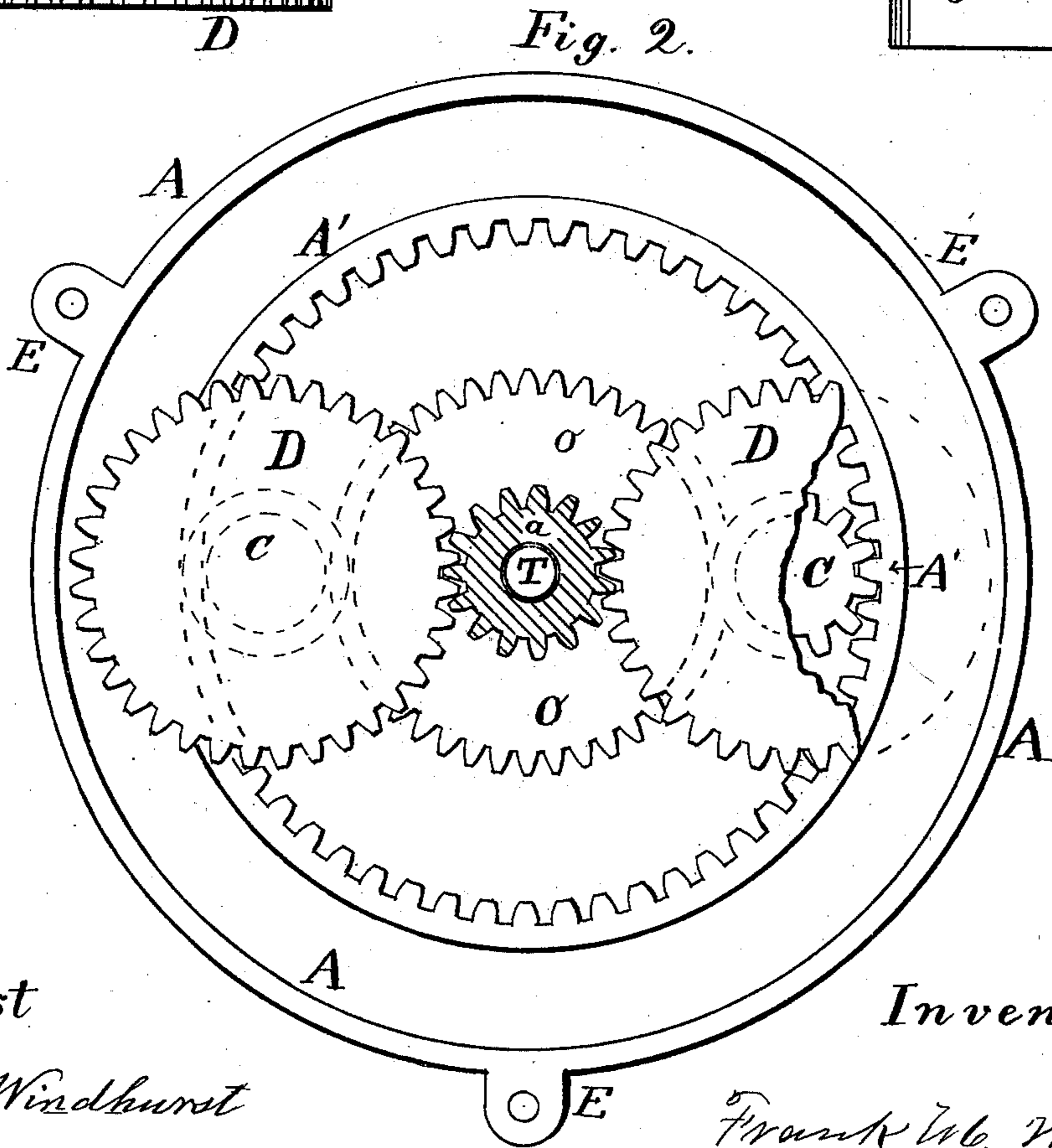
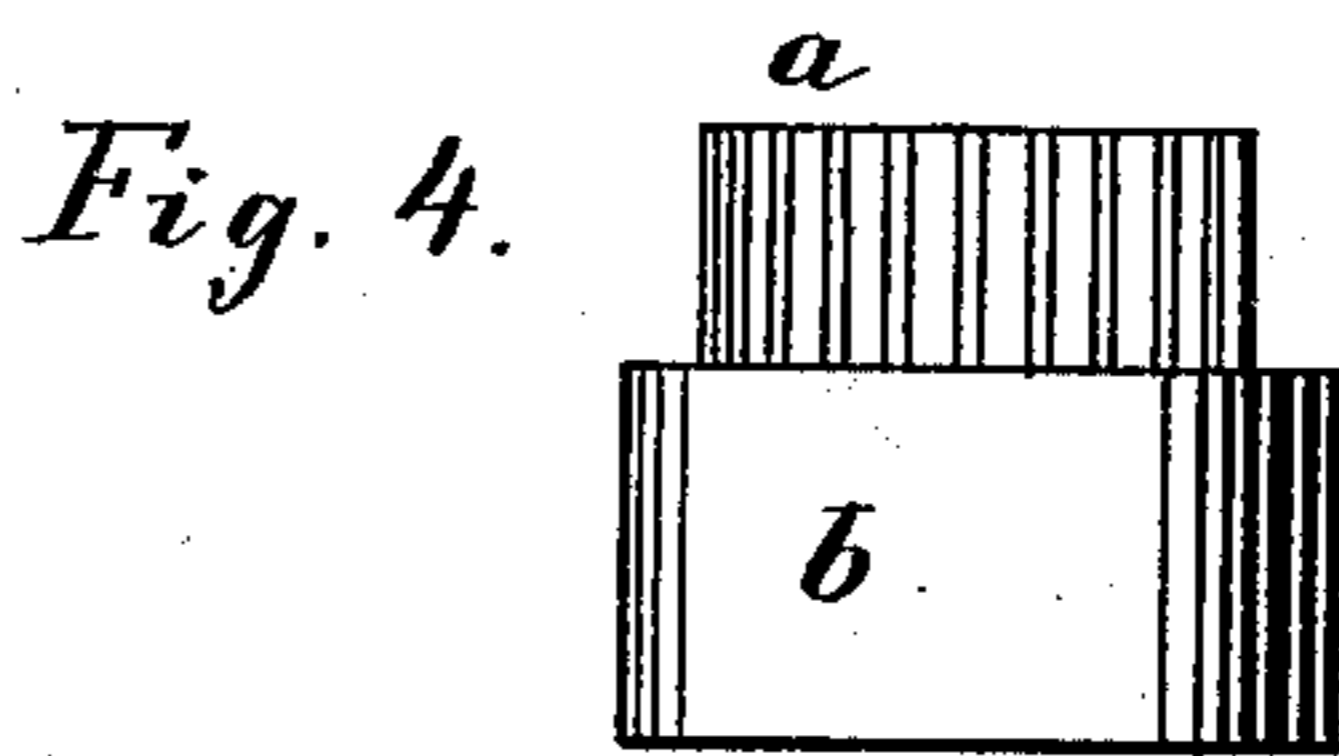
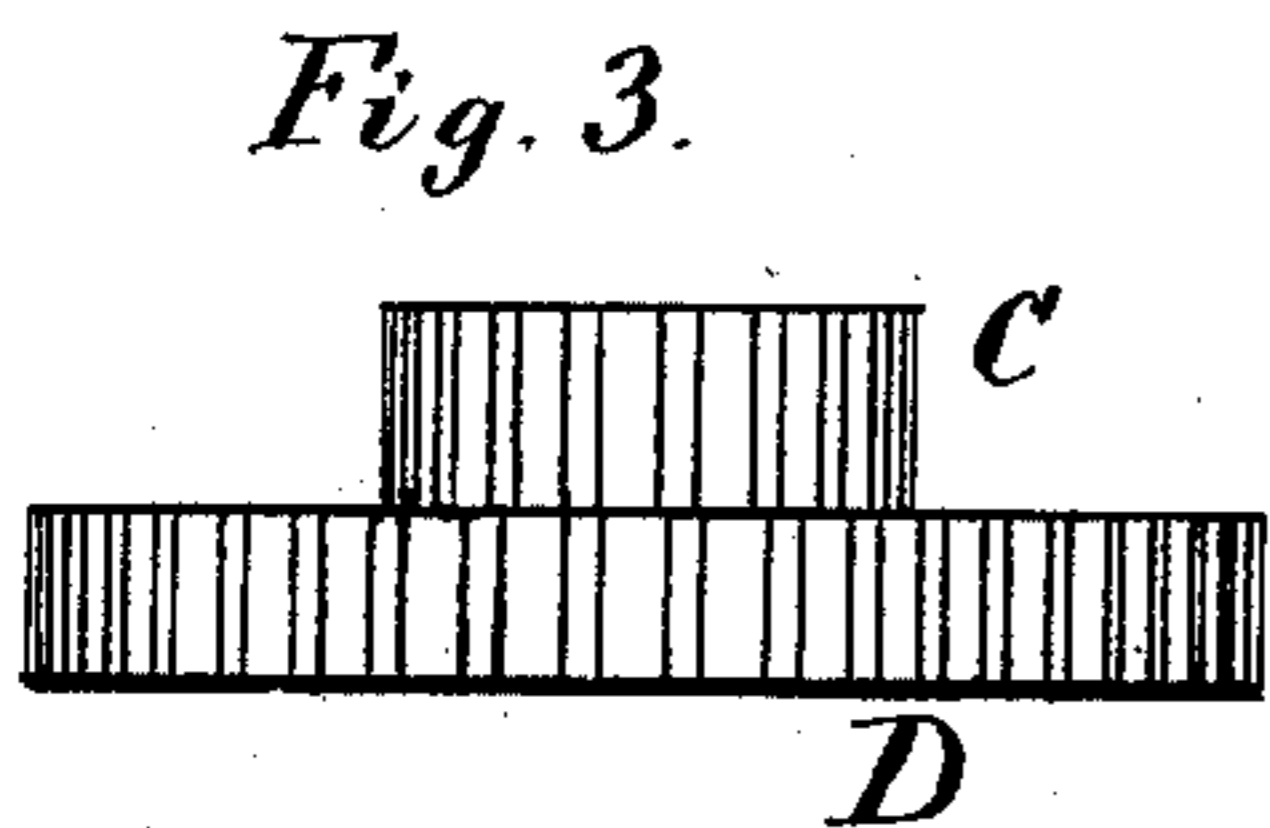
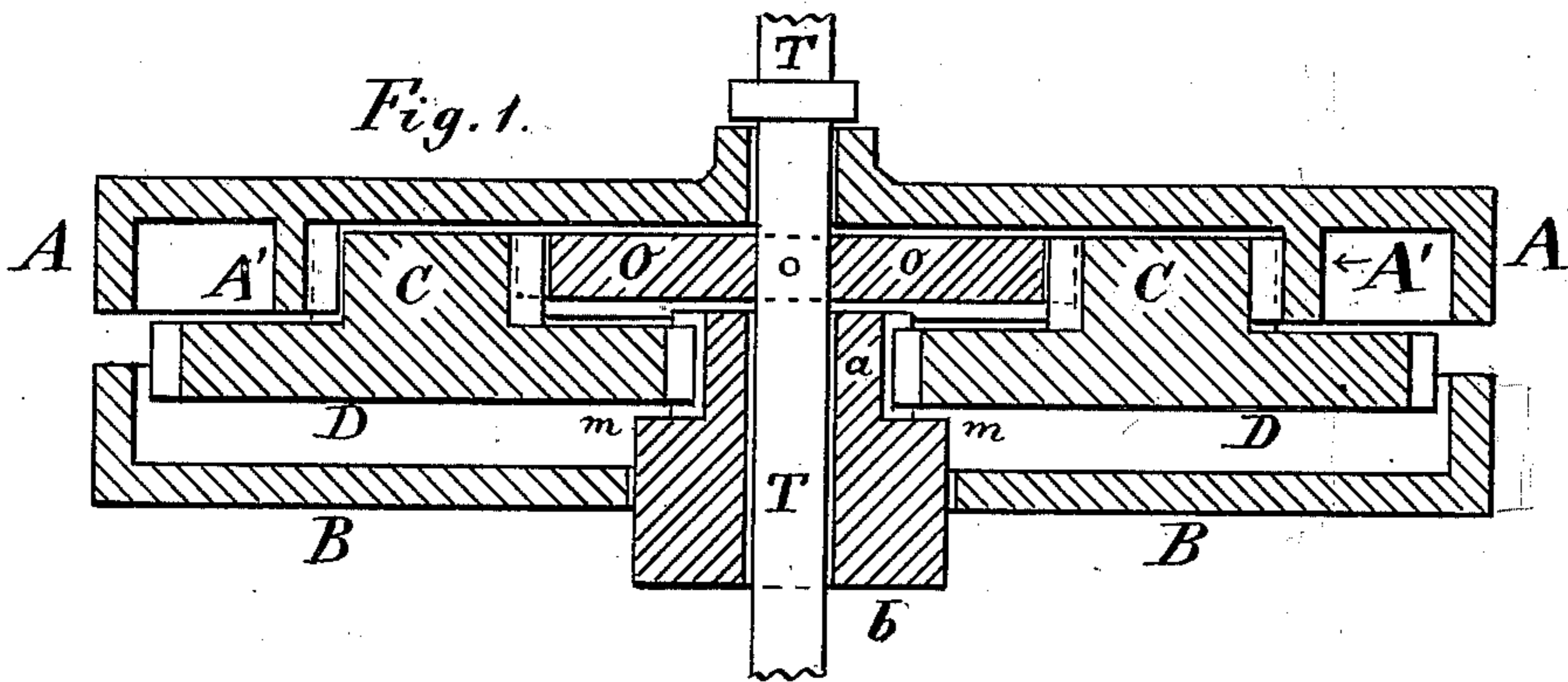


(No Model.)

F. M. WATERS.
MECHANICAL MOVEMENT.

No. 310,924.

Patented Jan. 20, 1885.



Attest

Lewis Windhurst

John E. Oldham

Inventor

Frank M. Waters

UNITED STATES PATENT OFFICE.

FRANK M. WATERS, OF SPRINGFIELD, OHIO.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 310,924, dated January 20, 1885.

Application filed December 17, 1883. Renewed November 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. WATERS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented a new and useful Mechanical Movement, of which the following is a specification.

My invention relates to an improvement in that class of devices for converting a slow rotary movement into a fast one or a fast rotary movement into a slow one with the aid of but one shaft or stud in connection with the gearing by which this result is accomplished.

It consists of a webbed internally-gear-
15 wheel, having a hub in the center bored to receive the shaft, which rotates freely in it. Upon the shaft is keyed or otherwise fastened a spur-gear having a pitch-diameter something less than the pitch-diameter of the internal gear, and when in proper position resting upon or against the web of the internal gear, thus bringing the sides of both upon or nearly so the same line, and leaving a space
20 between the faces of the two gears sufficient to admit a cogged spur-pinion having the same pitch of teeth as the annular and spur gear, and properly meshing into both at the same time. The spur-pinion is part of a spur-gear of larger diameter than itself, to which it is
25 fastened on the side, or may more properly form part of the same casting, and this spur-gear in turn meshes into a smaller gear or pinion, which is bored through its center to allow it to run freely upon the shaft, and may
30 be part of or connected to either a fly-wheel with eccentric, crank with crank-pin, pulley, spur, annular or bevel gearing for transmitting motion to other mechanism. The internally-gear-
35 wheel may, and in this case does, form part of a casing in which the gearing is protected from dirt or other foreign substances which might interfere with its proper working, the other part of the casing being
40 bolted or otherwise fastened to it sufficiently close to allow the free movement of the combined gear and pinion, and to prevent at the same time any tendency to dip or rotate in any direction other than that desired, and in which it is further assisted by having upon
45 the side of the shaft-pinion a flange or extension of the casting above the tops of the

cogs. While this movement may be accomplished by using only one intermeshing combined spur and pinion, the result will be the same if two or more are used at the same time, with the advantage of equalizing the pressure of the pinion upon the shaft on all sides. It will now readily be seen that by turning the shaft upon which the spur-gear is fastened, and allowing the annular gear to remain fixed, the combined spur-gear and pinion will revolve upon its own axis and at the same time move in a circle around the shaft. The advantages derived by allowing the pinion of the combined or double gear to run free between the annular and spur, instead of upon a stud or shaft, are, it requires no oil to lubricate at that point, and the required motion gotten with less cost and fewer pieces in building it.

To better illustrate my invention, reference is had to the accompanying drawings, in which—

Figure 1 is a cross-section with the casing partly removed, in which T represents the shaft with collar, and upon which is fastened the spur-gear O. A shows the other part of the casing, being part of the internally-gear-
7 wheel, A'. C and D are the combined spur and pinion, with the pinion C meshing into both annulus A' and spur O, and D in turn meshing into the pinion a, which runs freely upon the shaft T. b represents a part of a projecting over the teeth of D at m.

Fig. 2 is a side elevation showing casing A, internally-gear-
85 wheel A', and shaft T, upon which is fastened spur O. C and D are the combined pinion and spur, and a the loose pinion upon shaft T. E shows the lugs or projections by which the casing A and B are fastened together.

Fig. 3 shows the combined pinion C and spur D.

Fig. 4 is a side elevation of the central or shaft pinion, a, with projection b, which can
95 be made part of fly-wheel, pulley, spur, bevel, or annular gear, for transmitting the motion, as may be desired.

The mechanism may be employed to produce any rapid or slow movement, and may be
100 operated by manual or other power. Numerous obvious applications of the device may be

made—such as to mowing and reaping machines, lawn-mowers, and horse-powers—where an accelerated motion is required, and in traction-engines, hoisting machinery, &c., where a slow motion is needed.

I claim as new and of my invention—

In combination with the internal-gear wheel A', the shaft T, with spur O, having the intermeshing double gear C and D, spur D mesh-

ing into pinion a, with casing A and B, having projections E, as shown.

In testimony of which I hereunto set my hand.

FRANK M. WATERS.

Witnesses:

JOHN C. OLDHAM,

FRANCIS M. HAGAN.