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PATENTED JUNE 28, 1904.

G. A. ENSIGN.
POLISHING MACHINE.
APPLICATION FILED FEB. 12, 1904.

NO MODEL.

4 SHEETS—SHEET 1.

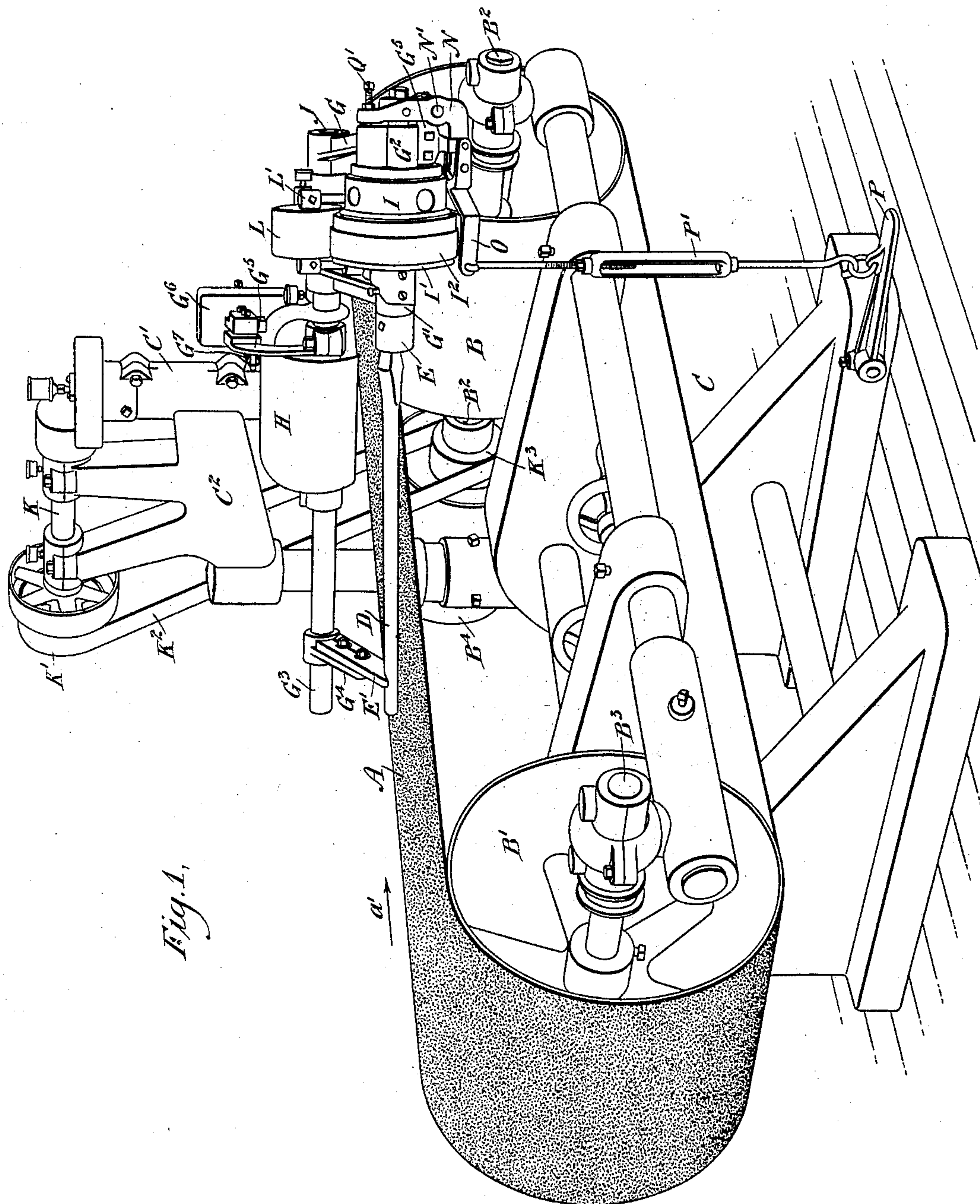


Fig. 1.

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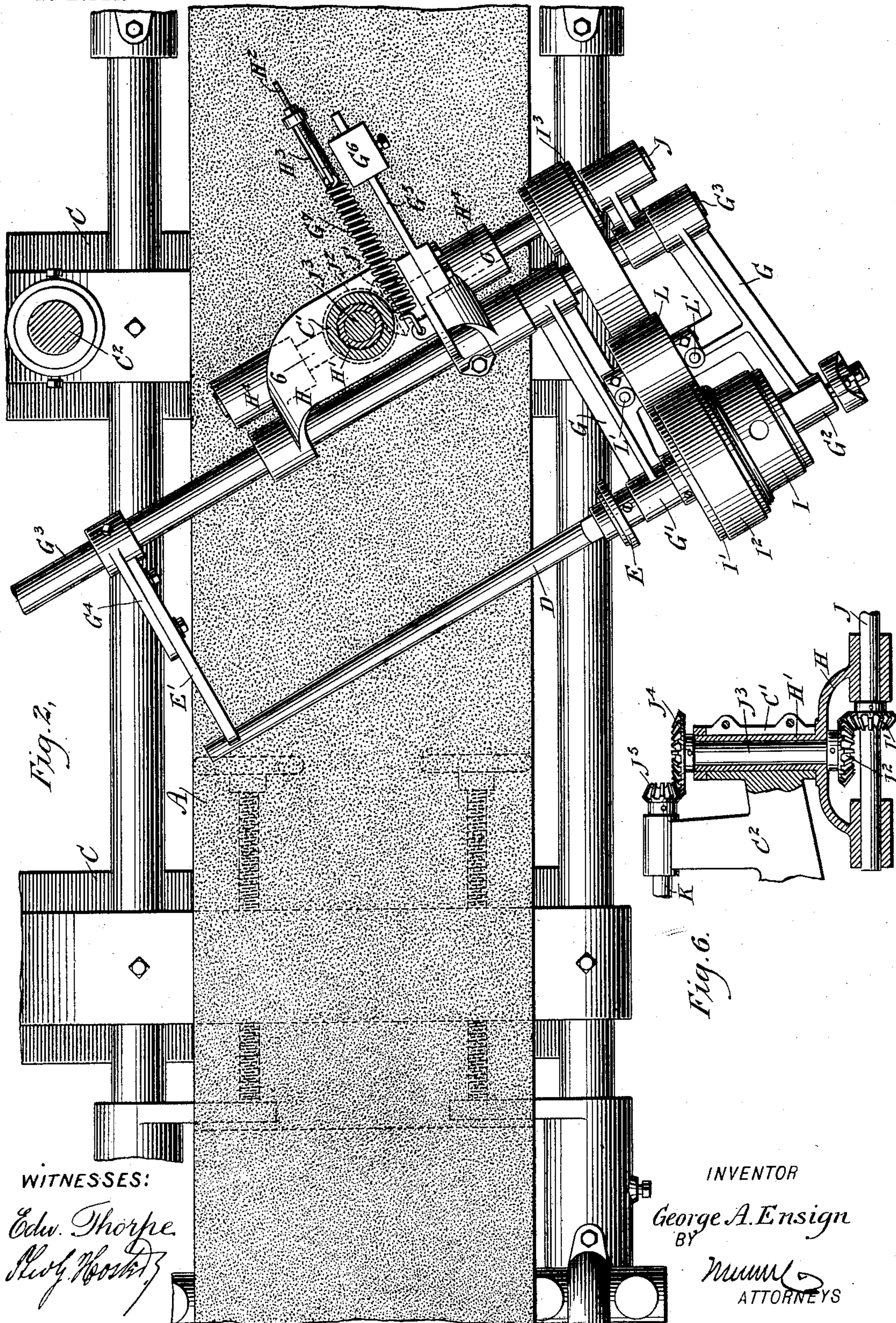
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4 SHEETS—SHEET 2.



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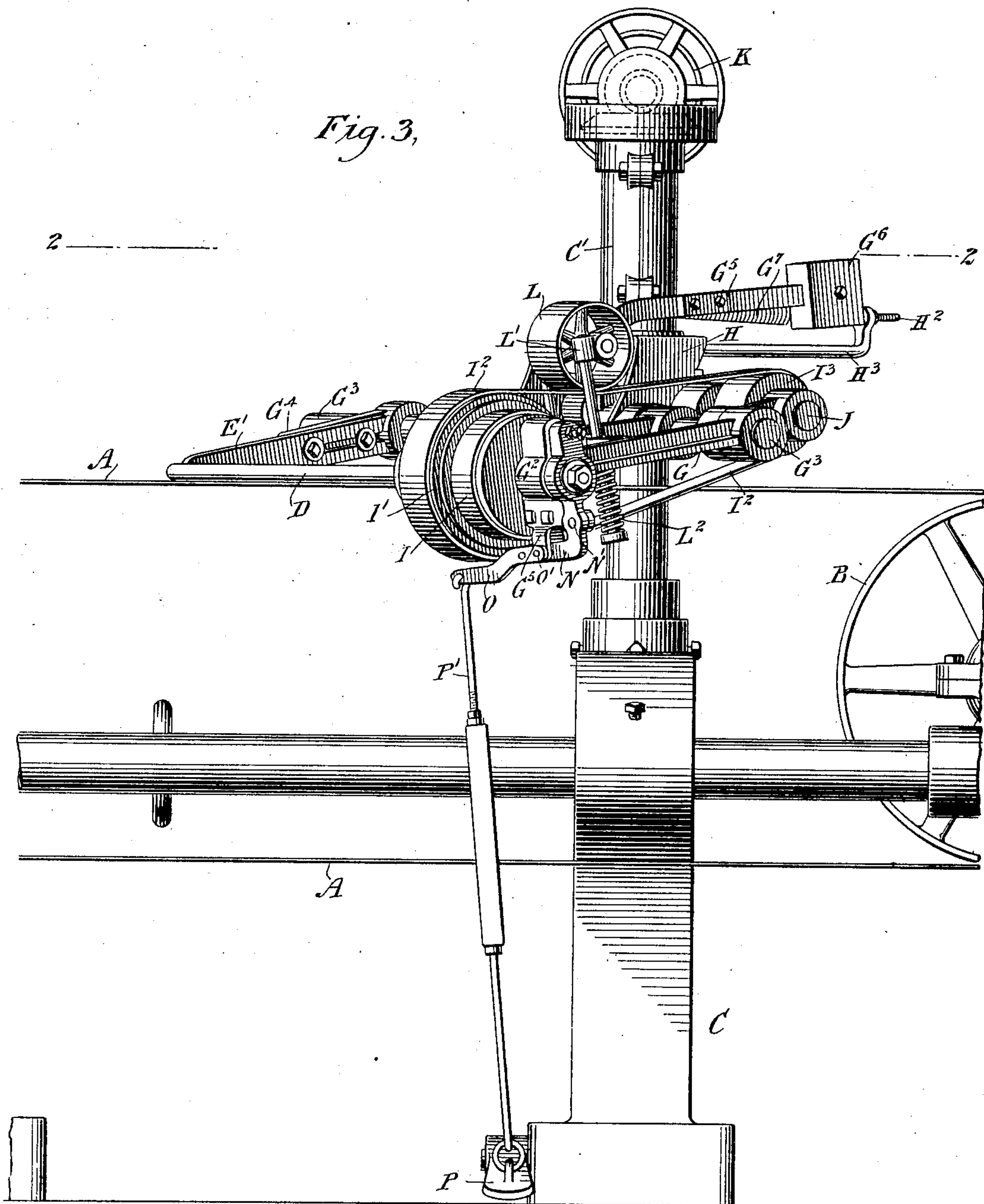
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 4.

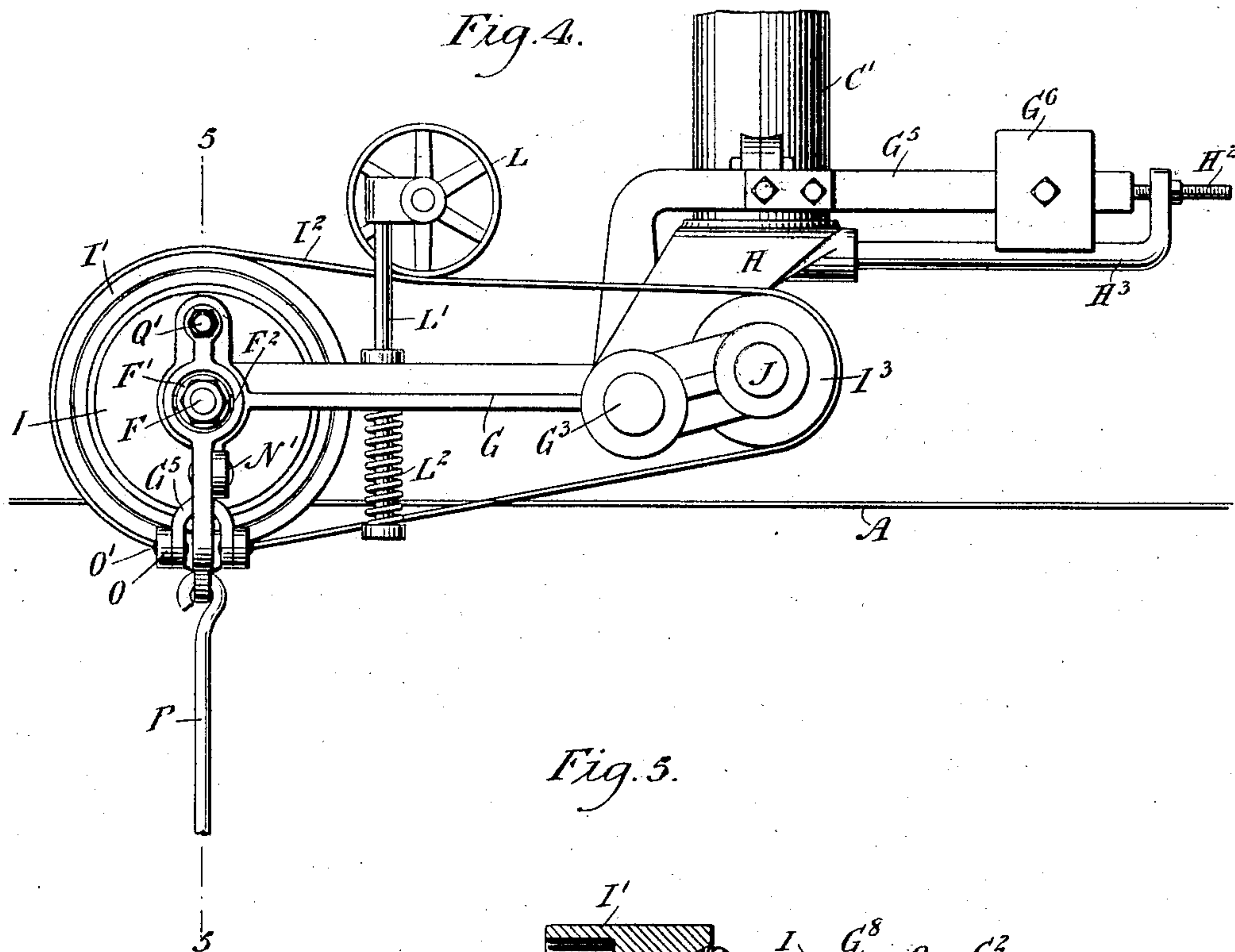
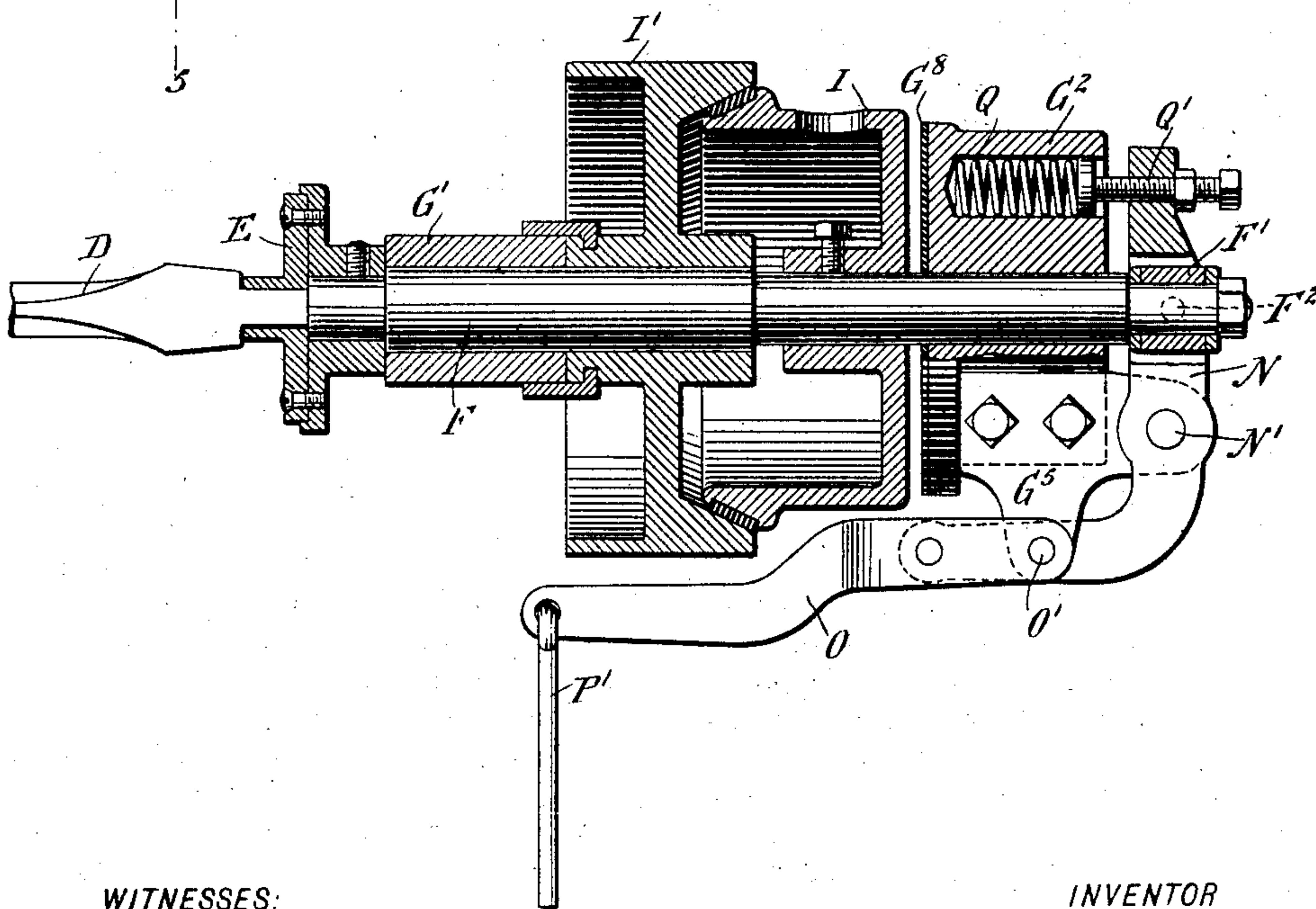


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE A. ENSIGN, OF DEFIANCE, OHIO, ASSIGNOR TO THE DEFIANCE MACHINE WORKS, OF DEFIANCE, OHIO.

POLISHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 763,743, dated June 28, 1904.

Application filed February 12, 1904. Serial No. 193,273. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. ENSIGN, a citizen of the United States, and a resident of Defiance, in the county of Defiance and State of Ohio, have invented a new and Improved Polishing-Machine, of which the following is a full, clear, and exact description.

The invention relates to woodworking machinery, and more particularly to polishing-machines using an endless sand or other polishing-belt.

The object of the invention is to provide a new and improved polishing-machine more especially designed for polishing wagon and carriage wheel spokes, neck-yokes, swingle-trees, whiffletrees, handles, and other turned articles requiring a high finish, the machine being arranged to automatically rotate the article when moving it in contact with the polishing-belt.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the improvement. Fig. 2 is an enlarged plan view of the same, parts being in section, on the line 2 2 of Fig. 3. Fig. 3 is a side elevation of the improvement. Fig. 4 is a side elevation of the driving and supporting means for the article. Fig. 5 is a transverse section of the same on the line 5 5 of Fig. 4, and Fig. 6 is a cross-section of the improvement on the line 6 6 of Fig. 2.

The endless web or polishing-belt A passes over pulleys B and B', having their shafts B² and B³ journaled in suitable bearings on the main frame C of any approved construction. On the shaft B² is secured a pulley B⁴, connected by belt with other machinery for imparting a rotary motion to the shaft B² and the pulley B to impart a traveling motion to the web or belt A in the direction of the arrow a', so that the polishing-surface of the upper run of the

web or belt A travels toward the spoke or other article D to be polished and extending obliquely across the upper run of the belt, as plainly indicated in Figs. 1, 2, and 3.

One end of the article D is held in a suitable socket E, fastened on a shaft F, mounted to rotate in bearings G' and G², arranged on a swing-frame G, having a rod G³ mounted to turn in suitable bearings arranged on a support H, provided with a vertically-disposed cylindrical bearing H', adapted to be clamped within a split column C', forming part of a standard C², forming part of the main frame C. The axis of the bearing H' is disposed approximately in the middle of the belt or web A, so that when the column C' is loosened to allow turning of the bearing H' then the whole support H can be turned to bring the article D into the desired oblique position relative to the belt A to insure the best result—that is, to highly polish the article D without leaving any marks or scratches thereon and also to allow of polishing longer and shorter articles on the same belt.

On the rod G³ is secured an arm G⁴, on which is removably secured a bearing E', preferably made of wood and formed with a half-round recess for the outer or free end of the article D to revolve in to prevent the article D from being bent while being polished by the belt A.

The swing-frame G is counterbalanced to insure an easy swinging motion thereof, and for this purpose an arm G⁵ is secured to the rod G³, and on this arm is adjustably fastened a counterbalancing-weight G⁶.

In order to hold the swing-frame G normally in an uppermost position—that is, the work D out of engagement with the upper run of the belt A—a spring G⁷ is provided and connected at one end to the arm G⁵ and at the other end to a bolt H², held adjustably in a bracket H³, projecting from the support H, as plainly indicated in Figs. 3 and 4.

The shaft F is rotated in unison with the web or belt A from the shaft B², and for this purpose the following driving mechanism is provided: On the shaft F (see Fig. 5) is secured a friction clutch member I, adapted

to be moved in frictional engagement with a clutch-pulley I', mounted to rotate loosely on the said shaft F. The clutch-pulley I' is connected by a belt I² with a pulley I³, secured on a shaft J, mounted to turn in bearings H⁴, held on or forming part of the support H, and on the said shaft J (see Fig. 6) is secured a bevel gear-wheel J' in mesh with a bevel gear-wheel J², secured on the lower end of a shaft J³, mounted to turn in the cylindrical bearing H', previously mentioned, and on the upper end of the said shaft J³ is secured a bevel gear-wheel J⁴ in mesh with a bevel gear-wheel J⁵, fastened on a transverse shaft K, journaled in suitable bearings in the upper end of the standard C', as plainly indicated in Figs. 1 and 3.

On the shaft K is secured a pulley K', connected by a belt K² with a pulley K³ on the shaft B², so that when the latter is rotated a rotary motion is given to the shaft K by the pulleys K³ and K' and the belt K², and the rotary motion of the shaft K is transmitted by the gear-wheels J⁵ and J⁴ to the shaft J³, which by the bevel gear-wheels J² and J' rotates the shaft J. The rotary motion of the shaft J is transmitted by the pulley I³ and belt I² to the pulley I', and when the clutch member I has been moved in frictional engagement with the clutch-pulley I' then the latter's rotary motion is imparted to the clutch member I, and consequently to the shaft F, so that a rotary motion is given to the article D, held in the socket E, fastened to the shaft F.

In order to keep the belt I² sufficiently tight, a belt-tightening pulley L is provided, journaled on rods L', mounted to slide up and down in the swing-frame G and pressed on by a spring L² to hold the tightening-pulley L in sufficient frictional contact with the upper run of the belt I² to tighten the latter.

In order to move the clutch member I in and out of frictional contact with the clutch-pulley I', the following device is provided: On the outer end of the shaft F is held a shifting collar F', hung on centers F², carried by one end of a lever N, fulcrumed at N' (see Figs. 3 and 5) on a bracket G⁵, attached to or forming part of the frame G. The lever N is L-shaped and has its horizontal lower end pivotally connected with an arm O, fulcrumed at O' on the bracket G⁵, the free end of the arm O being connected by a rod or link P' with a treadle P, fulcrumed on the main frame C and under the control of the operator's foot. When the operator presses the treadle P, then a downward swinging motion is given to the arm O, which by its connection with the lever N imparts a swinging motion thereto to shift the collar F', and consequently the shaft F, transversely to move the clutch I into frictional engagement with the clutch-pulley I' for transmitting the rotary motion of the latter to the shaft F, as previously explained. When the operator re-

leases the pressure on the treadle P, then the clutch member I moves out of frictional engagement with the clutch-pulley I', the return movement of the parts being accomplished by a spring Q, held on the frame G and pressing on a screw-rod Q', adjustably secured to the upper terminal of the lever N. (See Fig. 5.) The bearing G² supports a friction-disk G⁸ for the front face of the clutch member I to abut against to bring the latter, and consequently the shaft F and the article D, quickly to a stop after the operator releases the treadle P.

The operation is as follows: The swing-frame G is normally held by the action of the spring G⁷ in such a position that the spoke or other article D inserted at one end in the socket E and resting with the free end on the bearing or shoe E' stands a distance above the polishing-face of the upper run of the belt A, as illustrated in the drawings. Now when the shaft D² is rotated a traveling motion is given to the belt A and the clutch-wheel I' is rotated, and when the operator now presses the treadle P then the clutch member I is thrown into engagement with the rotating clutch-wheel I' to rotate the shaft F and the article D, and as soon as the shaft F is started and the treadle P is further pressed downward then a swinging motion in a downward direction is given to the swing-frame G, so as to move the article D in contact with the polishing-surface of the belt A, and as the article D is rotated it is evident that the contact of the article with the polishing-surface of the belt produces a high polish on the rotating article. As soon as the operator releases the treadle P the swing-frame G swings back to its normal uppermost position by the action of the spring G⁷ and at the same time the shaft F, with the clutch member I, is caused to slide outward by the action of the spring Q, so as to move the clutch member I out of frictional engagement with the clutch-pulley I' and in engagement with the fixed surface G⁸ to bring the clutch member I, shaft F, and article D to a stop to permit the operator to readily remove the polished article D from the socket E and bearing E' and to allow of inserting another article in the said socket and bearing for repeating the above-described operation and polishing the second article.

From the foregoing it will be seen that the operator has both hands free to insert and remove the articles, and as the article is turned while in contact with the polishing-belt it is evident that the polishing operation is performed very quickly, and a single operator can quickly handle the articles to allow of highly polishing a large number of articles in a comparatively short time.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A polishing-machine having a traveling polishing-web, a counterbalanced support mounted to swing and having means for ro-

tatably supporting the article to be polished, a driving mechanism for turning the said means and the article held thereon, a spring for normally holding the said support in an uppermost position and the article out of contact with the polishing-web, and a manually-controlled device for swinging the support downward, to move the article in frictional contact with the polishing-web, as set forth.

2. A polishing-machine having a traveling polishing-web, a counterbalanced support mounted to swing and having means for rotatably supporting the article to be polished, a driving mechanism for turning the said means and the article held thereon, a spring for normally holding the said support in an uppermost position and the article out of contact with the polishing-web, and a manually-controlled device for swinging the support downward, to move the article in frictional contact with the polishing-web, the said device controlling the said driving mechanism, as set forth.

3. A polishing-machine having a support mounted to swing and provided with means for rotatably supporting the article to be turned, a driving mechanism for the said means, including a driven clutch-pulley and a clutch member, and manually-controlled means for moving the said clutch member in or out of contact with the clutch-pulley, as set forth.

4. A polishing-machine having a support mounted to swing and provided with means for rotatably supporting the article to be turned, a driving-gear for the said means, including a driven clutch-pulley and a clutch member, and manually-controlled means for moving the said clutch member in or out of contact with the clutch-pulley, and for imparting a swinging motion to the said support, as set forth.

5. A polishing-machine provided with a swing-frame, a shaft journaled thereon and having means for supporting the article to be polished, a driven clutch-pulley loose on the said shaft, a clutch member secured on the said shaft and adapted to engage the said clutch-pulley, and a manually-controlled mechanism for shifting the said shaft longitudinally in its bearings to move the clutch member in and out of contact with the clutch-pulley, as set forth.

6. A polishing-machine provided with a swing-frame, a shaft journaled thereon and having means for supporting the article to be polished, a driven clutch-pulley loose on the said shaft, a clutch member secured on the said shaft and adapted to engage the said clutch-pulley, and a manually-controlled mechanism for shifting the said shaft in its bearings to move the clutch member in and out of contact with the clutch-pulley, the said mechanism being connected with the said frame,

to impart a swinging motion to the latter, as set forth.

7. A polishing-machine provided with a swing-frame, a shaft journaled thereon and having means for supporting the article to be polished, a driven clutch-pulley loose on the said shaft, a clutch member secured on the said shaft and adapted to engage the said clutch-pulley, a manually-controlled mechanism for shifting the said shaft in its bearings, to move the clutch member in and out of contact with the clutch-pulley, the said mechanism being connected with the said frame, to impart a swinging motion to the latter after the clutch member is in engagement with the said clutch-pulley, and a spring-balance connected with the said frame, to return the same and parts connected therewith on releasing the said mechanism, as set forth.

8. A polishing-machine provided with a swing-frame, a shaft journaled thereon and having means for supporting the article to be polished, a driven clutch-pulley loose on the said shaft, a clutch member secured on the said shaft and adapted to engage the said clutch-pulley, and a manually-controlled mechanism for shifting the said shaft in its bearings, to move the clutch member in and out of contact with the clutch-pulley, the said mechanism being connected with the said frame, to impart a swinging motion to the latter, the said mechanism comprising a treadle, an arm fulcrumed on the said frame and connected with the treadle, and a lever fulcrumed on the frame and connected at one end with the said arm and at its other end with the said shaft, as set forth.

9. A polishing-machine provided with a swing-frame, a shaft journaled thereon and having means for supporting the article to be polished, a driven clutch-pulley loose on the said shaft, a clutch member secured on the said shaft and adapted to engage the said clutch-pulley, and a manually-controlled mechanism for shifting the said shaft in its bearings, to move the clutch member in and out of contact with and from the clutch-pulley, the said mechanism being connected with the said frame, to impart a swinging motion to the latter, the said mechanism comprising a treadle, an arm fulcrumed on the said frame and connected with the said treadle, a lever fulcrumed on the said frame and connected with the said arm, and a shifting collar hung on centers in the said lever and engaging the said shaft, as set forth.

10. A polishing-machine provided with a swing-frame, a shaft journaled thereon and having means for supporting the article to be polished, a driven clutch-pulley loose on the said shaft, a clutch member secured on the said shaft and adapted to engage the said clutch-pulley, and a manually-controlled mechanism for shifting the said shaft in its bearings, to

move the clutch member in and out of contact with the clutch-pulley, the said mechanism being connected with the said frame, to impart a swinging motion to the latter, the
5 said mechanism comprising a treadle, an arm fulcrumed on the said frame and connected with the treadle, a lever fulcrumed on the frame and connected at one end with the said arm and at its other end with the said shaft,
10 and a spring connection between the said lever and the said frame, as set forth.

11. A polishing-machine provided with an endless polishing-belt, and a work-support, adapted to be turned on an axis approximately
15 at right angles to the belt, at the middle thereof, as set forth.

12. A polishing-machine provided with a driven polishing-belt, a work-support adapted to be turned on an axis approximately at right
20 angles to the belt at the middle thereof, a swing-frame hung on the said support and having revoluble means for holding and turning the work, and a gearing for driving the said means, as set forth.

25 13. A polishing-machine provided with a driven polishing-belt, a work-support adapted

to be turned on an axis approximately at right angles to the belt at the middle thereof, a swing-frame hung on the said support and having revoluble means for holding and turning
30 the work, and a gearing for driving the said means, part of the gearing being supported on the said support and part by the swing-frame, as set forth.

14. A polishing-machine provided with a
35 driven polishing-belt, a work-support adapted to be turned on an axis approximately at right angles to the belt at the middle thereof, a swing-frame hung on the said support and having revoluble means for holding and turning
40 the work, a gearing for driving the said means, and a manually-controlled device for operating the said swing-frame and for controlling the said gearing, as set forth.

In testimony whereof I have signed my name
45 to this specification in the presence of two subscribing witnesses.

GEORGE A. ENSIGN.

Witnesses:

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JOS. BAUER.