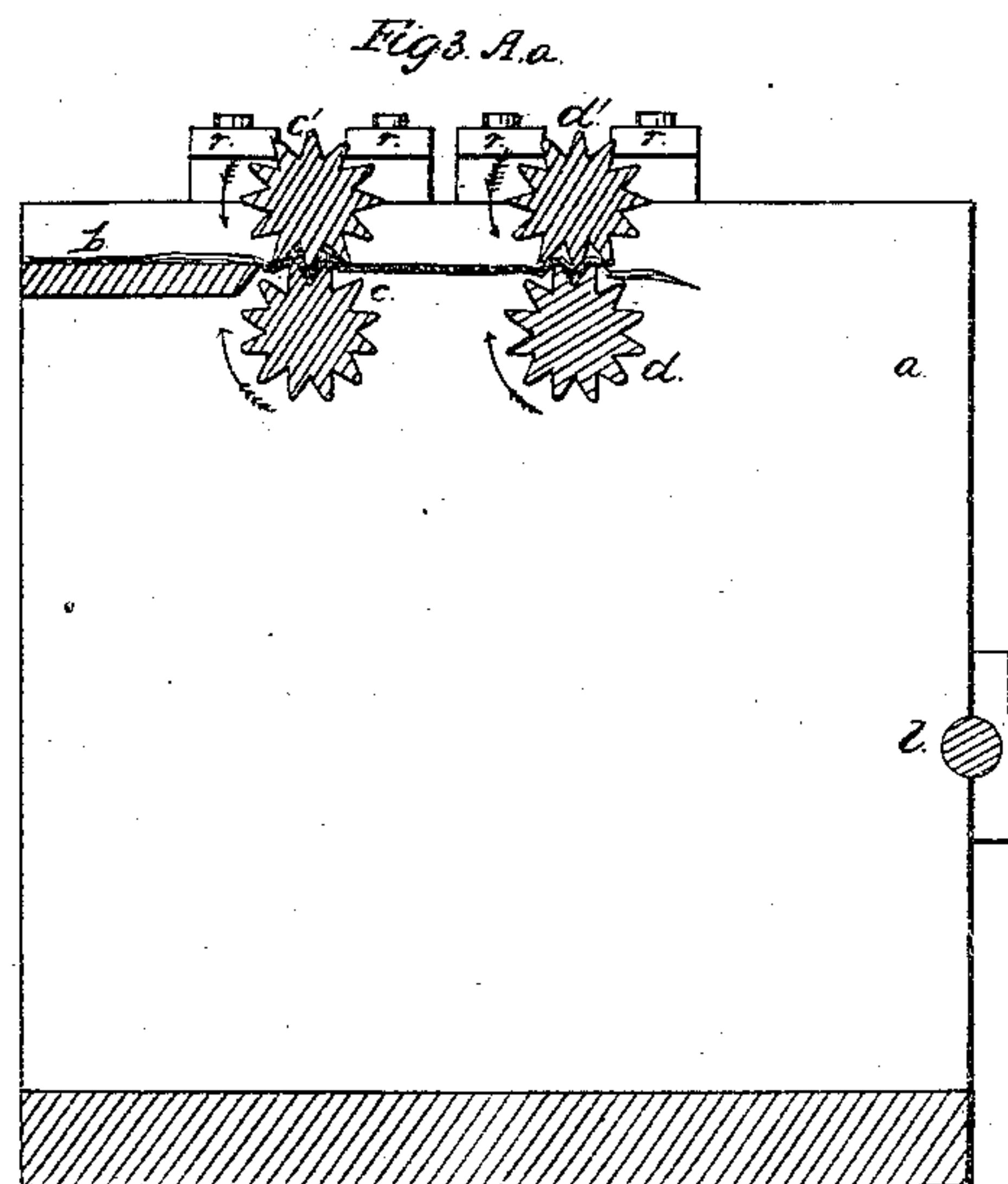
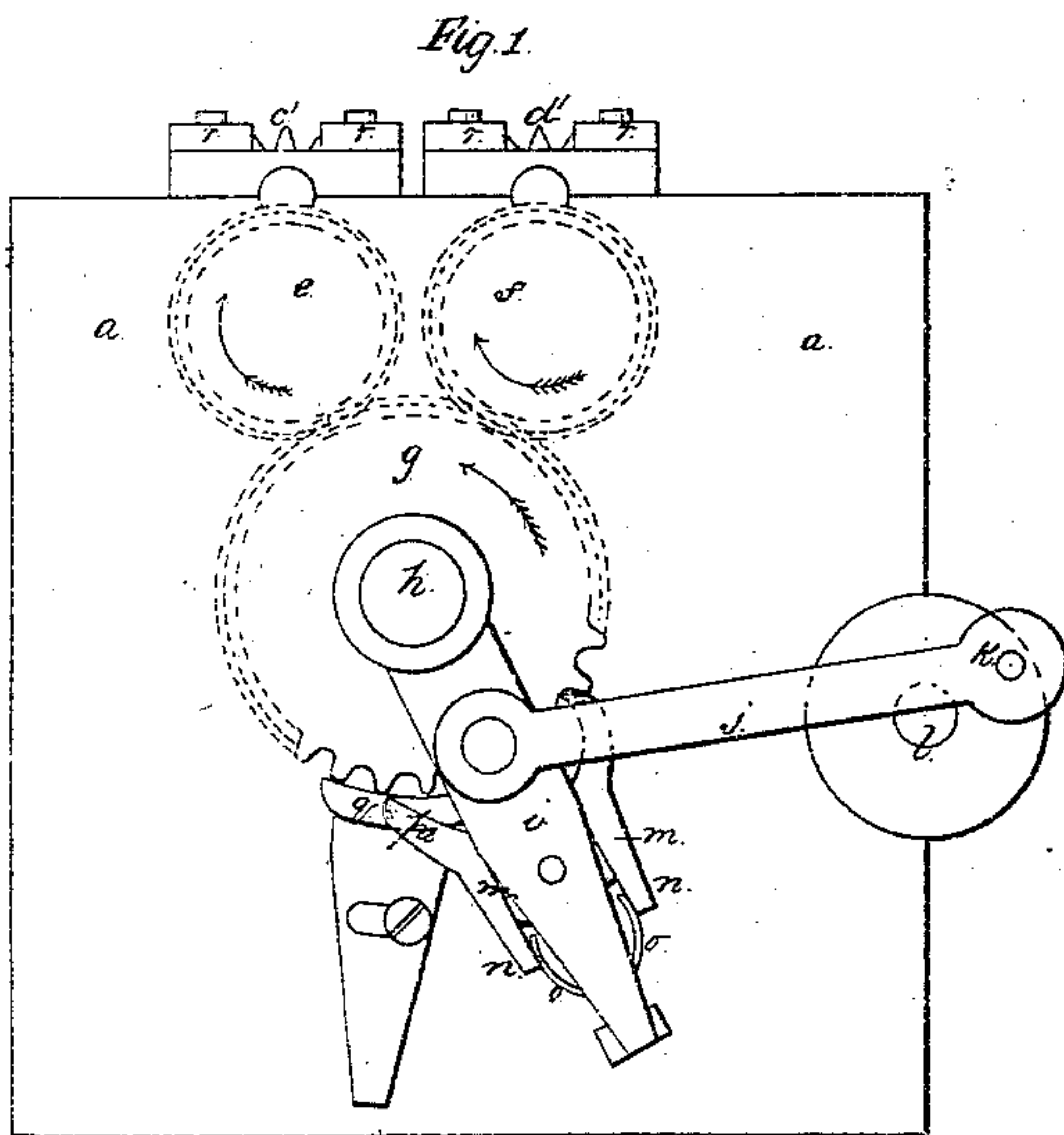
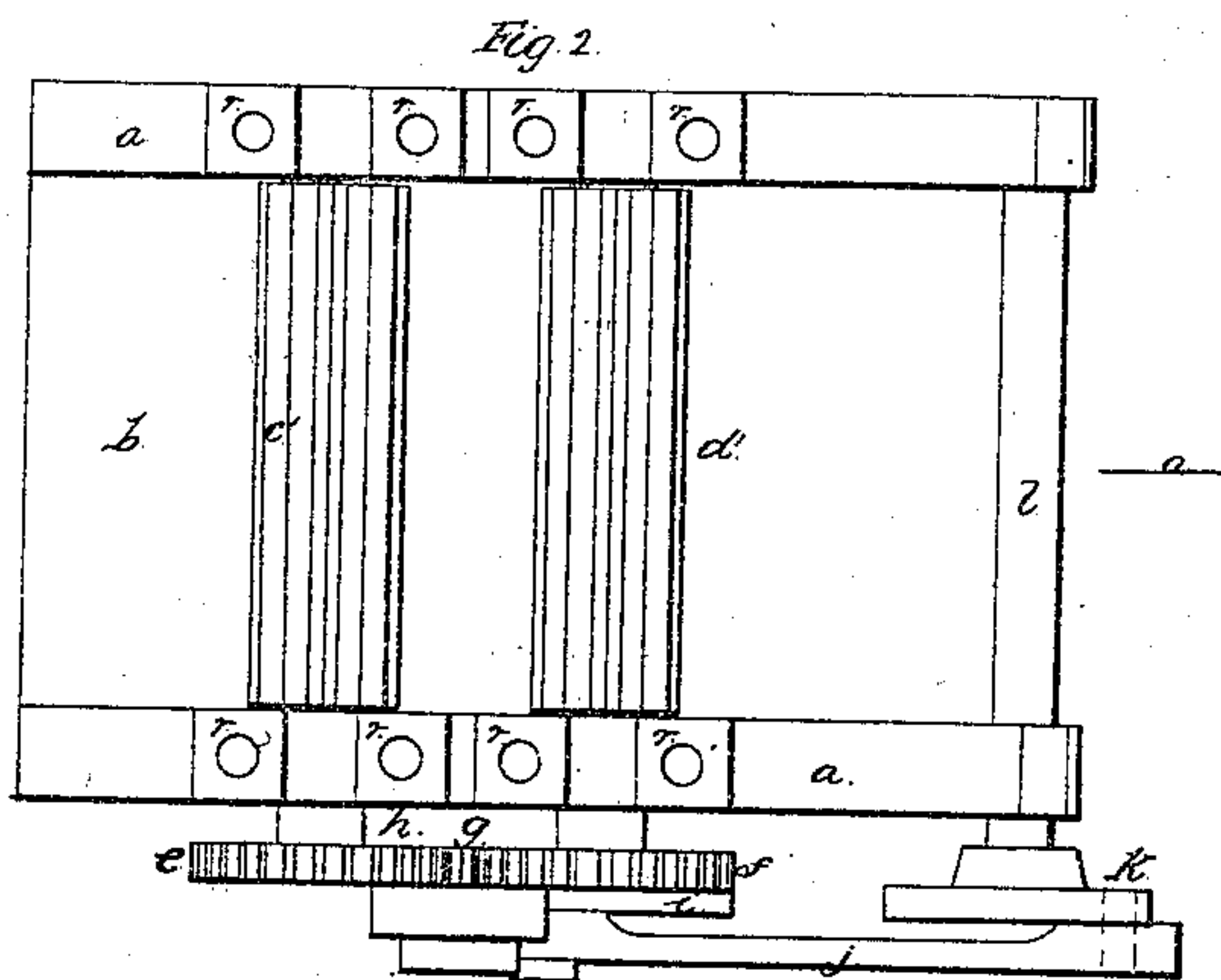
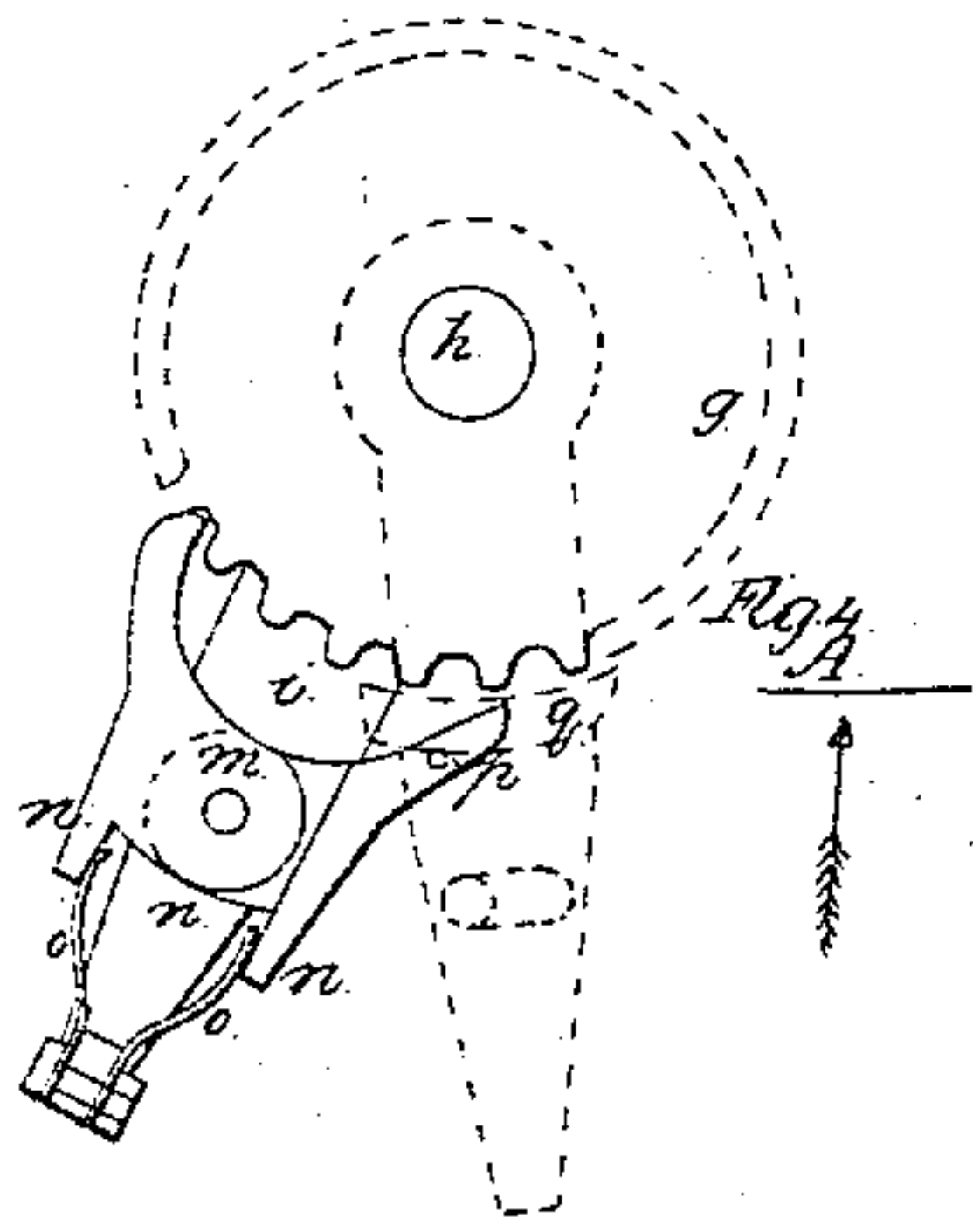


G. SANFORD & J. E. MALLORY.
MACHINERY FOR BREAKING AND CLEANING FLAX AND HEMP.
No. 36,485.
Patented Sept. 16, 1862



Witnesses.
Wm. H. Smith
A. L. Lacey

Inventors.
Gideon Sanford
Jas. E. Mallory

UNITED STATES PATENT OFFICE.

G. SANFORD AND J. E. MALLORY, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINERY FOR BREAKING AND CLEANING FLAX AND HEMP.

Specification forming part of Letters Patent No. 36,485, dated September 16, 1862.

To all whom it may concern:

Be it known that we, GELSTON SANFORD and JAMES E. MALLORY, both of the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Breaking and Cleaning Flax, Hemp, and other like Fiber-Yielding Plants; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation; Fig. 2, a plan; Fig. 3, a vertical section taken at the line A a of Fig. 2; and Fig. 4, a section representing the inner face of the vibrating arm, pawls, and sector.

The same letters indicate like parts in all the figures.

The object of our said invention is to break and clean flax, hemp, and other like fiber-yielding plants by one or more pairs of gripping fluted rollers, having a mode of operation by which the material to be operated upon is fed in on one side, the woody part broken by a crushing action, and the broken fragments loosened from the fibers by a rubbing action of the flutes alternately in opposite directions and equally on both sides of the bunch, and the bunch of fibers then delivered on the other side.

In the accompanying drawings, *a* represents the frame, and *b* the table, on which the material to be treated is placed to be presented to the action of the machine. There are two pairs of fluted rollers, *c c'* and *d d'*. The two lower rollers, *c* and *d*, turn in fixed boxes in the frame, and each carries a cogged pinion, *e* and *f*, outside the frame, both of which engage and are operated by a cog-wheel, *g*, that turns on a fixed stud, *h*. On the said stud *h* there is a vibrating arm, *i*, connected by a connecting-rod, *j*, with a crank-pin, *k*, on the driving-shaft *l*, so that the arm is vibrated back and forth by each rotation of the driving-shaft. There is a double bifurcated pawl, *m*, mounted on a fulcrum-pin on the inside of the arm, and the lower bifurcation, *n*, embraces two springs, *o o*, on the lower end of the arm, the tension of which springs keeps the two pawls in such position that they both partially engage the cogs of the wheels *g*, so that when the arm *i* is vi-

brated in either direction the pawl on the side toward which the arm is moving will fully engage the cogs and turn the wheel in that direction, the springs allowing the pawl to yield for that purpose. So far as described, it will be seen that such an arrangement would turn the cog-wheel *g* and the two fluted rollers *c* and *d* to an equal distance alternately in opposite directions; but the object is to have them turn in the direction of the arrows to a greater distance than in the opposite direction. To accomplish this result the bifurcated pawl is provided on the inside with a pin or projection, *p*, which, as the arm *i* vibrates to turn the wheel *g* in the direction of the arrow, passes under a sector, *q*, which is concentric with the stud on which the arm *i* vibrates, or nearly so, and on the return vibration of the arm *i* the opposite pawl cannot engage the cogs of the wheel *g* to turn it in the opposite direction until the pin or projection *p* passes beyond the sector, and in this way by the length of the sector or by changing its position on the frame the return motion of the wheel *g* and fluted rollers *c* and *d* can be made as much less as may be desired.

To facilitate the adjustment of the sector, it is formed on the upper end of a plate having one or more elongated holes, through which the screw or screws pass by which it is secured to the frame. The two upper fluted rollers, *c'* and *d'*, have their journals mounted in boxes held down by india-rubber or other springs, *r*, by the tension of which these rollers are pressed down toward the lower rollers, so that the material to be operated upon shall be gripped by a yielding pressure between the flutes of the upper and the lower rollers. As the rollers turn in the direction of the arrows, the flax or other plant is presented to the bight of the rollers *c c'*, and caught by them and carried forward between them, and as the return motion is less than the forward motion the flax is gradually carried or fed forward from the first pair of rollers to the second pair, *d d'*, and then carried forward jointly by both pairs, and finally delivered by the second pair, *d d'*.

By the above-described mode of operation the flax or other plant is acted upon by the flutes of the rollers alternately in opposite directions, and equally on the lower and on the upper side, not only effectually breaking the woody parts of the plant, but effectually sepa-

rating the woody fragments from the fibers by a rubbing action alternately in opposite directions, both above and below; and by the use of two pairs of rollers (or more, if desired) the woody particles are shaken out from between the fibers in the open space between the pairs of rollers; and although we have above described two pairs of rollers, we do not wish to be understood as limiting our claim to the use of two pairs, as one pair or more than two pairs may be used. Nor do we wish to be understood as claiming the above-described mechanism for giving to the rollers a greater forward than backward motion, nor as limiting our claim of invention to the use thereof, as other and equivalent mechanism may be substituted for this purpose.

What we claim as our invention, and desire to secure by Letters Patent, is—

The mode of operation, substantially as described, of one or more pairs of fluted rollers for breaking and cleaning flax, hemp, and other like fiber-yielding plants, which mode of operation consists in giving to the pair or pairs of fluted rollers which grip the flax or other plant a reciprocating rotary motion alternately in opposite directions, the motion in one direction being greater than in the opposite direction, substantially as and for the purpose described.

GELSTON SANFORD.
JAS. E. MALLORY.

Witnesses:

A. DE LACY,
WM. H. BISHOP.