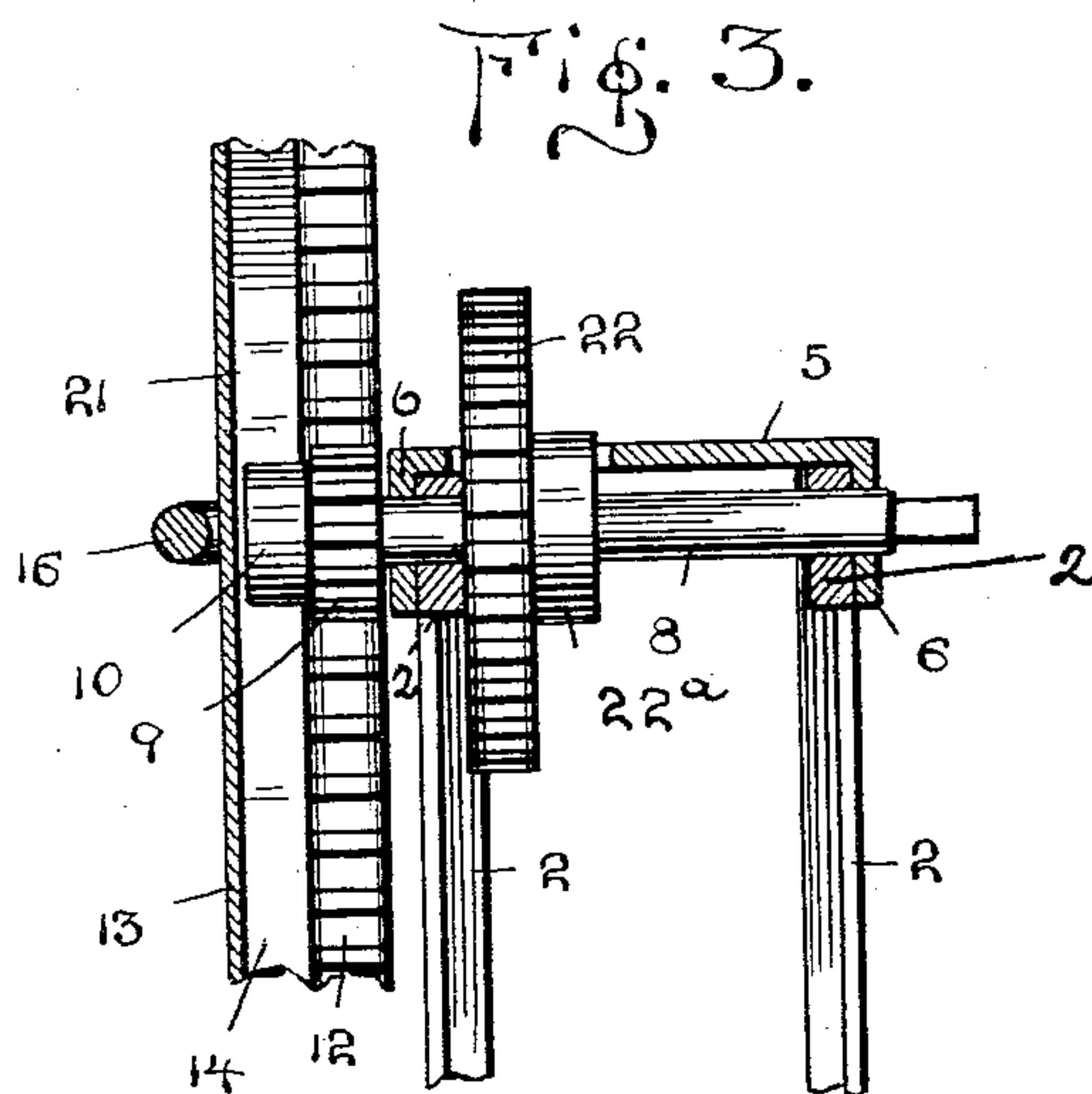
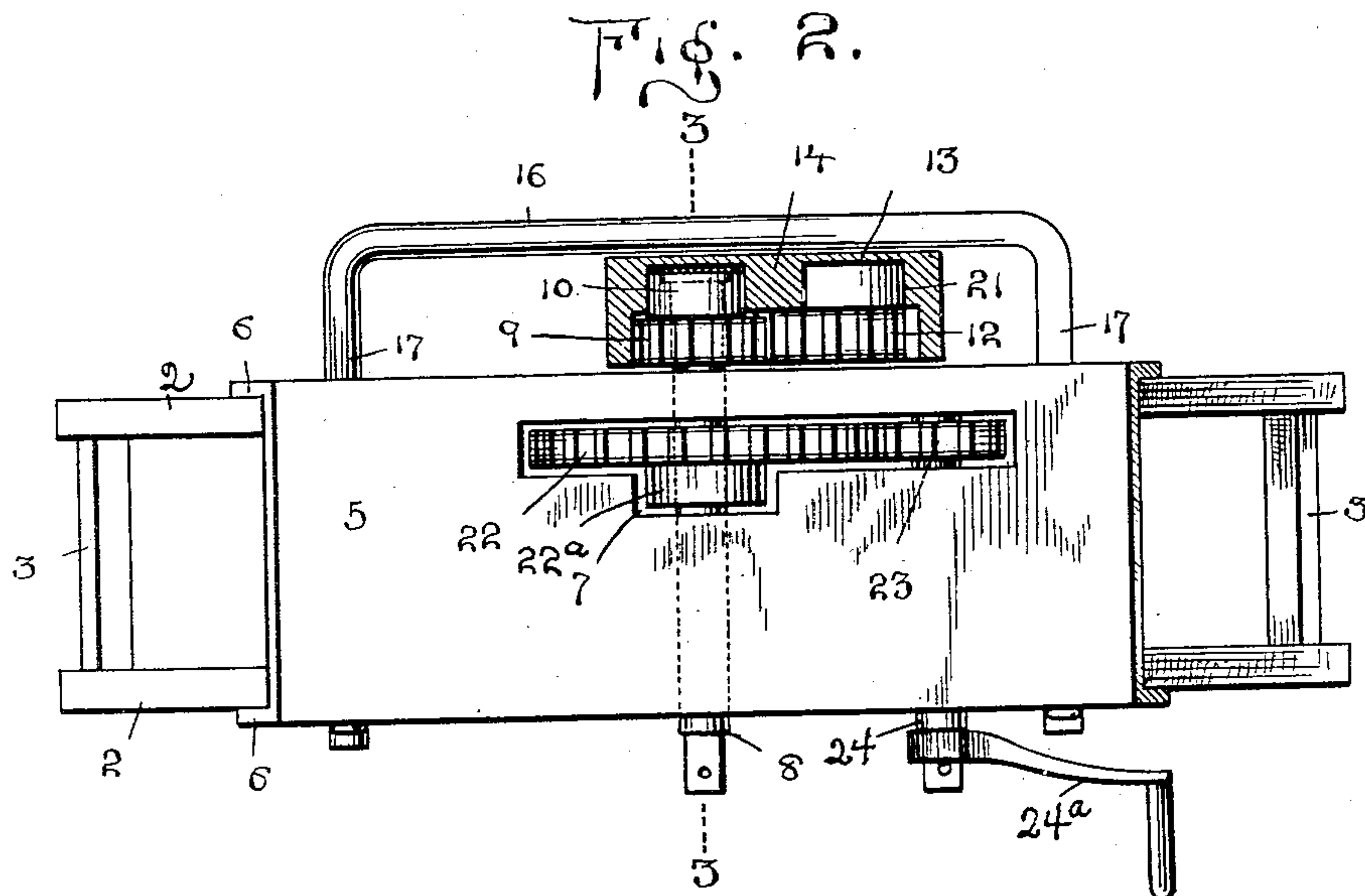
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2 SHEETS—SHEET 2.



Witnesses  
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# UNITED STATES PATENT OFFICE.

DAVID FELGAR, OF NEWTON, KANSAS.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 733,177, dated July 7, 1903.

Application filed May 3, 1902. Serial No. 105,795. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID FELGAR, a citizen of the United States, residing at and whose post-office address is Newton, in the county of Harvey and State of Kansas, have invented new and useful Improvements in Mechanical Movements, of which the following is a specification.

My invention relates to mechanical movements, and more particularly to improved means for converting rotary motion into reciprocating motion.

The improvement is specially designed as a substitute for the ordinary crank and pitman employed for operating pump-rods and for various other purposes where a reciprocating motion is to be transmitted from a rotary shaft.

The invention comprises an elliptical rack, in combination with a connecting-rod secured thereto, a revoluble shaft, a pinion and roller on said shaft, and means for guiding the rack in its movement around the pinion.

The construction of the mechanism will be fully described hereinafter in connection with the accompanying drawings, which form part of this specification, and its novel features will be defined in the appended claim.

In the drawings, Figure 1 is a side elevation of the improvement in connection with a supporting-frame. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1, and Fig. 3 is a vertical section on the line 3 3 of Fig. 2.

The reference-numeral 1 designates the standards of a supporting-frame, connected at their upper ends by parallel side bars 2 and end bars 3 and suitably braced, as shown at 4. Upon the side bars is secured a platform or table 5, having depending side flanges 6, overlapping the bars 2 and formed with a suitable recess 7, through which the power or actuating gearing employed projects.

The numeral 8 designates a shaft revolubly mounted across the frame in bearings formed in the side flanges 6 of the platform 5 and having fixed thereon adjacent to one end thereof a gear-pinion 9, and beyond said pinion at the end of the shaft 8 is loosely journaled a roller 10.

11 designates the elliptical rack formed with internal teeth 12, the toothed surface of the rack being rounded at its ends, as clearly

shown at Fig. 1. The outer side of the rack is closed by a plate 13, cast integral with the rim of the rack, and secured centrally to said plate or formed integral therewith is a longitudinal guide-bar 14, having rounded ends 15, disposed a sufficient distance from the ends of the rack to permit of the passage thereover of the pinion 9 and roller 10. A keeper and guide bar 16 is arranged horizontally across and parallel with the outer face of the rack-body and is provided with arms 17, bent at right angles to the bar and projected through the opening in the side bars of the frame and the flanges 6 of the table and being secured in place by pins 18, extending through openings in the ends of the arms. This guide-bar, as best shown in Fig. 2, is positioned to be parallel with the back of the elliptical rack 11 and serves as a guide therefor, while at the same time the parallel arms 17 reinforce and brace the frame structure transversely and also at the end portions constitute keepers and stops to limit the lateral movement of the rack-plate.

Depending from the lower end of the rack 11 is an arm 19, to which is secured the upper end of a connecting-rod 20 of a pump or other apparatus.

The operation of the mechanism as thus far described is as follows: The shaft 8 is revolved by any suitable means, (a hand-crank 24<sup>a</sup> being shown in Figs. 1 and 2 merely for illustration,) causing the pinion 9 to engage the teeth on one side of the rack and move the rack until its rounded end reaches the pinion when the end teeth move the rack laterally, causing the pinion to engage the teeth on the opposite side of the rack. The longitudinal bar 14 guides the rack in its movement around the pinion, and the roller 10, which revolves between the guide 14 and the plain untoothed surface 21 of the rack, constitutes an important element in insuring a steady and easy movement of the mechanism. It will be obvious that the movement of the elliptical rack serves to impart a reciprocating movement to the connecting-rod 20.

The power-transmitting mechanism above described may be employed in connection with any suitable auxiliary gearing or power-multiplying devices. In the drawings I have shown a spur-wheel 22, having its hub 22<sup>a</sup>



mounted on the shaft 8, concentric with the pinion 9, and said wheel 22 is engaged by a spur-pinion 23, mounted on a counter-shaft 24, supported in bearings in the side flanges 5 of the platform 5, parallel to the shaft 8.

The closing of the outer side of the rack protects the intermeshing teeth of the pinion and rack and provides a substantial support for the guide-bar 14.

10 While the invention is specially well adapted for operating pumping apparatus, I would have it understood that the invention is not restricted to such application, but is intended for general use with machinery where rotary 15 motion is to be converted into reciprocating motion.

I claim—

20 A mechanism of the character described, comprising a suitable support, a platform on the support formed with depending side flanges provided with shaft-bearings, a shaft

8 journaled in bearings in the said side flanges, a pinion on the shaft, a roller loosely journaled on the inner end of the shaft, an elliptical rack having a closed back and internal teeth to engage with the said pinion, 25 and a continuous track behind the teeth wherein the roller engages, and a longitudinal guide-strip projecting centrally from the back, a horizontally-arranged guide-bar 16 30 extending across the outer face of the back plate of the rack and having its end portions directed at right angles to the bar to serve as stops to limit the lateral movement of the rack and extended across the frame, and op- 35 erating means substantially as described.

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

DAVID FELGAR.

Witnesses:

W. E. GROVE,

JESSIE A. BLATCHLEY.