

**No. 641,799.**

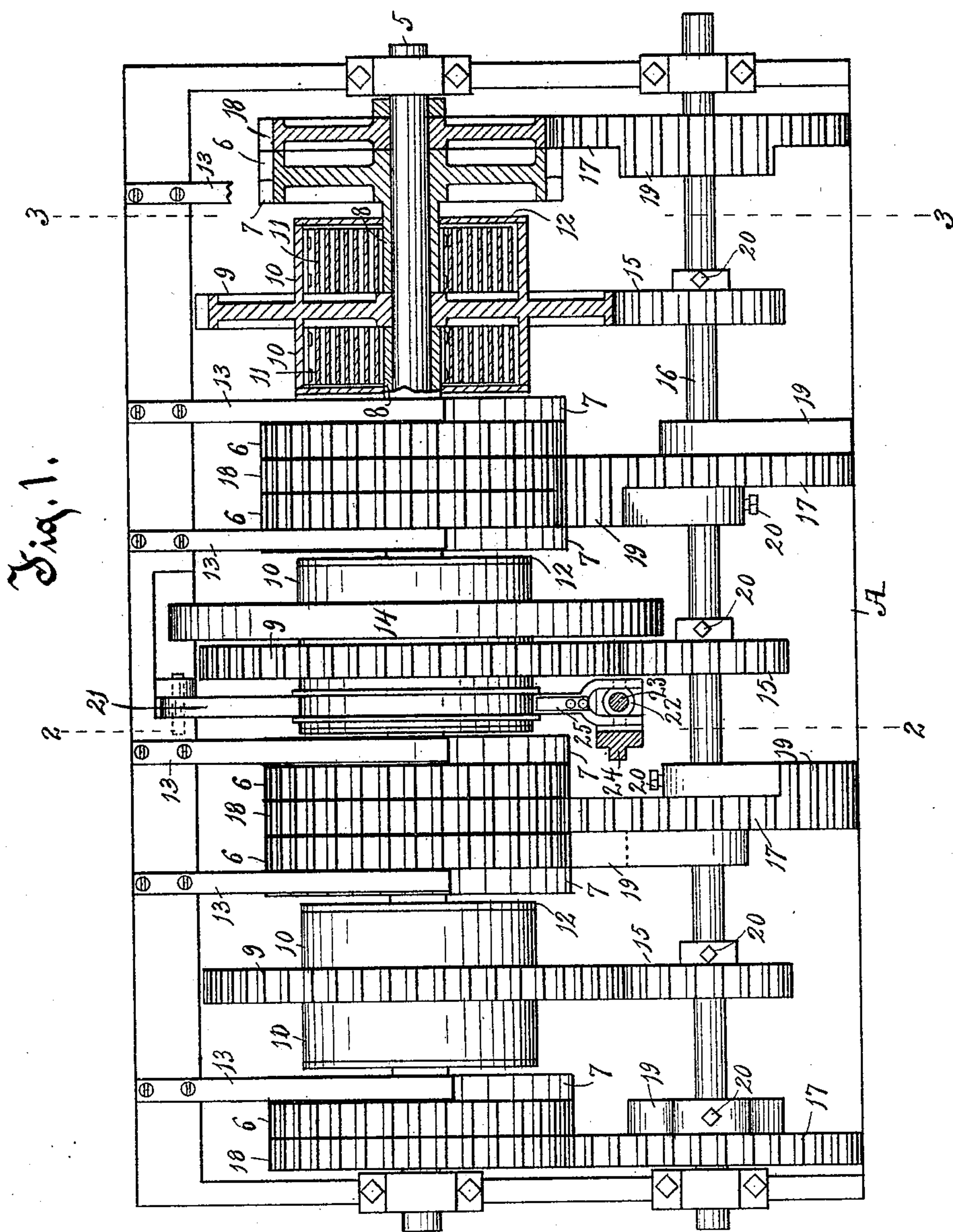
**Patented Jan. 23, 1900.**

**A. C. & H. RUTZEN.**  
**MOTOR.**

(Application filed Oct. 18, 1899.)

(No Model.)

**2 Sheets—Sheet 1.**



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2 Sheets—Sheet 2.

Fig. 2.

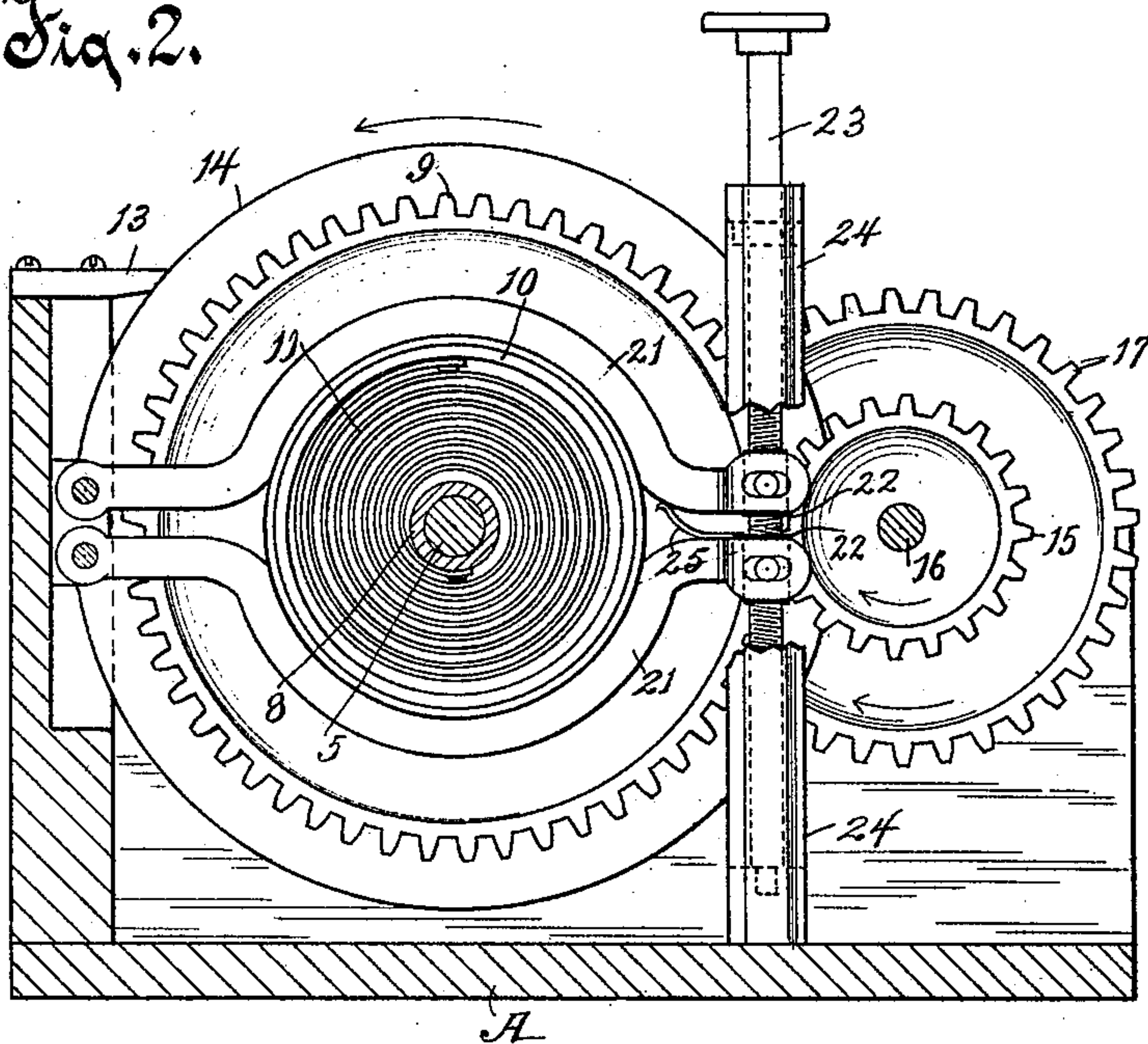
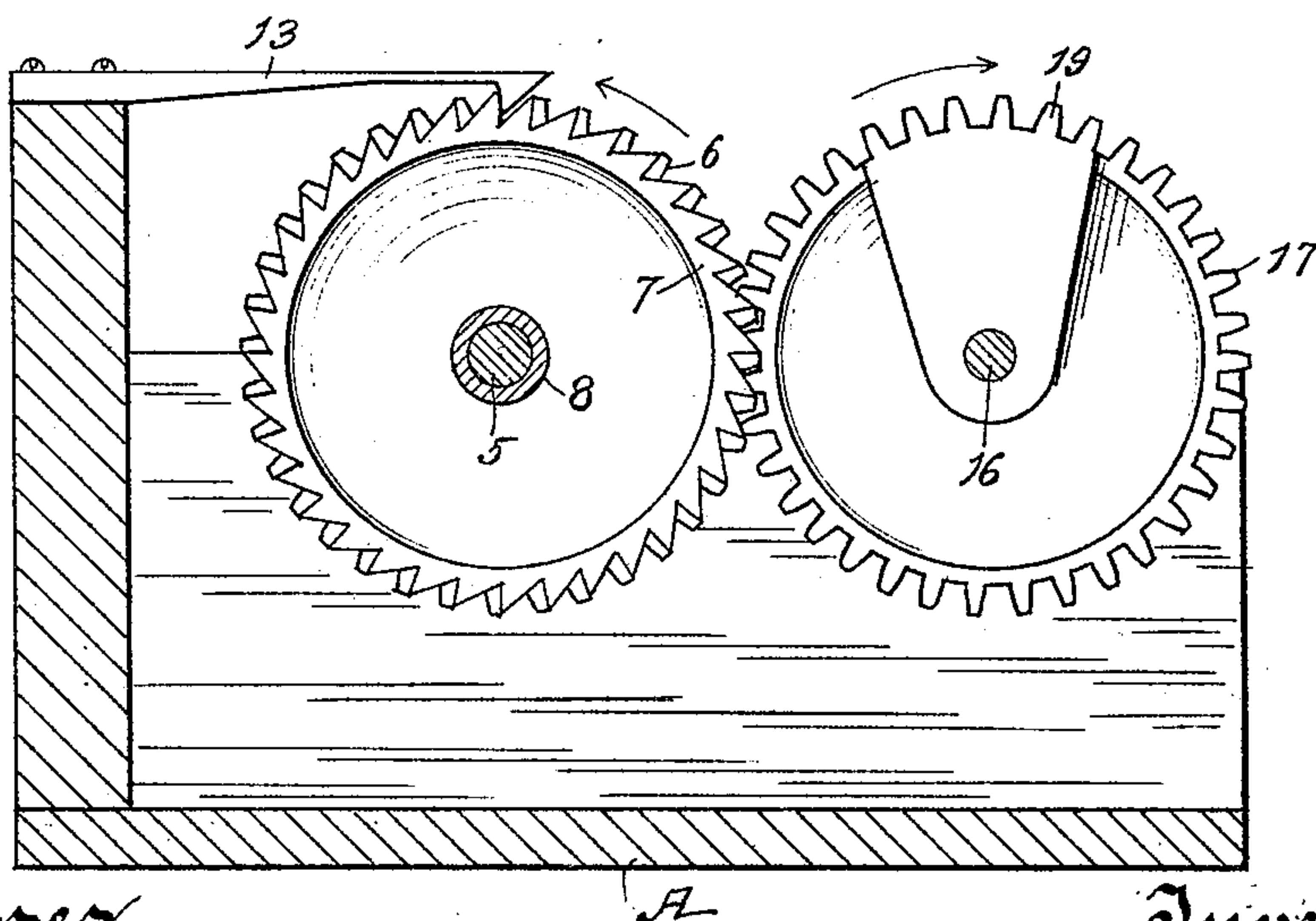


Fig. 3.



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# UNITED STATES PATENT OFFICE.

AUGUST C. RUTZEN AND HERMANN RUTZEN, OF MILWAUKEE, WISCONSIN.

## MOTOR.

SPECIFICATION forming part of Letters Patent No. 641,799, dated January 23, 1900.

Application filed October 18, 1899. Serial No. 733,950. (No model.)

*To all whom it may concern:*

Be it known that we, AUGUST C. RUTZEN and HERMANN RUTZEN, of Milwaukee, in the county of Milwaukee, and State of Wisconsin, have invented a new and useful Improvement in Motors, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

Our invention relates to an improved motor that may be built either in large or small size, as desired, for driving extensive machinery or for operating simple mechanisms.

The invention consists of the motor, its parts and combinations of parts, as herein described and claimed, or the equivalents thereof.

In the drawings, Figure 1 is a top plan view of our improved motor, parts being shown in section to more fully illustrate the construction. Fig. 2 is a transverse section of the motor on line 2 2 of Fig. 1 looking toward the right. Fig. 3 is a transverse section of the motor on line 3 3 of Fig. 1 looking toward the right.

In the drawings, A is the frame, which may be of any suitable size and form to adapt it for supporting the operative parts of the motor. The main shaft 5 has its bearings on the frame and is provided with a plurality of gear-wheels 6 6 and ratchet-wheels 7 7, integral and concentric with the gear-wheels 6 6, these wheels 6 6 and 7 7 being provided with sleeve-like hubs 8 8, which wheels and hubs are loose on the shaft 5. Also a plurality of larger gear-wheels 9 9, which may be denominated the "barrel" gear-wheels, are tight on the shaft adjacent to the ends of the sleeve-like hubs 8 8. These wheels 9 9 are provided with concentric laterally-extending cylindrical cases or barrels 10 10, integral with or rigid to the wheels, which barrels project over the hubs 8 8 and encircle those hubs at a distance therefrom. Motor-springs 11 11, coiled about the hubs 8, are secured at their outer extremities to the barrels 10 and at their inner extremities to the hubs 8. Disk covers 12 are preferably secured to the outer ends of the barrels 10 to close them. These covers are loose about the hubs 8. Elastic catches 13 13, fixed to the frame, are disposed and adapted to catch the teeth of the ratchet-

wheels 7 7, preventing their rotation in one direction, but permitting the ratchet-wheels to rotate in the other direction, the catches yielding sufficiently to allow the teeth to pass the catches in that direction. A belt-pulley 14, fixed on the shaft 5, is the means for transmitting power from the shaft 5 to the mechanism being operated by the motor.

The barrel gear-wheels 9 9 mesh with pinions 15 15, tight on a counter-shaft 16, and this counter-shaft is provided with tight guide gear-wheels 17 17, that mesh with traveler gear-wheels 18 18, loose on shaft 5. The complete wheels 17, to which the segmental racks 19 are affixed, are for convenience of designation denominated "guide-wheels," and the wheels 18, that mesh with the wheels 17 and are loose on shaft 5, are for the same purpose designated "traveler-wheels." Segmental racks 19 19 or partial gear-wheels tight on the counter-shaft 16 mesh with the hub-provided wheels 6 on shaft 5. As there are six springs 11 and six hub-provided gear-wheels 6, we provide six of the segmental racks 19, each of which has a rack of such length as to equal one-sixth of the perimeter of a wheel having a radius equal to the radius of the racks 19. The segmental racks 19 are shown in the drawings as being integral with the guide-wheels 17, and this is a preferable form of construction, but is not necessary. The wheels and racks on the counter-shaft 16 are secured thereto adjustably by set-screws, as shown at 20 20. These segmental racks 19 are arranged on the counter-shaft 16 in positions forming a spiral line about the counter-shaft. The spiral or non-registering positions of the segmental racks 19 cause these racks to mesh severally and successively each with its complementary hub-provided gear-wheel 6 on the shaft 5 when the motor is in operation.

The operation of the motor is substantially as follows: The motor-springs 11 being wound up by rotating the hub-provided wheels 6 in any convenient way, the resilience of the springs left to their own action will cause the rotation of the shaft 5, and as it rotates the counter-shaft 16 will be caused to rotate through the gear-wheels 9 and pinions 15 and will by means of the segmental racks 19 at each rotation of the counter-shaft cause a



partial rotation of the hub-provided wheels 6 6 on the shaft 5, which partial rotation will correspondingly rewind the spring 11 secured thereto, thus accomplishing a certain compensating rewinding of the springs during the time their resilience and unwinding cause the rotation of the shaft 5.

For holding the shaft 5 against rotation during the process of winding up the springs 11 and for controlling the motion of the motor at other times we provide a brake consisting of two clamping-arms 21 21, pivoted at one extremity to the frame and passing, respectively, above and below and bearing on one of the barrels 10 and provided at their free extremities with nuts 22 22, swiveled by trunnions thereon in recesses therefor in the furcate ends of the arms, through which nuts a brake-rod 23, provided with right and left screw-threads, passes. The brake-rod is mounted revolubly in a standard 24 on the frame. A spring 25 is adapted to hold the free extremities of the arms 21 21 apart yieldingly.

What we claim as our invention is—

1. A motor comprising a main shaft, a plurality of hub-provided gears loose on the shaft, ratchet-wheels rigid to said hub-provided gears, slip-catches engaging said ratchet-wheels, other gears provided with barrels tight on the shaft, springs coiled in the barrels about the hubs and secured to the barrels and to the hubs, a counter-shaft provided with pinions meshing with the barrel-provided gears on the main shaft, and segmental racks on the counter-shaft arranged to mesh severally successively with the several hub-provided gears on the main shaft.

2. In a motor, the combination of a main

shaft provided with a belt-pulley, a plurality of hub-provided gear-wheels loose on the shaft, ratchet-wheels rigid to said hub-provided gears, slip-catches engaging said ratchet-wheels, a corresponding number of barrel-provided gear-wheels tight on the shaft, springs coiled about the hubs and secured to the hubs and to the barrels, a counter-shaft provided with pinions meshing with the barrel-provided wheels, segmental racks on the counter-shaft meshing successively with their complementary hub-provided gears on the main shaft, guide gear-wheels fixed to the segmental racks on the counter-shaft, and traveler gear-wheels loose on the main shaft meshing with the guide-wheels on the counter-shaft.

3. In a motor, the combination of a main shaft, a hub-provided gear loose on the shaft, a ratchet-wheel rigid to said hub-provided gear, a slip-catch engaging said ratchet-wheel, another gear provided with a barrel tight on the shaft, a spring coiled in the barrel about the hub and secured to the barrel and to the hub, a counter-shaft provided with a pinion meshing with the barrel-provided wheel, a segmental rack on the counter-shaft meshing with a complementary hub-provided gear on the main shaft, a brake consisting of clampable arms pivoted on the frame and contacting with said barrel, and means for clamping the brake-arms to said barrel.

In testimony whereof we affix our signatures in presence of two witnesses.

AUGUST C. RUTZEN.  
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