

(No Model.)

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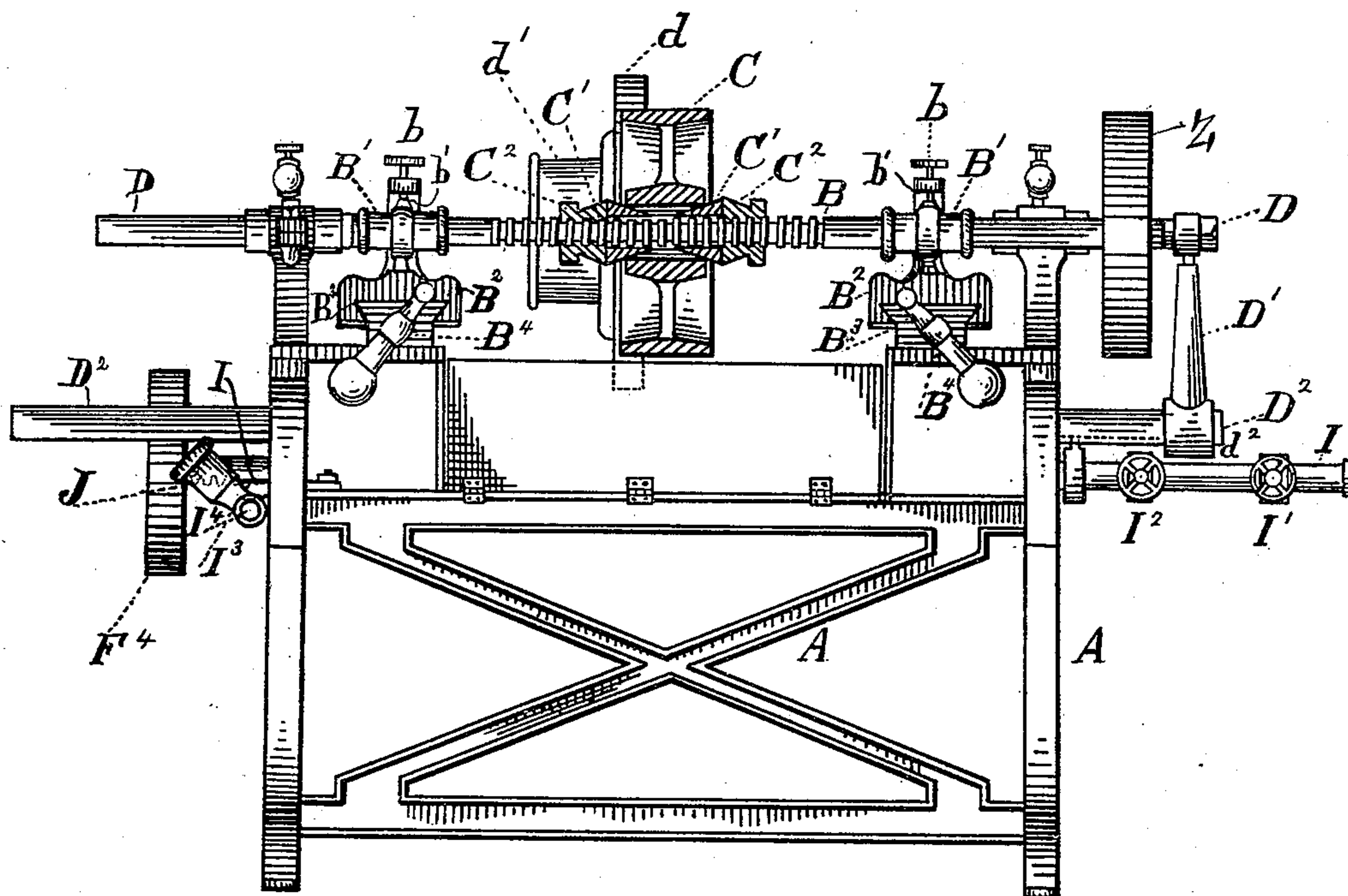
F. M. SIMMONS.

MACHINE FOR GRINDING PULLEYS.

No. 251,141.

Patented Dec. 20, 1881.

Fig. 1.



WITNESSES

Samuel & Thomas
J. Edward Warren

Frank M. Simmons INVENTOR
By W. W. Leggett, ATTORNEY

ATTORNEY

(No Model.)

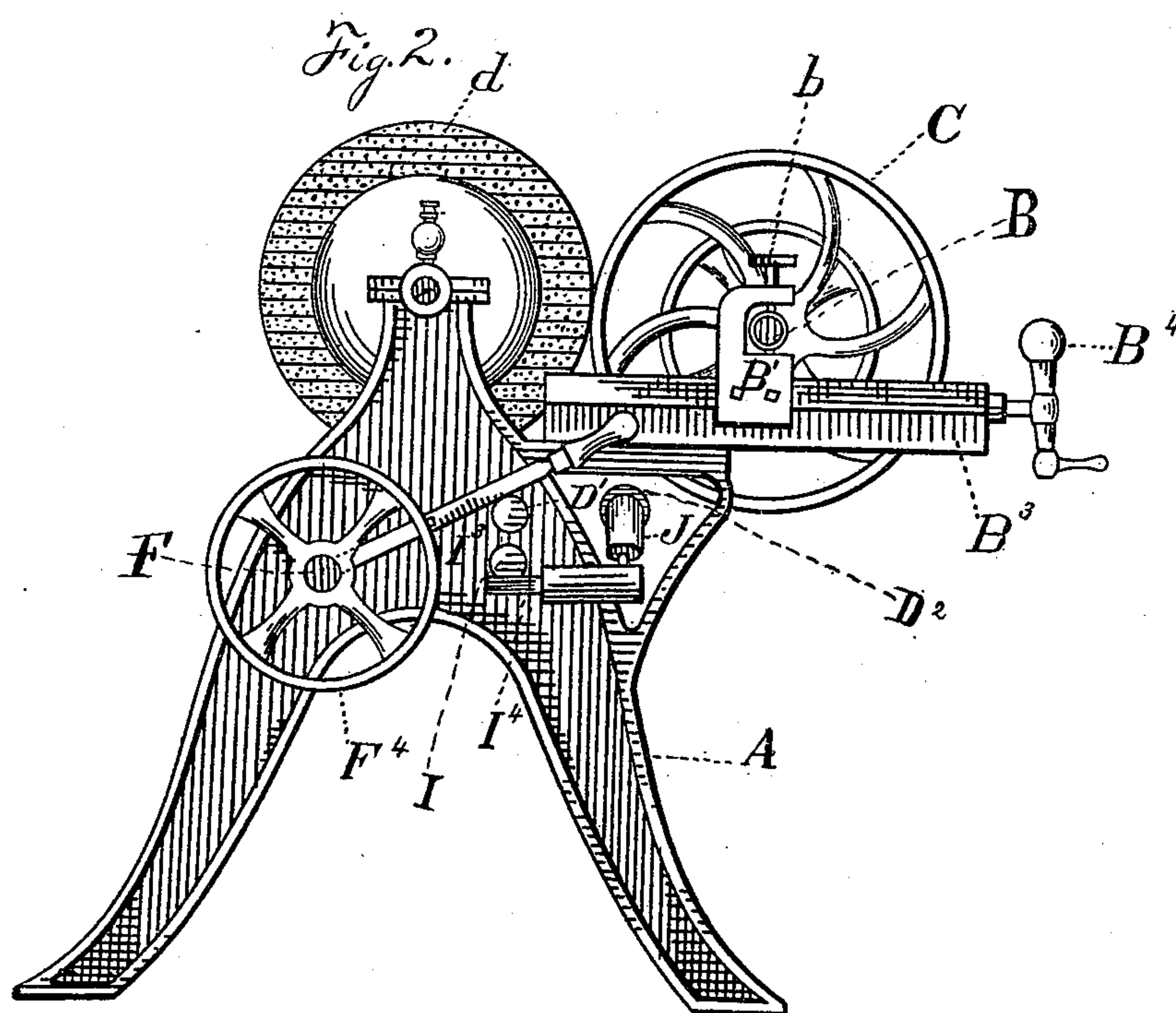
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F. M. SIMMONS.

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WITNESSES

Samuel C Thomas
J. Edward Warren

Frank M. Simmons
By W. W. Feggett,
ATTORNEY

ATTORNEY

(No Model.)

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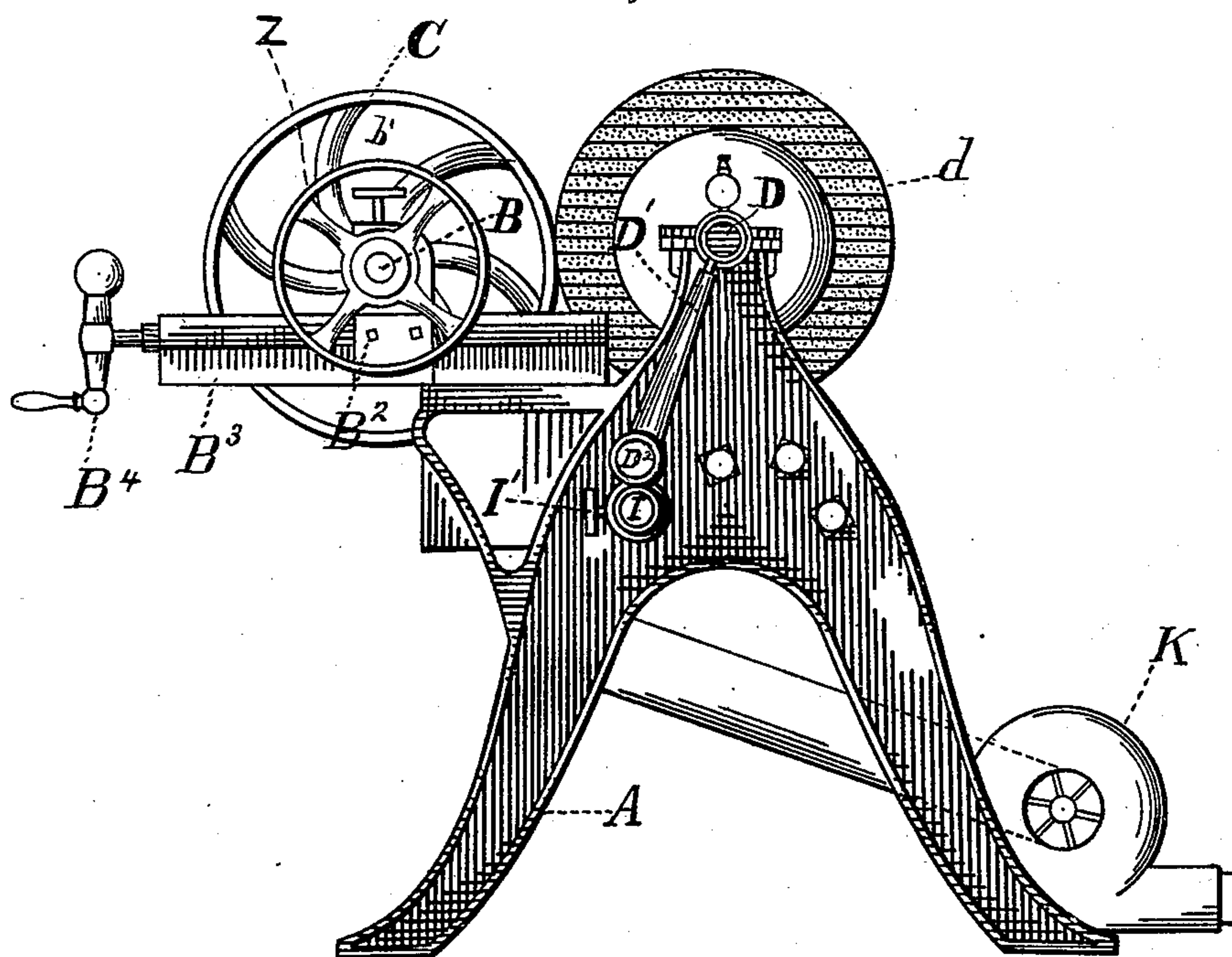
F. M. SIMMONS.

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Fig. 3.



WITNESSES

Samuel E. Thomas.
J. Edward Warren

INVENTOR

Frank M. Simmons
By W. W. Leggett,

ATTORNEY

(No Model.)

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Fig. 4.

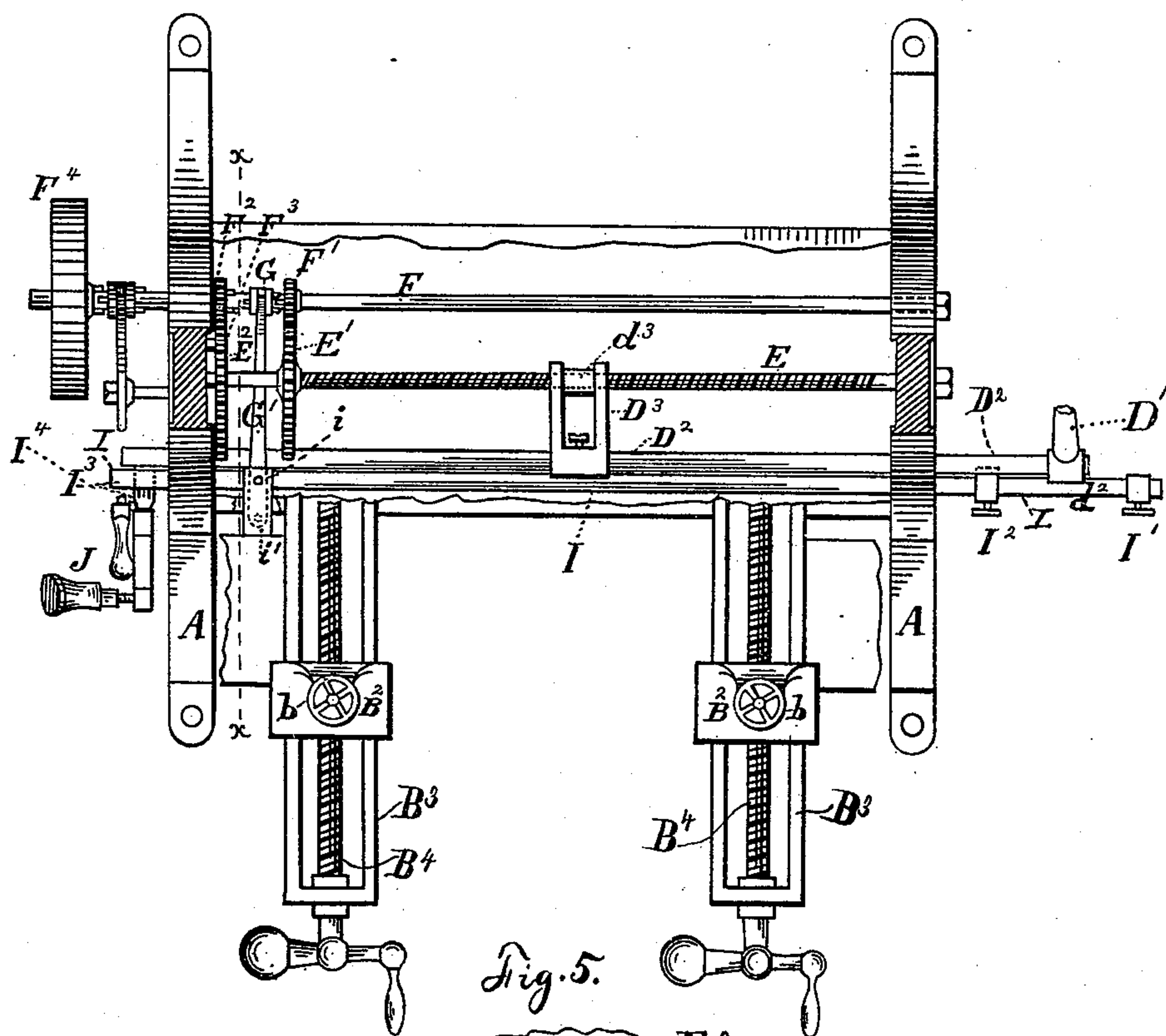
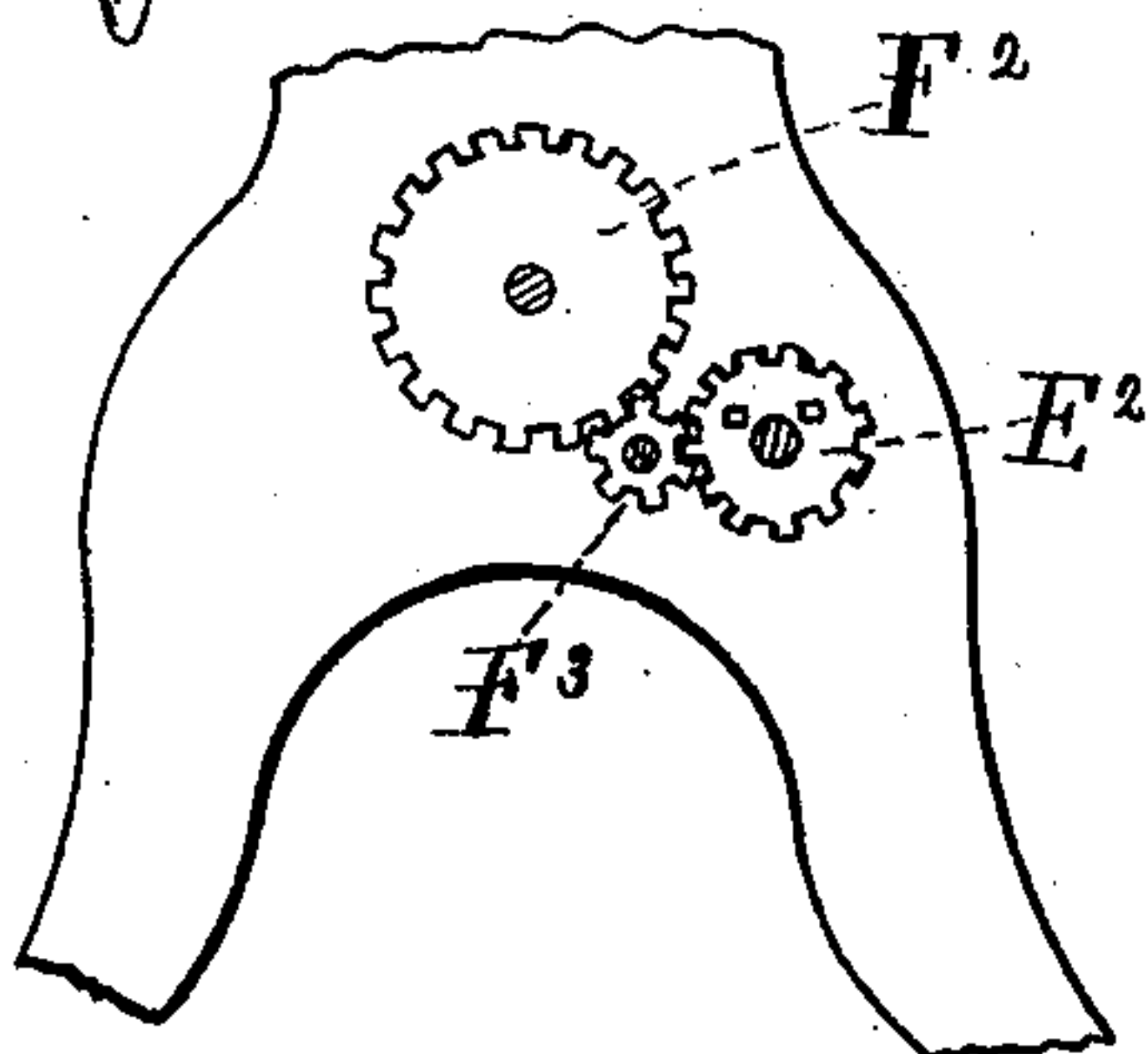


Fig. 5.



WITNESSES

Samuel C. Thomas.

J. Edward Warren

Frank M. Simmons INVENTOR
W. W. Leggett.

ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK M. SIMMONS, OF DETROIT, MICHIGAN.

MACHINE FOR GRINDING PULLEYS.

SPECIFICATION forming part of Letters Patent No. 251,141, dated December 20, 1881.

Application filed August 23, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRANK MORELL SIMMONS, of Detroit, county of Wayne, State of Michigan, have invented a new and useful Improvement in Machines for Grinding Pulleys; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention consists in apparatus hereinafter described for presenting the face of the pulley properly to the emery-wheel, for causing the emery-wheel to traverse across the face of the pulley, for presenting the pulley so as to dress its face with the usual central ridge, and in other features of construction.

In the drawings, Figure 1 represents a front elevation of an apparatus embodying my invention. Fig. 2 is a side elevation adjacent to the drive-pulley; Fig. 3, a side elevation adjacent to the pulley which revolves the pulley-wheel that is being dressed. Fig. 4 is a plan view, illustrating also the operating mechanism for causing the emery-wheel to traverse across the face of the pulley, but with pulley and emery-wheel removed. Fig. 5 is a detail view, illustrating a portion of the reversing-gear.

A is a frame. B is a screw-shaft designed to support the pulley to be dressed. It is housed at its end in journals B', which are pivoted to sliding head-blocks B², which latter are adjusted to slide upon ways B³ as they are actuated by the adjusting-screws B⁴. Set-screws b, set into recesses b' in the journals B', prevent any longitudinal thrust of the shaft.

C is a pulley that is in position to be ground. A belt wheel or pulley, Z, on shaft B affords means for giving rapid rotation to the said pulley C. It is held in position and centered by the sliding conical heads C', which are thrust into the pulley-eye, and forced firmly into place by the jam-nuts C². By loosening the screws b the shaft B may be slid to the right, or in the direction of the pulley Z, sufficiently to remove it from its bearing at the left-hand end, and then the nut and conical head next that end may be removed in order to permit the placing of the pulley on the shaft, after which the parts may all be replaced in position, as shown.

D is a sliding shaft, which bears the emery-wheel or other grinder, d. It is rotated by any suitable means—as for instance, by a belt leading to the pulley d'. D' is an arm connecting one end of this shaft with a sliding bar, D². An arm, D³, bearing a stationary nut, d³, at its free end, is firmly collared or otherwise rigidly secured to the bar D².

A screw-shaft, E, engages the threads of the nut d³. This shaft E can rotate freely, but has no longitudinal movement. Upon it there are two cog-wheels, E' E². The wheel E' meshes directly with a loose pinion, F', on the power-shaft F, while the other provides for a reverse motion by first meshing with an intermediate pinion, F³, which in turn engages the loose pinion F² on the power-shaft. A clutch, G, is located between the loose pinions F' F², and is permitted to slide freely toward either pinion; but a feather-and-groove connection with the power-shaft F causes the clutch to rotate with the shaft. The clutch G is caused to engage either pinion F' F² by projecting pins entering corresponding orifices or engaging corresponding lugs on the pinion.

The operation of this portion of the device will now be understood. We will presume a rapid rotation to have been imparted to the pulley C that is to be dressed, and to the emery-grinder d. The belt is thrown upon the power-pulley F⁴, which imparts rotation to the shaft F. The clutch is now, by the lever G', thrown into gear with the pinion F'. This causes the screw-shaft E to turn, and in working through the nut d³ the latter is forced, say, to the right, carrying with it the bar D², and the emery-wheel shaft D, causing it to travel across the face of the pulley. When it has gone far enough the clutch G is disengaged and slid over and engaged with the pinion F². This, through the intermediate pinion, F³, imparts a reverse motion to the screw-shaft E, and consequently causes the emery-wheel shaft and wheel to traverse in the opposite direction.

I will now describe how this reversing operation is rendered automatic.

I is a sliding bar. At one end it is provided with two adjustable blocks, I' I², which are so located that the heel d² of the arm D' will travel between them. At the other end of this bar is a rack, I³, meshing with a pinion, I⁴, on the

shaft of a toppling weight, J. An arm, G', loosely engages the clutch G, and, leading back, is first pivoted to the bar I at i, and then pivoted to a stationary plate at i', which point becomes the fulcrum of the lever-arm G'. Now, the emery-wheel having been adjusted at one edge of the pulley C at its starting-point, the blocks I' I² are correspondingly adjusted, so that when the emery-wheel has nearly completed its travel the heel d² will engage one of the blocks I', and as it proceeds farther the bar I is slid lengthwise, and gradually disengages the clutch G from the pinion F'. At the same time the rack and pinion I³ I⁴ have lifted the weight J so that its center of gravity is nearly over its shaft. Now, as the bar I is moved a little farther and the clutch G has nearly disengaged, the weight J topples over, and forcing the lever G' with it, the clutch is suddenly thrown across, engages with the pinion F², and the emery-wheel starts on its back travel. When it is near the end of its return travel a similar operation takes place, which reverses it, and so on.

In order to present the pulley C so that it shall be dressed to leave a central ridge, it is only necessary to adjust one of the head-blocks B² nearer to the emery-wheel than the other. A suction from K may draw in and force away the dust from the machine when in operation. With suitable cone-pulleys or other speeding-gear the wheel C may be given any desired speed.

By an apparatus of this character I am enabled to dress the faces of pulley-wheels with great accuracy and with wonderful celerity, taking only a few minutes to do what required hours of labor to do ineffectually by the old method.

What I claim is—

1. In a pulley-grinding machine, the combination, with an endwise-movable shaft carrying a grinding-wheel, and a shaft arranged to carry and provided with means for holding a pulley to be ground, of means for traversing the grind-

ing-wheel back and forth automatically across the face of the pulley while grinding the same, and mechanism for adjusting the opposite edges of the face of the pulley alternately toward the grinding-wheel, substantially as described. 50

2. In combination with an endwise-movable shaft carrying an emery-wheel and a shaft carrying the pulley to be ground, a pair of head-blocks carrying the bearings for the latter shaft, these head-blocks being independently adjustable toward or from said emery-wheel shaft, substantially as set forth. 55

3. In combination with the grinding-wheel and its endwise-movable rotary shaft and the pulley-carrying shaft, the shifting and reversing mechanism, substantially as described, for changing the endwise motion of said grinding-wheel shaft, a shipping-lever for such mechanism, and devices for automatically shifting said shipping-lever, substantially as described. 60 65

4. In combination with a shaft arranged to carry and provided with means for holding a pulley to be ground, an endwise-movable shaft carrying a grinding-wheel, a sliding bar provided with means for engaging and moving said grinding-wheel shaft, a nut and screw-shaft which moves said sliding bar, a pair of cog-wheels on said screw-shaft, an additional shaft having two loose pinions, one of which engages directly with one of said cog-wheels and the other of which connects with the other cog-wheel through an intermediate pinion, a clutch arranged to lock either of said loose pinions to its shaft, a lever which moves said clutch, a sliding bar pivotally connected with said lever and arranged to shift the same, and a rack, pinion, and toppling weight arranged to reverse the motion of the latter bar, all arranged to operate substantially as set forth. 70 75 80

In testimony whereof I sign this specification in the presence of two witnesses. 85

FRANK MORELL SIMMONS.

Witnesses:

J. EDWARD WARREN,
SAMUEL E. THOMAS.