(No Model.)

J. J. OTTO.

POWER MACHINE.

No. 458,695. Patented Sept. 1, 1891.

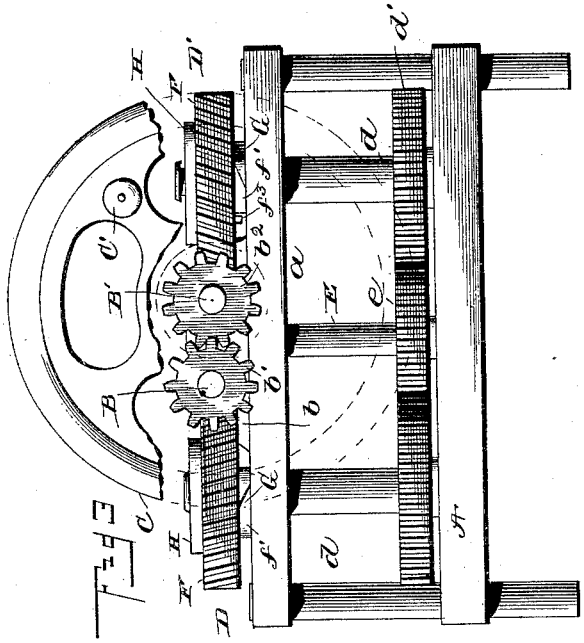

Fig. 1.

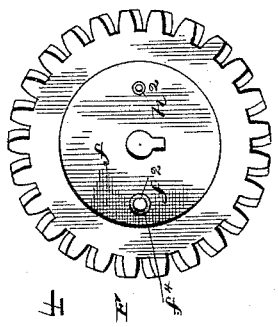

Fig. 4.

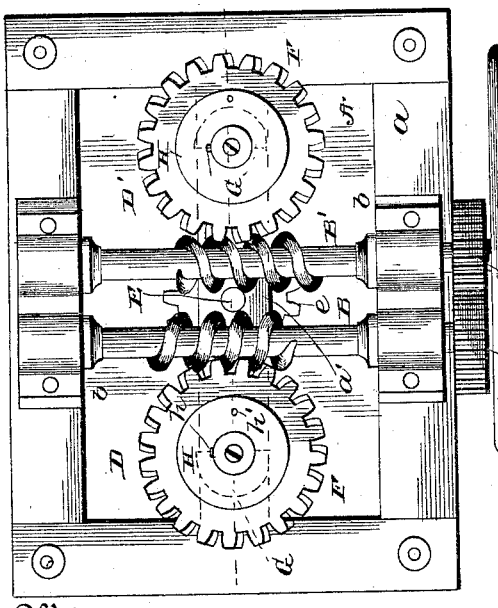

Fig. 2.

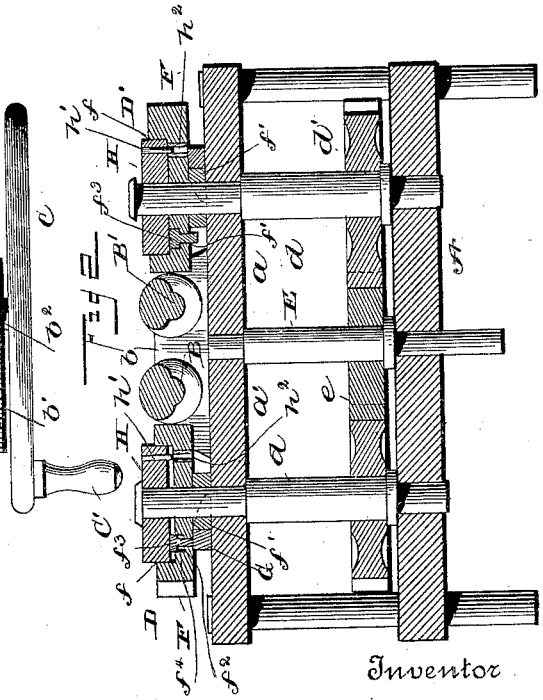

Fig. 3.

Witnesses

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JOSIAH J. OTTO, OF ALTOONA, PENNSYLVANIA.

POWER-MACHINE.

SPECIFICATION forming part of Letters Patent No. 458,695, dated September 1, 1891.

Application filed January 3, 1891. Serial No. 376,643. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH J. OTTO, a citizen of the United States of America, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Gearing or Power Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in gearing or power machines, having for its object the production of simple and highly efficient means for securing a reverse or reciprocal motion, the fly-wheel being continuously turned in one direction.

The invention comprises two sets of gear-wheels, a central intermediate power-shaft driven alternately by each set, said sets having their upper wheels gearing with worm-shafts driven by a fly-wheel continuously in one direction.

The invention also comprises means for automatically engaging and disengaging the upper wheel of each set thereof with the shaft, through which motion is imparted to the central shaft.

It further comprises the detail construction, combination, and arrangement of parts, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of my improved power-machine. Fig. 2 is a vertical sectional view on the line x x. Fig. 3 is a front elevation with a portion of the fly-wheel broken away. Fig. 4 is a detail view of one of the worm-wheels.

Referring to the drawings, A designates a stand or table, and a a frame or support secured thereto.

B B′ are two parallel worm-shafts secured at or near their ends in journal-boxes b, attached to the front and rear bars of frame a. The shaft B is connected to the shaft B′ through intermeshing cog-wheels b' b^2, secured to said shafts, and upon the extended end of worm-shaft B′, is secured a fly-wheel C, having a handle C′, by which it can be turned by hand; but power may be applied to this fly-wheel through the agency of a motor or other mechanical means, or the same may be driven by an engine.

D D′ designate two sets of gearing, each of which has a vertical shaft d journaled in stand A and frame a, its upper end being passed through the central longitudinal bar a' of said frame. Upon shafts d are secured lower gear-wheels d', which are constantly in engagement with a gear-wheel e on a central shaft E. This shaft is likewise secured in place by stand A and frame a, and its lower end is extended below said stand, so that its power can be imparted by a belt or other means to the machine to be driven, such as a washing-machine or churn.

F F are worm-wheels loosely mounted upon the upper reduced ends of shafts d, and the same are each continuously in gear with its respective worm-shaft. These wheels have central recesses or chambers f in their upper faces and lower hubs or collars f', which bear upon bar a' of frame a. In holes or apertures f^2 of these wheels are placed pins or studs f^3, having upper heads or flanges designed to engage shoulders f^4 in said holes or apertures to hold the pins or studs as against being lowered to too great an extent. The lower ends of these pins or studs are designed to engage semicircular cams G, which are secured upon bar a', encircling one-half of each shaft d, said pins or studs being raised or elevated when they are in contact with said cams. Each cam G is beveled or inclined at each end.

H designates blocks or collars located in the recesses or chambers f of wheels F and designed to loosely engage shafts d by keys or splines h, secured to said shafts and fitting grooves or recesses in the collars. From the under side of these blocks or collars H project short lugs or studs h', which, when the blocks are in their normal lowered position, project into and engage corresponding holes h^2 in wheels F, said holes being at points diametrically opposite the pins or studs f^3. Bushings are preferably located in these holes h^2. When the lugs h' are in engagement with holes h^2 of wheels F and the latter are in motion, power is transmitted to the vertical shafts d and through wheels d' to shaft E; but when pin or stud f^3 of either block or collar H is in engagement with the respective cam G such block or collar H is elevated by the elevation of said pin or stud,

and the lug h' being thrown out of engagement with the corresponding wheel F the latter and its block or collar will revolve without imparting motion to shaft d, the block or collar having been elevated out of engagement with the key or spline on said shaft; but instantly said pin or stud f^3 is free of cam G the connection between the block or collar and the wheel is re-established. The cams G of the sets of gearing are opposed to each other—that is, they are placed one to the left and the other to the right of their respective shafts d. By this means the upper worm-wheels F are alternately in and out of engagement with their respective blocks or collars. In other words, when the block or collar of the set D is in engagement with its wheel F (motion being applied to the fly-wheel) the shaft d will be turned from right to left, and consequently the shaft E will be driven from left to right. During this time the block or collar of the set D′ is out of engagement with its wheel F; but as soon as the engagement is established the shaft d will be turned from left to right, and consequently the shaft E will be moved from right to left. Thus it will be seen that the fly-wheel is continuously turned in one and the same direction; but the central power-transmitting shaft is reversed after each complete revolution.

My invention is extremely simple, cheap, and durable, and the same can be readily and easily adapted for imparting a reciprocal motion to a washing-machine or churn.

I claim as my invention—

1. The herein-described improved power-machine, comprising two sets of gearing, driving-shafts continuously in engagement therewith, a central power-shaft driven by said gearing, and movable blocks or collars alternately in engagement with their respective gearings for imparting reciprocal motion to said central shaft, substantially as set forth.

2. The herein-described improved power-machine, comprising two sets of gearing having each a loose worm-wheel, driving worm-shafts continuously in engagement with said worm-wheels and with each other, a central power-shaft driven by said gearing, and movable blocks or collars alternately in engagement with the respective worm-wheels and the shafts thereof, substantially as set forth.

3. The herein-described improved power-machine, comprising two sets of gearing, driving worm-shafts, and a central power-shaft driven in alternate directions by said gearing, each set of said gearing consisting of a shaft having a lower gear-wheel fast thereto, an upper loose worm-wheel having a recess or chamber in its upper face, a block or collar fitted in said recess and having a lug engaging a hole in said worm-wheel, and a pin or stud fitting a hole in said wheel for automatically raising said block or collar and disengaging said lug from its hole, substantially as set forth.

4. The combination, with the frame having the cams secured thereon, of the sets of gearing herein described, consisting each of a central shaft having a key or spline, a lower fast gear-wheel, an upper loose wheel having a recess or chamber in its upper face and two diametrically-opposite holes, a pin or stud fitting one of said holes and designed to engage one of said cams, and a movable block or collar located in said recess or chamber and having a stud engaging the other one of said holes in the wheel and designed to be automatically raised by said pin or stud and be disengaged from said wheel and the shaft, substantially as set forth.

5. The herein-described improved power-machine, comprising the stand, the frame or support, the semicircular opposed cams, the parallel worm-shafts having intermeshing gear-wheels, the fly-wheel secured to one of said shafts, the central power-shaft having a gear-wheel and a lower extended end, and the two sets of gearing having each a lower gear-wheel, a shaft, an upper loose worm-wheel having a movable block or collar engaging therewith, and a pin or stud designed to engage said cam and disengage said block or collar from its wheel, substantially as set forth.

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

JOSIAH J. OTTO.

Witnesses:

WM. S. HAMMOND,

H. T. HEINSLING.