

No. 677.589.

Patented July 2, 1901.

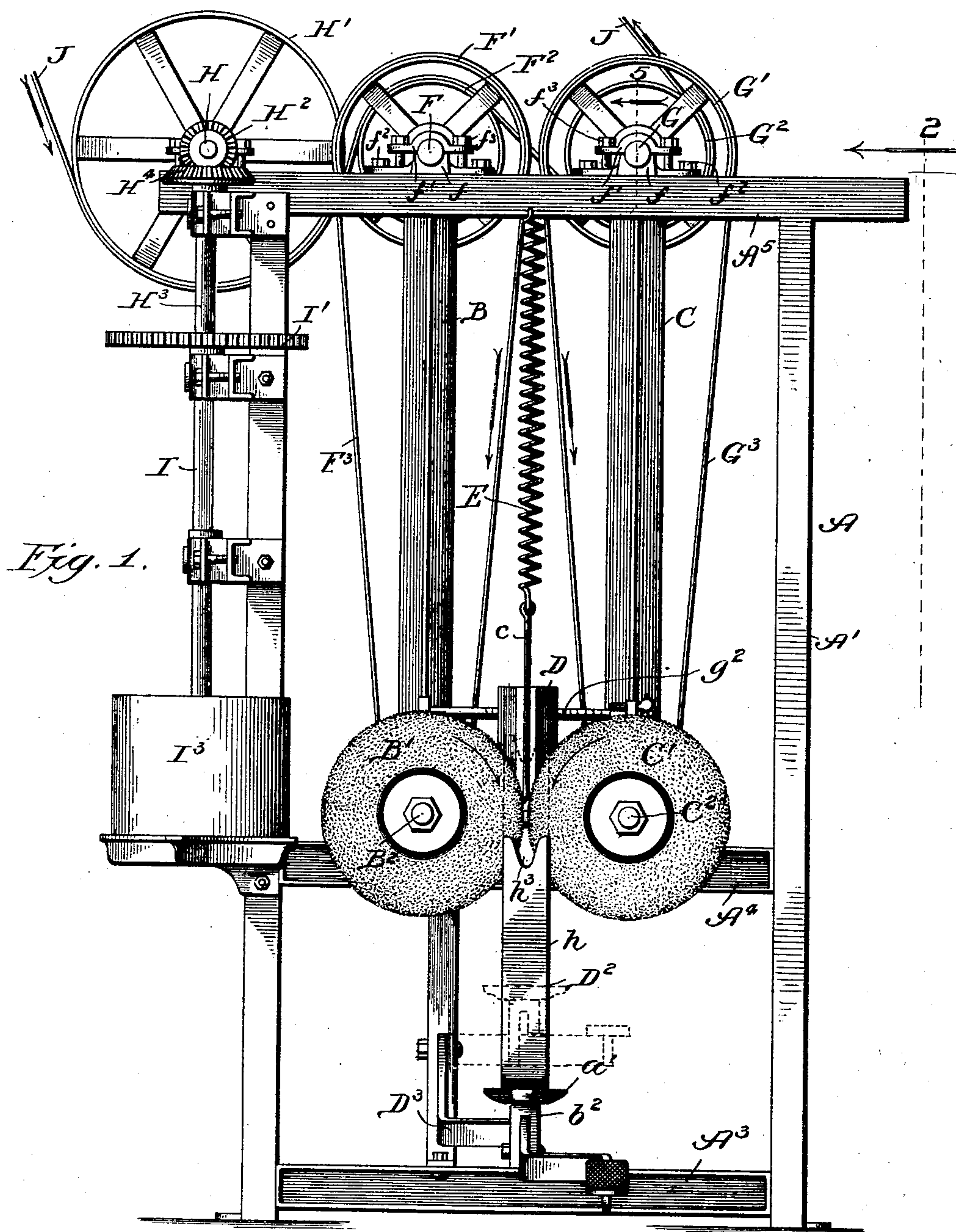
B. NICHOLS.

BRUSHING, GRINDING, OR POLISHING MACHINE.

(Application filed Mar. 5, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

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John Enders Jr.

Inventor:

Benjamin Nichols,
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Att'ys

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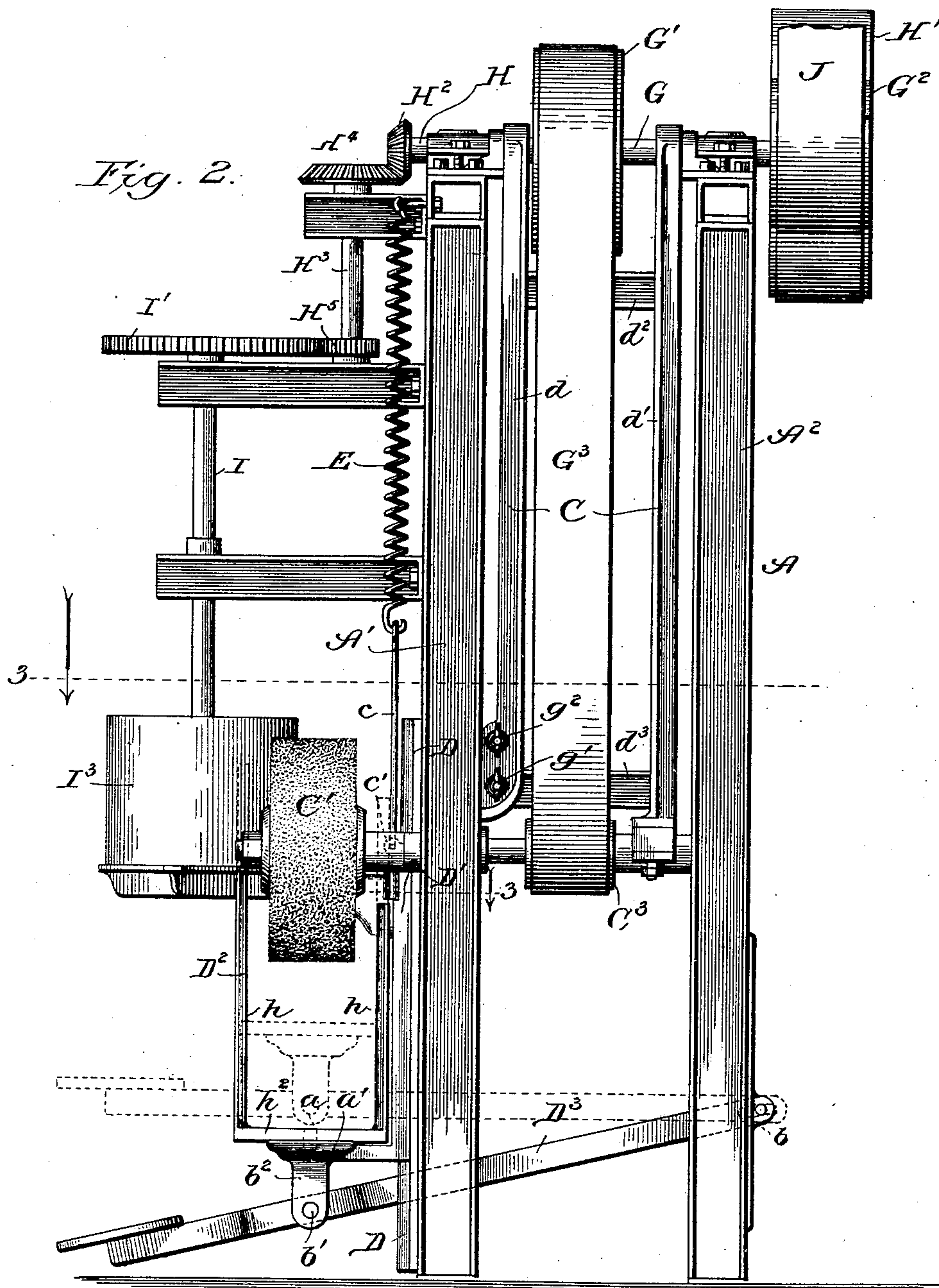
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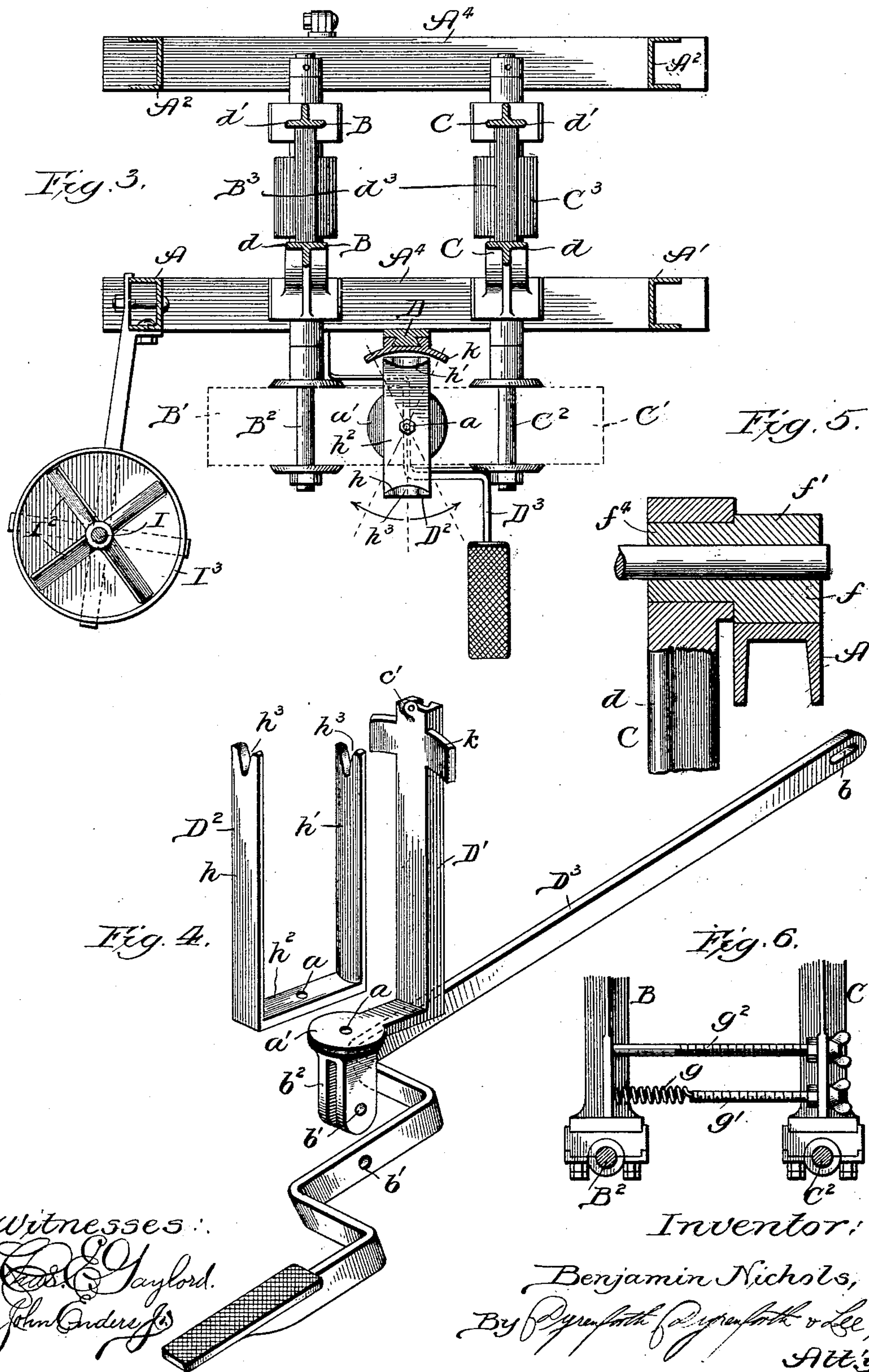
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3 Sheets—Sheet 3.



UNITED STATES PATENT OFFICE.

BENJAMIN NICHOLS, OF JAMESTOWN, NEW YORK.

BRUSHING, GRINDING, OR POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 677,589, dated July 2, 1901.

Application filed March 5, 1901. Serial No. 49,905. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN NICHOLS, a citizen of the United States, residing at Jamestown, in the county of Chautauqua and State of New York, have invented a new and useful Brushing, Grinding, or Polishing Machine, of which the following is a specification.

My invention relates particularly to machines used for grinding, polishing, and brushing various implements of hardware, such as axes or the like.

My object is to provide a machine of this character of improved general construction, particular attention being paid to simplicity of construction and ease of manipulation.

In the preferred construction I mount the grinding or polishing disks adjacent to each other in swinging frames and connect the work-holder with a spring-supported vertically-movable slide, the work-holder being manually depressible. I employ no mechanism for separating the disks, as this can be accomplished through the medium of the article being operated upon.

My invention is shown in its preferred form in the accompanying drawings, in which—

Figure 1 is a view in front elevation of the machine; Fig. 2, a view in side elevation, the direction of view being indicated at line 2 of Fig. 1; Fig. 3, a horizontal section taken as indicated at line 3 of Fig. 2; Fig. 4, a perspective view of the work-holder and accessory parts, the parts being disconnected; Fig. 5, an enlarged broken vertical section taken as indicated at line 5 of Fig. 1 and illustrating the manner in which the swinging frames are mounted; and Fig. 6 a broken view, in side elevation, showing the lower portions of the two swinging frames employed and the manner in which the same are connected.

For clearness of illustration the work-holder is represented in full lines in its depressed position, its elevated position being indicated in dotted lines in Fig. 1.

A represents the frame of the machine, comprising mainly side frames $A^1 A^2$, each having horizontal connecting members $A^3 A^4 A^5$; B C, swinging frames pivotally connected with the upper portion of the main frame A; $B^1 C^1$, grinding or polishing disks fixed to shafts $B^2 C^2$, journaled in the lower ends of

the frames B and C, respectively; $B^3 C^3$, pulleys on the shafts $B^2 C^2$, respectively; D, a vertical guide connected with the side frame A and having dovetail connection with a vertically-movable slide D^1 ; D^2 , a work-holder having pivotal connection at a with an offset a^1 at the base of the slide D^1 ; D^3 , a foot-lever having pin-and-slot connection at b with the main frame and pivotally joined at b^1 to a slotted depending lug b^2 , with which the offset a^1 is provided; E, a spring supported from the upper portion of the main frame and connected through a rod c with a boss c^1 on the slide D^1 ; F G, shafts journaled in the upper portion of the frame A and having secured thereon pulleys $F^1 F^2$ and $G^1 G^2$, respectively; $F^3 G^3$, belts connecting the pulleys $F^1 G^1$, respectively, with the pulleys $B^3 C^3$; H, a shaft journaled in the upper portion of the main frame and equipped with a pulley H^1 and a bevel-gear H^2 ; H^3 , a vertically-disposed shaft journaled in the main frame and equipped with a gear H^4 , meshing with the bevel-gear H^2 and provided also with a spur-gear H^5 ; I, a vertically-disposed shaft journaled in the main frame and provided with a spur-gear I^1 , meshing with the gear H^5 and equipped at its lower end, Fig. 3, with stirrer-blades I^2 ; I^3 , a receptacle into which the stirrer-blades dip, said receptacle serving to receive a semiliquid material used in the grinding or polishing process, and J the main driving-belt for the machine, said belt passing about the pulleys H^1 , F^2 , and G^2 .

Each swinging frame B C comprises, preferably, side members $d d^1$, connected by cross members $d^2 d^3$.

As shown in Fig. 1, the journal-boxes at the top of the main frame, which receive the shafts F and G, each comprise two parts $f f^1$, the former secured to the frame by bolts f^2 and the latter by bolts f^3 . Each journal-box is provided with an inwardly-projecting (divided) sleeve or hollow boss f^4 , Fig. 5, upon which is journaled the upper end of the adjacent side member of the corresponding swinging frame. The swinging frames are connected at their lower portions, Fig. 6, by a spring g , secured to an adjustable stud g^1 . Adjacent thereto is provided a stud g^2 , adjustably connected at one end with one of

the swinging frames and having its opposite end in position to serve as a stop for engaging the companion swinging frame. The stud g^2 is adjusted to prevent the disks from coming in contact with each other under the action of the spring g . The journal-boxes at the lower ends of the frames B and C for receiving the shafts $B^2 C^2$ are preferably divided, as shown. As shown in Fig. 3, suitable collars are provided for receiving any longitudinal thrust from the shafts $B^2 C^2$.

The work-holder D^2 in the form shown comprises vertical members $h h$, connected at their lower ends with a web h^2 and provided at their upper ends with recesses h^3 . The slide D' is provided near its upper end with a curved gage k , whose radius of curvature extends from a projection of the axis at a , upon which the work-holder is pivoted. It will readily be seen that the work-holder may be swung in a horizontal plane, as desired. It may also be depressed to any required degree, and the resilience of the spring E should be sufficient to return it to its elevated position when the foot-pressure is removed.

The operation of the machine is exceedingly simple. The work is rested on the work-holder and held in proper position thereon by the operator. Motion is imparted to the grinding-disks through the medium of the belts J and $F^3 G^3$. The operator, through the medium of the foot-lever, depresses the work-holder, at the same time forcing the article to be ground downward between the grinding-disks. As the article passes between said disks it forces the latter apart. When the foot-pressure is relieved, the work-holder is raised by the spring E. It is obvious that the amount of grinding to which any portion of the article is subjected will depend upon the length of time that portion remains between the disks. This is within the control of the operator. It will also be readily seen that the desired cross-section or contour can be given to the article by swinging the holder in a horizontal plane. This may be accomplished through the medium of a handle, upon which the ax or other article is secured, or by any other suitable means. The receptacle I^3 , containing the grinding or polishing fluid, is in close proximity to the disks, and the material therein is kept constantly stirred by the blades I^2 .

It will readily be perceived that my construction involves a comparatively small number of parts and may be cheaply manufactured and easily operated.

The work-holder may be stated to be resiliently held, from which it is to be understood that the resilience of the spring under stress (or some equivalent force) is the retractive force serving to return the holder to its normal position at rest.

Changes in details of construction within the spirit of my invention may be made.

Hence no limitation is to be understood from the foregoing detailed description, except as shall appear from the appended claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the character described, the combination with a main frame of swinging frames secured thereto, grinding or polishing disks journaled in the said swinging frames, means for yieldingly holding said swinging frames together in a given position to oppose separation of the disks, and means for imparting rotary motion to said disks, substantially as described.

2. The combination with a main frame, of swinging frames pivotally connected therewith toward their upper ends, shafts journaled toward the lower ends of said swinging frames and equipped with grinding or polishing disks, means for yieldingly holding said swinging frames with a given degree of separation and yieldingly opposing further separation, and means for imparting rotary motion to the disks, substantially as described.

3. The combination with a main frame of swinging frames connected therewith, grinding or polishing disks operatively connected with the lower portion of said swinging frames, a spring connecting the lower ends of said swinging frames and a stop limiting the relative approach of the lower ends of said swinging frames, substantially as described.

4. The combination with a main frame of shafts journaled in the upper portion thereof, swinging frames pivotally supported concentric with said shafts, parallel shafts journaled in the lower ends of said swinging frames and equipped with grinding or polishing disks, and belt connection between the parallel shafts at each swinging frame, substantially as described.

5. The combination with a main frame, of shafts journaled in the upper portion thereof, swinging frames pivotally supported concentric with said shafts, parallel shafts journaled in the lower ends of said swinging frames and equipped with grinding or polishing disks, belt connection between the parallel shafts at each swinging frame, and a belt communicating motion to both said upper shafts, substantially as described.

6. The combination with a main frame, of parallel shafts at the upper portion thereof, journal-boxes fixed to the main frame and receiving said shafts and provided with projecting sleeves, swinging frames pivotally connected with said sleeves, parallel shafts journaled toward the lower ends of said swinging frames and equipped with grinding or polishing disks, belt-and-pulley connection between each set of shafts at each swinging frame, and means for communicating motion to the upper shafts, substantially as described.

7. The combination with the main frame of

yieldingly-supported disks, and a resiliently-held work-holder coacting with said disks, substantially as described.

8. The combination with a main frame, of
5 yieldingly-supported rotary disks, a spring-held work-holder coacting with said disks, and means for manually moving the work-holder relatively to the disks, substantially as described.

10 9. The combination with a main frame, of yieldingly-held swinging frames, shafts journaled toward the lower ends of said swinging frames and equipped with disks, a guide connected with the main frame, a yieldingly-held
15 slide connected with said guide, a work-holder connected with said slide, and means for manually moving said work-holder in one direction, substantially as described.

10. The combination with a main frame, and
20 operatively-mounted polishing or grinding disks and a work-holder movable toward and away from the disks, said work-holder being swiveled to swing in a plane parallel to the axes of the disks, substantially as described.

25 11. The combination with a main frame, of operatively-mounted polishing or grinding disks, a work-holder movable toward and away from the disks, said work-holder being swiveled to swing in a plane parallel to the axes
30 of the disks, and a curved gage having its radii of curvature intersecting the axis upon which said holder is swiveled, substantially as described.

12. The combination with a main frame, of operatively-mounted polishing or grinding
35 disks having horizontal axes, a work-holder movable toward and away from the disks, a vertical axis upon which the said work-holder is pivoted, and a vertically-disposed concave gage having radii of curvature intersecting a
40 prolongation of said axis, substantially as described.

13. The combination with a main frame, yieldingly-connected swinging frames supported thereon, grinding or polishing disks
45 operatively mounted toward the lower ends of said swinging frames, means for communicating motion to said disks, a polishing-fluid receptacle located adjacent to the disks, a vertically-disposed stirrer-shaft equipped at
50 its lower end with a stirrer located within said receptacle and connecting means between said stirrer-shaft, and means for operating said disks, substantially as and for the
55 purpose set forth.

14. The combination with a main frame and yieldingly-held rotary disks, of a yieldingly-held movable slide connected with the main frame, a foot-lever connected with said slide, and a work-holder connected with said slide,
60 substantially as described.

BENJAMIN NICHOLS.

In presence of—

CHARLES M. NICHOLS,
JAMES S. CONNER.