

No. 628,458.

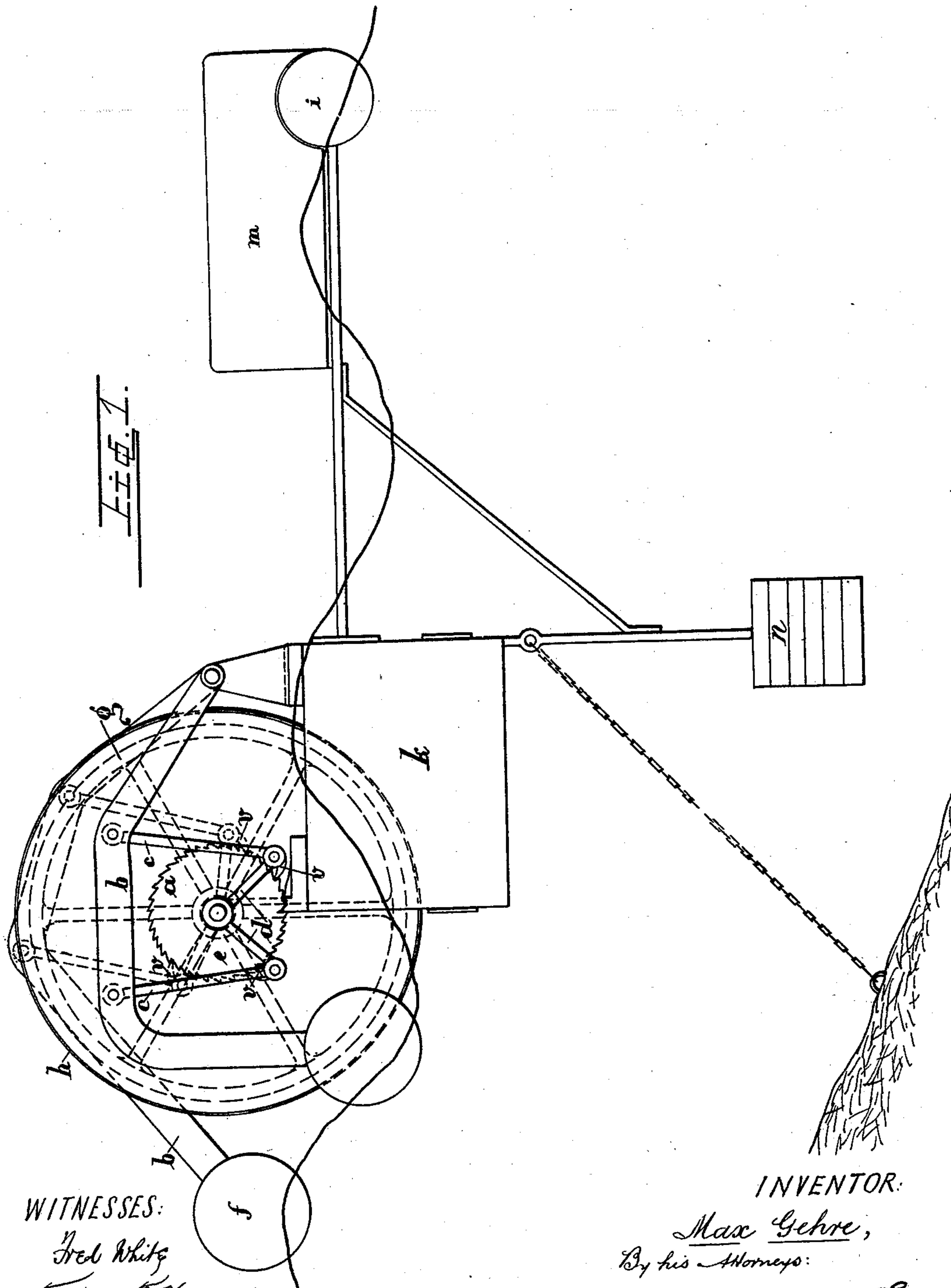
Patented July 11, 1899.

M. GEHRE.  
WAVE MOTOR.

(Application filed Apr. 13, 1899.)

2 Sheets—Sheet 1.

(No Model.)



WITNESSES:

Fred White  
Thomas F. Wallace

INVENTOR:

Max Gehre,  
By his Attorneys:  
Arthur C. Orner & Co.

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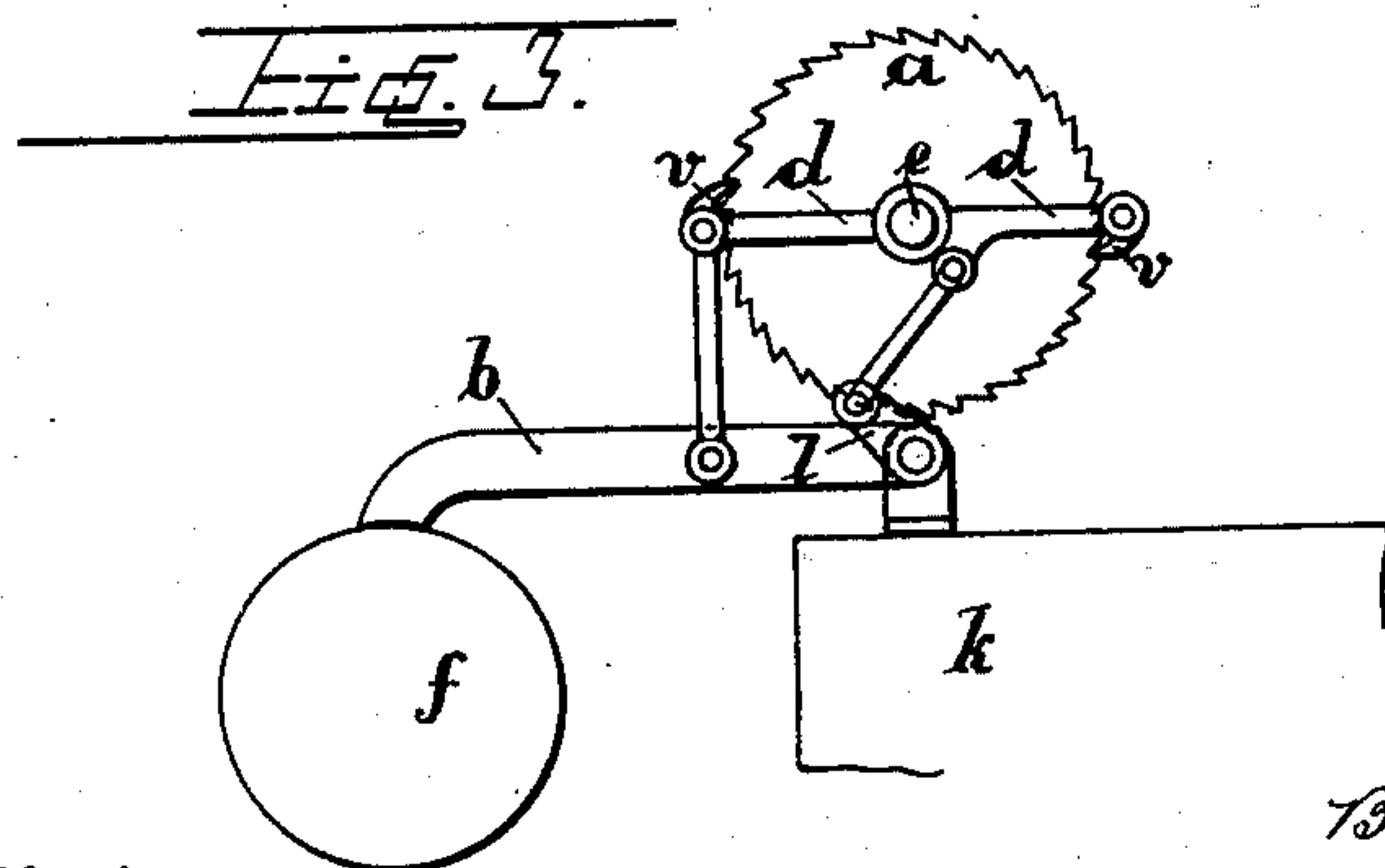
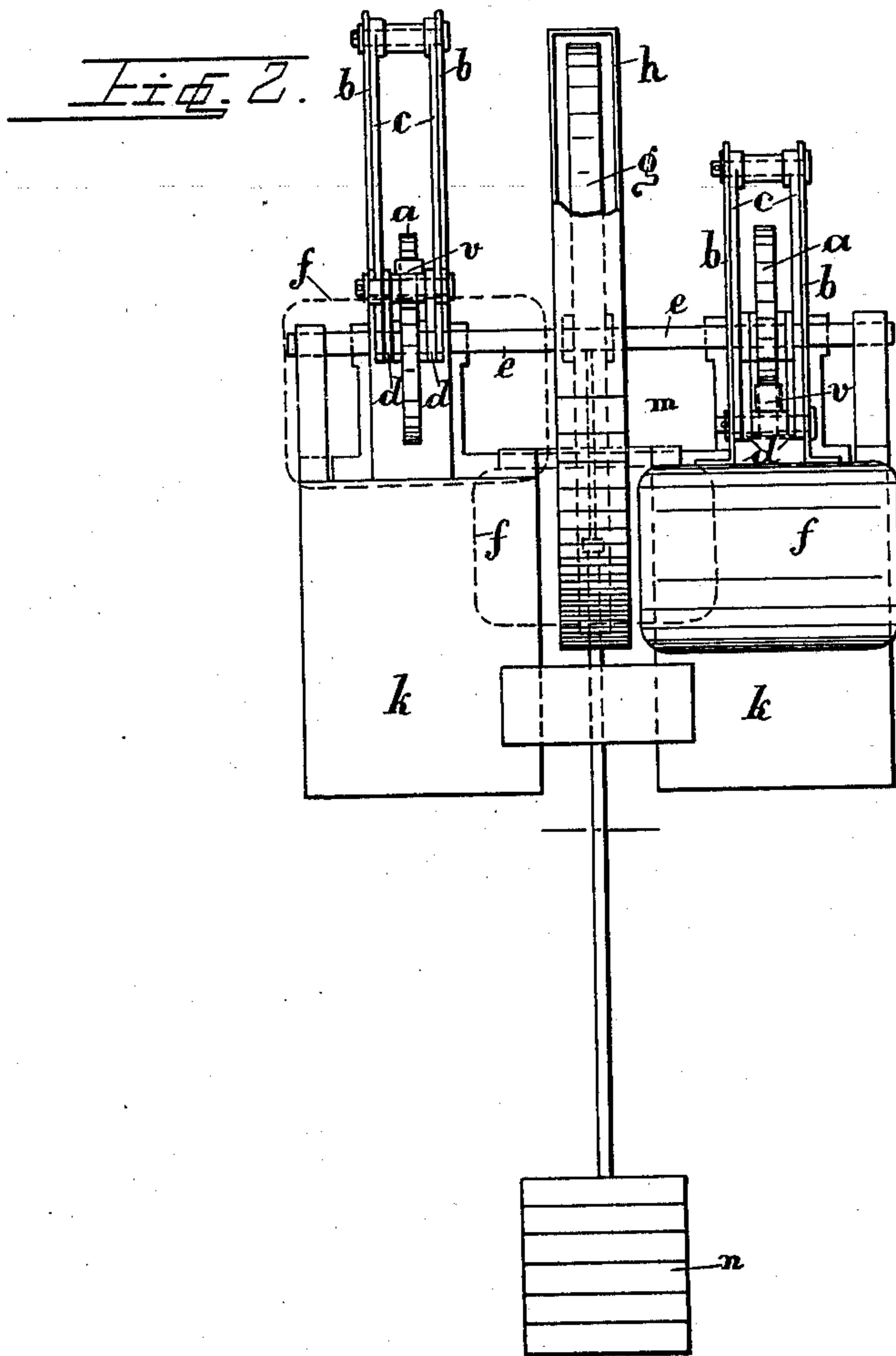
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# UNITED STATES PATENT OFFICE.

MAX GEHRE, OF RATH, GERMANY.

## WAVE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 628,458, dated July 11, 1899.

Application filed April 13, 1899. Serial No. 712,877. (No model.)

*To all whom it may concern:*

Be it known that I, MAX GEHRE, engineer, a subject of the German Emperor, residing at Rath, near Dusseldorf, in the German Empire, have invented certain new and useful Improvements in Wave-Motors; 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.

The usual arrangements for transmitting movement for ordinary purposes by means of floats swinging under the action of the waves of the sea are such that a reciprocatory or rotary movement is transmitted on the rise and fall of the floats or floating bodies or when a ratchet-gearing is employed as transmitting device a ratchet movement is produced only on the descent or only on the ascent of the floating body.

In the wave-motor which forms the object of the present invention the transmission-shaft undergoes a rotation in the same direction both during the upward movement and also the downward movement of a float swinging on a point on a buoy or float. For this object the connection of two ratchet-arms with a float is established in such a way that on the upward movement and also on the downward movement of the float the two ratchet-arms make rotations in opposite directions one to another, while during the ratchet movement of the one pawl the other pawl returns to the position necessary for its ratchet movement.

In the accompanying drawings, Figure 1 is a side view of the double-ratchet mechanism; Fig. 2, a front view of same; Fig. 3, a modification.

The floating bodies *f* pivot or swing on a fixed point by means of levers *b* on a raft or buoy *k*, carrying the ratchet-gearing. The ratchet-pawls *v* are pressed on the teeth of the ratchet-wheel *a* in the ordinary manner by means of springs and are operated by a ratchet-arm *d*, revoluble on the shaft of said ratchet-wheel, which shaft is provided with a fly-wheel *g*. In the example shown two ratchet-wheels are arranged on the shaft *e*, each of which is operated by a float *f*. The two ratchet-arms *d* belonging to one of the ratchet-wheels are guided by and connected

with the levers *b* belonging thereto by means of links *c*, lying on opposite sides of the shaft *e*, in such a way that on the rise as well as on the fall of the respective floats *f* the two ratchet-arms make rotations in opposite directions one to another, whereby during the forward or ratchet movement of the one pawl *v* the other pawl *v* makes the return movement to prepare for a forward or ratchet movement. On the rise and fall of one of the floats *f* the shaft *e* receives from the floating body two rotations or impulses in the same direction by means of the double-pawl gear.

In Fig. 3 the transmission of the up-and-down movement of the floating body *f* takes place directly from the lever *b* to one of the two arms *d* through a link; but the other ratchet-arm *d* is operated through a link from an arm on the spindle of the lever *b*, so that here also the two ratchet-arms make rotations in opposite directions to one another.

A float *i*, arranged at some distance from the buoy *k* on an arm, acts to prevent the up-setting of the buoy in the one direction by means of its buoyancy and in the other direction by means of its weight.

In order to direct the buoy and the floats always against the waves, a vane or blade *m* is arranged on the float *i* or between the buoy and the float *i*, which gives the buoy the direction of the wind.

In order to increase the stability of the buoy, a weight *n* is attached thereto by means of suspension-rods and immersed as deeply as possible, which weight prevents any tipping up of the buoy. The buoy is anchored or otherwise suitably moored to the bottom of the sea.

The fly-wheel *g* of the shaft *e* is arranged in a casing *h*, which prevents the waves striking against the fly-wheel and impeding its travel and losses resulting by friction in the water, and the rotary movement of the shaft *e* is utilized in the ordinary manner for generating electricity or for other purposes.

As in the present arrangement it is mainly a question of obtaining as even a travel as possible, several floats *f*, with levers *b* of different lengths, may be so arranged that they do not rise and fall simultaneously, but at certain intervals of time.

Having now described my invention, what

I claim, and desire to secure by Letters Patent, is—

1. In a motor for utilizing the power of the sea-waves, the combination of a buoy provided with pivoted or oscillatory floats, a transmission-shaft, and two ratchet-arms connected with the floats so that both on the upward and the downward movement of the floats the said arms are caused to turn in opposite directions, substantially as and for the purpose set forth.

2. In a motor for utilizing the power of the

sea-waves, the combination with a buoy of a float arranged on an arm thereon and a vane mounted either on the float or between the float and the buoy, substantially as and for the purpose set forth.

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

MAX GEHRE.

Witnesses:

WILLIAM ESSENWEIN,  
GEO. P. PETTIT.