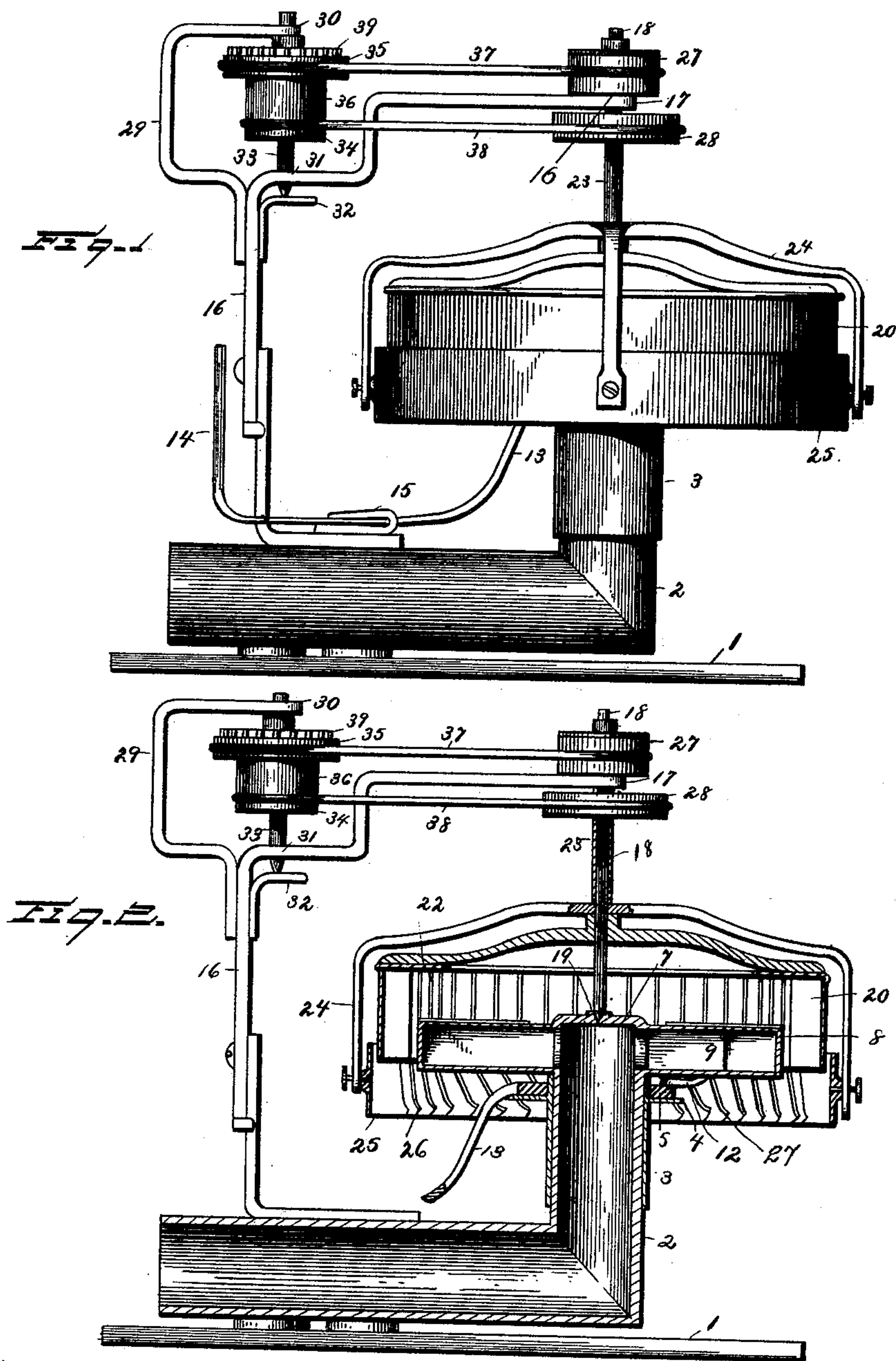


2 Sheets—Sheet 1.

No. 414,196.

Patented Nov. 5, 1889.



Witnesses:

E. Hurdman.

W. L. Linnell

Inventor:

Jackson L. Eaby.

By his Attorneys

Chas Snow & Co

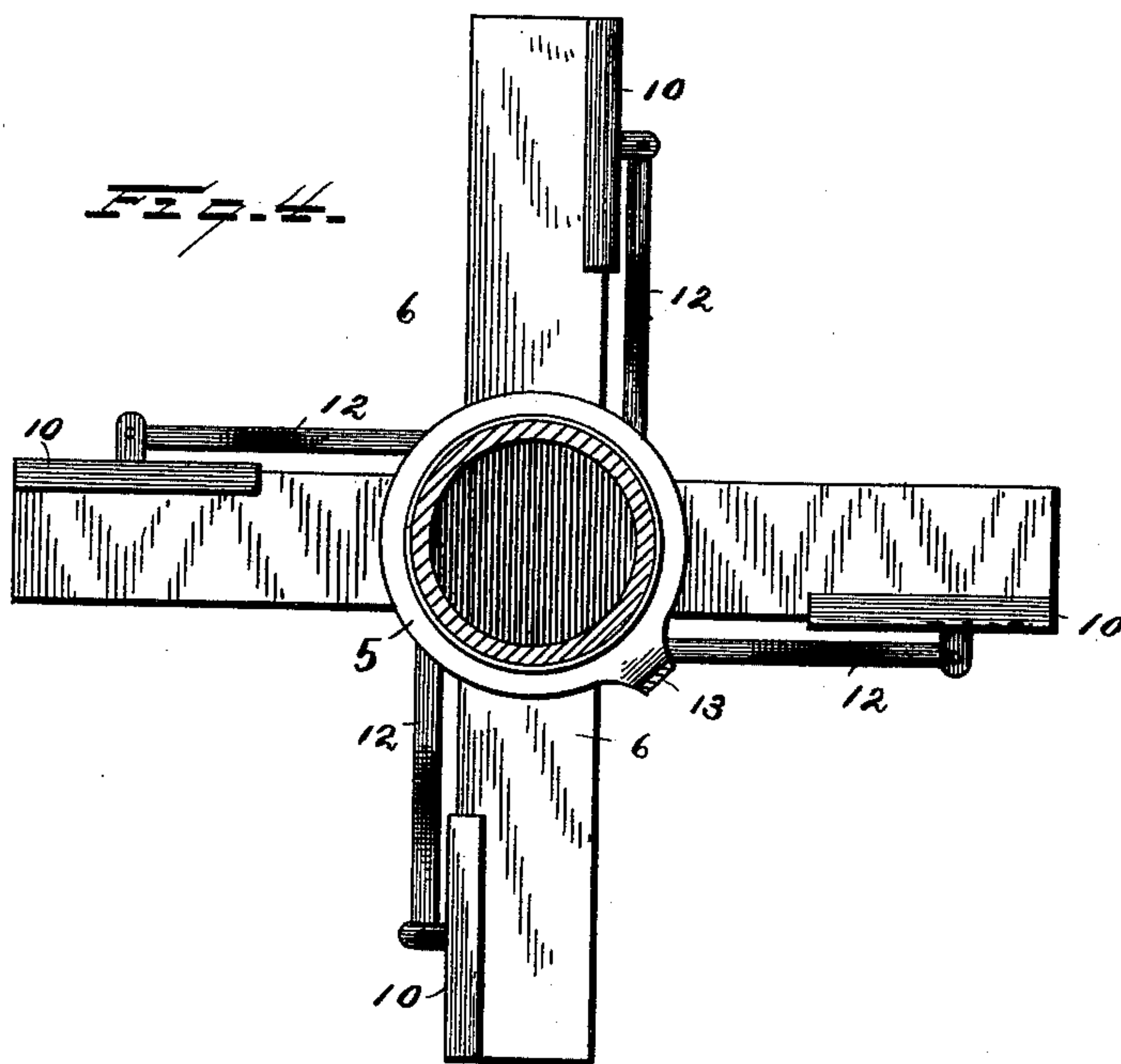
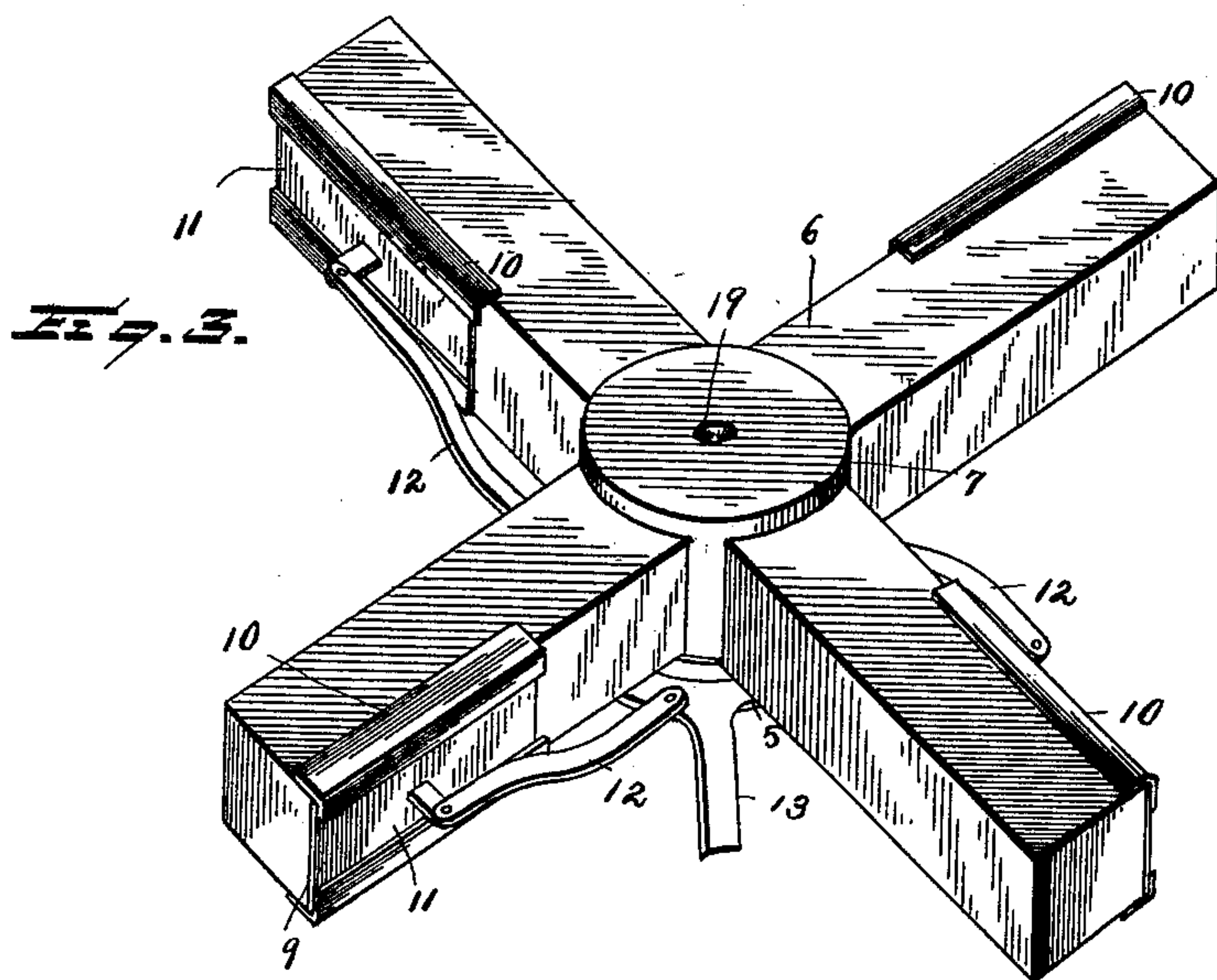
(No Model.)

2 Sheets—Sheet 2.

J. L. EABY.
WATER MOTOR.

No. 414,196.

Patented Nov. 5, 1889.



Witnesses:

E. C. Wurdeman

W. J. Laval

Inventor

Jackson L. Eaby.

By his Attorneys

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UNITED STATES PATENT OFFICE.

JACKSON L. EABY, OF WEST CHESTER, PENNSYLVANIA.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 414,196, dated November 5, 1889.

Application filed May 10, 1889. Serial No. 310,215. (No model.)

To all whom it may concern:

Be it known that I, JACKSON L. EABY, a citizen of the United States, residing at West Chester, in the county of Chester and State of Pennsylvania, have invented a new and useful Water-Wheel, of which the following is a specification.

This invention has relation to water-motors, and among the main objects in view are to utilize to the fullest extent the water-power, and this in a simple manner, and to provide compensating devices, whereby the counter-shaft shall be rotated at a uniform speed, all as will be hereinafter set forth.

The invention consists in certain features of construction hereinafter specified, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a water-motor constructed in accordance with my invention. Fig. 2 is a substantially central vertical section of the same. Fig. 3 is a perspective of the water-chute casting. Fig. 4 is a bottom plan of the same.

Like numerals of reference indicate like parts in all the figures.

1 represents any ordinary base, secured upon which is the elbow 2 of the supply-pipe, to the upper end of which is secured a fixed collar 3, having an annular flange 4 at its upper end, upon which is located a ring 5.

Referring more particularly to Fig. 3, 6 represents what I have termed a "water-chute" casting, and the same consists of a central cylindrical body portion 7, from which radiate hollow water-arms 8, the ends of which are closed and provided with side openings 9, provided with opposite ways 10, in which are located sliding shutters 11, said shutters being loosely connected to the ring 5 by means of links 12, the ends of which are pivoted to the ring 5. An arm 13 extends from the ring and terminates in a handle 14, which is embraced by a guide 15 and adapted to be held thereby at such a position as to control the supply of water through the openings in the water-arms.

16 represents a standard of substantially U shape, one of the terminals of which is projected over the water-arm and provided with a bearing 17, in which is journaled a vertical

shaft 18, the opposite end of which takes bearing in a step 19, formed in the upper end of the cylinder 7 of the water-chute casting. Upon the spindle or shaft 18 is mounted rigid therewith an ordinary turbine wheel 20, the spider or arms of which radiate from the shaft and are fastened to the rim of said wheel. Inwardly-disposed blades 22 project from the inner surface or periphery of the wheel and closely to the ends of the water-arms, and against the same the stream of water from the arms is adapted to be thrown.

Above the water-wheel 20 and its spider is located upon the shaft 18 a loose sleeve 23, which carries a rigid spider 24, the ends of which loosely embrace the water-wheel 20, and are provided below said wheel with a second water-wheel 25, of a size approximating the wheel 20. The wheel 25 is provided upon its inner periphery with inwardly-disposed slanting blades 26, the ends of which are outwardly bent, as at 27, the blades registering in number and location with those of the wheel 20.

Above the bearing 16, formed in the arm 17, and rigid with the shaft, is a small pulley 27, and upon the sleeve is mounted a larger pulley 28, the second pulley being substantially twice the size of the pulley 27.

29 represents a supplemental U-shaped standard secured to the standard 16, and is provided with a bearing 30 at its terminal, which registers with a bearing 31, formed in the upper branch of the standard 16, and below the same and affixed to the standard 16 is a bearing-step 32. In the bearings thus described and terminating in the step is a vertical counter-shaft 33, which carries a rigid pulley 34, having an upper large pulley portion 35 and a smaller pulley portion 36. A belt 37 extends from the pulley 27 to the large pulley 35, and from the large pulley 28 there extends a belt 38, which takes over the smaller pulley 36. The counter-shaft is also provided with a gear or other motion-transmitting device 39.

The operation of my invention is as follows: Water admitted through the supply-pipe 2 passes into the cylinder 7 and the arms 8, where its emission is regulated by the gates 11 through the medium of the handle. Water passing through the arms 8 is first projected

against the blades of the wheel 20, which blades are preferably arranged in a vertical position, or at a right angle to the wheel. This propels the wheel, and said wheel being
 5 rigid with the vertical shaft 18, said shaft is rotated, as is also the pulley 27, and through the medium of the belt 31 the pulley 35 and its counter-shaft are also rotated. The water
 10 that falls from the vertical blades of the wheel 20 next falls upon the inclined blades of the lower wheel 25, which is rotated in the same direction as the wheel 20, though at a decreased speed. As the wheel 25 rotates, it rotates its sleeve, which embraces the shaft 18,
 15 and then imparts motion to the pulley 28 and through the medium of its belt to the smaller pulley 36. By this it will be seen that although the two water-wheels operate at different speeds, and also that their respective
 20 pulleys 27 and 28 likewise operate at different speeds, yet they are so proportioned with relation to each other and with relation to the pulleys 35 and 36 as to operate the counter-shaft at a uniform speed, each water-wheel
 25 contributing to the rotation of the shaft.

I have described the water-chute 6 as being cast; but, if desired, I may form the same of sheet metal or other desirable material, and do not limit myself in this respect or to other
 30 details of construction and the proportions herein specified, but hold that I may vary the same in any manner and to any extent within the scope of persons skilled in the construction of motors.

35 Having described my invention, what I claim is—

1. In a water-motor, the combination, with a vertical shaft carrying a water-wheel having a series of inwardly-disposed straight ver-
 40 tical blades, a sleeve mounted loosely on the shaft, and a wheel mounted thereon provided with a series of inwardly-disposed blades terminating in lower curved ends and arranged below the first-mentioned blade, of a water-
 45 chute mounted within the first-mentioned

wheel and arranged to deliver water at a right angle to the straight blades, substantially as specified.

2. In a water-motor, a water-chute formed with the central cylindrical portion, radiating
 50 arms provided with side openings, and sliding gates mounted over the openings, in combination with a ring mounted below the cylinder, links for connecting this ring and gates, and a lever for operating the ring, substan-
 55 tially as specified.

3. In a water-motor, a supply-pipe provided with a collar having an annular flange at its upper end, and a ring mounted for movement on the collar and having an operating-lever, in
 60 combination with a water-chute consisting of a central cylinder seated within the collar and having radiating arms provided with openings and shutters for closing the same, and links connecting the shutters and ring, 65 substantially as specified.

4. The combination, with the U-shaped standard 16, terminating in the bearing 17, having the intermediate bearing 31 and the
 70 step 32 arranged below the latter, of the pipe 2, the casting mounted thereon and having the bearing 19 in line with the bearing 17, the smaller U-shaped frame or standard 29, terminating in the bearing 30 in line with the bearing 31 and mounted upon the rear
 75 end of the standard 16, the counter-shaft 33, mounted in bearings 30, 31, and 32, and having large and small pulleys 35 and 36, the water-wheel-carrying shaft 18, mounted in bearings 17 and 19 and having small and large pulleys
 80 27 and 28, and the belts 37 and 38, connecting the pulleys 35 and 27 and 36 and 28, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in
 85 presence of two witnesses.

JACKSON L. EABY.

Witnesses:

JOHN L. GREENFIELD,
 HOWARD I. REED.