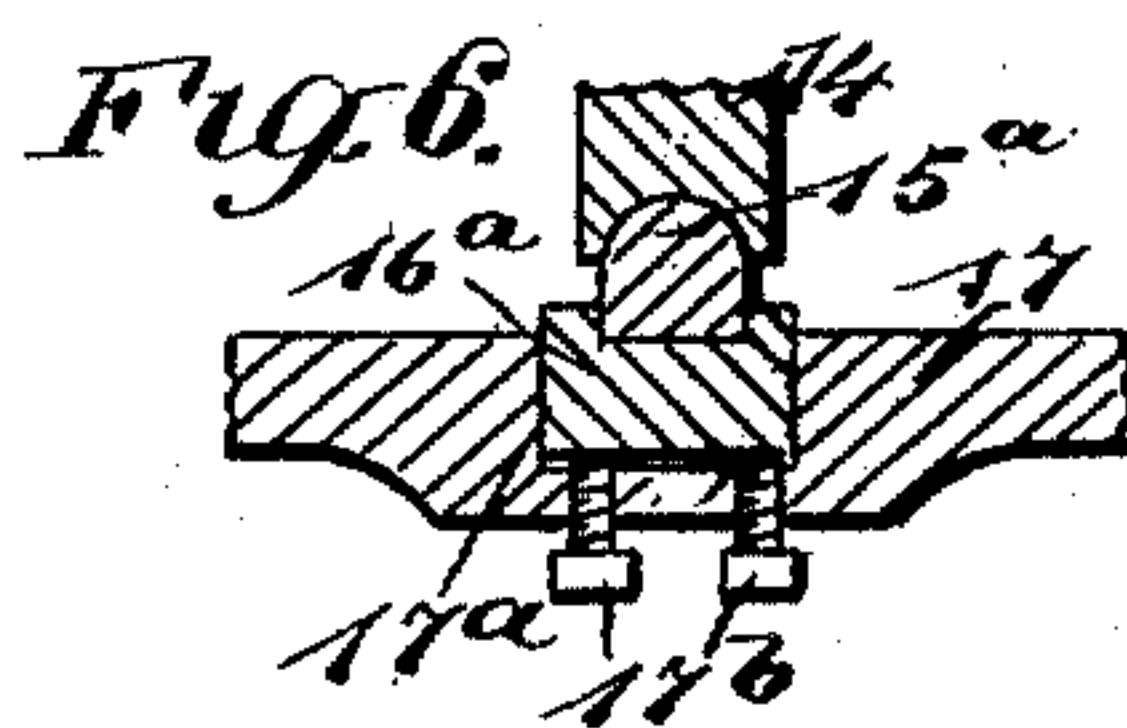
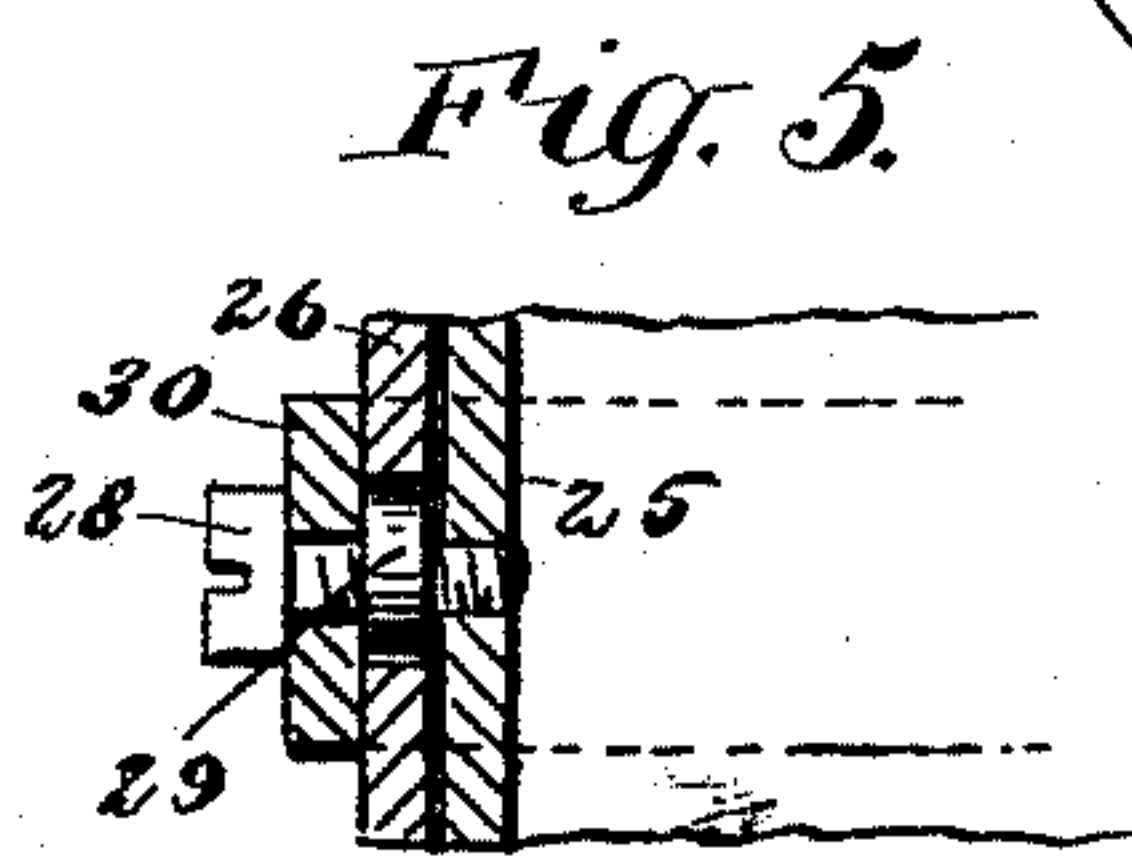
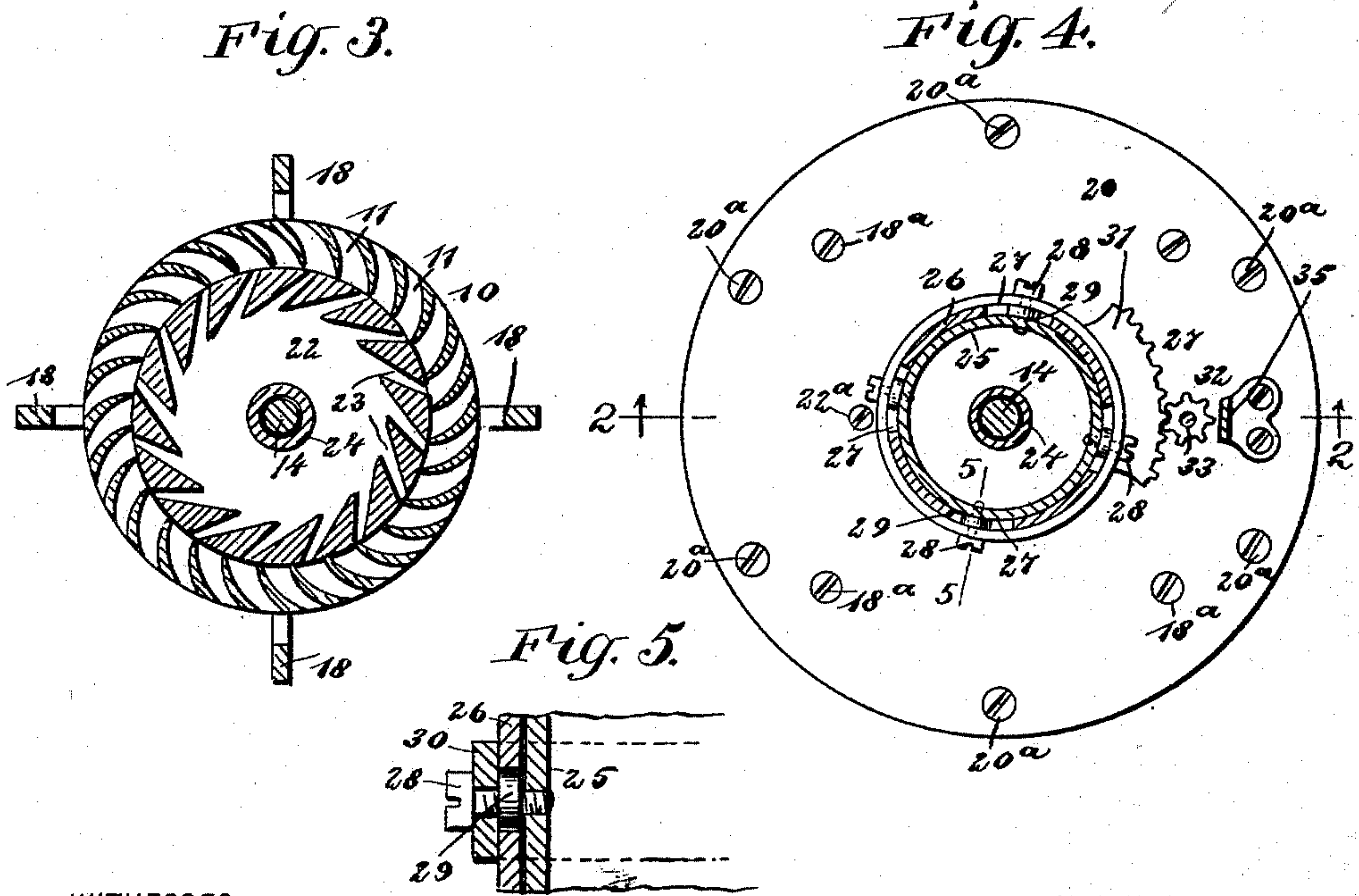
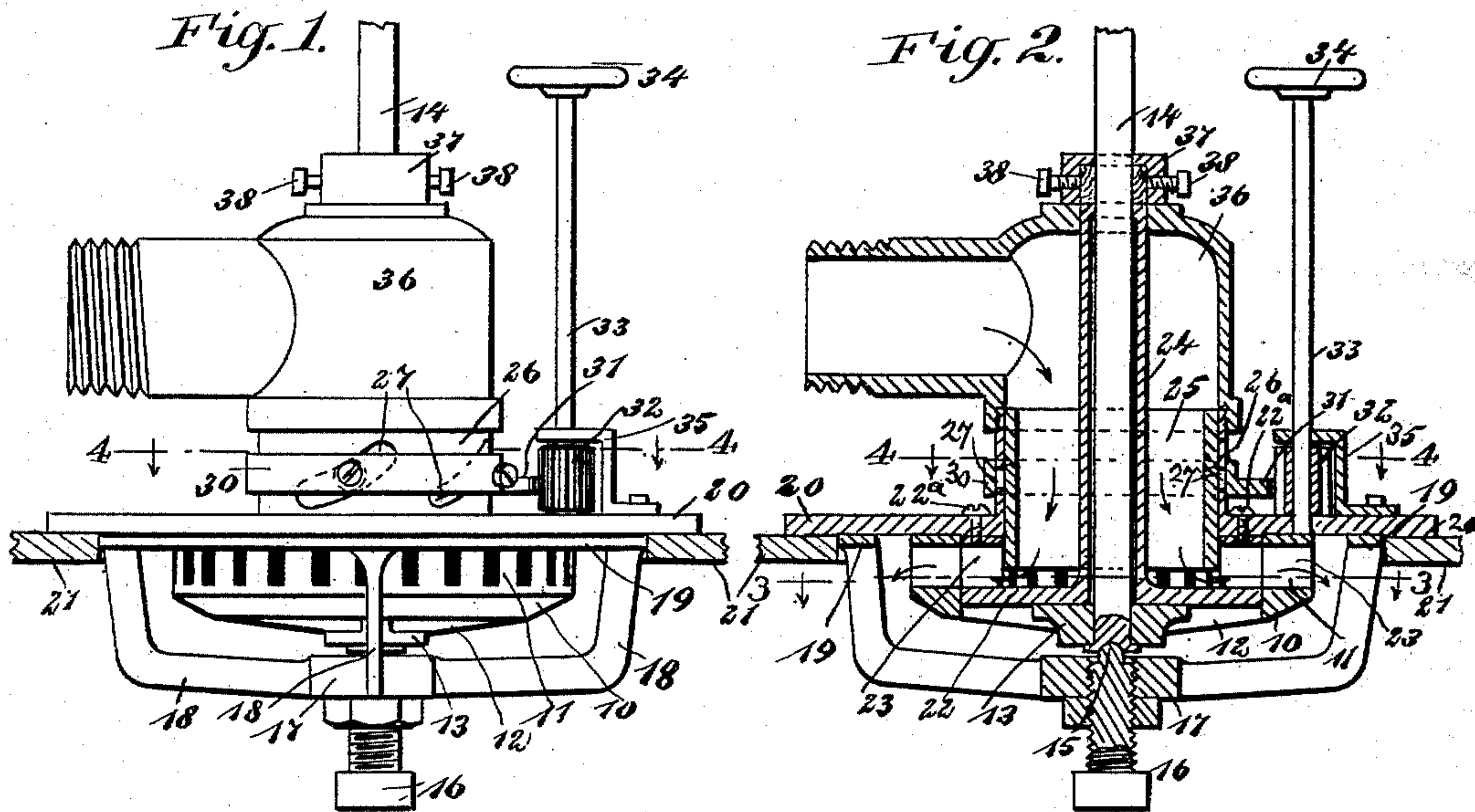


(No Model.)

W. E. SEELYE.  
WATER MOTOR.

No. 483,394.

Patented Sept. 27, 1892.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

WILLIAM E. SEELYE, OF BRAINERD, MINNESOTA.

## WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 483,394, dated September 27, 1892.

Application filed January 27, 1892. Serial No. 419,438. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. SEELYE, of Brainerd, in the county of Crow Wing and State of Minnesota, have invented a new and  
5 Improved Water-Motor, of which the following is a full, clear, and exact description.

My invention relates to improvements in water-motors; and the object of my invention is to produce a simple and efficient motor in  
10 which the water-wheel buckets are near the periphery of the wheel, so as to get the benefit of the greatest possible amount of leverage, which is provided with means of delivering the water in solid columns to the wheel-buck-  
15 ets, and which is provided with a peculiar form of gate, which enables the motor to be very easily and nicely controlled, this latter feature being one of the important features of the invention.

20 To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying  
25 drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a motor embodying my invention. Fig. 2 is a vertical  
30 cross-section of the same on the line 2 2 in Fig. 4. Fig. 3 is a horizontal section through the water-wheel and water-chest on the line 3 3 in Fig. 2. Fig. 4 is a sectional plan on the line 4 4 in Fig. 2. Fig. 5 is a broken enlarged sectional  
35 view on the line 5 5 in Fig. 4, and Fig. 6 is an enlarged detail sectional view of a modified means of vertically adjusting the water-wheel and its shaft and also of a support for the shaft.

40 The water-wheel 10 has an outer or peripheral rim, which is divided into a plurality of curved buckets 11, extending tangentially across the rim, the buckets being open at their outer and inner ends, but having their larger  
45 openings inward, from which direction the water enters them, and as the discharge is through the outer or smaller ends it will be seen that the driving force of the water will be applied at a point very near the circum-  
50 ference of the wheel. The wheel has on the under side a series of radial spokes 12, the outer ends of which support the bucket-rim

and the inner ends of which merge in a hub 13, which is fixed to the main vertical shaft 14 of the wheel, so that the wheel and shaft 55 will turn together. The lower end of the shaft 14 is provided with a socket, which turns on the rounded upper end 15 of a screw-bolt 16, which is held to turn in the threaded hub 17, formed at the junction of the several bent  
60 arms 18, which arms are bent upwardly and terminate at their outer ends in a collar 19, which is secured by means of screws 18<sup>a</sup> to the under side of a base-plate 20, and this is secured by means of screws 20<sup>a</sup> or their equiv- 65  
alent to a support 21, which may be the bottom of a flume, as hereinafter described.

The screw-bolt 16 is provided with a suitable lock-nut, and by adjusting the bolt the height of the shaft and water-wheel may be 70 regulated, and the bolt also forms an easy bearing for the wheel. Instead of the bolt, however, an oval bearing 15<sup>a</sup> may be provided for the shaft, which bearing is held in a block 16<sup>a</sup>, mounted in a recess 17<sup>a</sup> of the hub 17, 75 and the block is adjusted by the set-screws 17<sup>b</sup>, which extend upward from the under side of the hub. This construction is shown clearly in Fig. 6.

The spokes 12 of the water-wheel are flat on 80 their upper surfaces, which fit close to a water-chest 22, which fits snugly within the bucket-rim of the water-wheel 10 and which is held in place by screws 22<sup>a</sup>, extending downward through the base-plate 20 and into the upper 85 portion of the water-chest. The water-chest is provided with a series of circumferential and tangential ports 23, which are adapted to register with the inner openings of the buckets 11 and the inclination of which is oppo- 90  
site to the inclination of the buckets, so that the water which issues from the ports will strike forcibly against the concaved walls of the buckets, and thus turn the water-wheel with great power. The chest 22 has also a 95 hollow central shaft 24, through which the main shaft 14 extends and to the upper end of which a box is secured, which forms an abutment for the water-pipe elbow, as hereinafter described. 100

A cylindrical gate 25 is adapted to enter the middle portion of the chest 22, so that its outer surface will fit against the inner wall of the rim of the chest, and the upper portion of



this gate is held to slide in a cylinder 26, formed centrally on the upper portion of the base-plate 20, the cylinder 26 being open at top and bottom, so that the gate 25 may have a free vertical movement. The lower edge of the gate is adapted to fit snugly upon the bottom of the chest, so that when the gate is in its lowest position it will shut the water entirely off from the chest-ports 23, and consequently from the water-wheel.

At intervals in the cylinder 26 are formed diagonal slots 27, and extending through these slots are set-screws 28, the inner ends of which are secured to the gate 25, and the set-screws carry rollers or washers 29, adapted to move longitudinally in the slots 27, so as to reduce friction. These set-screws 28 also extend through a collar 30, which is held to slide on the outer portion of the cylinder 26, and on this collar is a segmental gear 31, which meshes with a horizontally-turning pinion 32 on the shaft 33, which shaft has a hand-wheel 34 at the top to enable it to be turned, and it is mounted upon a suitable support 35, secured to the base-plate 20. By turning the shaft 34 the segmental gear 31 may be turned either to the right or left, so as to cause the collar 30 to move the set-screws 28 and rollers or washers 29 either up or down in the slots 27, and consequently the set-screws, which are also secured to the gate 25, will carry the gate with them, and by means of the hand-wheel 34 it will thus be seen that the gate may be either raised or lowered. By this arrangement the gate may be adjusted so that just the desired quantity of water will flow to the buckets of the water-wheel.

An elbow 36 is screwed to the upper end of the cylinder 26, and this elbow is adapted to connect with a water-pipe which supplies the motor with water, and the shaft 24, which extends upward through the elbow, has a box 37 at its upper end, in which the shaft 14 turns, and this box is held to the shaft 24 by the set-screw 38. The elbow 36 forms no part of the motor, and when the motor is used the base-plate 20 may be secured in the bottom of the flume and the water allowed to flow directly downward through the gate and out through the water-wheel buckets, as indicated by the arrows in Fig. 2.

Having thus fully described my invention,

I claim as new and desire to secure by Letters Patent—

1. The herein-described water-motor, comprising the annular plate 20, arms 18 thereunder having an adjustable center, an outer slotted cylindrical casing 26 upon the upper side of the slotted plate, an elbow secured to the upper end of said casing, a main shaft extending down through said elbow and stepped on said center, a water-wheel mounted on the lower end of the shaft and provided with an annular series of buckets open at their inner and outer ends, the water-chest 22, secured to the lower side of the plate 20 within the series of buckets and having an annular series of ports registering with said buckets, the vertically-sliding open-ended cylindrical gate closing the inner ends of said ports and resting at its lower edge on the upper face of the water-chest, and operating mechanism connected with the gate through the slotted casing, substantially as set forth.

2. The combination, with the base-plate having a central open-ended cylinder thereon with diagonal slots in the wall thereof, of the horizontally-rotating water-wheel mounted beneath the base-plate, the water-chest held centrally within the water-wheel and having an open top and side ports opening into the water-wheel buckets, the sliding gate held within the base-plate cylinder and adapted to enter the water-chest, the collar embracing the base-plate cylinder, screws extending through the cylinder-slots and connecting the collar and gate, and a gear mechanism for moving the collar, substantially as described.

3. The combination of the open-top water-chest having side ports, the base-plate held above the water-chest and provided with a diagonal slotted open-top cylinder, the gate held to slide in said cylinder and in the water-chest, the collar embracing the base-plate cylinder and having a gear thereon, screws or their equivalents extending through the cylinder-slots and connecting the collar and gate, and a shaft and pinion for turning the collar, substantially as described.

WILLIAM E. SEELYE.

Witnesses:

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JOHN N. NEVERS.