

No. 711,758.

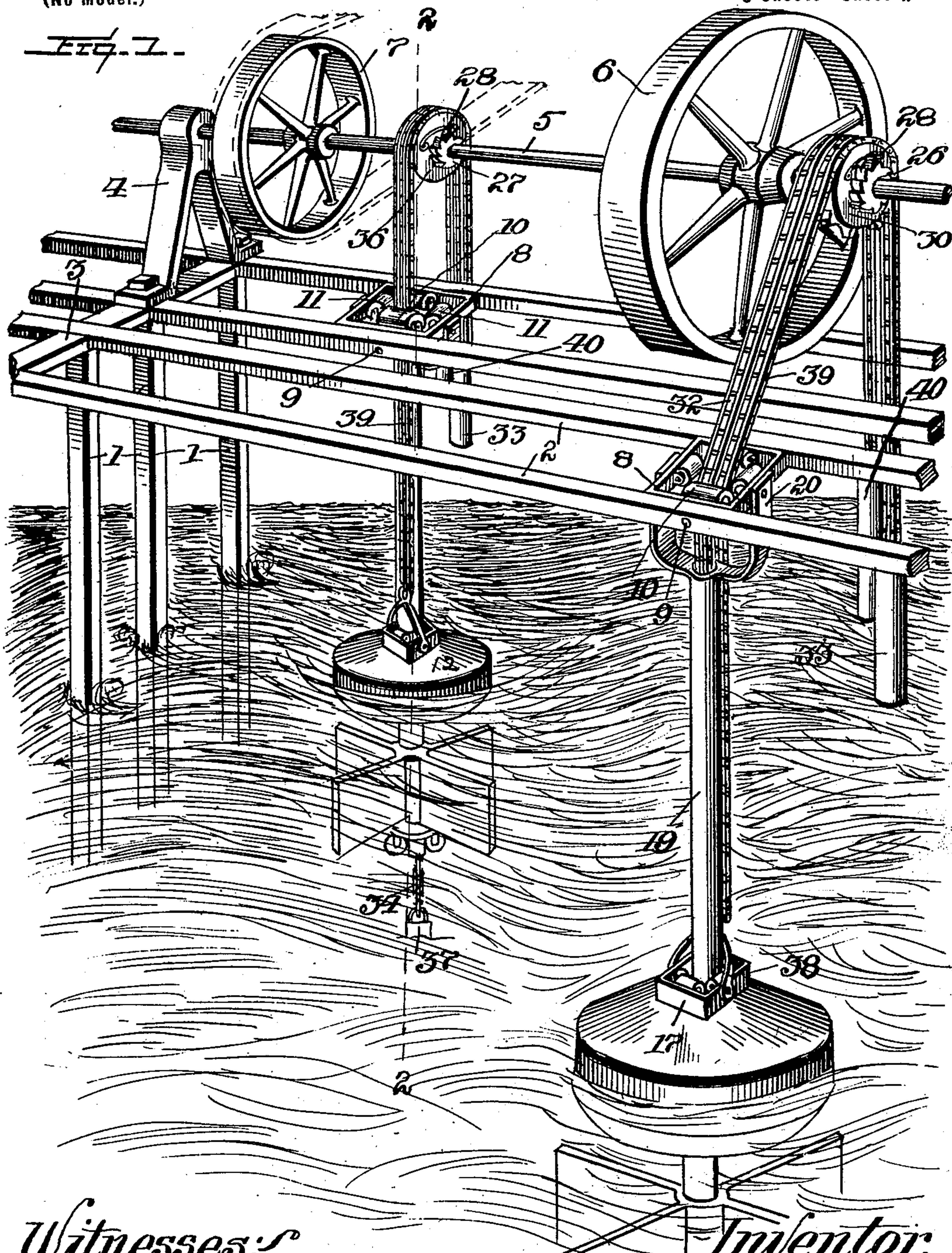
Patented Oct. 21, 1902.

D. K. BRYSON.
WAVE POWER MOTOR.

(Application filed Feb. 7, 1902.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
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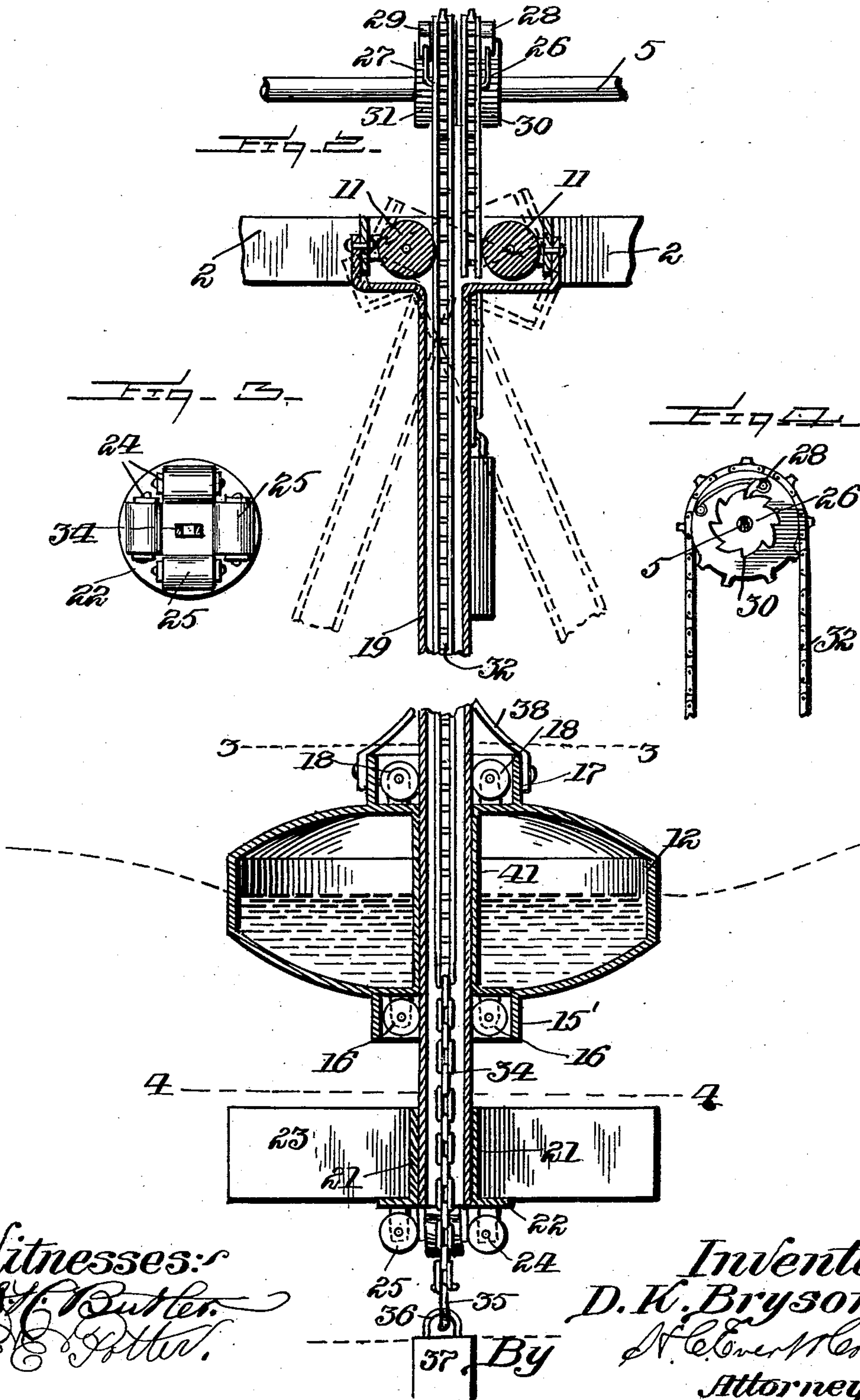
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

Fig. 5 -

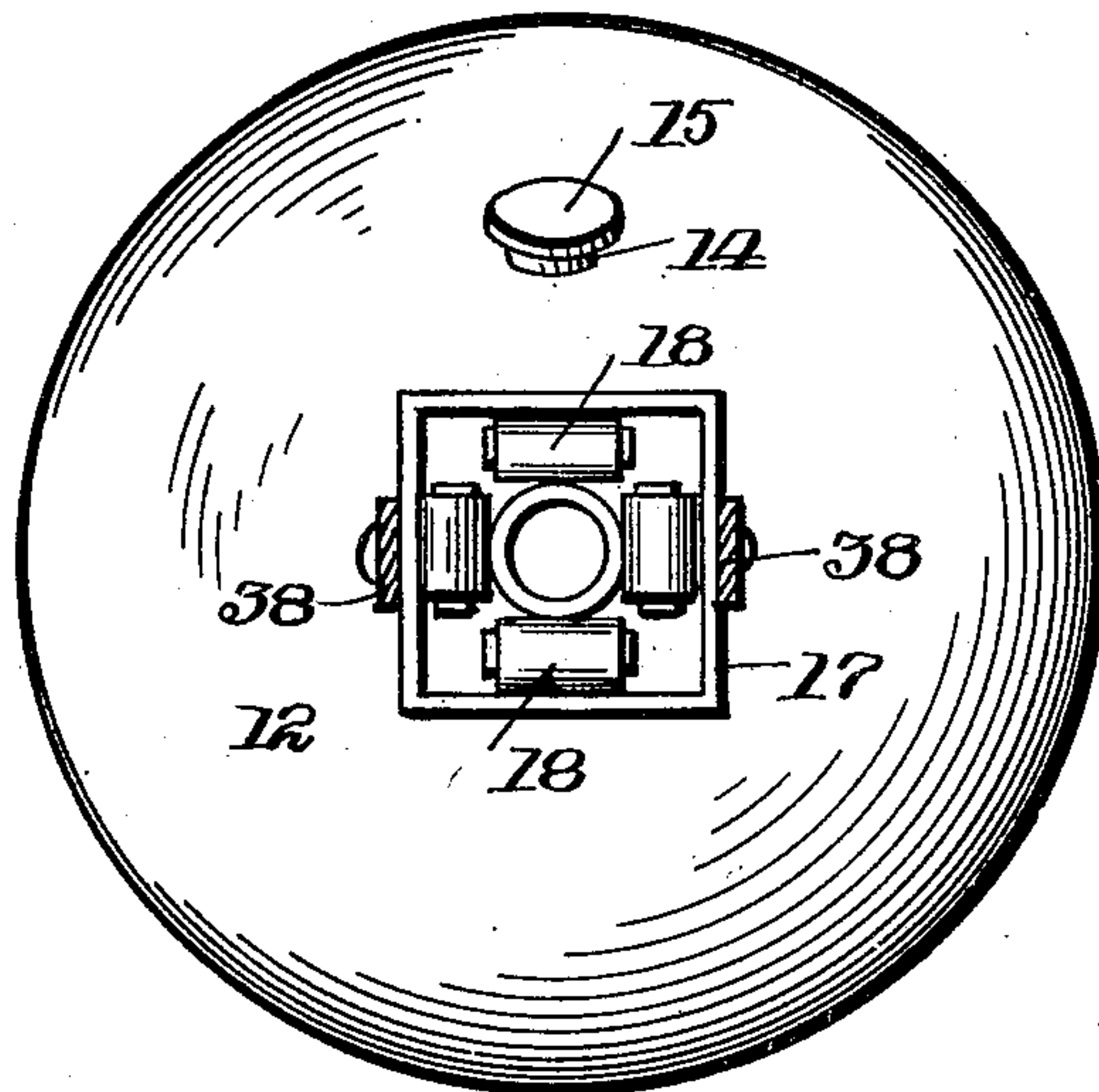


Fig. 6 -

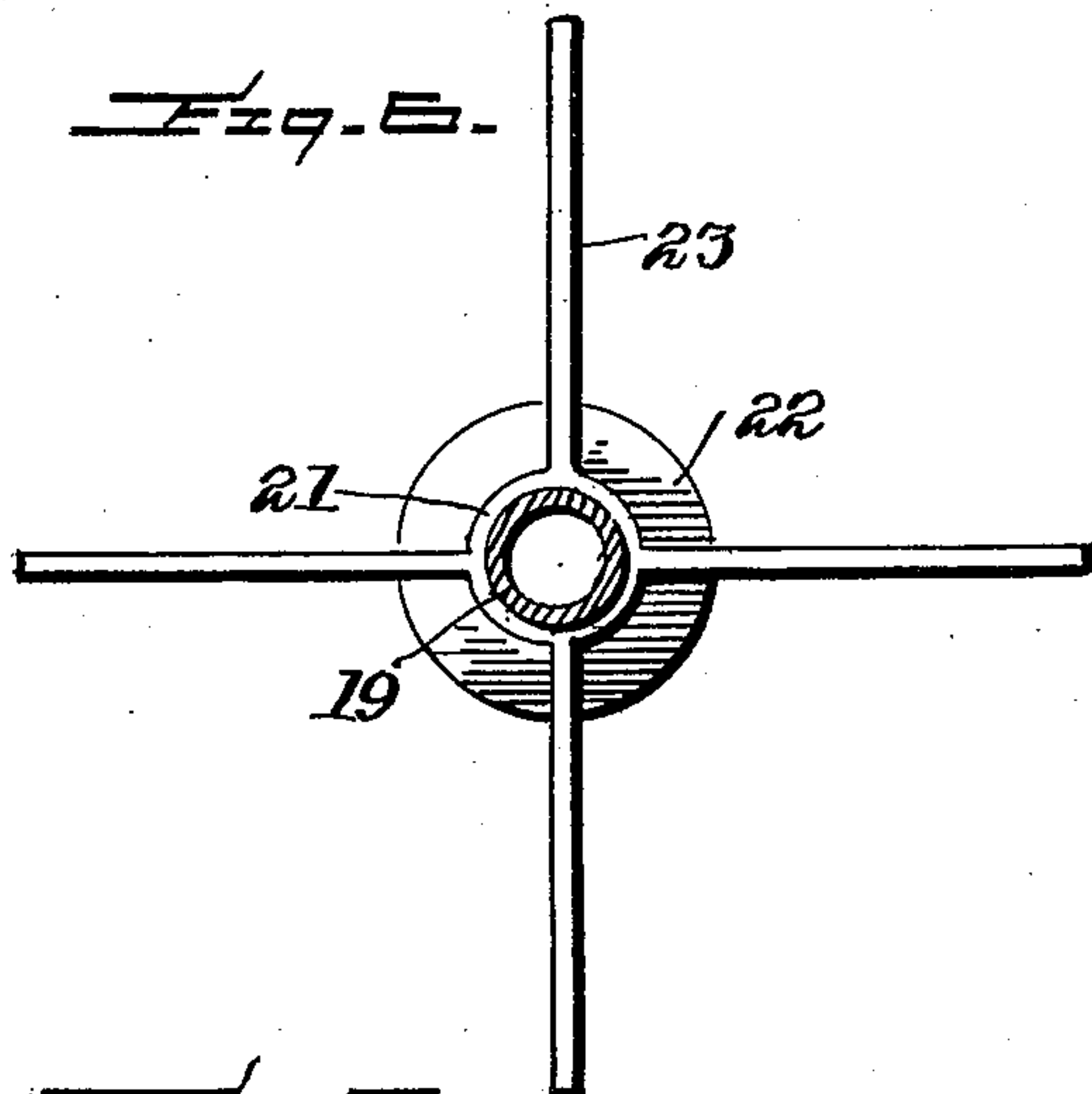
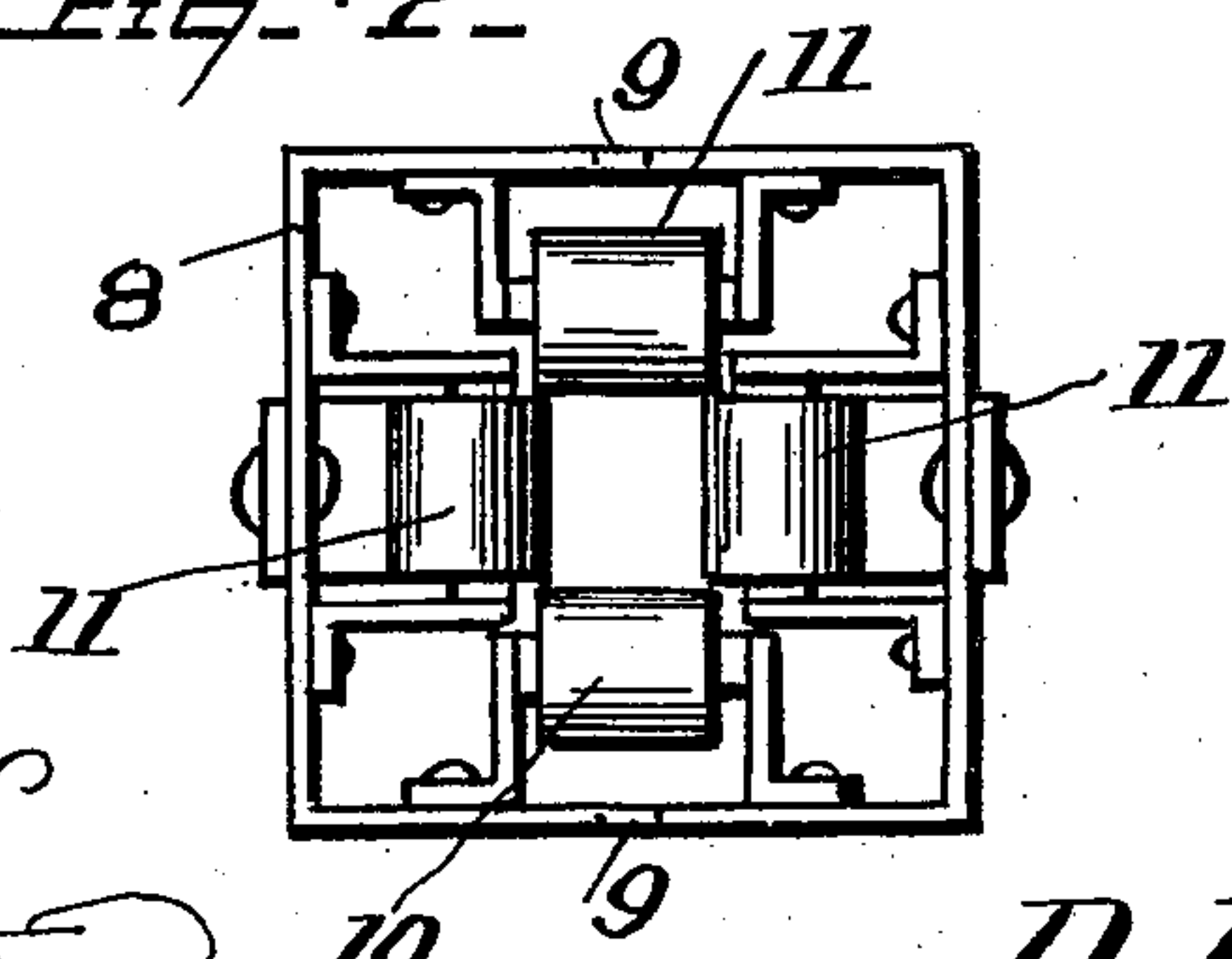


Fig. 7 -



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UNITED STATES PATENT OFFICE.

DAVID K. BRYSON, OF PITTSBURG, PENNSYLVANIA.

WAVE-POWER MOTOR.

SPECIFICATION forming part of Letters Patent No. 711,758, dated October 21, 1902.

Application filed February 7, 1902. Serial No. 93,005. (No model.)

To all whom it may concern:

Be it known that I, DAVID K. BRYSON, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Wave-Power Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in wave-motors, and has for its object a motor which will utilize the horizontal as well as the vertical motion of the waves.

15 My invention has for its further object a wave-motor wherein the direction of the propeller means shall at all times remain invariable, irrespective of the direction in which the waves are running.

20 The invention further resides in the simplicity and economical features of construction, the comparative inexpense to manufacture, and the efficient operation.

25 With the above and other objects in view the invention consists in the novel combination and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claims.

30 In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

35 Figure 1 is a perspective view of my invention, showing the staggered arrangement of the series of motors. Fig. 2 is a central vertical sectional view taken on the line 2-2 of Fig. 1. Fig. 3 is an underneath plan view of the guide-rollers carried by the float. Fig. 4
40 is a side elevation of one of the sprocket-wheels. Fig. 5 is a horizontal sectional view taken on the line 3-3 of Fig. 2. Fig. 6 is a horizontal sectional view on the line 4-4 of Fig. 2. Fig. 7 is a top plan view of the rocking
45 frame and the guide-rollers carried thereby.

50 In order to afford a rigid structure for the purpose of supporting the series of power units, I embed within the bed of the body of water the motion of which is to be utilized to actuate the power units a series of standards 1, carrying suitably-spaced beams 2 and a transverse bar 3 at their upper end. This

rigid frame may be constructed in various manners, and the material employed in connection therewith may also vary. Shaft-supports 4 are carried by the frame and have a revoluble shaft 5, carrying a fly-wheel 6 and a drive-wheel 7, connected thereto.

Between the beams 2 is mounted a series of rocking frames 8, which are pivotally mounted as shown at 9. Mounted within this rocking frame are two pairs of diametrically-arranged guide-rollers 10 11, the purpose of which will be fully hereinafter set forth.

65 The float or casing 12 is perfectly air-tight and is preferably of an annular form with convexed upper and lower faces. The upper face of this float or casing 12 has a suitable inlet 14 therein, closed by means of the plug 15, whereby access to the interior may be had in order to place a sufficient quantity of water or any other liquid therein, the quantity of liquid varying according to the specific gravity of the same, but in all cases being such as will cause the float or casing to have substantially one-half of its height submerged in the body of water. To the lower side of this casing is a depending flange 15', surrounding a series of antifriction-rollers 16, which are revolubly carried by the bottom of the float or casing 12. A like flange 17 is carried by the upper side of the casing and likewise surrounds a series of antifriction-rollers 18, revolubly carried by the upper side of the float or casing 12. A tube 19 has its upper end carrying a yoke 20, the upper ends of the yoke being pivoted to the sides of the rocking frame 8. The lower end of this tube 19 carries a collar 21, the lower end of which is bent outwardly to form an annular flange which engages a series of outwardly-extending fins 23, carried by the collar 21. Downwardly-extending brackets 24, carrying antifriction-rollers 25, are carried by this annular flange 22 of the collar 21.

To the drive-shaft 5 is keyed a pair of ratchet-wheels 26 and 27, which are adapted to be engaged by the spring-pressed pawls 28 and 29, carried by the loosely-mounted sprocket-wheels 30 and 31 of the drive-shaft 5. The loosely-mounted sprocket-wheel 31 has a chain 32, carrying a suitable weight 33 at its one end mounted thereon, the other end

of the chain passing through the tube 19 and carries the ordinary chain 34 at its lower end, this chain passing downwardly through the collar 21 between the several antifriction-
5 rollers 25 and carries a hook 35 at its lower end which is engaged by the staple 36 on the upper end of the post 37, the latter being rigidly affixed in the bed of the body of water.

To the upwardly-extending flange 17 of the float or casing 12 is pivotally secured a yoke 38, the upper end of which has secured thereto a sprocket-chain 39, which extends upwardly between the guide-rollers 10 and 11 over the loosely-mounted sprocket-wheel 31
15 and from thence passes downwardly and carries a weight 40 at its lower end.

It will be noted that the float 12 is slidingly mounted upon the tube 19 by means of a sleeve 41, which is rigidly attached to the float or casing 12. This casing in its movement upon the tube 19 will be materially furthered in its ease of action by means of the guide-rollers 16 and 18, which contact with the periphery of the tube 19. I desire to call
20 attention to the fact that any number of these floats may be employed in connection with the shaft in order to propel the latter, the number being dependent upon the amount of power desired. I find when more than one
25 float is employed that it is highly advantageous to give the same a zigzag or staggered arrangement, as clearly illustrated in Fig. 1 of the drawings.

We will assume for the purpose of illustration that the several floats have been placed in their respective positions, as previously described, in which instance the latter are in a position to utilize the various motions of the waves. The up - and - down motion of the
35 waves, or rather the vertical motion of the same, will cause the float 12 to ride up and down upon the tube 19, which will cause the weight 40 to move therewith. Upon the upward movement of the float the sprocket-chain will propel the sprocket-wheel in the direction from left to right, and upon the
45 downward movement of the float the spring-pressed pawl will engage in the teeth of the ratchet-wheel and cause the shaft 5 to revolve. The invention also aims to utilize the horizontal motion of the waves—that is, the movement from said right to left or left to right or in a plane transverse to that direction, which movement of the float will cause
55 the tube to move therewith, the tube moving about its pivoted connection with the rocking frame. This motion of the tube and the float will cause the rollers 25 to engage with the chain 34, which is rigidly secured at its
60 lower end to the post 37, and move the chain in a horizontal direction, which is made possible by the rocking frame having a pivotal movement. This horizontal motion of the tube and the float will cause the sprocket-chain 32
65 to revolve the loosely - mounted sprocket-wheel 31, mounted on the shaft 5, causing the spring-pressed pawl to engage in the teeth of

the ratchet-wheel, and thus revolve the shaft 12. It will be noted that when the vertical movement of the waves is utilized the downward motion of the float is the power-stroke, causing the pawl to engage in the ratchet-wheel and revolve the shaft 5, and when the horizontal motion of the waves is utilized the outward movement of the float is the power-stroke, the weights in both instances merely serving to take up the slack in the sprocket-chain, thereby causing the latter to engage in the teeth of the sprocket-wheels at all times. The fins 23 serve the purpose of steadying or retarding the horizontal motion of the tube carrying the float when it is desired to utilize the vertical movement of the float only, which relieves the frame of any strain which would result were the lower end of the tube rigidly
70 affixed to the bed of the body of water. I desire to call attention to the fact that this double action of the motor may be carried on simultaneously—that is, the tube and float may move to the horizontal direction simultaneously with the up-and-down movement of the float—which will utilize both the vertical and horizontal motion of the waves and cause delivery of power on the shafts to be more constant, the power from the downstroke
75 commencing where the power from the outward or horizontal stroke stops.

I have illustrated in the accompanying drawings the most practical embodiment of my invention; but I do not wish to limit myself to the exact construction as shown and described, since it is obvious that various minor changes in the details of construction and combination of parts may be made without departing from the general spirit and
80 scope of my invention.

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

1. In a device of the character described, the combination with a suitable support and a shaft carried thereby, of a rocking frame mounted on the support and carrying a tube, a float movably mounted on said tube, sprocket-wheels loosely mounted upon said shaft and carrying pawls with ratchet-wheels rigidly carried by the shaft and adapted to be engaged by said pawls, chains engaging over said sprocket-wheels with one of said chains passing through the said tube and secured in the bed of the water, the other of said chains being connected to said float, the other ends of both of the chains being weighted, substantially as described.

2. In a device of the character described, the combination with a suitable support and a shaft carried thereby, of a tube having a movable connection with said support and a float movably mounted on said tube, means for driving said shaft by the horizontal motion of the waves connected to the shaft and passing through the said tube and connected to the bed of the body of water, means for driving the shaft by the vertical motion of

the waves connected to the shaft and the float, substantially as described.

3. In a device of the character described, the combination with a support and the shaft carried thereby, of a tubular means having a movable connection with the support in a rotary horizontal plane, a float having a vertical movement mounted on said tubular means, means carried by the shaft adapted to be actuated by the movement of said float and the tubular means, means connected to said last-named means and secured in the bed of the body of water, and means engaging the means carried by the said shaft and connected to the float, substantially as described.

4. In a device of the character described, the combination with the support carrying the shaft, of tubular means having a movable connection with the support in a rotary horizontal plane and carrying a float thereon movable in a vertical plane, of means received within said tubular means and secured to the bed of the body of water and engaging the shaft, and means secured to the float and the shaft, and operative independently of the means engaging the tubular means, substantially as described.

5. In a device of the character described, the combination with a support carrying a shaft, of a tube carrying a yoke at its upper end and a frame pivotally carried by the support and

having a movable connection with said yoke, a float movable on said tube, sprocket-wheels carrying pawls mounted on the shaft with ratchet-wheels rigidly connected to the shaft and engaging the pawls, a weighted chain passing over one of said sprocket-wheels received within said tube and secured to the bed of the body of water, a second weighted chain engaging the other sprocket-wheel and secured to the float, and a series of fins carried by the lower end of the tube, substantially as described.

6. In a device of the character described, the combination with the support carrying the shaft, tubular means movable in a rotary horizontal plane and engaging a means suitably connected to the shaft and secured in the bed of the body of water whereby the shaft may be actuated, and means movable on said tubular means in a vertical direction and having means connected thereto and to the shaft whereby the shaft may be rotated by the movement of said means, substantially as described.

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

DAVID K. BRYSON.

Witnesses:

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