

No. 762,682.

PATENTED JUNE 14, 1904.

A. J. BUTTS.  
ESCAPEMENT FOR TIMEPIECES.

APPLICATION FILED JAN. 14, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

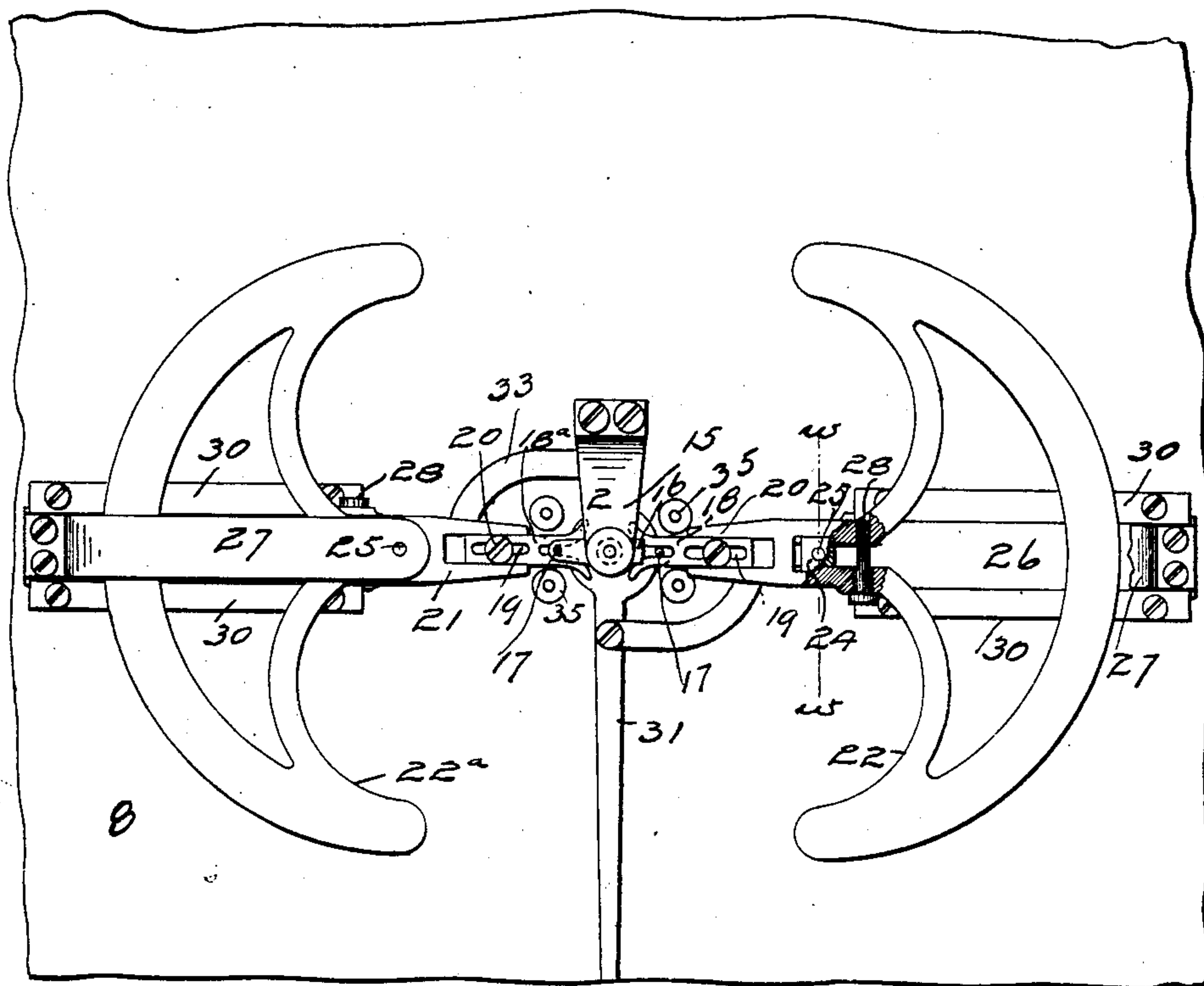
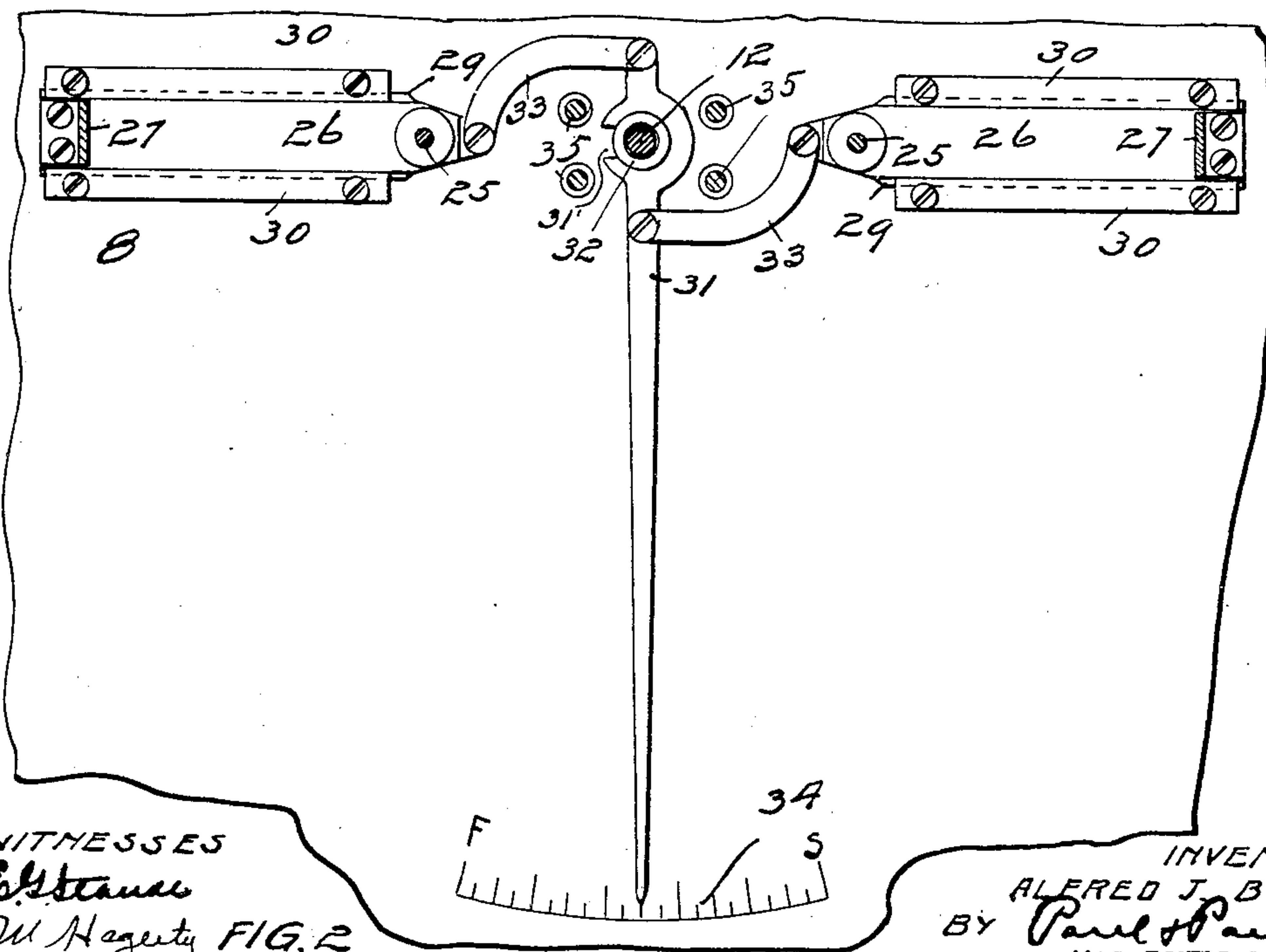


FIG. 1



WITNESSES

E. H. H. H.

W. H. H. H. FIG. 2

INVENTOR

ALFRED J. BUTTS

BY *Paul & Paul*  
HIS ATTORNEYS

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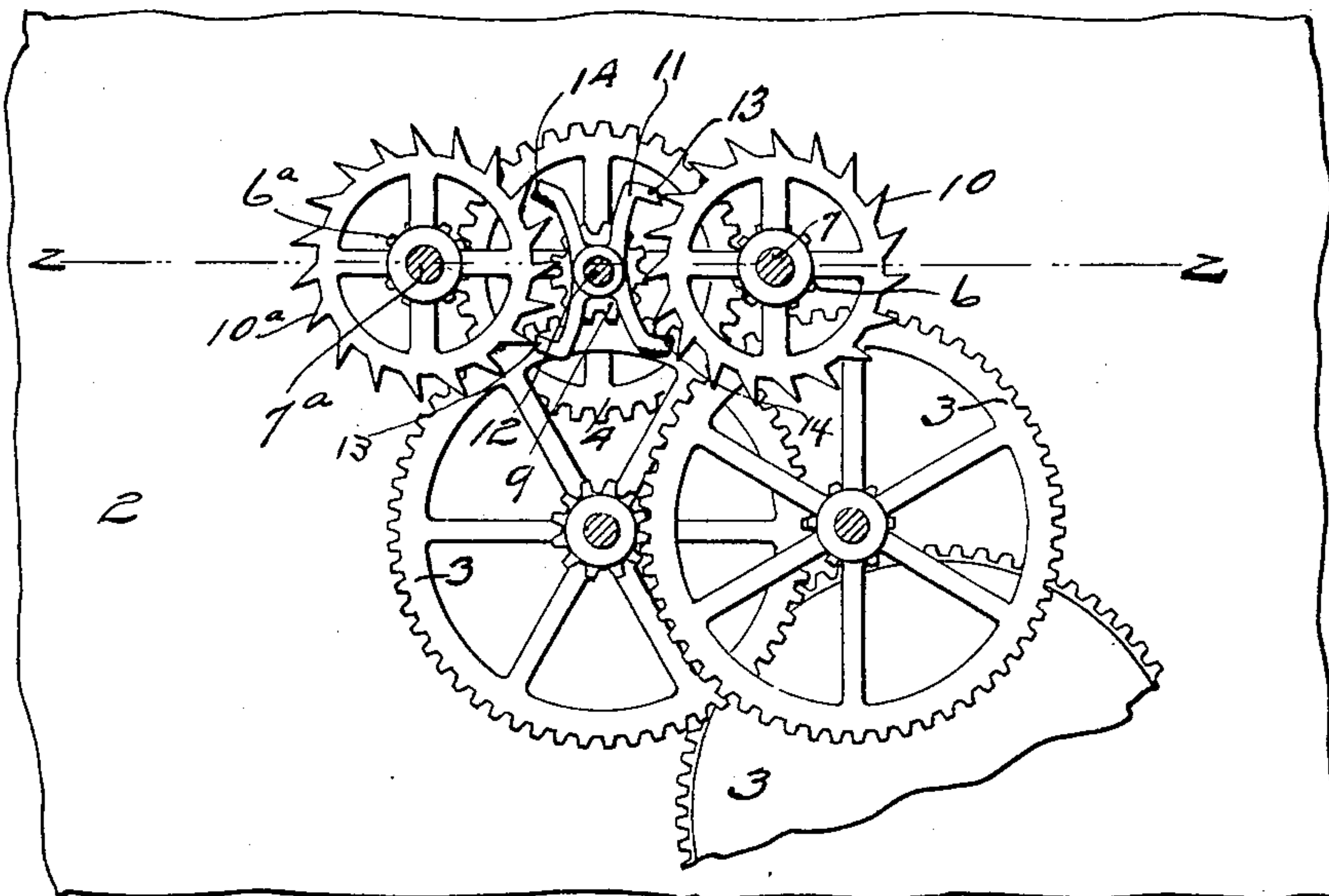


FIG. 3.

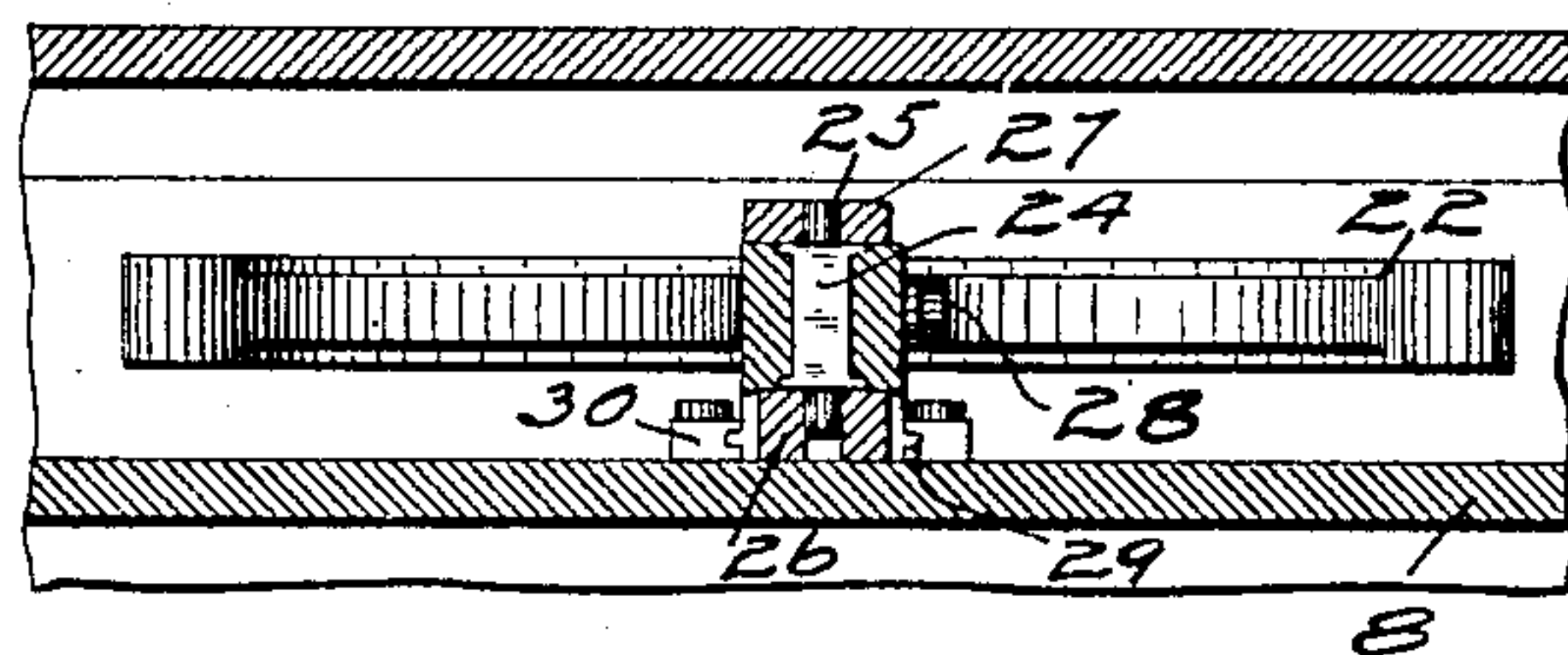


FIG. 5.

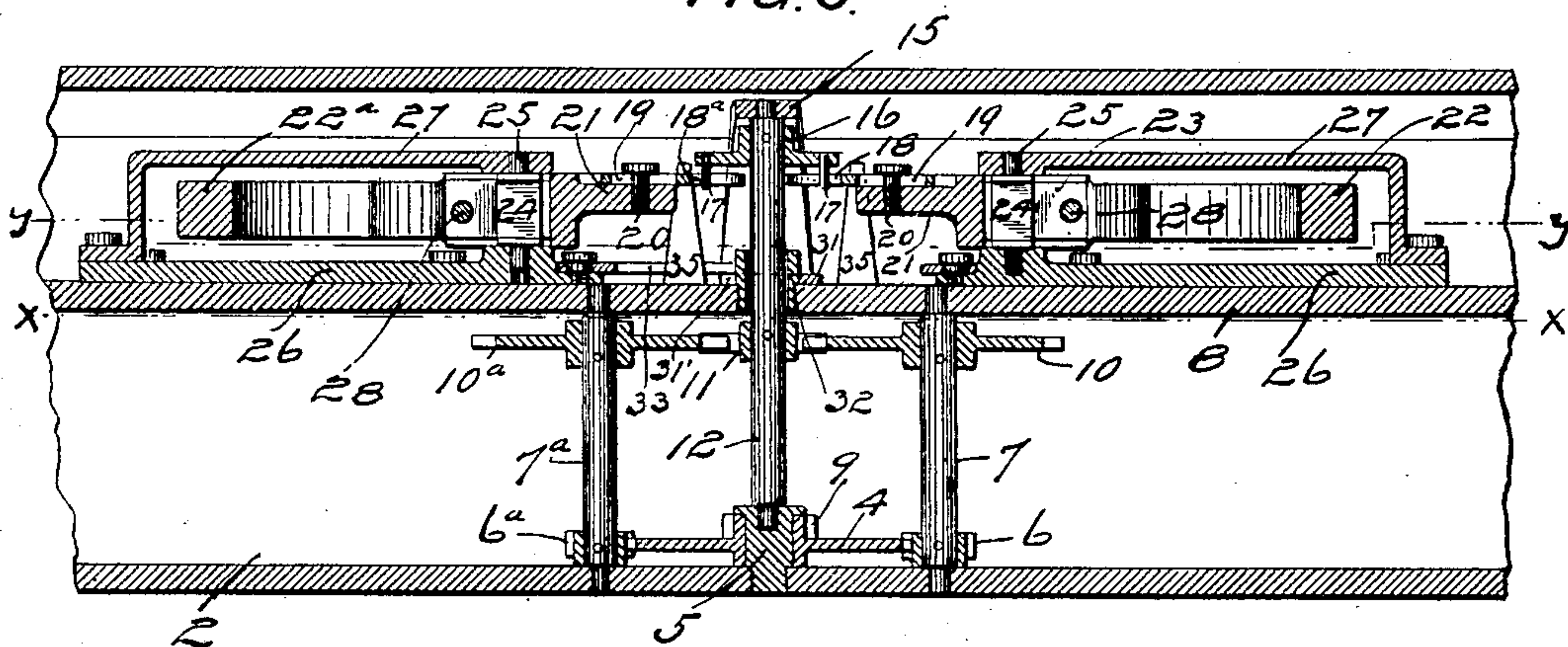


FIG. 4.

WITNESSES.

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BY *Paul & Paul*  
HIS ATTORNEYS



# UNITED STATES PATENT OFFICE.

ALFRED J. BUTTS, OF MANISTIQUE, MICHIGAN.

## ESCAPEMENT FOR TIMEPIECES.

SPECIFICATION forming part of Letters Patent No. 762,682, dated June 14, 1904.

Application filed January 14, 1904. Serial No. 188,962. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED J. BUTTS, of Manistique, Schoolcraft county, Michigan, have invented certain new and useful Improvements in Watch-Regulators, of which the following is a specification.

The object of my invention is to provide a watch regulating or balancing mechanism that dispenses entirely with the hair or balance spring usually employed in connection with the balance-wheel of a watch, thereby rendering the mechanism less delicate and liable to get out of repair and less expensive to repair when any attention is required.

The invention consists generally in utilizing the power of the mainspring to impart an oscillating movement to the balance mechanism.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of the balance mechanism, showing the position of the regulating device. Fig. 2 is a similar view showing the mechanism for moving the balance-wheel segments toward or from each other to regulate the speed of the watch, the view being taken substantially on the line *xx* of Fig. 4. Fig. 3 is a horizontal sectional view on the line *yy* of Fig. 4. Fig. 4 is a vertical sectional view on the line *zz* of Fig. 3. Fig. 5 is a transverse section of the regulating mechanism on the line *ww* of Fig. 1.

In the drawing Fig. 4, 2 represents a suitable case wherein the mechanism of the watch is arranged.

3 is a train of gears through which power is transmitted from the mainspring (not shown) to a gear 4, loosely mounted on a stud 5 near one wall of the case and having its teeth in mesh with pinions 6 and 6<sup>a</sup>, secured on shafts 7 and 7<sup>a</sup>, that are mounted in bearings in the wall of the case and in a plate 8, provided within said case. A pinion 9 on the hub of the gear 4 meshes with an adjacent gear-wheel of the train 3 and transmits the power through the wheel 4 to the pinions 6 and 6<sup>a</sup>.

Secured on the shafts 7 and 7<sup>a</sup> near their upper ends are escape-wheels 10 and 10<sup>a</sup>, and between the said escape-wheels and engaging the teeth thereof is a double escape-lever or pallet 11, secured on a shaft 12, that is sup-

ported at its lower end in the stud 5 and extended up through the plate 8 to a point near the upper wheel of the casing. The escape-lever or pallet 11, as shown in Fig. 3, is provided with two inwardly and outwardly turned points 13 and 14, arranged diagonally opposite each other and engaging the teeth of the escape-wheels, there being an inwardly and an outwardly turned point on the escape-lever for each escape-wheel. In Fig. 3 the inwardly-turned points are shown in contact with the teeth of the escape-wheels, the said teeth being on the point of passing out of contact with the lever. The engagement of the teeth with the inclined surfaces on the ends of the inwardly-turned points of the escape-lever will swing the said lever in one direction and impart a corresponding movement to the shaft 12. Then when these teeth pass out of contact with the inwardly-turned points other teeth will engage the outwardly-turned points of the escape-lever and oscillate it in the other direction, and this movement will be continued, the power of the mainspring transmitted through the escape-wheels imparting a constant oscillating movement to the escape-lever and its shaft.

The upper end of the shaft 12 is mounted in a bracket 15, and a cross-head 16 is secured on said shaft and provided with depending pins 17, that are suspended between the prongs of forks 18 and 18<sup>a</sup>, that are adjustably mounted, by means of slots 19 and set-screws 20, on the shanks 21 of semicircular segments 22 and 22<sup>a</sup>. These segments have slots 23, adapted to receive boxes 24, carrying pins 25, that are mounted in plates 26 and brackets 27 and form pivots for the oscillating segments.

I prefer to make the segments adjustable on the said boxes by means of clamping-screws 28, that extend through the shanks of the segments across the slots therein and have the effect of drawing the sides of the slots together and clamping the boxes therein. By loosening these screws the segments can be easily moved back and forth toward or from each other, according to the adjustment desired.

The plates 26 have flanges 29, that are slid-



able in grooves provided in guides 30, that are secured to plate 8. A regulating-lever 31 is loosely mounted on a hub 32, secured to the plate 8 and concentric with the shaft 12.

5 The lever 31 has a slot 31' in its hub of sufficient size to allow it to be slipped onto the shaft above the hub 32. The removal or insertion of the lever is thus permitted without affecting the other connections. When, how-  
10 ever, the lever has been dropped down over the hub 32, its disengagement from the shaft is prevented, though it is free to oscillate horizontally with respect thereto. The lever is connected on each side of said hub with the  
15 plates 26 by pivotal links 33. The other end of the lever 31 terminates in a pointer or indicator-hand that is movable over a scale 34 to move the oscillating segments toward or from each other to increase or decrease the  
20 length of the arc described thereby and regulate the speed of the movement. Pins 35 are provided in the plate 8 upon each side of the forks 18 and 18<sup>a</sup> to limit the oscillation of the same.

25 From the foregoing description it will be understood that the power of the mainspring is applied to both of the escape-wheels and from thence to the double escape-lever or pallet to oscillate or rock the shaft from which  
30 the balance-wheel segments are operated. With this arrangement the power exerted to operate the shaft is uniform in both directions, and in this respect the mechanism is an improvement over the ordinary escape-  
35 ment where the balance-wheel is moved in one direction by the power of the mainspring and returned by the weaker hair-spring.

I claim as my invention—

1. An escapement mechanism for watches,  
40 comprising two escape-wheels, a gear-train connected therewith and operated from the mainspring, and a shaft between said escape-wheels, a double pallet or escape-lever secured on said shaft and having its ends in engage-  
45 ment respectively with the teeth of said escape-wheels, two of the diagonally opposite ends of said pallet being outwardly turned and the other two inwardly turned, and a balance mechanism connected with said shaft and  
50 operated through the oscillation thereof.

2. The combination, with an oscillating

shaft, of a cross-head secured thereon, pivoted segments provided near said cross-head, forks adjustably mounted on said segments and arranged to be engaged and operated by the os- 55  
cillation of said cross-head.

3. The combination, with an oscillating escapement-shaft, of a cross-head having depending pins secured thereon, pivoted balance-wheel segments arranged near said cross-head, 60  
forks adjustably mounted on said segments and arranged to straddle said pins respectively, and means for limiting the oscillating movement of said forks.

4. The combination, with an oscillating escapement-shaft, of a cross-head having depending pins secured thereon, sliding plates, balance-wheel segments pivoted on said plates, 65  
forks mounted on said segments and arranged to straddle said pins respectively and be oscillated thereby, and means for moving said  
70 plates toward or from each other, for the purpose specified.

5. The combination, with a vertically-arranged oscillating escapement-shaft, of a 75  
cross-head secured thereon, sliding plates provided near said cross-head, balance-wheel segments pivoted on said plates and adjustable on their pivots toward or from each other, forks  
80 mounted on said segments and adapted to straddle pins on said cross-head, a lever loosely mounted on said shaft and having a pointer movable over a suitable scale, and links pivotally connecting said plates with said lever  
85 upon opposite sides of said shaft, substantially as described.

6. The combination, with an oscillating escapement-shaft, of balance-wheel segments pivotally mounted on slidable supports near 90  
said shaft, a mechanism for causing the oscillation of said segments simultaneously with the movement of said shaft, and means for moving said segments toward or from each  
95 other to vary the length of the arc described thereby, for the purpose specified.

In witness whereof I have hereunto set my hand this 6th day of January, 1904.

ALFRED J. BUTTS.

In presence of—

RICHARD PAUL,  
M. HAGERTY.