

(No Model.)

C. MONSON.

MECHANICAL MOVEMENT.

No. 273,876.

Patented Mar. 13, 1883.

Fig. 1.

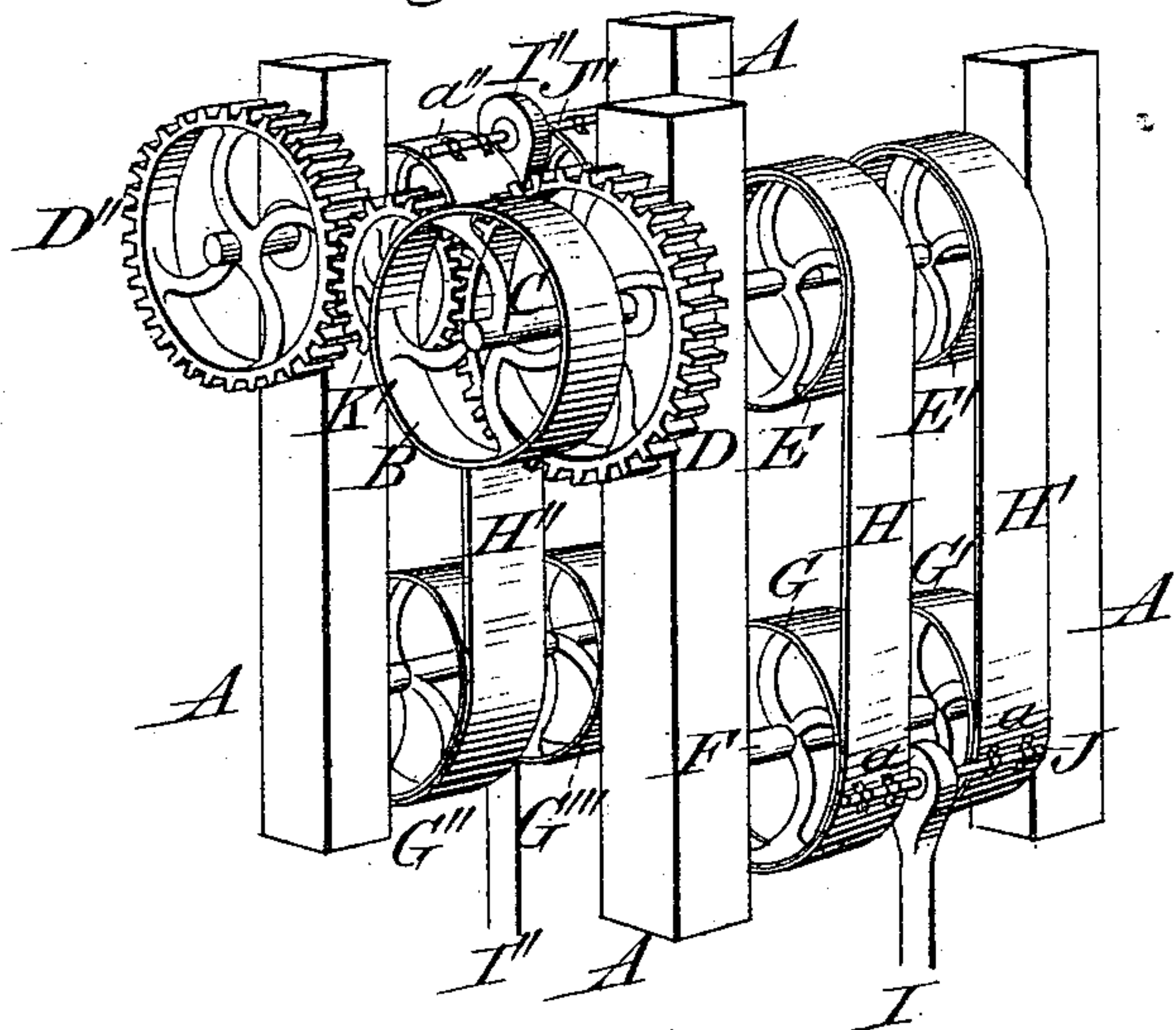


Fig. 2.

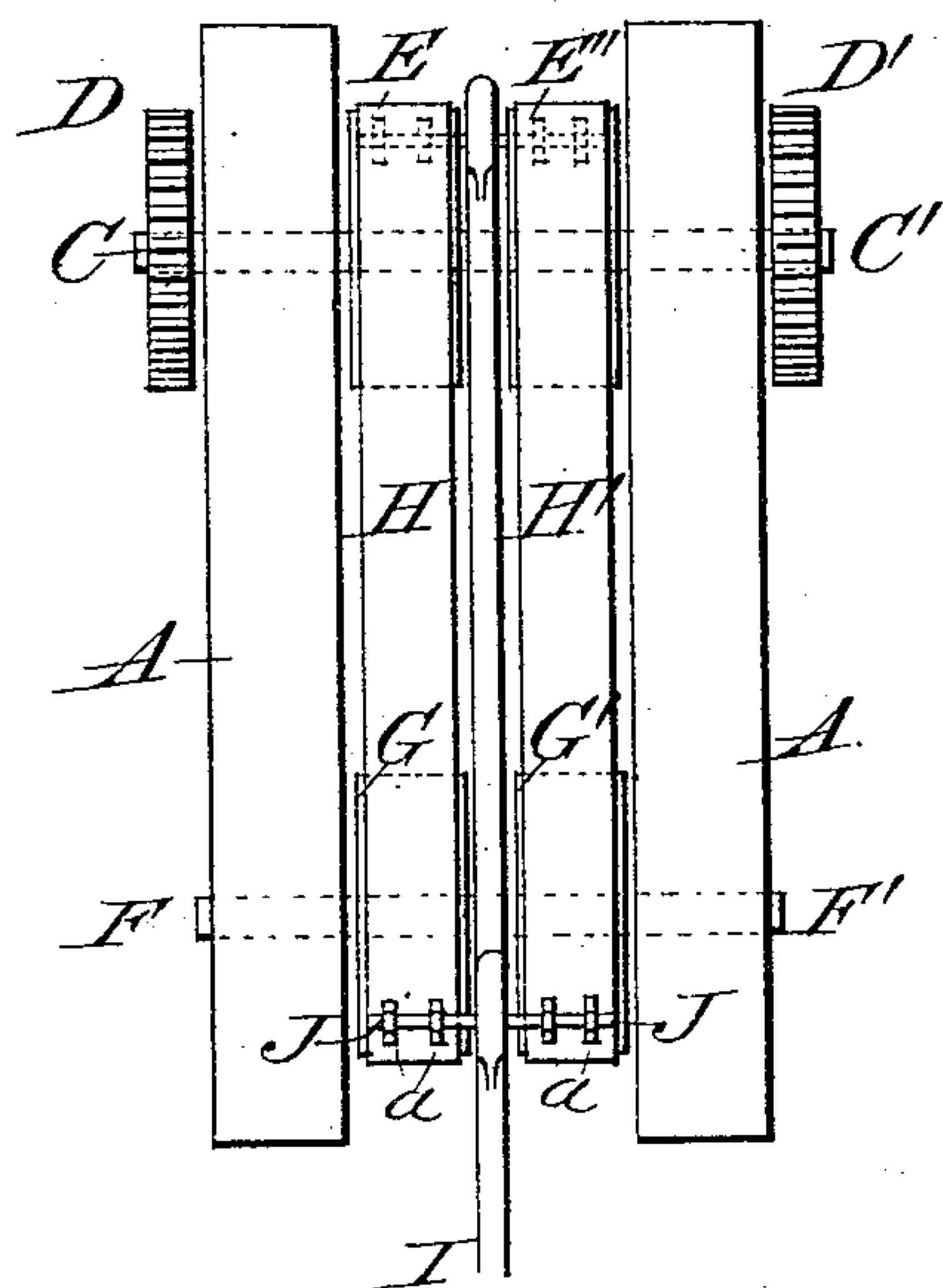
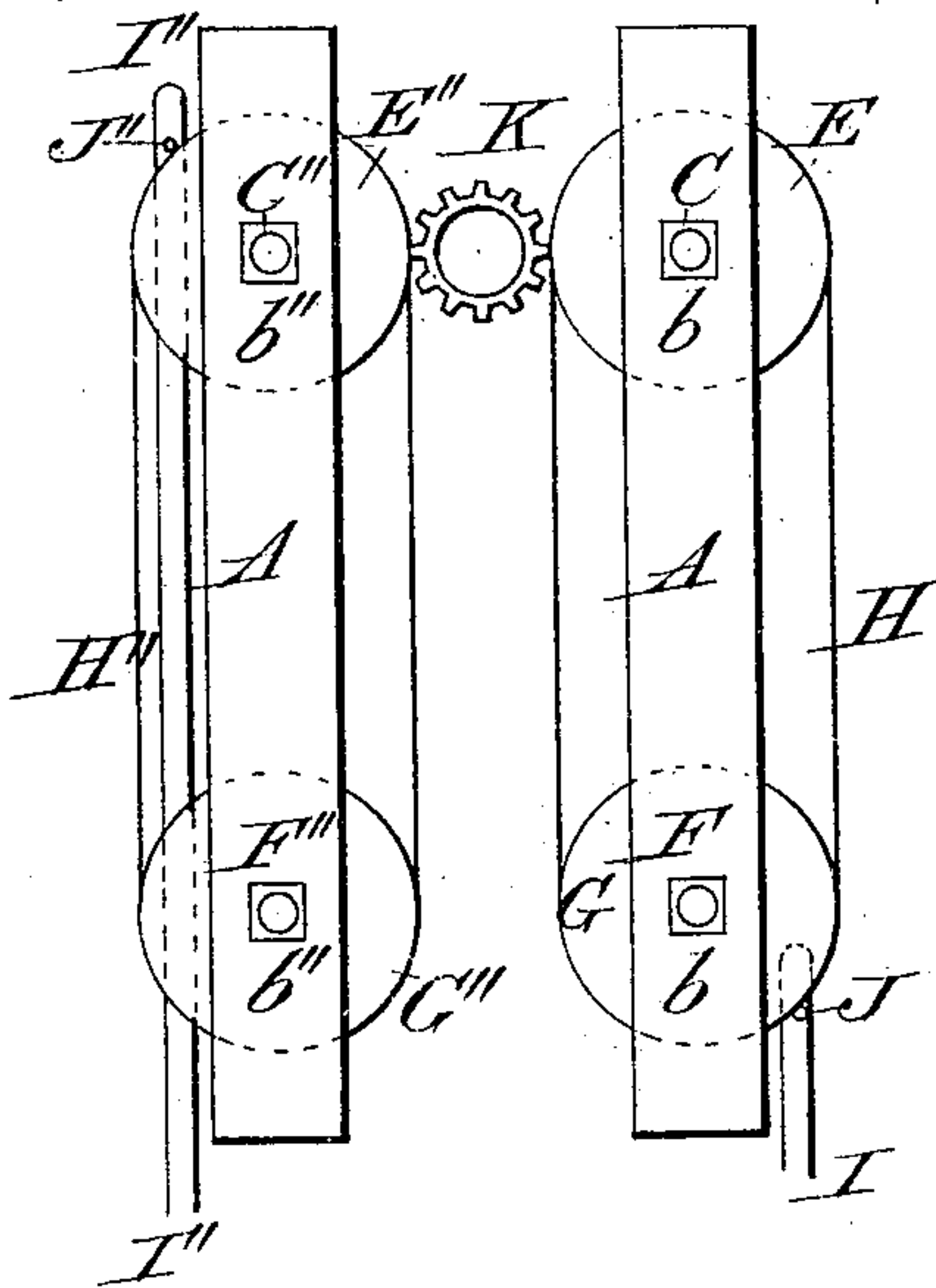


Fig. 3.



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MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 273,876, dated March 13, 1883.

Application filed August 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MONSON, of the city and county of New Haven, in the State of Connecticut, have invented a new and useful Improvement in Mechanical Movements; and I declare the following to be a specification thereof, reference being had to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a perspective view of my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a side elevation of the same.

My invention is designed to furnish a substitute for the crank in mechanical movements, whereby a rotary motion is converted into a reciprocating linear motion. To produce this change of motion machinists have heretofore made use of a crank. The practical disadvantage of this old and familiar device is that the crank in its revolution must describe a true circle, and therefore its lateral play is exactly equal to its direct movement, and the length of the stroke which it imparts to its connecting-rod is invariable, and also is limited to a distance equal to double the length of the arm of the crank. Thus to obtain a long stroke by means of a crank movement the connecting-rod at its junction with the crank will be carried by the revolution as far on each side of the desired working-line as is the length of the radius of the revolution. If such a reciprocating movement is desired to drive a piston in a cylinder, or for similar purposes, this lateral displacement of the rod causes the power to be applied in an angular direction, thereby increasing the friction; and in case a long stroke is required it has been found necessary to furnish the rod with a joint, in order that the piston-rod may work in a straight line along the longitudinal axis of the cylinder.

It is the purpose of my invention to obviate these difficulties and to convert an invariable and continuous rotary motion into a reciprocating motion of whatever length may be reasonably desired, and to reduce to a minimum degree the lateral movement hereinbefore complained of, and thus to apply the power in a more direct line, and consequently with less friction.

My invention consists in the use of two endless bands or belts, each carried by a set of two

pulleys driven by power, between which bands is suspended a connecting-rod or pitman, which follows said bands in their revolution, being attached thereto by a cross-bar.

In the drawings, A A represent the standards or frame which support the working parts of my device. Power is communicated from the main shaft by a belt to the driving-wheel B, fixed upon a shaft, C, which shaft also carries with it a cog-wheel, D, and pulley E. In line with the shaft C is another shaft, C', with similar wheels and pulleys, B' D' E'. Below these and supported by the frame A are the shafts F F', on which revolve loosely the pulleys G G'. Bands or belts H H', respectively surrounding the pulleys E G and E' G', revolve with said pulleys and carry a pitman, I, the head of which hangs loosely upon and is suspended by the cross-bar J, which bar J is fastened by loops *aa* to the belts H H', and passes through the head of the pitman I, as clearly shown in Fig. 1. A free vertical space is thus provided between the inner ends of the shafts C C' and F F' to allow the vertical movement of the pitman I therein as it is carried around the pulleys by the belt.

I have shown in my drawings a duplication of said device, with the letters corresponding, but marked " and '". In case of such duplication I employ a connecting-gear, K, properly supported on a cross-piece of the frame A and meshing with the cog-wheels D D', with a similar intermediate gear, K', to connect the opposite cog-wheels, D' D''. By this arrangement of gears I give motion in the same direction to the supplementary wheels D'' D''' and their accompanying pulleys. In case of such double mechanism I place the pitmen I I'' in the position shown in the drawings—that is, at points exactly opposite to each other, so that when one begins its downward motion its companion begins an upward motion. This duplication is useful in all cases where double work is required—as, for example, in a pump having two cylinders.

The belts H H' have sufficient tension to hold by friction upon the rims of their respective pulleys. For light work such an arrangement is sufficient; but for heavier work it may be found necessary to roughen the exterior surface of the rims of the pulleys into cor-

rugations or rasp-like projecting points to increase the friction, or to set pins at intervals upon the periphery of the pulleys to enter corresponding holes in the belt in the fashion of a rag-wheel and chain. Octagonal pulleys carrying belts fitted with square blocks to engage therewith might be useful for the purpose.

The operation of my invention is that as belts H H' are continuously carried by their respective pulleys E G and E' G' they pull with them the pitman I, causing it to describe the same course, thus giving to the pitman a long alternate stroke with a very small lateral variation of direction, the length of the stroke being determined not by the radius of the circle of revolution, as heretofore, but by the distance of the upper and lower pulleys from each other.

In Fig. 3 I show the ends of the shafts set in journal-boxes b b. The lower boxes may have a small sliding motion in slots of the frame, if desired, to enable the regulation of the tension of the bands.

It is obvious that instead of employing the pulleys E' G' to assist in sustaining and carrying the pitman I may dispense with said parts of my device, and suspend the pitman from the edge of the belt H, and allow the pitman to play across the faces of the pulleys E G. The essential feature of my invention is the abolition of the ordinary crank and substituting for it a rod or pitman which follows the course of a belt revolving with and upon two pulleys.

I have shown in the drawings the lower pulleys, G G', as of equal diameter with the pul-

leys E E'; but by making the lower pulleys of smaller diameter I can cause the pitman to move in a slanting direction, and thereby adapt it to work in an oscillating cylinder, if desired. In this manner, although the pitman changes from side to side on the pulleys in following their revolution, yet it always has its bearing at its lower end at a common center, on whichever side of the pulleys the head of the pitman may be.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. The improved mechanical movement herein described, consisting of the pulleys E G and E' G', driven by power and supported by their respective shafts C F and C' F' within a frame, A, and carrying in their revolution the belts H H', which sustain by a cross-bar, J, attached thereto, a pitman, I, substantially as and for the purpose specified.

2. The combination of two pulleys, E G, revolving upon shafts C F, the belt H, and the pitman I, suspended from said belt H, and operating together substantially as shown, and for the purpose specified.

3. In the improved crank-substitute movement herein described, the gear-wheel K, in combination with the gear-wheels D D'', for the purpose of actuating in the same direction a supplementary and duplicate mechanism of like description, substantially as specified.

CHARLES MONSON.

Witnesses:

CORNELIUS PIERPONT,
ALBERT N. ABBE.