

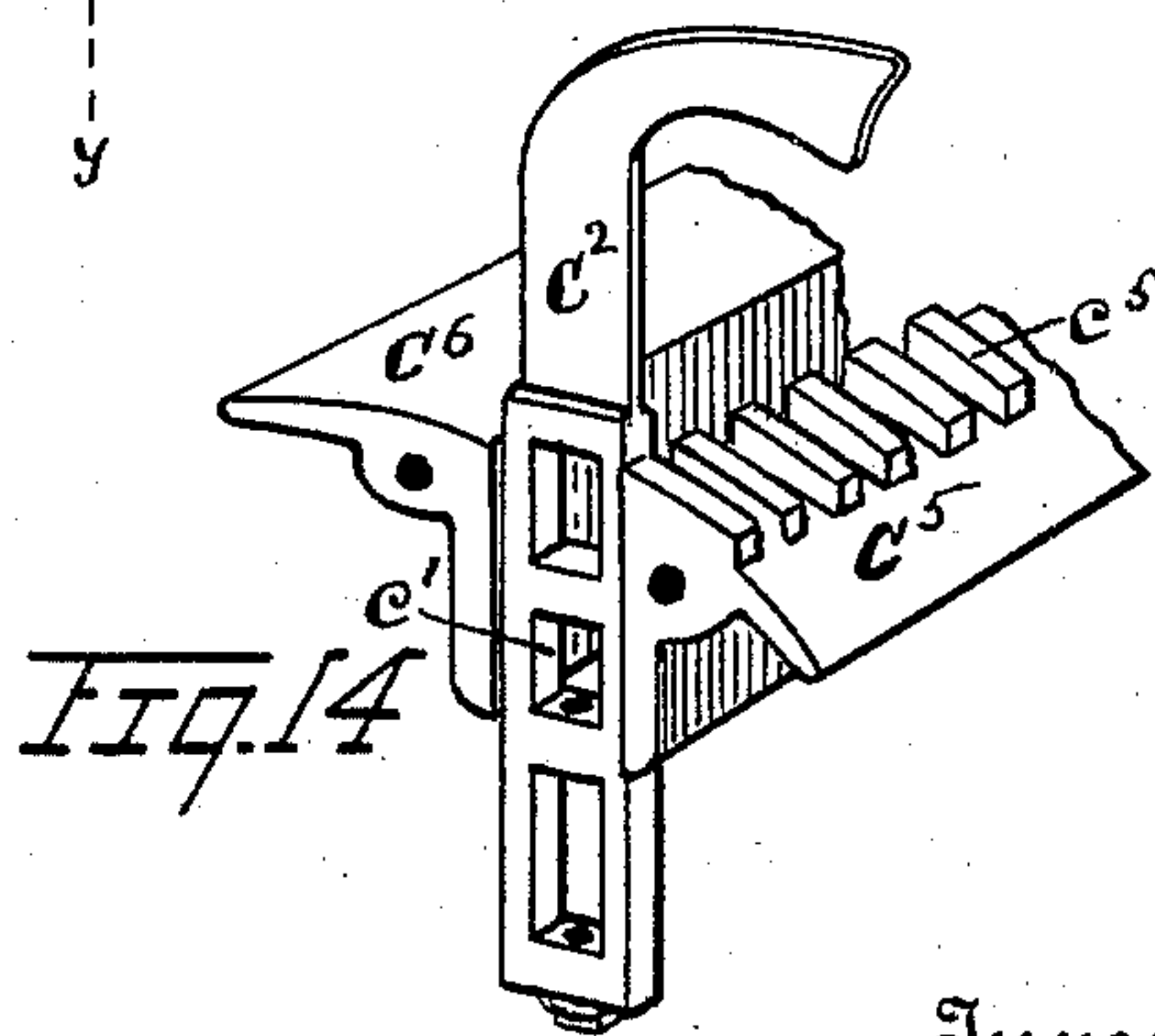
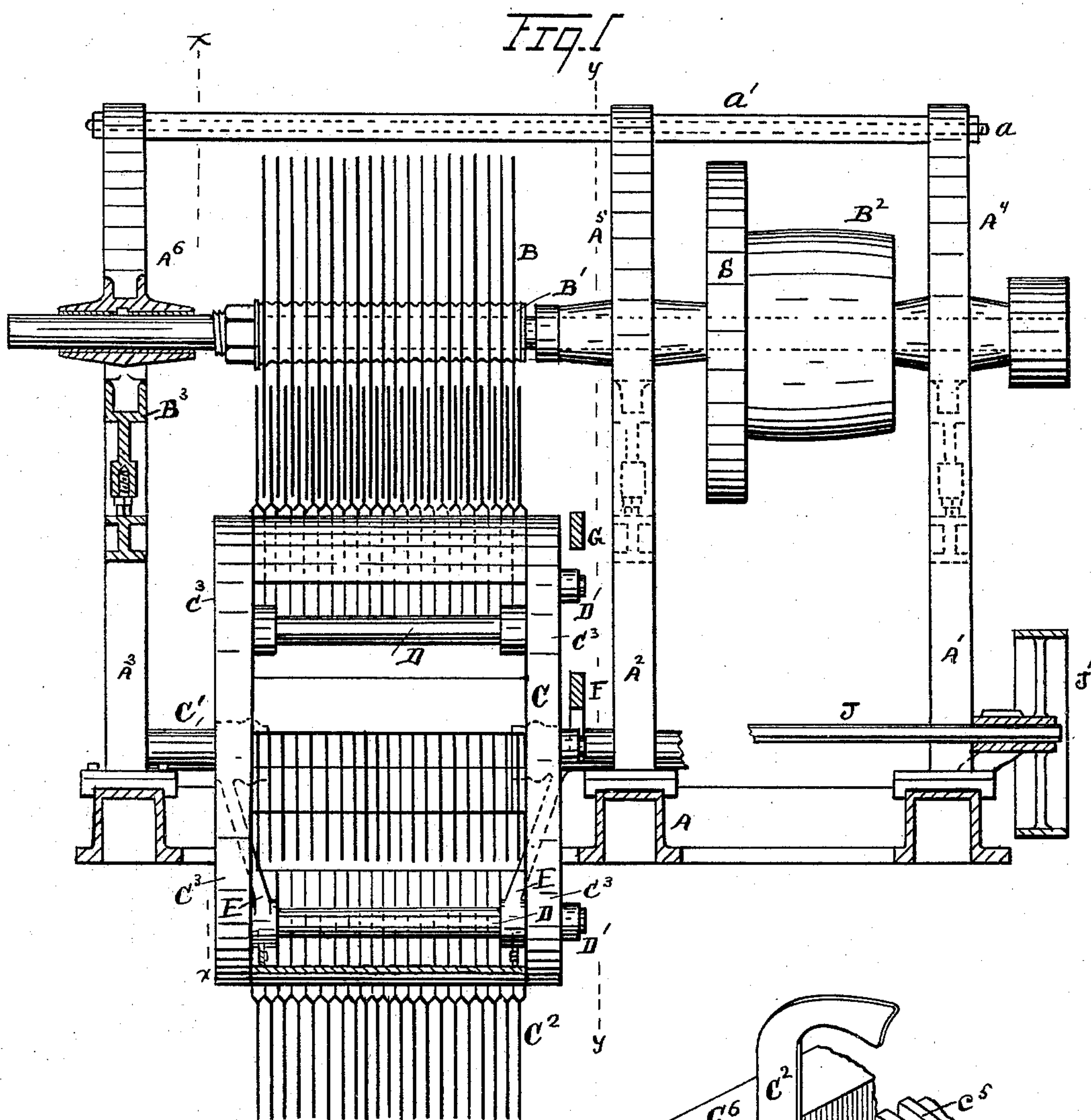
(No Model.)

7 Sheets—Sheet 1.

D. R. EDWARDS.
BLOCK SAWING MACHINE.

No. 474,233.

Patented May 3, 1892.



Witnesses
John Schuman
John F. Miller

Inventor

Daniel R. Edwards

By his Attorney

Newell S. Wright.

(No Model.)

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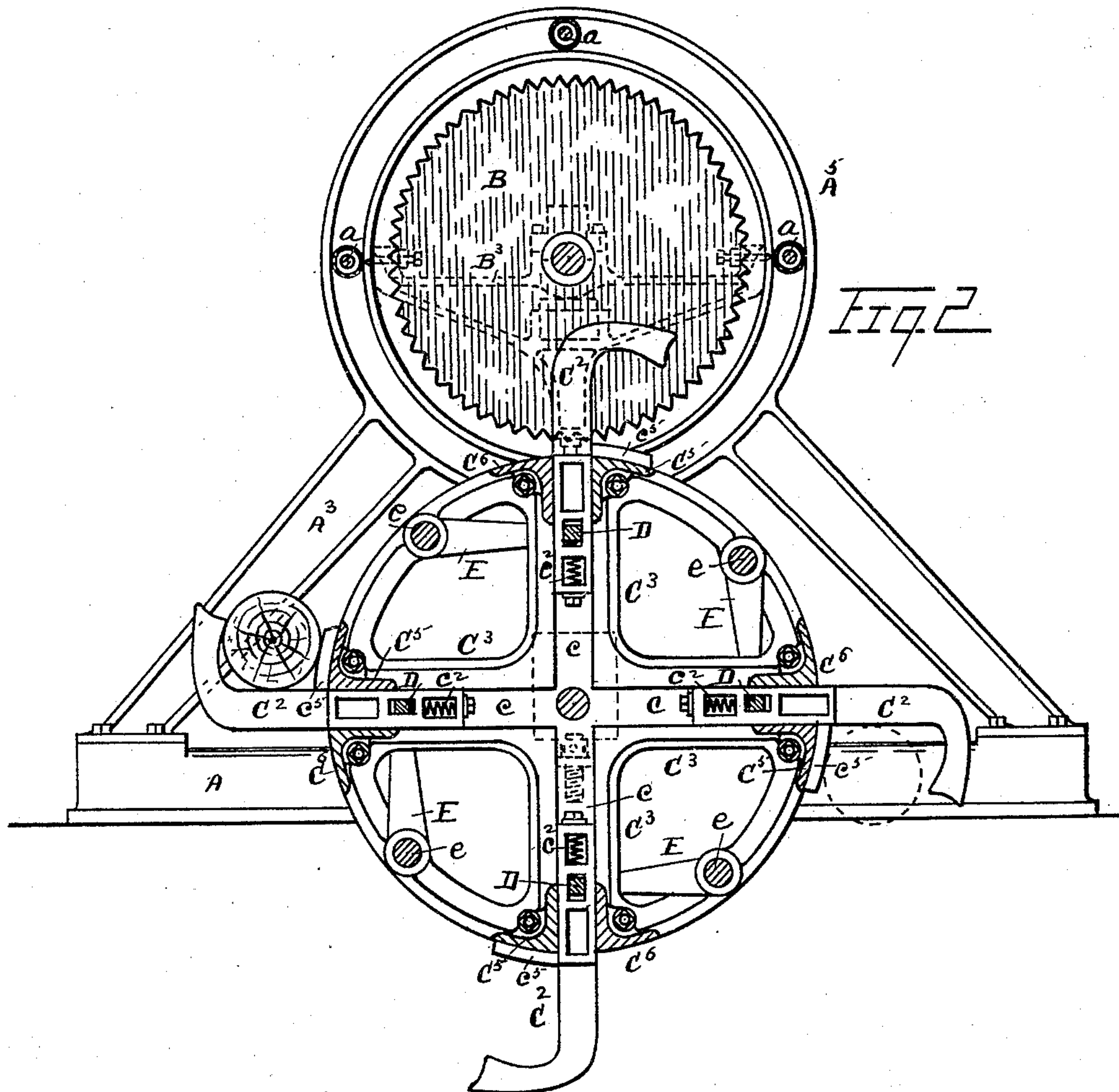
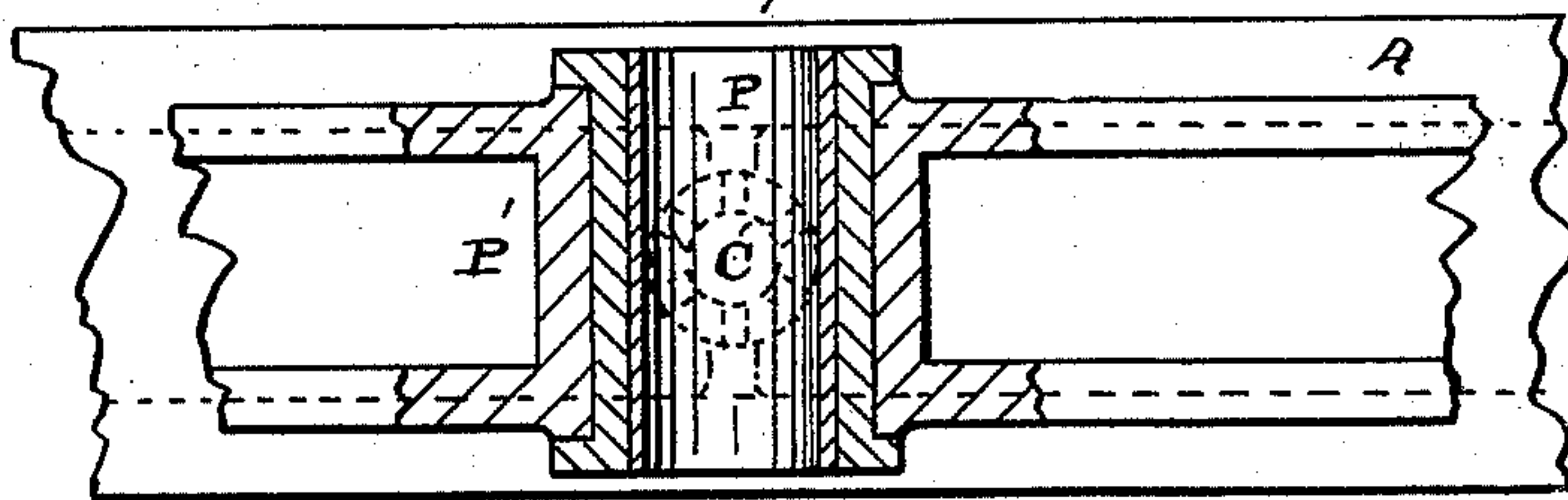


Fig. II



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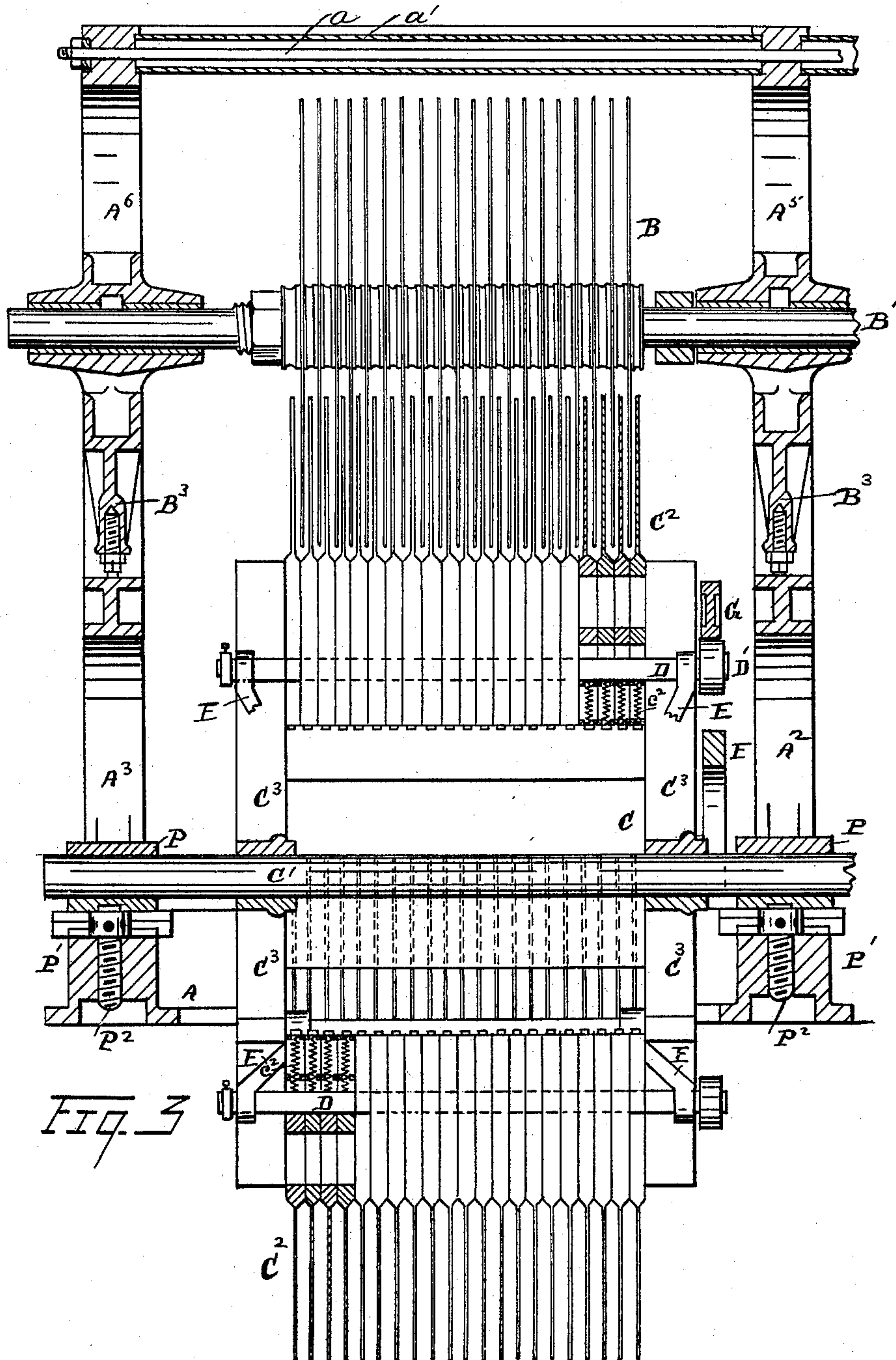
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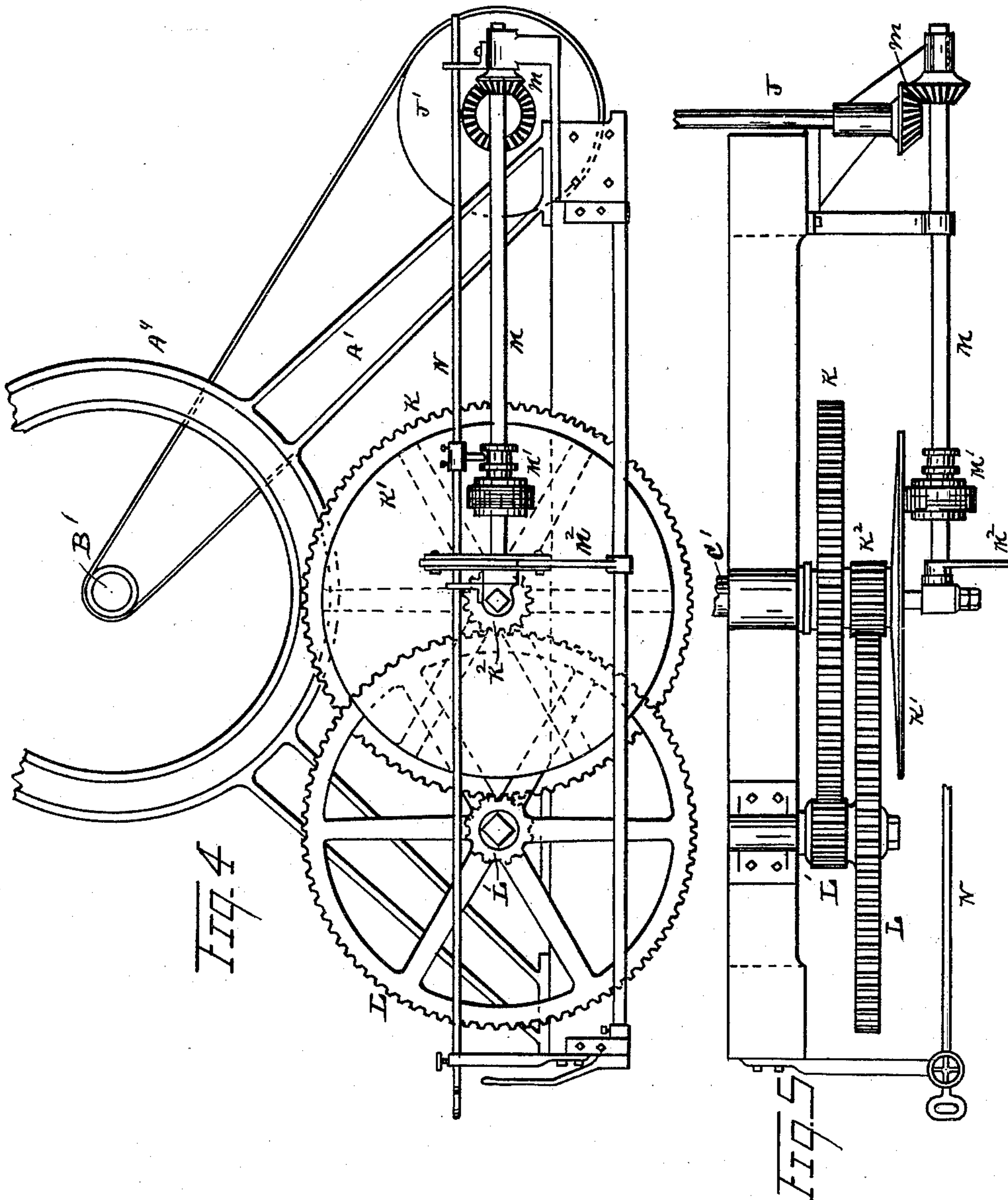
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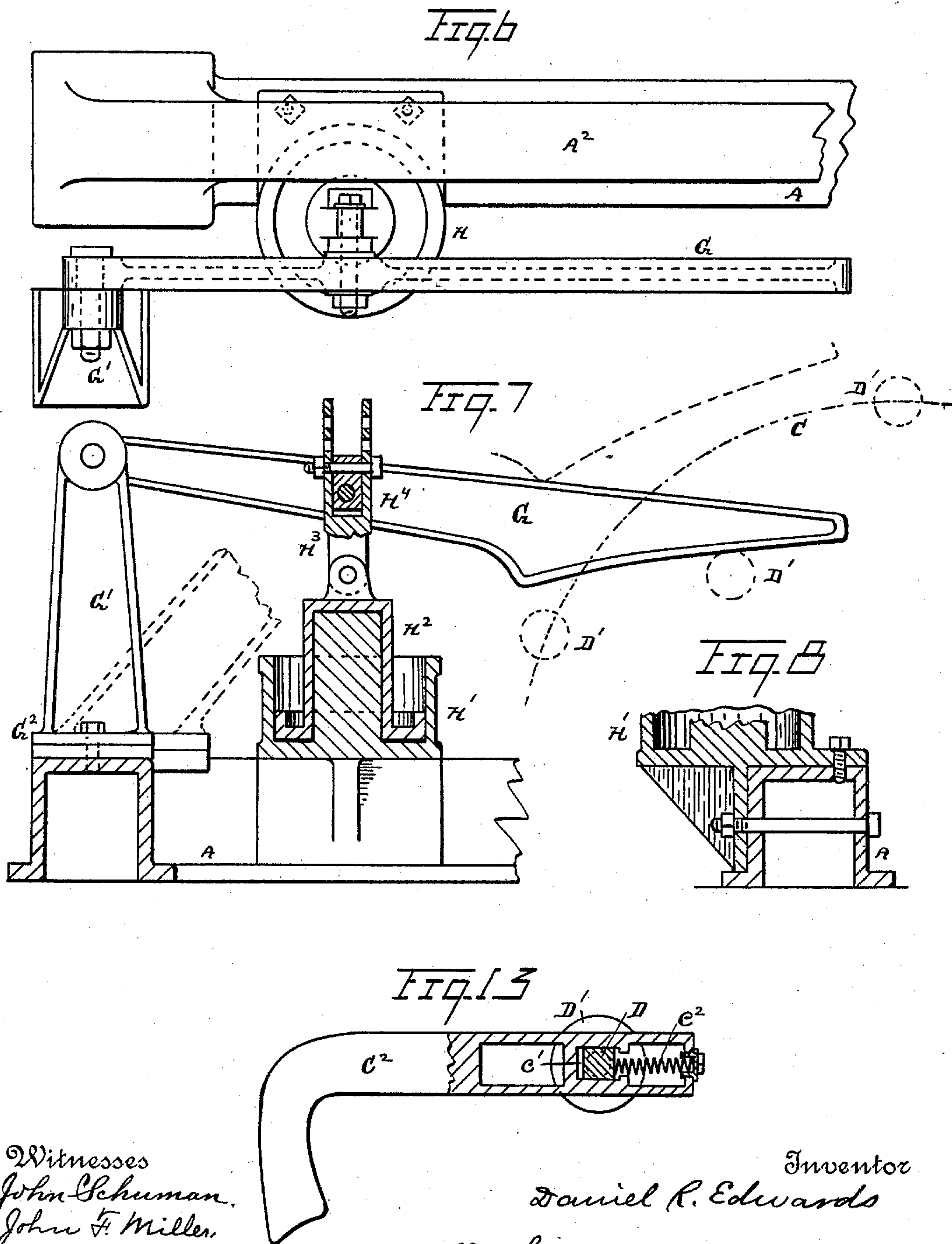
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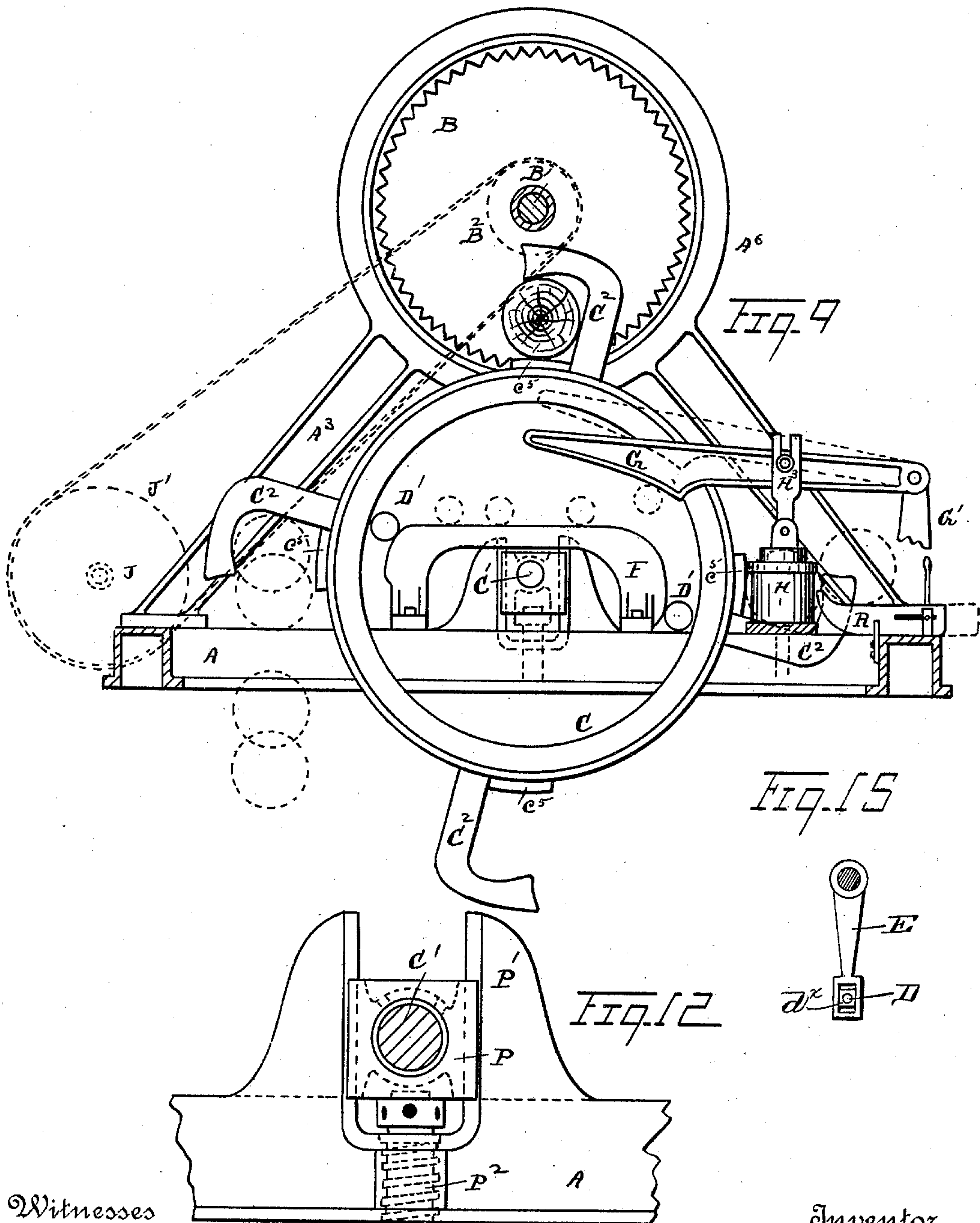
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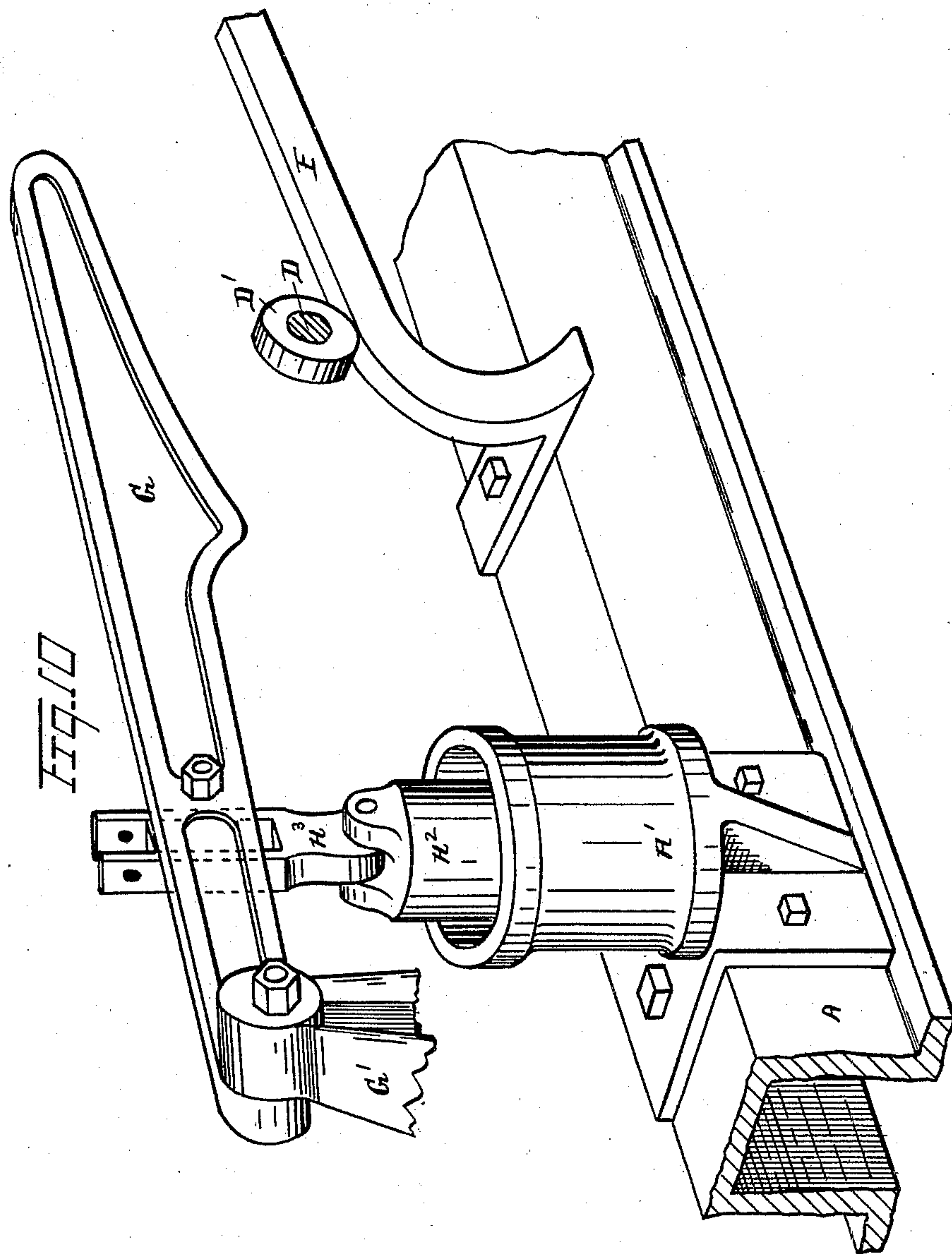
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UNITED STATES PATENT OFFICE.

DANIEL R. EDWARDS, OF SAGINAW, MICHIGAN, ASSIGNOR OF ONE-HALF TO
MARYETTE D. LA DUE, OF SAME PLACE.

BLOCK-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 474,233, dated May 3, 1892.

Application filed December 16, 1890. Serial No. 374,897. (No model.)

To all whom it may concern:

Be it known that I, DANIEL R. EDWARDS, a citizen of the United States, residing at Saginaw, county of Saginaw, State of Michigan, have invented a certain new and useful Improvement in Block-Sawing Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain new and useful improvements in block-sawing machines, having for its object a machine of this class of much larger capacity and efficiency than those hitherto devised.

To this end I design to make my improved machine automatic in its operation, thereby dispensing with considerable labor, as well as increasing the rapidity and quantity of work produced, securing much greater economy. At the same time my purpose is to make such a machine which shall be simple in its construction and not liable to get out of order.

I carry out my invention, therefore, as hereinafter specified and claimed and illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of my improved machine, showing parts in section. Fig. 2 is a vertical section on the line xx , Fig. 1. Fig. 3 is a vertical longitudinal section of portions of the machine. Fig. 4 is an end elevation. Fig. 5 is a plan view of certain portions of the driving mechanism. Fig. 6 is a plan view of the arm that closes the finger-bars and of the dash-pot. Fig. 7 is a side elevation of the same, showing the dash-pot in section. Fig. 8 is a detail view in section showing the engagement of the dash-pot cylinder upon the frame. Fig. 9 is a vertical section on the line yy , Fig. 1. Fig. 10 is a view in perspective showing the mechanism for closing and opening the finger-bars. Fig. 11 is a detail view, in horizontal section, showing a portion of the drum. Fig. 12 is another detail view illustrating the adjustability of the drum-shaft. Fig. 13 is a detail view of one of the fingers, showing the spring bearing against the shaft on which the finger is engaged. Fig. 14 is a detail view, in

perspective, showing the engagement of the fingers in the cross-bars of the drum; and Fig. 15, a detail view of one of the arms, showing the manner in which the finger-bar is attached thereto.

As shown in the drawings, A represents any suitable supporting-frame, preferably provided with upright supports $A^1 A^2 A^3$, constructed with annular upper portions $A^4 A^5 A^6$, united by longitudinal bars or bolts a , extending through pipes a' .

B denotes a gang of saws mounted upon a mandrel B^1 , having its bearings in the supporting-frame and provided with driving-pulley B^2 . I do not limit myself to any definite manner of constructing and arranging the bearings of the mandrel in the frame. I prefer to employ bearings B^3 , having an adjustable engagement with said frame in any suitable manner, so that the mandrel can be raised or lowered, as may be required.

An important feature of my invention is the provision of a revolving drum C, constituting a carriage or feeder, said drum revolving underneath said mandrel. C^1 is the shaft of said drum, journaled in any suitable manner upon said frame. The drum is provided with a series of gripping-fingers C^2 , arranged to pick up and firmly hold the log to be cut into blocks and carry it through the revolving gang-saws in the operation of sawing, releasing, and discharging the blocks from the machine. In order to the efficient operation of said fingers in the accomplishment of said results, they are constructed and arranged in such a manner as to open and close automatically at the proper time to pick up, hold, and release the timber in the progress of the work. The fingers are engaged upon a bar or rod D, connected to the extremities of oscillatory arms E at each end thereof, said arms having a jointed engagement upon the heads of the drum, as shown at e . As shown in the drawings, the drum is provided with a series of said bars or rods D, four being herewith illustrated, each of said bars being provided with a series of said gripping-fingers C^2 .

As will be seen by referring to Fig. 15, the bars D have their ends journaled in boxes d , which have a sliding movement in a slot in

the inner ends of the arms E. The outside fingers upon each bar D, respectively, have a sliding engagement in adjacent spokes or radial arms C^3 of the drum, said arms being
 5 constructed with guideways c for the adjacent fingers. Each finger is constructed with an orifice c' , Fig. 13, to receive the bar D, and is also provided with a spring c^2 , properly engaged in a suitable recess in the finger to bear
 10 against the bar D. This construction permits each finger to yield independently of the rest to conform to inequalities of surface on the log or allow the fingers to adjust themselves to a tapering log. It is evident that in the
 15 rotation of the drum gravity will cause the fingers and the supports upon which they are mounted to close upon the log as the drum revolves, so as to bring the log to the saws, while, also, on the other hand, gravity will
 20 tend to open the fingers as the drum revolves, so as to carry the blocks downward away from the saws after passing through them, the jointed or pivoted engagement of the bars D upon the drum permitting this reciprocation
 25 of the fingers to open and close them, as above mentioned. To facilitate the opening and closing of the fingers, however, and cause them to grip the log more firmly in carrying and holding it to the saws, as well as to accom-
 30 plish the opening and closing of the fingers at the proper time in every case, I prefer to provide additional means other than gravity alone to accomplish these results. Accord-
 35 ingly each of the bars D is provided with a roller D' at one extremity. Within the circle described by the rotation of the several rollers and adjacent to the corresponding head of the drum I locate a track F. This track may be
 40 secured upon an adjacent portion of the frame. As shown in Fig. 9, for example, it will be seen that when the rollers D' are at the ends of the track the track will serve to crowd out the fingers into an open position. The track is obvi-
 45 ously so located that the fingers are thus forced open at the points where the fingers are on the one side to pick up the log and on the other side to release the sawed blocks and discharge them, the track, as shown, being constructed
 50 with a straight upper face, rounded at the ends, evidently allows the fingers to contract or close upon the log as it carries it and holds it to the saws. When no block or log is in the fingers, the said rollers will travel on the face of said track. When a log is held in the fin-
 55 gers, the said rollers intermediate the ends of the track may rise above the track, according to the size of the log. In this manner it is clear the fingers tend to close as the said rollers pass toward the center of the track and
 60 begin to open as the roller passes from the center of the track toward the ends thereof. At the extreme end of the track the fingers are wide open. After discharging the blocks it is obvious from the position of the fingers
 65 that they will remain open by their own weight until they rise upward to engage the log and pass a horizontal position. To more

firmly close the fingers upon the log when the said rollers are intermediate the ends of the track and so hold the work more firmly to
 70 the saws, I locate an oscillatory arm G above the track and over said rollers. Against this arm G the rollers may strike in the rotation of the drum, said arm coming in contact with the rollers by its weight tends to force them
 75 inward and so close the fingers upon the log. This arm G has a pivotal engagement at one end upon a standard G' , mounted upon the frame, as at G^2 .

H is a vacuum dash-pot with which the arm
 80 G is connected, constructed, essentially, of a cylinder H' , mounted upon the frame A, a piston H^2 and rod H^3 , connecting the piston with said arm, as shown at H^4 . This vacuum dash-pot evidently tends to hold the free end
 85 of the arm G down firmly upon the rollers D' , while also said arm has a yielding engagement upon the rollers when they are brought into contact therewith. The vacuum dash-pot also cushions the fall of said arm when
 90 no block is in the fingers or when it descends to be ready for the next roller, causing the machine to run more quietly without jar or shock. The heads of the drum are connected
 95 by cross-bars C^5 and C^6 , (shown more in detail in Fig. 14,) between which the fingers C^2 project, said cross-bars forming at the same time a guide or support for the fingers. One of said bars, as the bar C^5 , is provided with
 100 ribs c^5 , said ribs spaced to come in line with the finger-bars, leaving spaces for the saws to move through, allowing the saws to cut through the log without coming into contact with the face of the drum.

I do not limit myself to any specific mech-
 105 anism for opening and closing the fingers of the drum, as I contemplate various ways of doing this as coming within the scope of my invention, as by weight, springs, or other devices. So, also, I do not limit myself to any
 110 particular driving mechanism. As shown, however, the driving-pulley B^2 is belted to a supplementary shaft J, provided with a pulley J' . The drum-shaft C' is provided with a cog-wheel K, rigidly fastened thereto and has
 115 loosely mounted thereon a disk friction-wheel K' and a pinion K^2 , rigid with the disk and meshing with a cog-wheel L, the shaft of which is also provided with a pinion L' , meshing with the wheel K. A rotatable shaft M is geared at
 120 one end with the shaft J, as at m . Adjacent to the friction-disk K' the shaft M is provided with a friction-wheel M' . A lever M^2 is arranged to throw the friction-wheel M' into and out of contact with the friction-disk. A
 125 bar N is also arranged to move the friction-wheel M' on the shaft M to and from the center of the disk K' to cause said disk, and correspondingly the drum, to run faster when the friction-wheel is nearer the center of the
 130 disk and slower when it is moved toward the periphery of the disk, providing for a variable rotation of the drum. I prefer, further, that the drum-shaft C' should be provided

with adjustable bearings. Accordingly, as shown more especially in Figs. 3, 11, and 12, P denotes the bearings of the drum-shaft, the same having a dovetailed or otherwise movable engagement in brackets P' of the bed or supporting-frame A. By means of a screw P² the bearings may be adjusted to any desired position. The object of these adjustable bearings is to raise the drum as the saws become worn with use.

R denotes a log-leading table constructed to permit the fingers to pick up one log only at a time, and when one is removed to allow another log to take its place. This table is movable toward and from the drum, as shown by the elongated slot, Fig. 9, and is made slanting with inner upturned points, as shown.

I prefer that the arbor or mandrel of the saws should be provided with a heavy fly-wheel S, since a wheel acts as an equalizer of power and helps to drive the saws through heavy cuts and restores the spent velocity between the cuts. It will be seen that this construction and arrangement allows one log to pass entirely through and clear of the saws before another log reaches them. This gives the saws a chance to straighten up, if inclined to run to one side in a given log, so that they will strike the next log in a straight line. The arm G might be provided with a spring or weight bearing thereupon, if desired to increase its pressure upon rollers.

What I claim as my invention is—

1. In a block-sawing machine, a rotatable feeding-drum provided with gripping-fingers arranged in two or more parallel series, each finger of each series independently reciprocatory in a line radial from the drum, substantially as set forth.

2. In a block-sawing machine, a rotatable feeding-drum having, in combination therewith, a series of gripping-fingers, a movable support engaging said fingers, a roller on said support, a track adjacent to said roller, and a movable arm located above the line of movement of the roller, substantially as set forth.

3. In a block-sawing machine, a rotatable drum provided with gripping-fingers, a track to open said fingers, an arm G to close said fingers, and a vacuum dash-pot connected with said arm, substantially as set forth.

4. In a block-sawing machine, a rotatable feeding-drum provided with radially-reciprocatory gripping-fingers engaged upon a shaft, and vibratory arms connected at their outer ends with said shaft, substantially as described.

5. In a block-sawing machine, a rotatable feeding-drum having, in combination therewith, radially-reciprocatory gripping-fingers located upon a transverse shaft, said shaft having a yielding engagement with said fingers, substantially as described.

6. In a block-sawing machine, a rotatable

feeding-drum constructed with radial guide-ways c, having, in combination therewith, gripping-fingers C², reciprocatory in said guide-ways, oscillatory arms E, having a jointed engagement upon the drum at one end, and shafts D, connected with the opposite ends of said arms and engaging said fingers, respectively, substantially as set forth.

7. In a block-sawing machine, a rotatable feeding-drum having, in combination therewith, oscillatory arms E, having a jointed engagement at one end with the drum, shafts D, engaged with the opposite ends of a pair of said arms, and a series of radially-reciprocatory fingers engaged with each of said shafts, the series of fingers simultaneously movable with the respective shafts with which they are engaged, substantially as set forth.

8. In a block-sawing machine, a rotatable feeding-drum having, in combination therewith, oscillatory arms E, having a jointed engagement at one end with the drum, shafts D, engaged with the opposite ends of a pair of said arms, and a series of radially-reciprocatory fingers engaged with each of said shafts, the series of fingers simultaneously movable with the respective shafts with which they are engaged and having an independently-yielding engagement therewith, substantially as set forth.

9. In a block-sawing machine, a rotatable feeding-drum constructed with heads and end connecting cross-bars C⁵ C⁶, having, in combination therewith, radially-reciprocatory gripping-fingers C², projected between said cross-bars, shafts D, engaged with said fingers, and oscillatory arms E, engaged at one end with said shafts and jointedly engaged with the drum at the opposite ends, substantially as set forth.

10. In a block-sawing machine, the combination, with rotatable saws, of a vertically-rotatable feeding-drum, said drum provided with radially-reciprocatory gripping-fingers projecting outward from the periphery of the drum to engage the work and hold it to the saws, substantially as described.

11. In a block-sawing machine, the combination, with a series of rotatable saws, of a rotatable feeding-drum provided with radially-reciprocatory fingers, said saws rotatable between said fingers, substantially as described.

12. In a block-sawing machine, the combination, with a series of rotatable saws, of a feeding-drum provided with radially-reciprocatory gripping-fingers arranged across the drum, and a shaft D, engaging said fingers, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

DANIEL R. EDWARDS.

Witnesses:

LEANDER SIMONEAN,
ROBERT N. WILSON.