

No. 615,569.

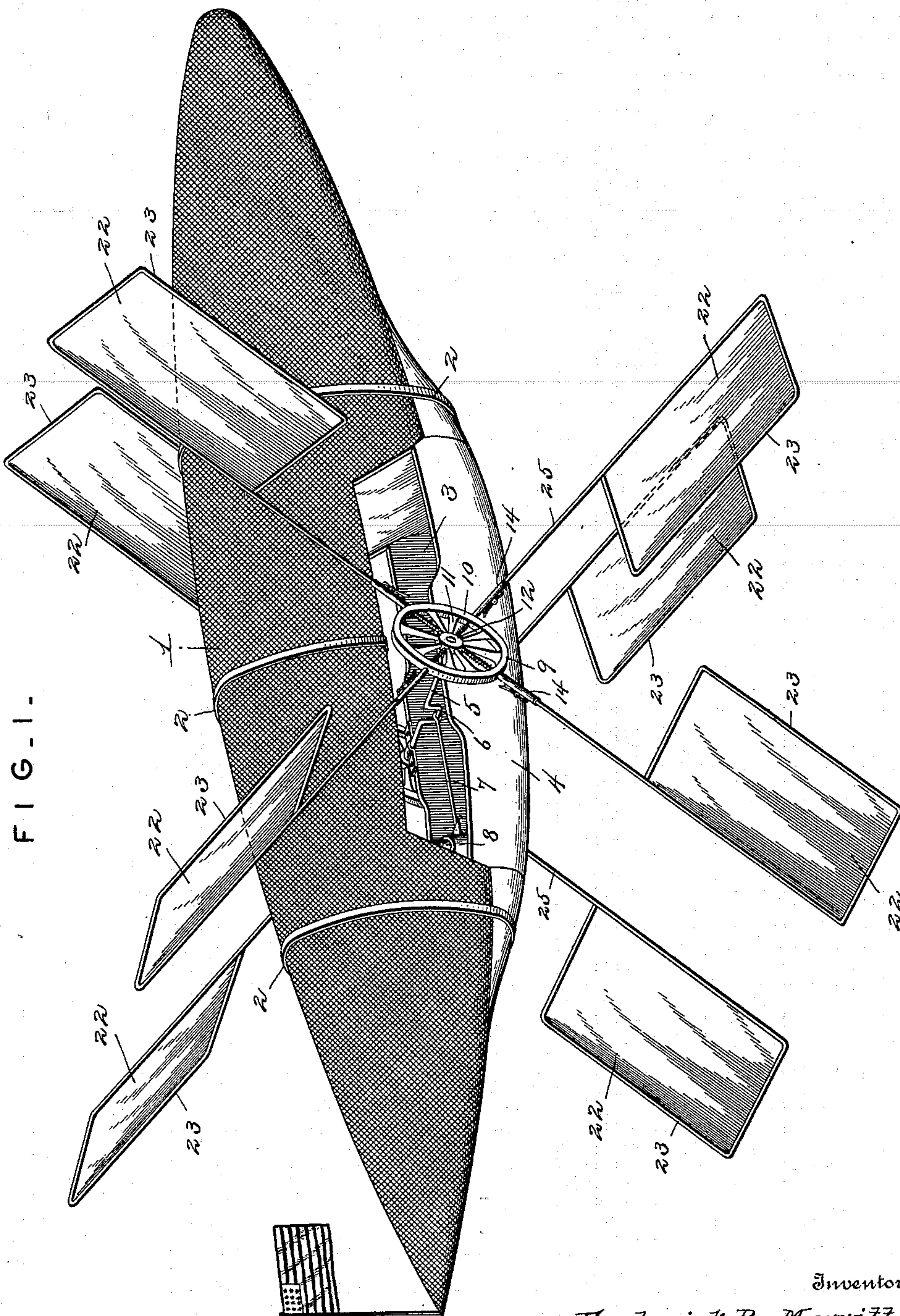
Patented Dec. 6, 1898.

F. R. MERRITT.  
AIR SHIP.

(Application filed Apr. 7, 1898.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses

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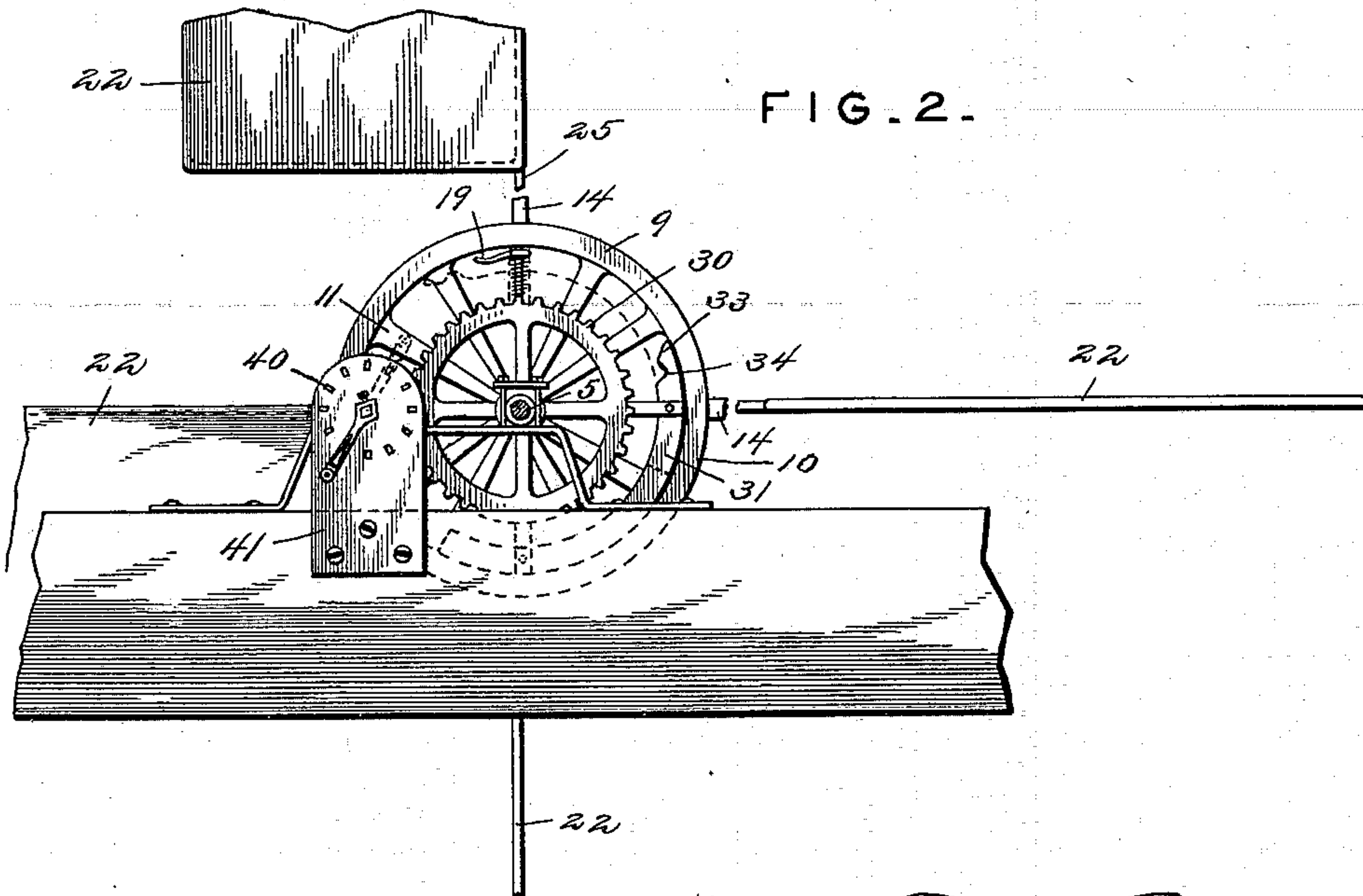


FIG. 2.

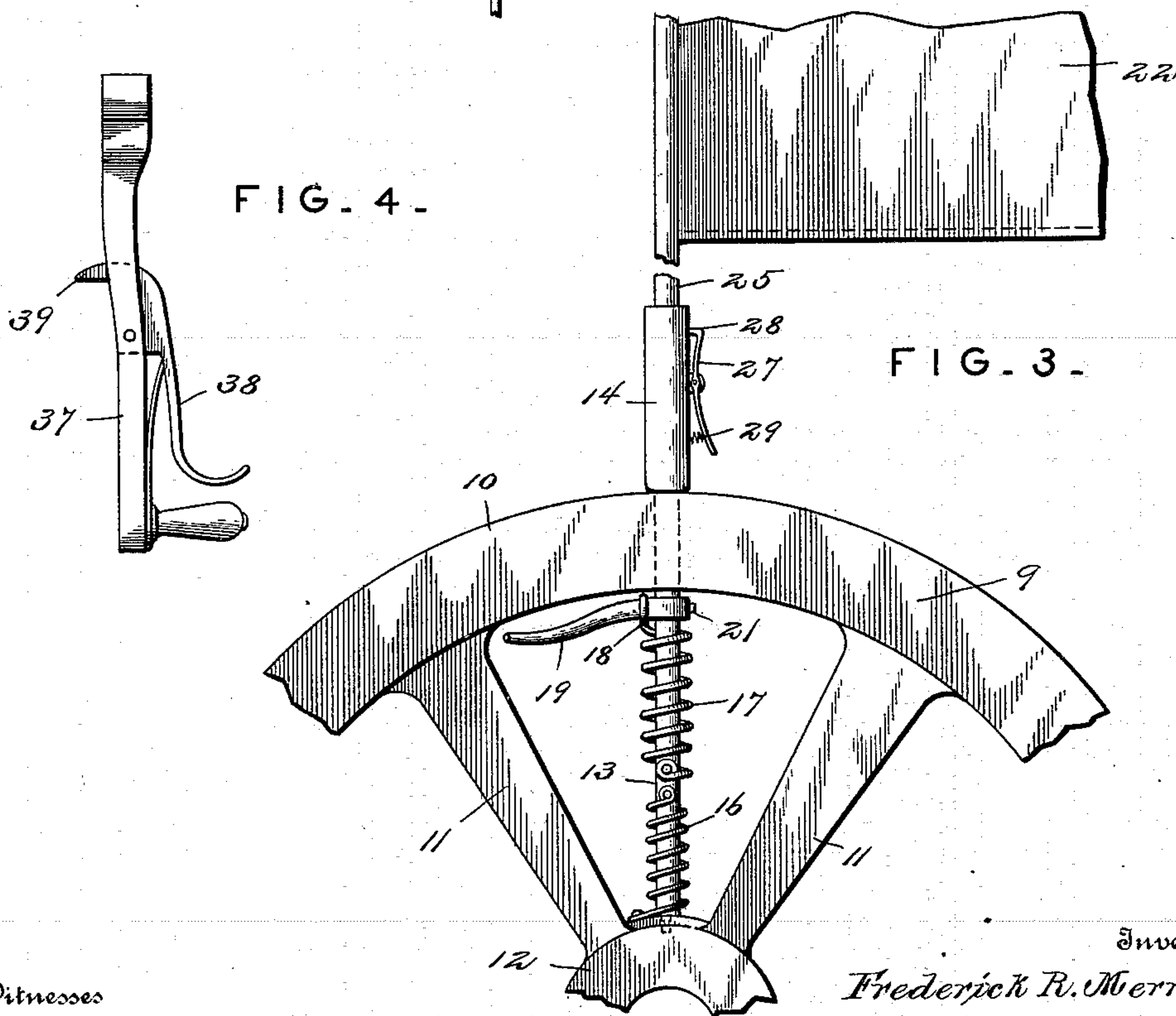


FIG. 4.

FIG. 3.

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FIG. 5.

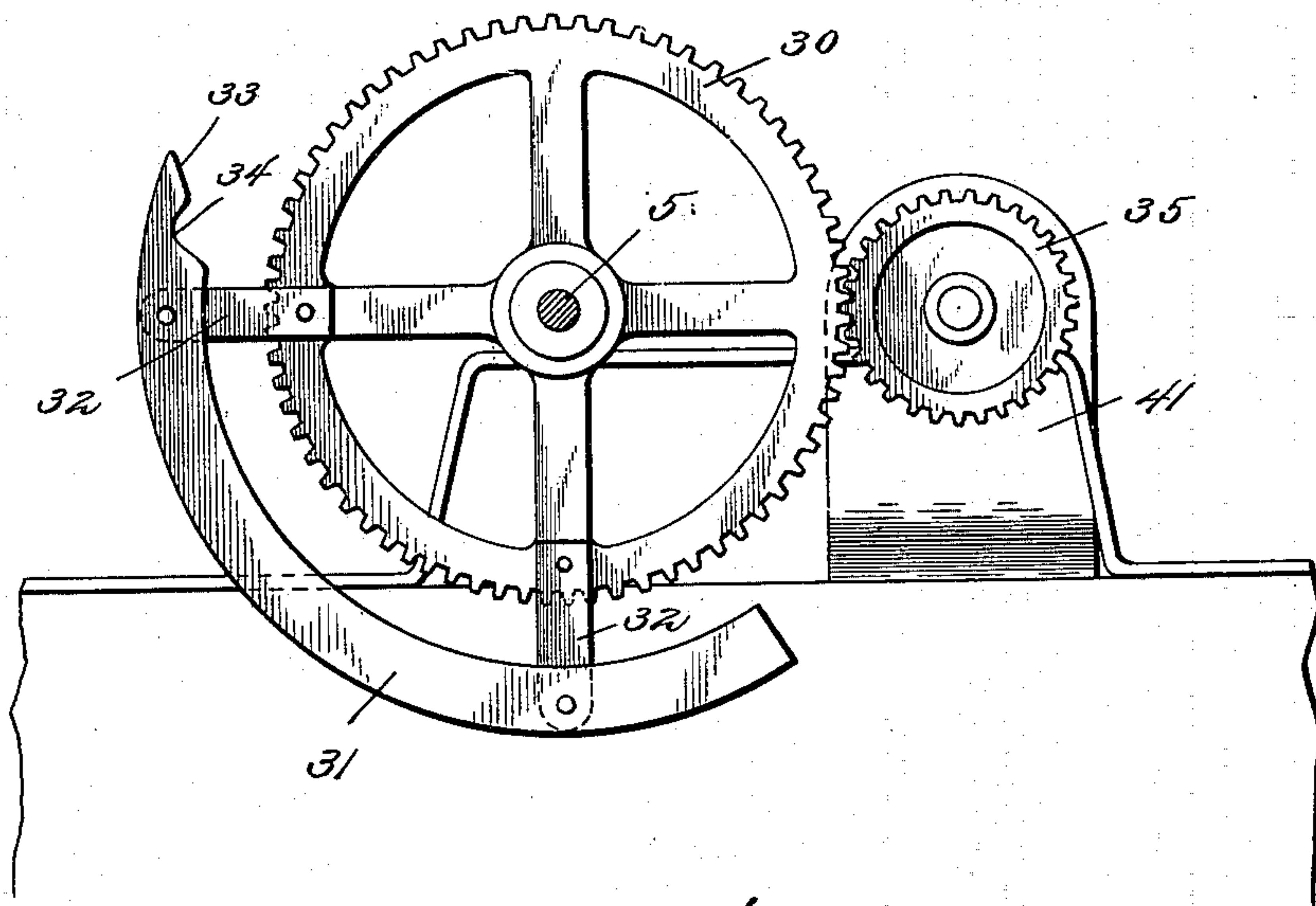
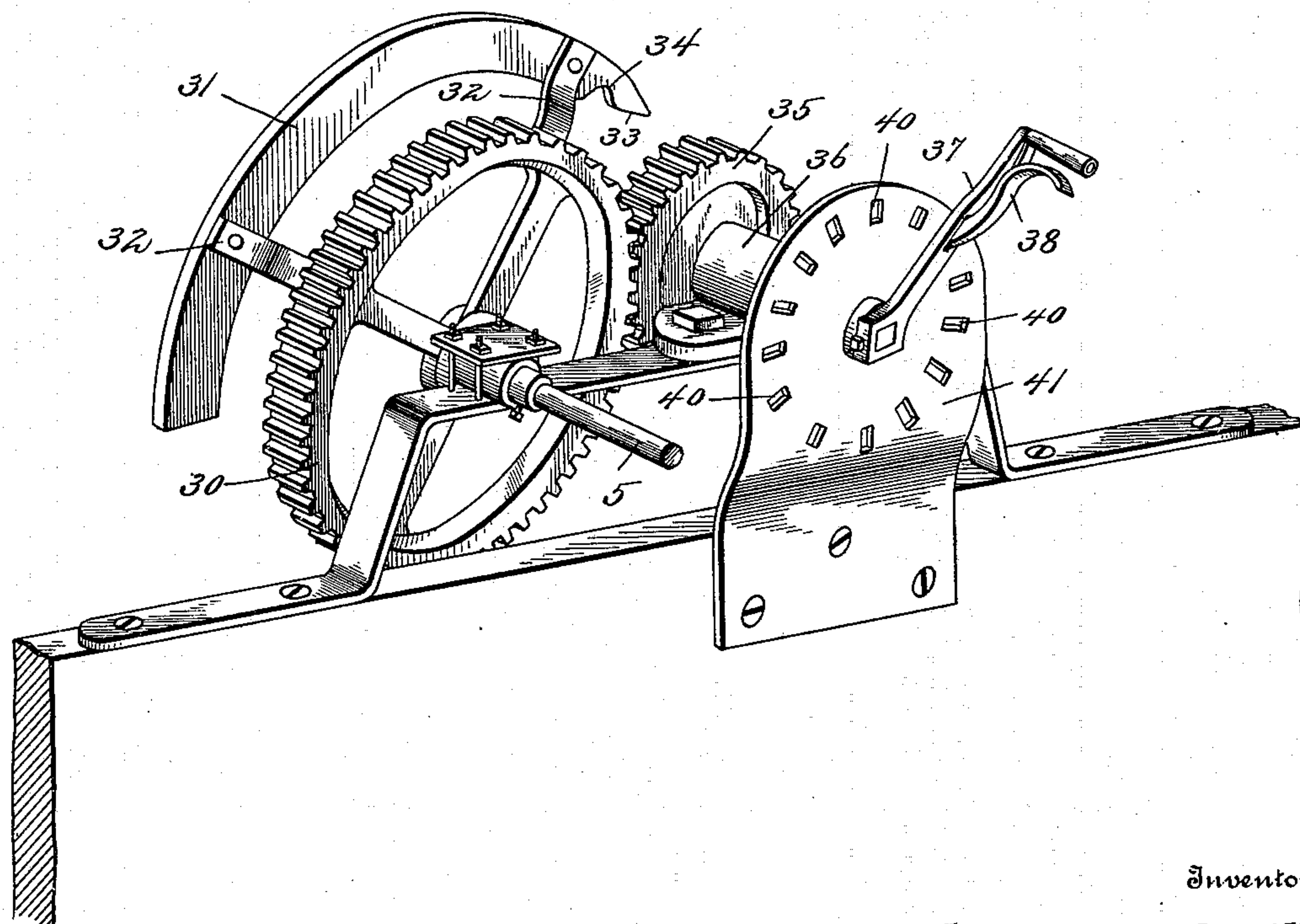


FIG. 6.



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4 Sheets—Sheet 4.

FIG. 7.

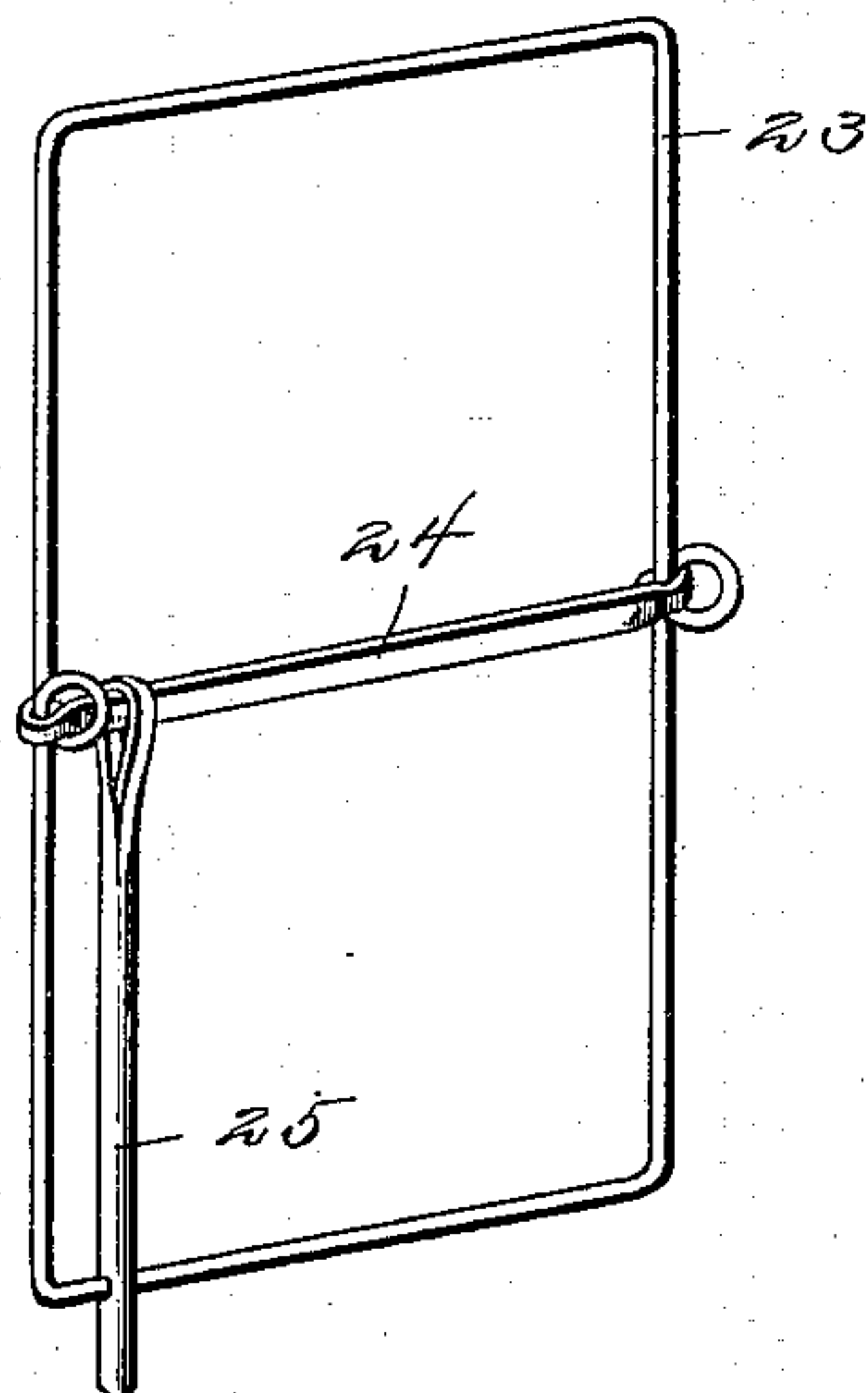


FIG. 8.

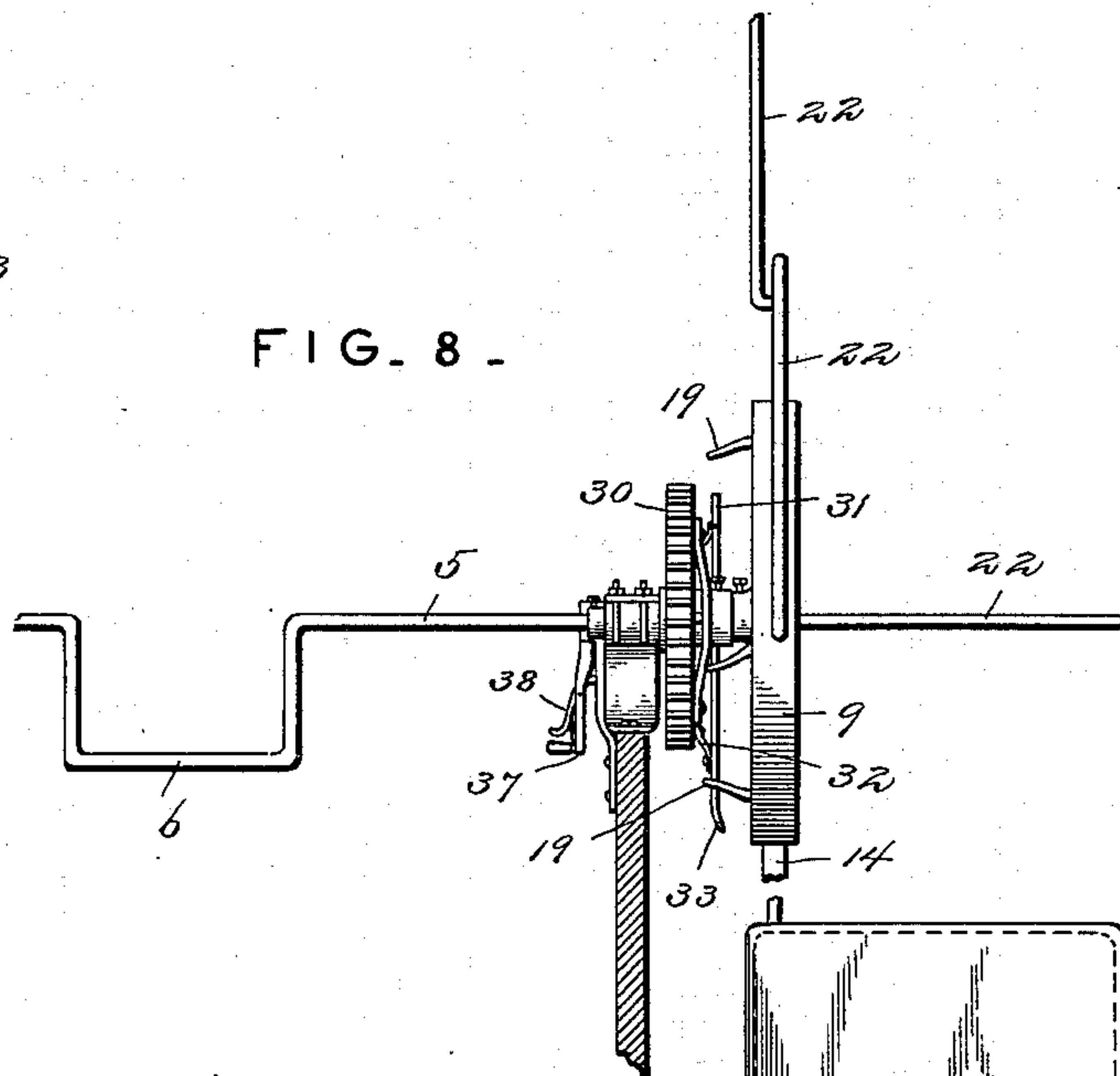


FIG. 9.

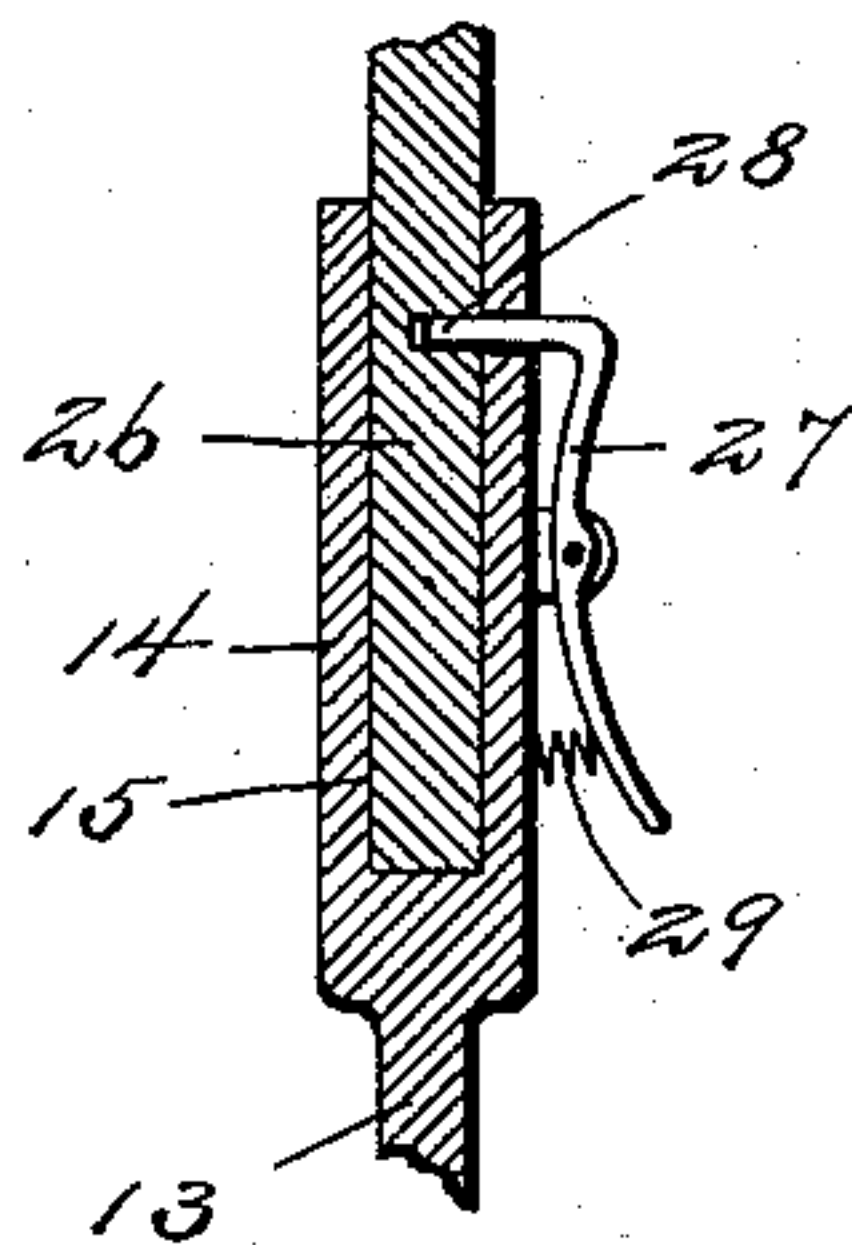


FIG. 10.

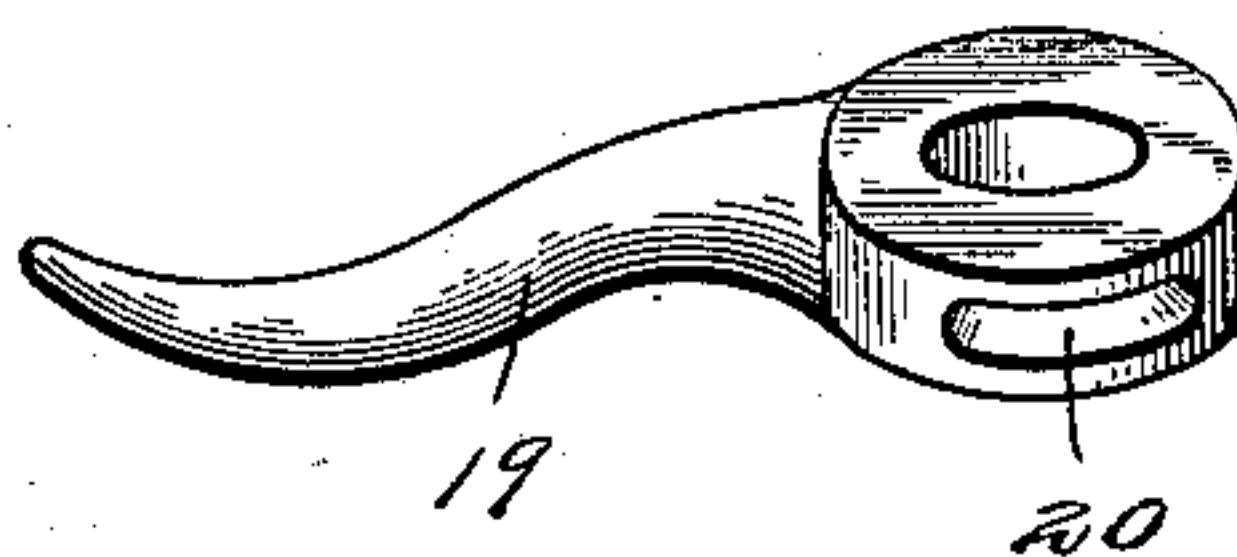
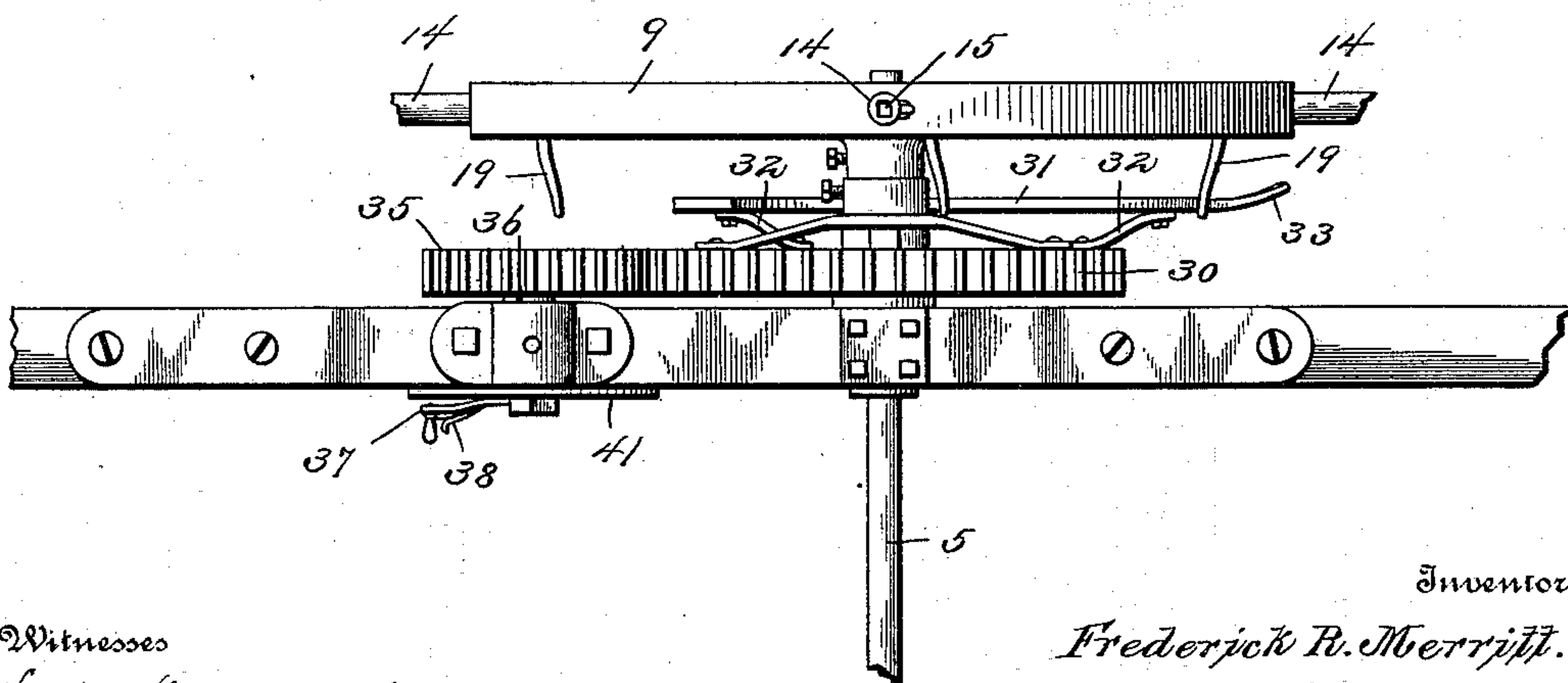


FIG. 11.



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# UNITED STATES PATENT OFFICE.

FREDERICK R. MERRITT, OF PRAIRIE CITY, OREGON.

## AIR-SHIP.

SPECIFICATION forming part of Letters Patent No. 615,569, dated December 6, 1898.

Application filed April 7, 1898. Serial No. 676,775. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK R. MERRITT, a citizen of the United States, residing at Prairie City, in the county of Grant and State of Oregon, have invented certain new and useful Improvements in Air-Ships; 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.

My invention relates to propelling and steering mechanism for air-ships, submarine vessels, and the like, the object of the same being to provide means whereby vessels of the character named may be, by the application of suitable power, propelled forward, rearward, elevated, lowered, or steered to the right or left.

The invention consists of a drive-shaft extending transversely of the vessel, disks or wheels keyed or otherwise secured to the ends thereof, wings on said wheels mounted upon shafts which extend radially of said wheels, laterally-extending arms yieldingly connected to the wing-shafts, and an adjustably-mounted segmental plate constituting the shifting mechanism against which said arms are adapted to bear.

The invention also consists in other details of construction and combinations of parts, which will be hereinafter more fully described and claimed.

In the drawings forming part of this specification, Figure 1 represents a perspective view of an air-ship with my improved propelling and steering mechanism applied. Fig. 2 is a detail elevation of the inner side of the vessel. Fig. 3 is a detail view, in side elevation, of a portion of one of the wing-carrying disks or wheels. Fig. 4 is a detail side elevation of the crank and clutch for moving the shifting mechanism and locking it in adjusted position. Fig. 5 is a detail elevation of the segmental plate constituting the shifting means and the gearing through which it is operated. Fig. 6 is a perspective view of the same, looking from the opposite side. Fig. 7 is a perspective view of one of the wing-frames. Fig. 8 is a detail vertical transverse sectional view through the side of the vessel, showing one of the wing-wheels and its coacting mechanism in end elevation.

Fig. 9 is a detail sectional view illustrative of the connection between one of the wing-shafts and the disk or wheel upon which it is mounted. Fig. 10 is a detail perspective view of one of the laterally-extending arms which coact with the shifting mechanism, and Fig. 11 is a detail plan view.

Like reference-numerals indicate like parts in the different views.

In Fig. 1 of the drawings I have illustrated my invention in connection with an ordinary cigar-shaped balloon or air-ship 1, the same being protected at points throughout its length by bands 2 2 and having a transverse opening 3 extending therethrough at a point between its upper and lower sides. Beneath the opening 3 the vessel or balloon is protected by a curved sheet 4, of metal or other suitable material, which defines the bottom of the car in which the occupants of the ship are seated.

Extending transversely of the vessel or balloon 1 and about amidships is a drive-shaft 5, which is mounted in suitable bearings and has its ends projecting beyond the sides of the vessel. At a point intermediate of its ends it is provided with a crank 6, by means of which and the pitman 7 said crank may be rotated by a suitable motor 8. Upon the outer ends of the shaft 5 are keyed or otherwise secured disks or wheels 9 9, as clearly shown. The wheels upon the opposite ends of said shaft are counterparts of each other, and but one will be described in this specification. The disk or wheel 9 may be of any suitable form and construction; but I prefer to make it with an outer rim 10 and radially-extending spokes 11, which connect said rim with the hub 12, this construction being for the purpose of decreasing the weight. Mounted to turn loosely in the rim 10 and hub 12 are a series of radially-extending spindles 13, which are provided with enlargements 14 upon their outer projecting ends, which enlargements are formed with rectangular sockets 15 for a purpose which will appear later. A light coil-spring 16 surrounds the inner end of each of the spindles 13, being secured thereto at one end and at the opposite end to the hub 12, said spring being designed for the purpose of holding the spindle normally in a certain position. Also surrounding each of the spin-



dles 13 is a coil-spring 17, of greater strength than the spring 16, the same being secured at one end to said spindle and at its opposite end being formed with a loop 18, which embraces the laterally-extending arm 19 on the spindle 13, the said arm being provided with an eye at one end, through which the spindle passes, and with an elongated slot 20 in one side of said eye, through which extends a pin 21, which is secured to the spindle and designed to engage the ends of the slot 20 for the purpose of limiting the movement of said arm.

The wings 22, which may be of any desired number on each wheel, are each constructed of a metallic frame 23, covered by suitable fabric and braced at a point intermediate of its ends by a cross-bar 24. The said cross-bar has secured to it the stem 25, which is formed with a rectangular lower end 26, which fits within the socket 15 in the outer end of the spindle 13. The said stem is held in place in said socket by means of a clutch 27, which is fulcrumed to the outer end of the spindle 13 and has an extension 28 thereon, which lies at right angles to the main portion of said clutch, said extension passing through registering openings in the enlargement 14 and the lower end of the stem 25. The said clutch is normally held in its operative position by a spring 29.

The shifting and regulating mechanism for the wings consists of a gear-wheel 30, mounted loosely on the shaft 5 at a point just inside of the wheel or disk 9, and a segmental plate 31, which is secured to the gear-wheel 30 by means of radially-extending arms or brackets 32, the said arms or brackets being bent outwardly toward the wheel or disk 9 for the purpose of locating the segmental plate 31 in a plane closer to the disk or wheel 9 than the gear-wheel 30 is. One end of the plate 31 is pointed and beveled, as shown at 33, and provided with a notch 34 adjacent to the beveled end. The plate is located in the path of movement of the laterally-extending arms 19 on the spindles 13 and serves when the shaft 5 is rotated to throw the wings 22 out into the wind. This operation is effected in the following manner: By reason of the connection between the stems 25 and the outer ends of the spindles 13 the springs 16, which are connected to said spindles, normally hold the wings 22 in a plane in line with or parallel with the wheels 9. When in this position, the arms 19 on the spindles 13 extend from said spindles at an angle which inclines toward the direction of movement of the wheel. The rotation of the wheel brings these arms successively in contact with the beveled end 33 of the segmental plate 31, the shock of the force of impact of said arms against said segmental plate being taken up partly by the springs 17 and the inclined or beveled end of said plate. After striking the plate the arms pass from the beveled end 33 into the notch 34, and are turned thereby carrying the wing 22, to which said arm is connected, outwardly at

right angles to the plane of movement of the wheel 9. This position of the wing is retained during the passage of the arm 19 across the entire outer surface of the segmental plate 31. When the arm passes from said plate, the spindle to which it is attached and the wing carried by said spindle are returned to their normal positions by the spring 16. The slot 20 in the arm 19 and the pin 21, which fits in said slot, serve to limit the outward movement of the arm, so that when one end of the slot 20 comes in contact with said pin a positive pressure will be exerted upon the spindle 13 to turn the wing 22 outwardly. Were it not for the provision of this slot, however, which permits of a small degree of independent movement of said arm, the shock of the force of impact against the plate 31 would be so great as to snap said arm or some of the parts which are connected either directly or indirectly thereto. The spring 17 serves to relieve the pressure exerted by the impact of the arm against the plate.

It will be obvious that if the wings 22 are in operation throughout only a portion of the time of rotation of the wheel 9 the vessel will be propelled up or down or turned in one direction or the other, according to the phase of the movement of said wheel in which said wings are operated. For example, as illustrated in Fig. 2 of the drawings, the beveled end 33 of the segmental plate 31 is located at a point just in advance of the shaft 5. During the rotation of the wheel 9, therefore, the wings 22 will be successively thrown outwardly or in operative position as they reach a point in line with the horizontal diameter of said wheel. The action of the wings, therefore, in the position in which the segmental plate is located will be to propel the vessel forward. If, however, the segmental plate 31 were located in a diametrically opposite position—that is, with the beveled end 33 thereof just in the rear of the shaft 5—the action of the wings would be to back the vessel. To elevate or lower the vessel, the location of the forward or beveled end 33 of the segmental plate 31 would be at a point just beneath or just above the shaft 5. The means I have provided for effecting the adjustment of the segmental plate 31 is the pinion 35, which meshes with the gear-wheel 30 and is mounted upon the counter-shaft 36 in the frame of the vessel just in the rear of the shaft 5. The shaft 36 is turned by means of a key or crank-handle 37, which has pivoted thereto a spring-actuated clutch-lever 38, whose engaging portion 39 is adapted to fit within one or the other of a series of slots 40 in the adjustment-plate 41. By disengaging the clutch 38 from the adjustment-plate 31 and turning the crank-handle 37 in one direction or the other the gear-wheel 30, with which the pinion 35 meshes and which carries the segmental plate 31, will be moved in one direction or the other and will be locked in its adjusted position by permitting the clutch



38 to engage another one of the slots 40 in the plate 41.

While my invention has been described as a propelling and steering mechanism for airships and submarine vessels, it will be apparent that the same may be utilized as a windmill by mounting the frame which carries the mechanism heretofore described pivotally upon the upper end of an upright or standard and adjusting the blades so that they will receive the force of the wing upon one side or the other.

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

1. The combination with a drive-shaft and pivotally-mounted wings operated thereby, of shifting mechanism for said wings, and laterally-extending arms yieldingly mounted on said wings and adapted to engage the shifting mechanism.

2. The combination of a drive-shaft, pivotally-mounted wings operated thereby, and laterally-extending yieldingly-mounted arms on said wings, shifting mechanism for throwing said wings into operative position, consisting of a segmental plate lying within the path of movement of said arms, and means for adjusting the position of said plate.

3. The combination with a drive-shaft and pivotally-mounted wings operated thereby, of laterally-extending arms loosely mounted on the shanks of said wings, springs connecting said arms with the shanks on which they are mounted, and shifting mechanism adapted to be engaged by said arms.

4. The combination with a pivotally-mounted wing and the shank thereof, of a laterally-extending arm for said shank having an opening therein through which the shank passes, and a transversely-extending elongated slot communicating with said opening, a pin on said shank extending through said slot, a

spring connecting said arm to said shank, and shifting mechanism adapted to be engaged by said arm, as and for the purpose set forth.

5. The combination with a drive-shaft, pivotally-mounted wings operated thereby, and laterally-extending arms yieldingly connected to the stems of said wings, of shifting mechanism for throwing said wings into operative position, consisting of a segmental plate, having a beveled end, and a notch adjacent thereto, and means for adjusting the plate and locking the same in its adjusted position, as and for the purpose set forth.

6. The combination with a drive-shaft, and disks or wheels thereon, of pivotally-mounted wings on said wheels, springs surrounding the shanks of said wings for normally holding them out of operative position, laterally-extending arms on said shanks, spring connections between said arms and said shanks, and shifting mechanism adapted to be engaged by said arms, as and for the purpose set forth.

7. The combination with a drive-shaft and disks or wheels thereon, of radially-extending spindles loosely mounted in said wheels, wings adapted to be removably secured to said spindles, coil-springs surrounding said spindles for holding the wings in inoperative position, laterally-extending arms loosely mounted on said spindles and provided with elongated slots, pins extending through said slots secured to said spindles, springs surrounding said spindles secured at one end thereto, and at their opposite end to said arm, and shifting mechanism, with which said arms are adapted to engage.

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

FREDERICK R. MERRITT.

Witnesses:

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HARRY L. AMER.