(No Model.)

J. G. C. & E. RANK.

MOTOR.

No. 372,086. Patented Oct. 25, 1887.

Fig. 1

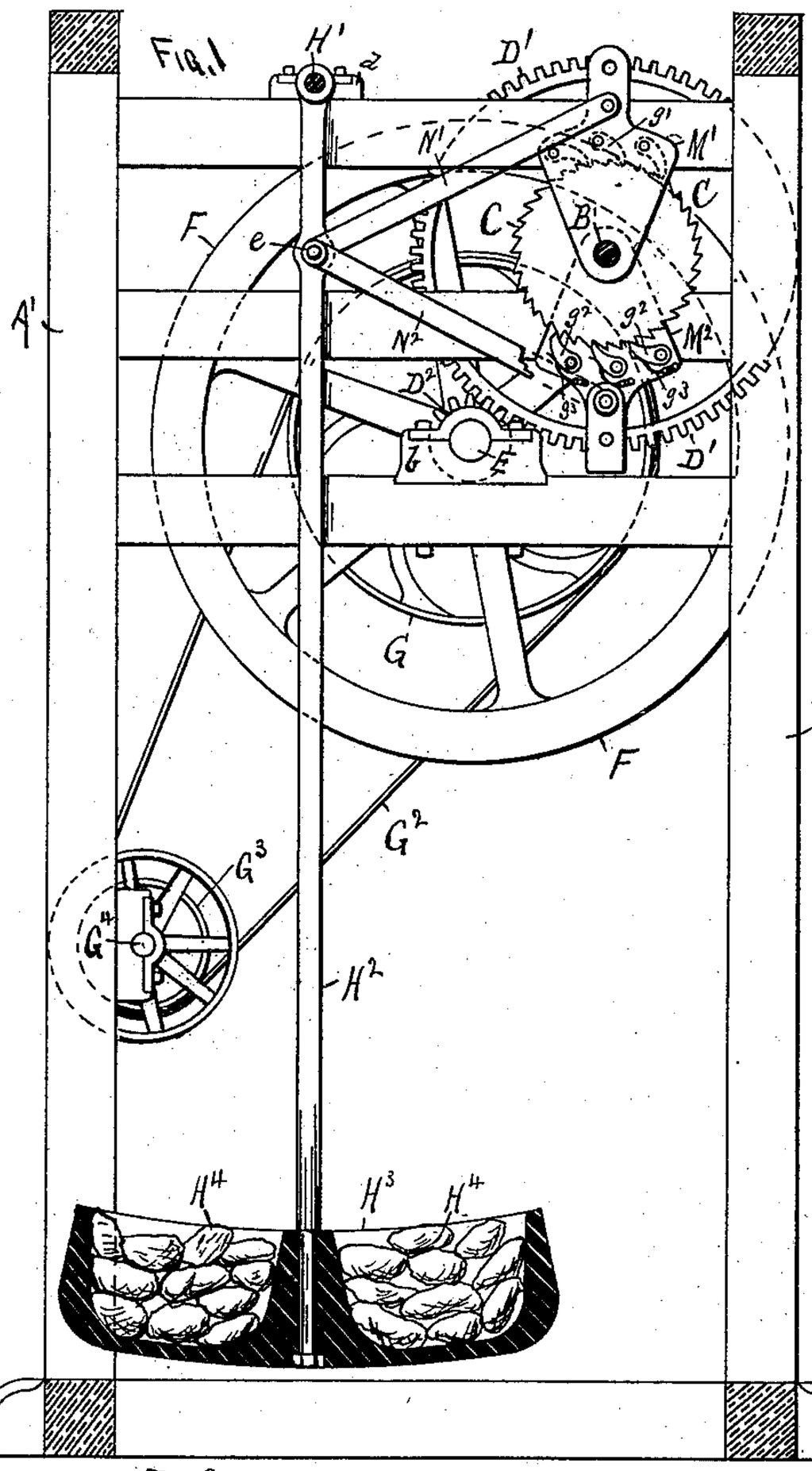


Fig. 2

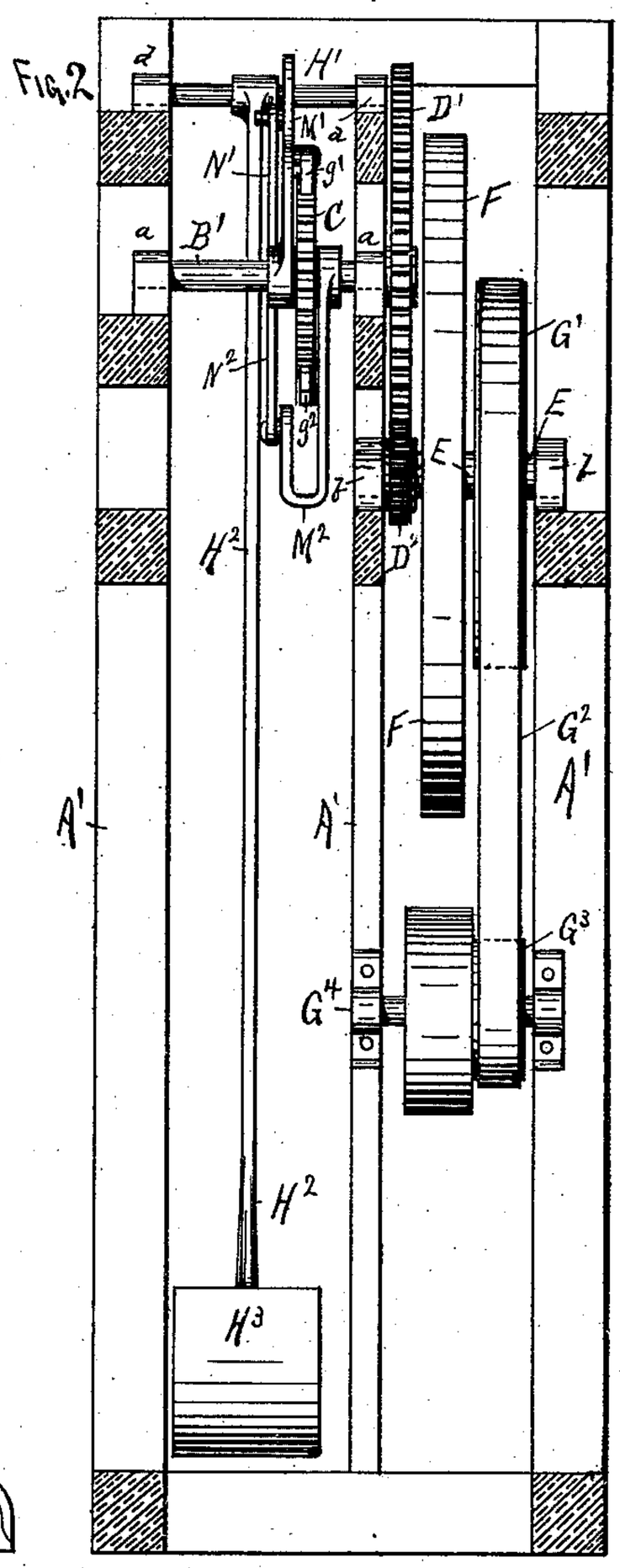
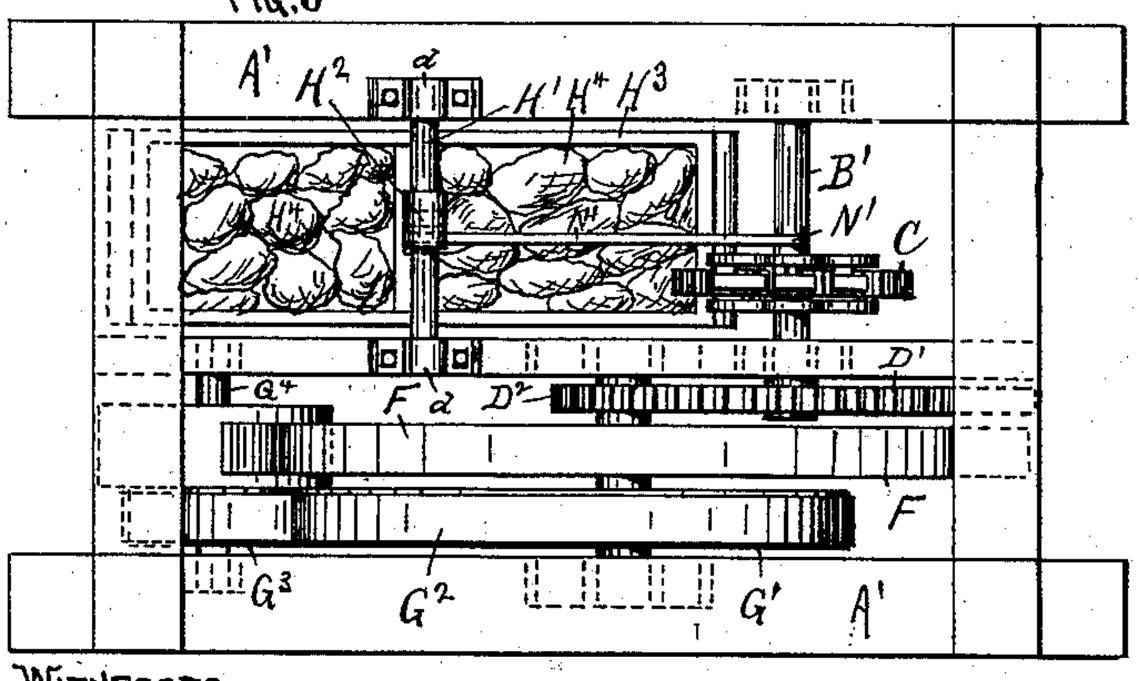


Fig. 3



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN GOTTFRIED CHRISTIAN RANK AND ERDMANN RANK, OF ST. PAUL, MINNESOTA.

MOTOR.

SPECIFICATION forming part of Letters Patent No. 372,086, dated October 25, 1887.

Application filed April 30, 1887. Serial No. 236,725. (No model.)

To all whom it may concern:

Be it known that we, JOHN GOTTFRIED CHRISTIAN RANK and ERDMANN RANK, both subjects of the Emperor of Germany, both having declared our intention of becoming citizens of the United States, and both residing at St. Paul, in the county of Ramsey and State of Minnesota, have jointly invented certain new and useful Improvements in Motors, of which the following is a specification.

This invention relates to machines for applying mechanical power; and it consists in the construction, combination, and arrangement of parts, as hereinafter shown and described, and specifically pointed out in the claim.

In the drawings, Figure 1 is a sectional side elevation of the machine. Fig. 2 is a sectional end elevation. Fig. 3 is a plan view of the machine complete.

A′ represents the frame of the machine, which may be made of any form or material, and will be provided with a shaft, B′, mounted in bearings *a* on the frame A′, and provided with a ratchet-wheel, C, and a gear-wheel, D′, the latter adapted to engage with a pinion, D^2, on another shaft, E, likewise mounted by suitable bearings, *b*, on the frame A′, as shown. The shaft E also has a balance-wheel, F, and band-wheel G′, by which the power from the shaft B′ may be transmitted to any machinery which it is desired to operate by the motor or power. In the drawings the band-wheel G′ is shown connected by belt G^2 to a smaller wheel, G^3, on a counter-shaft, G^4; but of course it will be understood that the power may be conducted to any point desired and used for driving any kind of machinery. H′ is another shaft mounted by bearings *d* upon the upper part of the frame A′, and having a pendulum, H^2, suspended from it, as shown, the pendulum having a weight, H^3, attached to its lower end.

Journaled upon the shaft B′ of the ratchet-wheel C are two plates, M′ M^2, one extending upward and the other extending downward, as shown, the upper plate, M′, connected by a rod, N′, to the pendulum H^2, and having pawls *g′*, engaging with the ratchet-teeth on the wheel C from above, and the other plate, M^2, connected by another rod, N^2, to the same pendulum, and having pawls g^2, engaging with the teeth of the ratchet-wheel from below, the two rods N′ N^2 being pivoted to the pendulum by one common pin or bolt, *e*. The pawls *g′* on the plate M′ point away from the pendulum H^2, and the pawls g^2 on the plate M^2 point toward the pendulum, as shown. The lower pawls, g^2, or those on the plate M^2, will be provided with springs g^3, or other means to cause them to engage constantly with the teeth of the ratchet-wheel, and the pawls *g′* on the plate M′ may be likewise provided with springs; but generally this will not be required, as the weight of the pawls will be sufficient to keep them in contact with the teeth on the ratchet-wheel.

By this simple construction it will be readily understood that when the weighted pendulum is moved toward the left the two plates M′ M^2 will be oscillated upon the shaft B′ and cause the pawls *g′* to engage with the ratchet and revolve the shaft B′ for a short distance, this action at the same time causing the pawls g^2 on the plate M^2 to be drawn across the lower line of the teeth of the ratchet-wheel C, but without engaging with them, and then, when the pendulum is moved in the opposite direction, the upper set of pawls, *g′*, will slip over the teeth of the ratchet-wheel C, while the lower pawls, g^2, will engage with the ratchet-teeth and cause the shaft B′ to be revolved a short distance in the same direction, thus causing the pendulum to act upon the shaft when moving in both directions of its stroke, and with only one ratchet-wheel. The balance-wheel F performs an important function in securing a constant and steady motion to the shaft E and other parts.

We have shown a number of the pawls *g′* g^2 on each plate M′ M^2 set so that only one engages with the teeth of the ratchet-wheel at a time, to prevent lost motion in the pendulum, as by this arrangement one of the pawls will engage with a tooth of the ratchet-wheel when the pendulum is moved the distance of only one-third of one of the teeth of the ratchet-wheel, as will be understood by reference to the drawings.

The sizes of the wheels, ratchets, and gears

may be varied to any desired extent, and the machine may be applied to transmit power to any kind of machine.

The weight H^3 is shown formed of a box with a number of separate weights, H^4, in it, so that the weight may be varied to adapt the machine to different purposes, or to increase or decrease the power.

The pivotal point *e* may be changed, or each of the rods N' N^2 connected to the pendulum H^2 by a separate pivot; but generally both rods will be united to the pendulum by one pivot, as shown.

Having thus described our invention, what we claim as new is—

In a machine for applying power, a shaft, B′, carrying ratchet-wheel C, plates M' M^2, journaled upon said shaft on opposite sides of the ratchet-wheel and pointing in opposite directions from each other, and a plurality of pawls, g' g^2, pivoted to each of said plates and engaging with the teeth on the opposite sides of said ratchet-wheel, in combination with a swinging weighted pendulum swinging in the same direction as said plates M' M^2, and rods N' N^2, pivoted on opposite sides of the pendulum below its point of suspension at one end, and pivoted at their opposite ends to said plates M' M^2, respectively, substantially as set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JOHN GOTTFRIED CHRISTIAN RANK.
ERDMANN RANK.

Witnesses:
C. N. WOODWARD,
H. S. WEBSTER.