

(No Model.)

3 Sheets—Sheet 1.

P. J. O'NEIL & J. W. YOUNG.

ROLLER MILL.

No. 342,838.

Patented June 1, 1886.

FIG. 1.

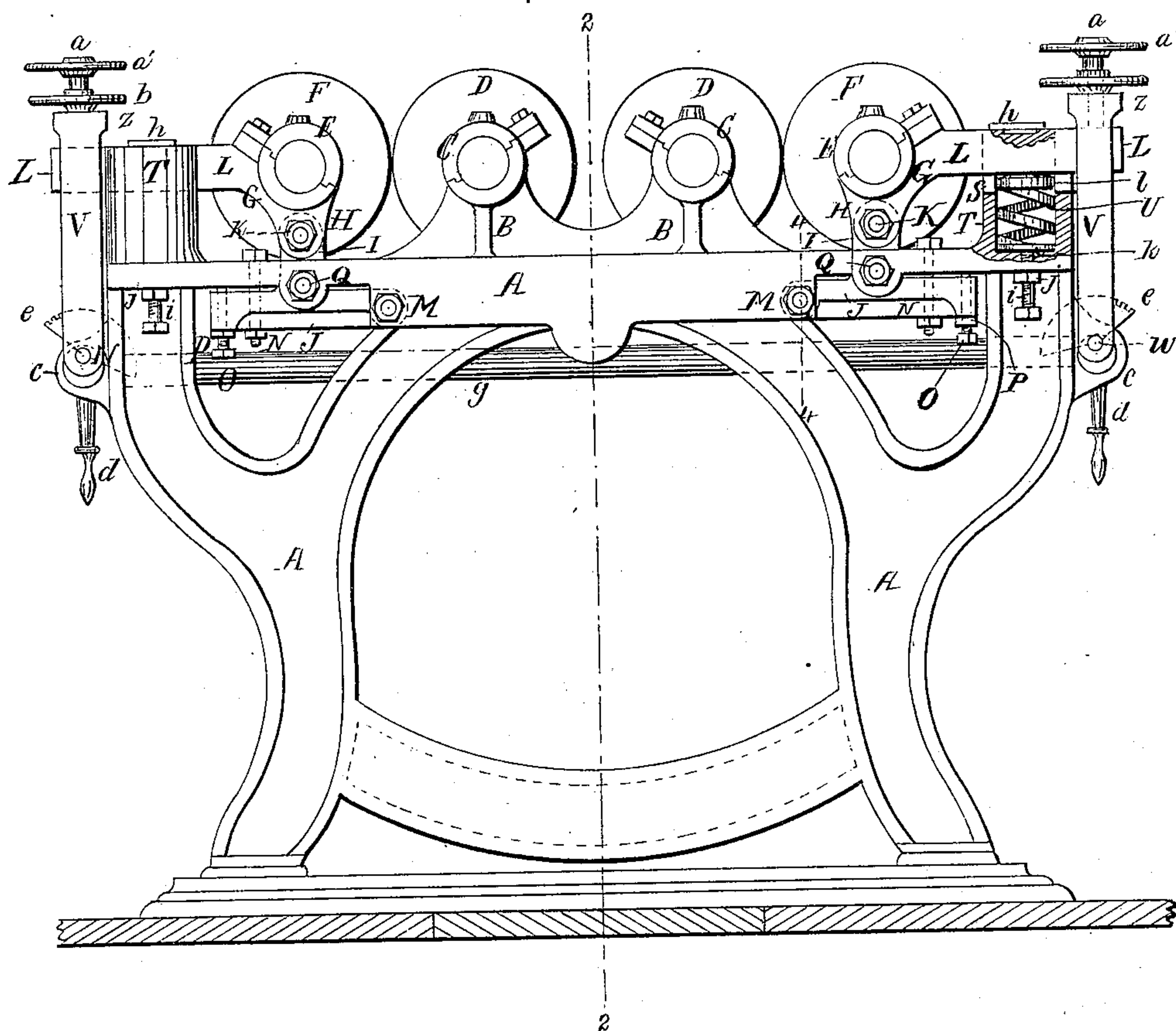
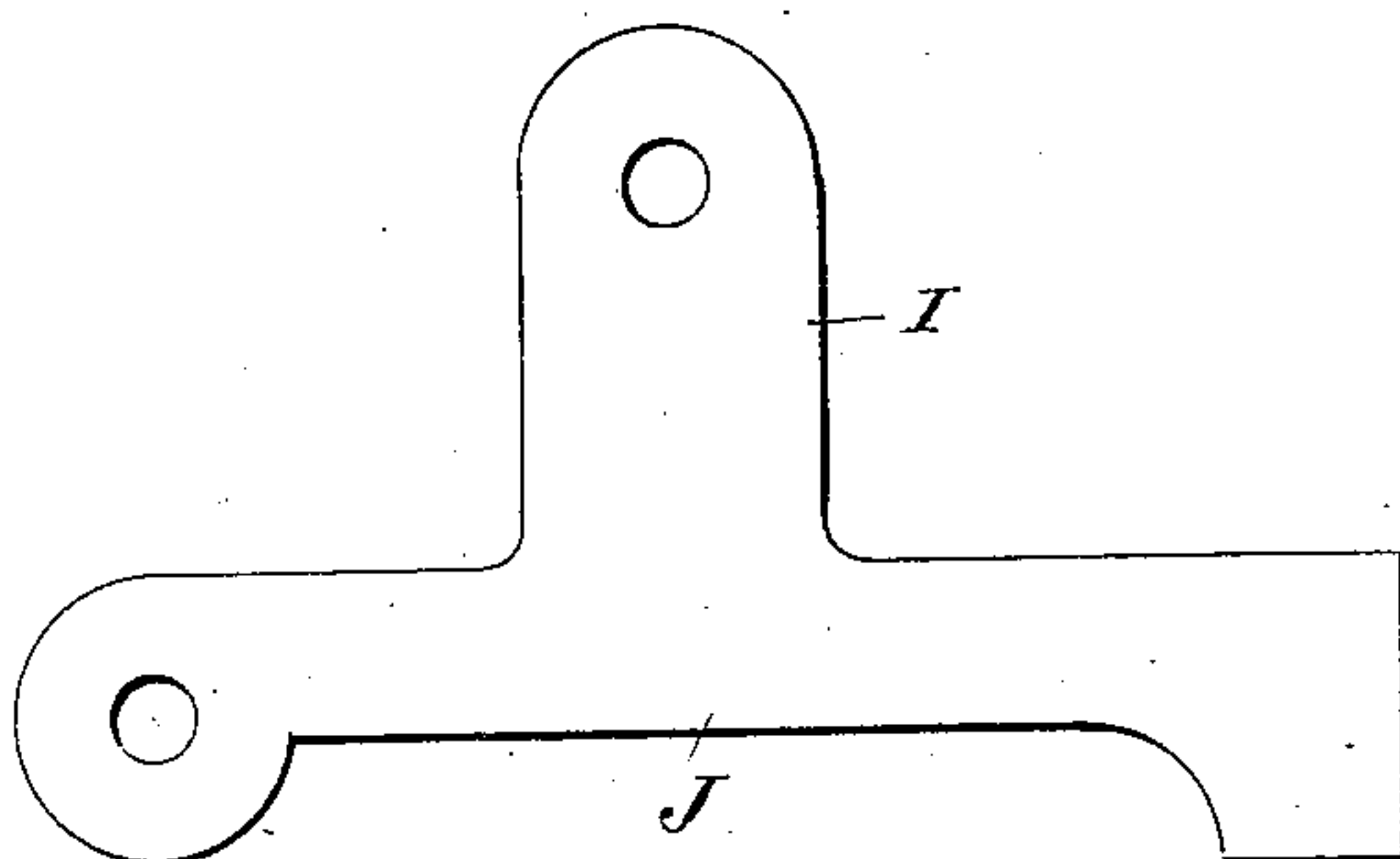


FIG. 5.



Attest:
F. A. Hopkins.
J. W. Hopkins

Inventors:
Philip J. O'Neil
John W. Young.
By Knight Bros.
Atty's.

(No Model.)

3 Sheets—Sheet 2.

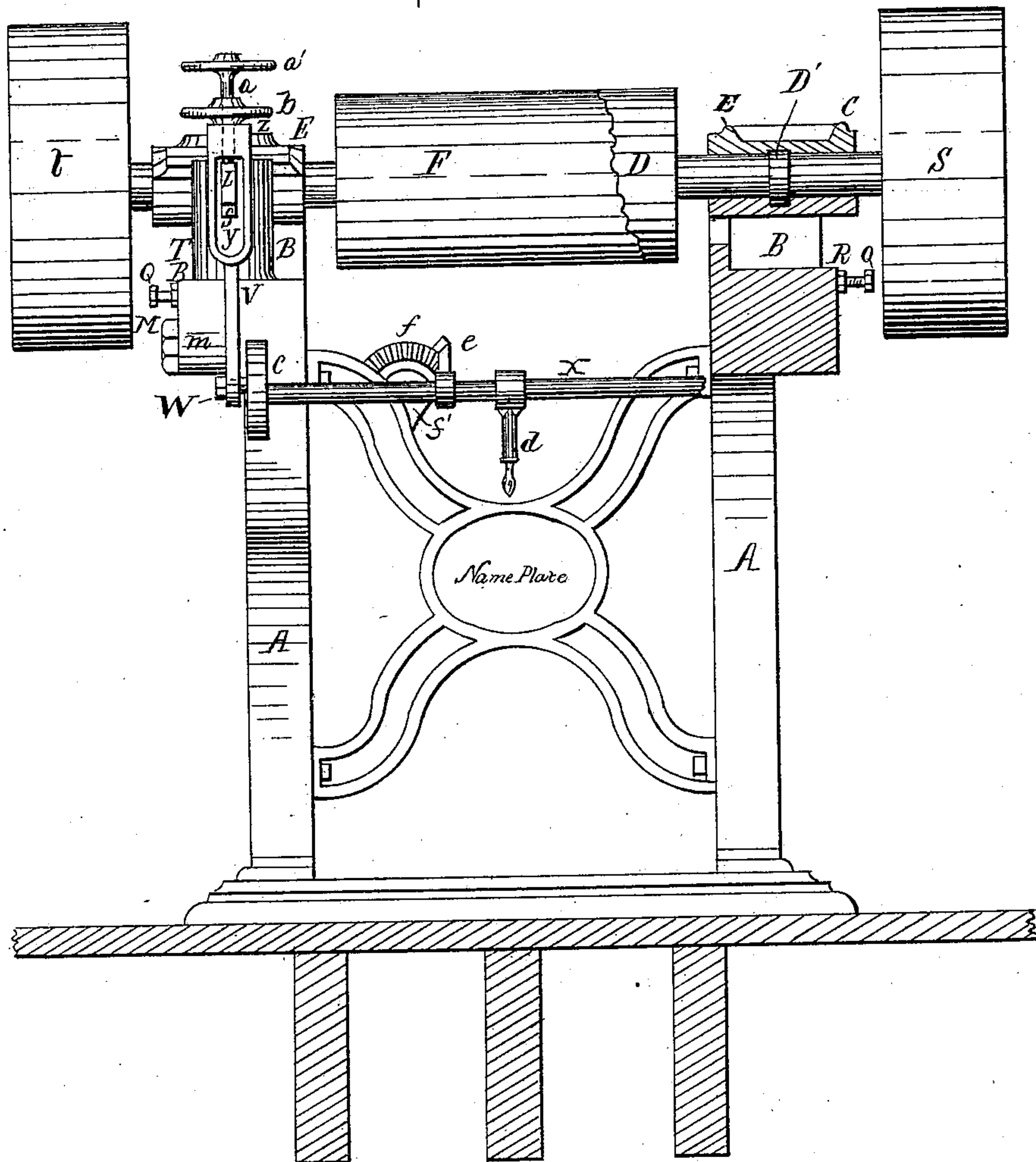
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FIG. 2.



Attest:

F. A. Hopkins.
F. A. Hopkins.

Inventors:

Philip J. O'Neil
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By *Knights Bros.*
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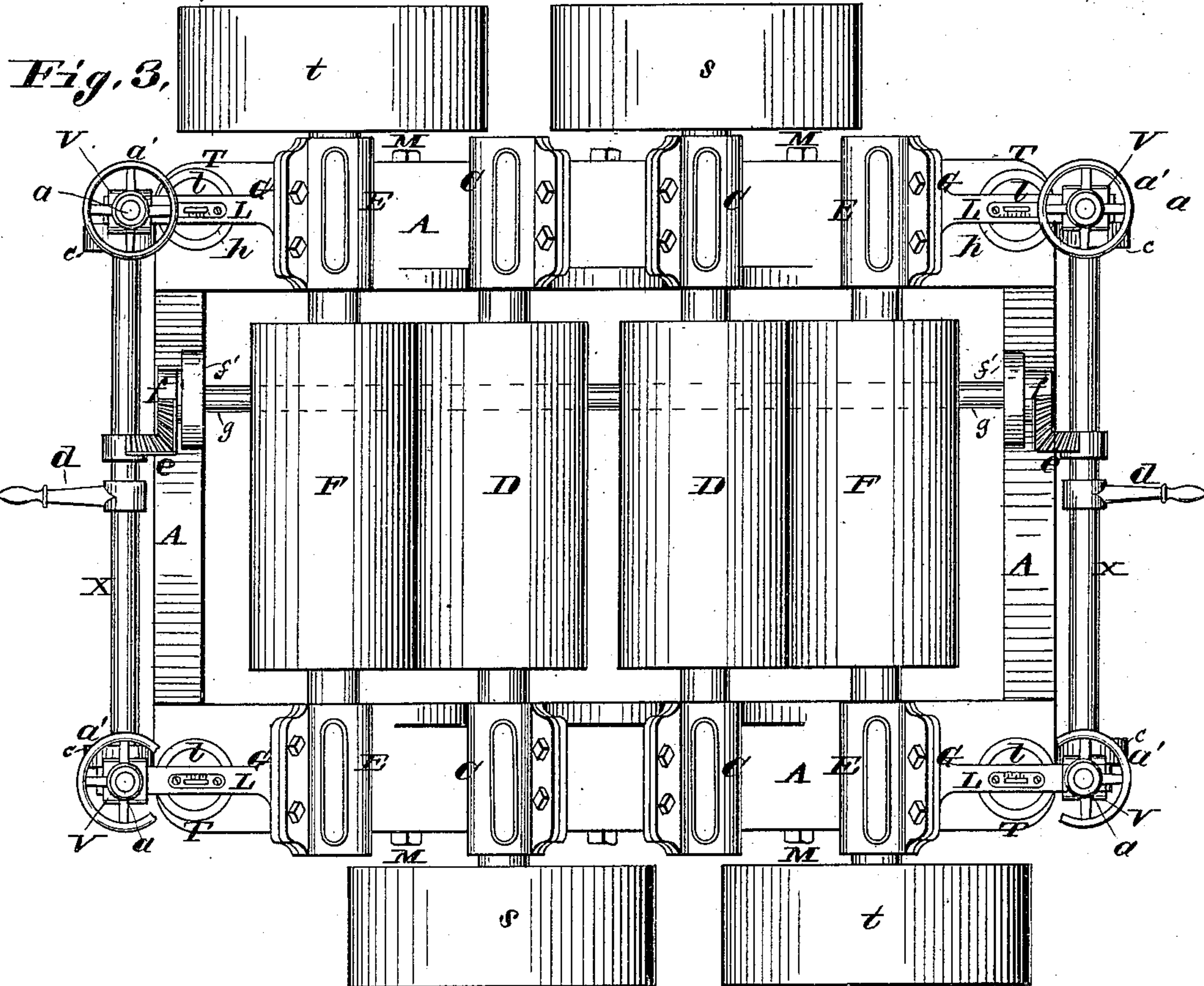
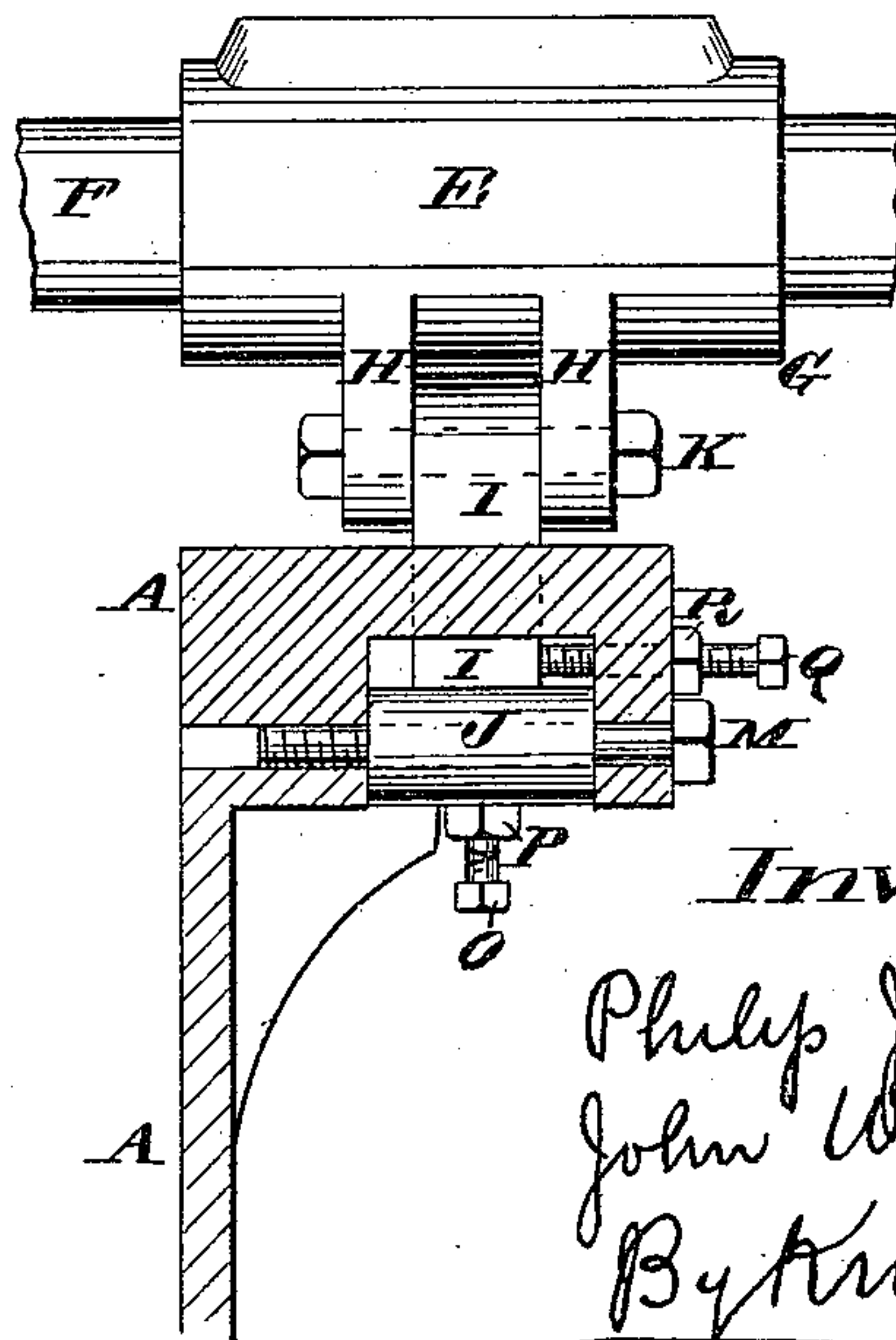


Fig. 4,



Attest;
Geo. Wheelock
Edward Steer.

Inventor;

Philip Joseph O'Neil.
John Wilson Young.
By Knight Bros.
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UNITED STATES PATENT OFFICE.

PHILIP JOSEPH O'NEIL AND JOHN WILSON YOUNG, OF LEAVENWORTH,
KANSAS.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 342,838, dated June 1, 1886.

Application filed May 29, 1885. Serial No. 167,080. (No model.)

To all whom it may concern:

Be it known that we, PHILIP JOSEPH O'NEIL and JOHN WILSON YOUNG, both of Leavenworth, Leavenworth county, Kansas, have invented a certain new and useful Improvement in Roller-Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is an end elevation of the mill-frame and parts composing our improvement. Fig. 2 is a view of the mill in side elevation, part being in vertical section at 2 2, Fig. 1. Fig. 3 is a plan view of the same. Fig. 4 is an enlarged detail vertical section at 4 4, Fig. 1. Fig. 5 is an elevation of one of the leveling-bars detached.

Our present invention applies to the construction of the frame and its appurtenances for the support and adjustment of the outer rollers.

A is the main frame, which may be of any suitable construction. The bearing-standards B of the two central rolls are cast solid with the frame. C are the journal-boxes of the central rolls, D. The journal-boxes E of the outside or movable rolls F are made adjustable in the manner hereinafter to be described. The bearing-frames G of these boxes E have lugs H upon the undersides, by means of which the bearing-frames G are hinged to the vertically-projecting lugs I, Figs. 4 and 5, of the leveling-bars J. K is the hinge bolt or pintle. The bearing-frames G have arms L, by means of which, together with their appliances, the boxes and rolls journaled therein are moved to and from the central rolls by vertical movement of the arms L. The leveling-bars J are hinged at one end to the frame by hinge-bolts M, so that the other end of the bars J may be raised or depressed to raise or lower the adjustable roll. The free end of each leveling-bar is supported on a screw-bolt, N, which passes through the top bar of the main frame and through the leveling-bar.

O are set-screws, one of which is tapped in the free end of each of the leveling-bars J, and whose upper ends bear against the under side of the top bar of the main frame, so as to hold the leveling-bar rigidly to its adjustment. The set-screws O each have a jam-nut, P. Each

of the lugs I passes up through a mortise in the flange of the main frame, and is prevented from moving sidewise by a set-screw, Q, having a lock or jam-nut, R.

The arms L pass through vertical slots S in the spring-cases T, fitting closely in said slots, yet with sufficient freedom to enable the spring U beneath the arm to lift said arm. Said slots serve as guides for the arms, and, taken in conjunction with the set-screws Q, entirely prevent any lateral movement of the bearing-frames, and enlargements or collars D' on the journals of the rolls, fitting corresponding depressions in the journal-boxes, prevent the longitudinal movement of said rolls when at work.

V are links by which the outer ends of the arms L are connected to the crank-wrists W of a shaft, X, the arrangement being such that by a part rotation of the shaft the ends of the arms may be drawn down or allowed to rise. The ends of the arms pass through vertical slots Y in the links, and may be adjusted therein by temper-screws *a*, tapped in bosses Z at the tops of the links, said temper-screws bearing at their lower ends upon the arms L, and being turned by hand-wheels *a'*. The temper-screws are each provided with a hand-wheel lock-nut, *b*, to hold them rigidly in place after adjustment. The crank-shafts X are journaled in lugs *c*, cast on the frame A, and are provided with handles *d*, by which they are turned. *e* are bevel-cog segments on the shafts X, which engage bevel cog-segments *f* at the ends of a shaft, *g*, journaled in lugs *f'*, projecting from the cross-braces or other parts of the frame, the arrangement being such that the two shafts X turn synchronously, owing to the described cog-connection, and the two movable rolls may be moved simultaneously from either side of the mill. The cross-shaft *g* passes through the frame so far below the rolls as to be out of the way of the spouts or other appliances (not here shown) for conducting the ground material from the rolls. Cog-segments *e* are used instead of whole wheels, so as to avoid projection beyond the frame.

The arms L are provided with graduated spirit-levels *h*, by which the arms L at the opposite ends of the roll may be set at an ex-

actly similar inclination, or both perfectly horizontal, so that the rolls will be parallel to each other when at work, it being a well-known fact that unless the rolls are parallel good work cannot be done on them, for, should they cross each other, proper reduction would only take place at the crossing point.

The steel springs U have sufficient strength to hold the rolls firmly to their work, and possess elasticity enough to give way and let foreign hard substances pass between the rolls without injury to the machine, the rolls, by the action of the springs, returning to the point from which they were thrown by such foreign substance. The bottom of each spring-case is provided with a set-screw, *i*, and lock-nut *j*, a follower-plate, *k*, interposed between the spring U and screw *i*, by means of which the tension of the spring may be regulated to suit the work to be done on the rolls. On top of the spring in each case T is a follower, *l*, said follower being fitted to move freely in the case, being made flat at bottom or otherwise suited to fit the top of the spring U, and crowning on top, this curved form having a tendency to bring the pressure of the spring to bear on the arm L centrally over the spring, thereby preventing the cocking or canting of the follower *l* and the spring when the arm L is out of a right angle to the face or top of the spring.

It will be understood that when the movable rolls are thrown outward from the central rolls by the passage of a foreign substance the ends of the arms L will leave the points of the temper-screws *a* and descend in the slots Y of the links V, the arms returning to their bearing against the lower ends of the temper-screws as soon as the foreign substance has passed through. Thus by the temper-screws *a* the approach of the movable rolls to the central rolls is limited and adjusted.

By disengaging the segment-gear *e* *f* at either side either pair of the rolls may be thrown apart independently of the other. This disengagement may be effected by turning the shaft *g* until its segments *f* are disengaged from and beyond the reach of the segments *e*.

The casing of the mill, the belt-tightening device, and feed mechanism are not shown, as they form no part of the present invention.

We claim—

1. The combination of the frame A, the movable roll F, its journals having the enlargements or collars D', the journal-boxes E, having corresponding depressions or grooves, the bearing-frames G, having the horizontal and vertical arms L and H, respectively, the slotted

spring-cases T, the springs U, the leveling-bars J, each having a lug, I, projecting upwardly therefrom, and the screws Q, tapped into the frame A, all constructed and arranged to operate substantially as and for the purpose set forth.

2. The combination, with the movable roll, of the oscillating bearing-frames G, having the horizontal arms L, the springs U, supporting said arms, the shaft X, having the eccentric wrist-pins W, and the links V, engaging said wrist-pins at their lower extremities and slotted at their upper extremities for engaging the arms L, as explained.

3. The combination, with the movable roll, of the oscillating bearing-frames G, having the horizontal arms L, the springs U, supporting said arms, the shaft X, having the eccentric wrist-pins W, the links V, engaging said wrist-pins at their lower extremities and slotted at their upper extremities, and the temper-screws *a*, all constructed and arranged to operate substantially as set forth.

4. The combination, with the movable rolls, of the oscillating bearing-frames G, having arms L, the links V, having the slots Y to receive the arms L, the temper-screws *a*, a shaft, X, at each end of the mill, having eccentric wrist-pins W, with which said links engage, a shaft, *g*, and cog connections between the shafts X and *g*, as and for the purposes set forth.

5. The combination of the frame A, the movable roll F, its journals having the enlargements or collars D', the journal-boxes E, having corresponding depressions or grooves, the bearing-frames G, the leveling-bars J, having the lugs I, to which said bearing-frames G are hinged, and the set-screw Q, all constructed and arranged to operate substantially as set forth.

6. In a grinding-mill, the combination, with the movable roll and the frames supporting its journals, of a spirit-level connected to each of the said frames, for the purposes set forth.

7. The combination, with the movable rolls F and the oscillating frames G, of a shaft, X, at each end of the mill, having the eccentric wrist-pins W, connections between said pins and frames, a shaft, *g*, and segmental cog-gear for connecting said shafts X and *g* at will, as explained.

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Witnesses:

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NEVIL WHITESIDES.