

L. B. BATCHELLER.
Machine for Finishing Chair-Stock.

No. 216,015.

Patented June 3, 1879.

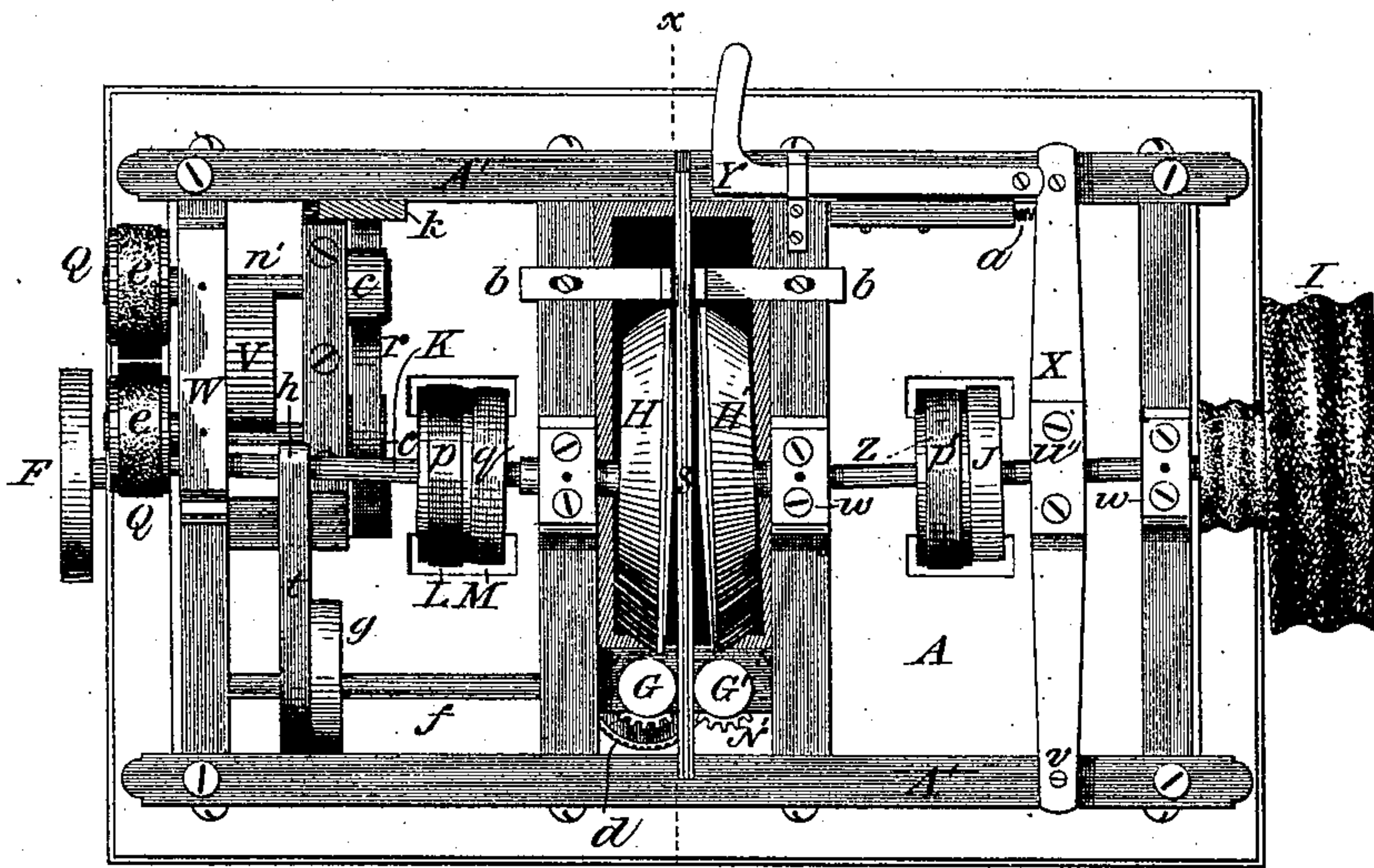


Fig. 1.

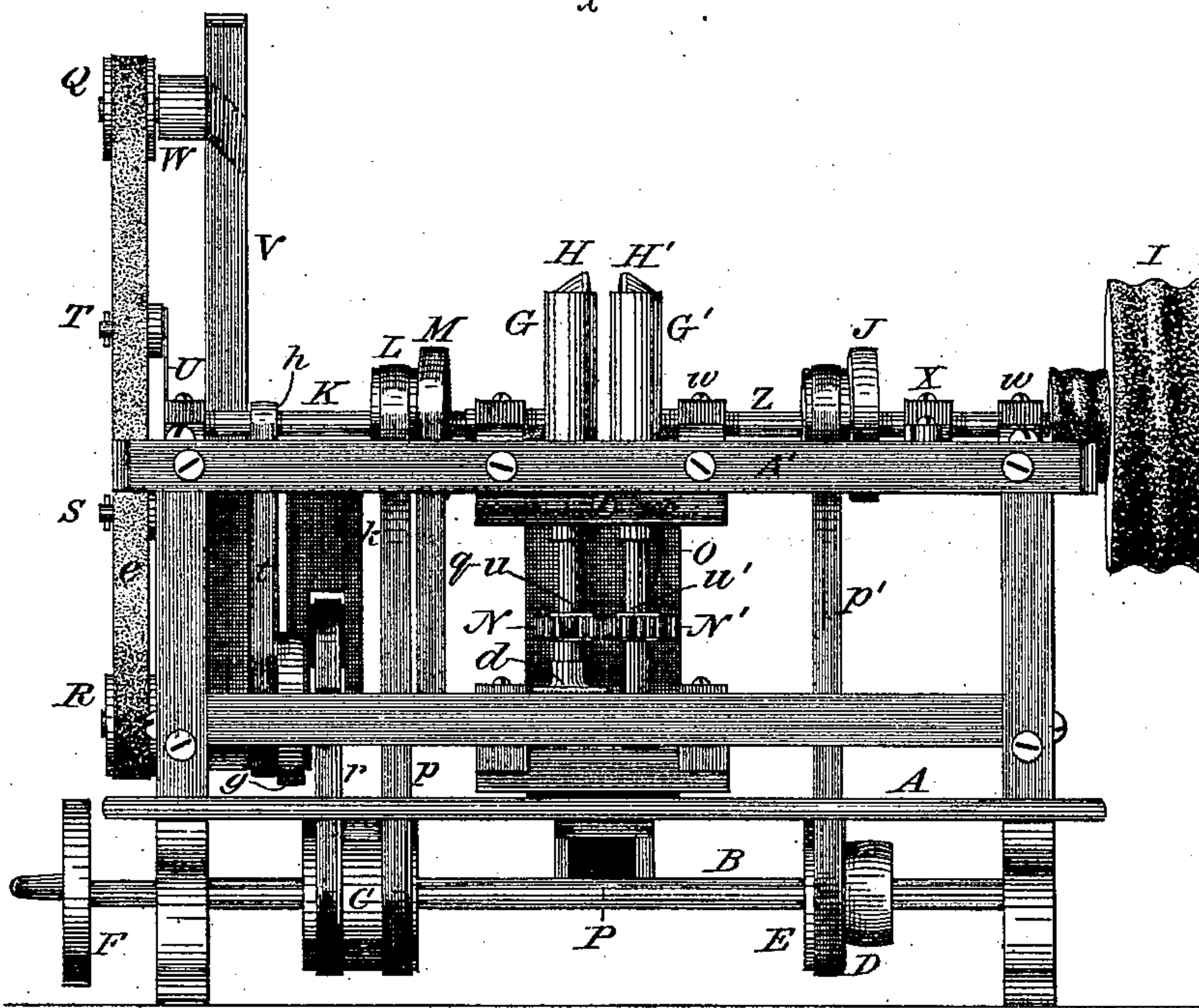


Fig. 2.

WITNESSES,

INVENTOR,

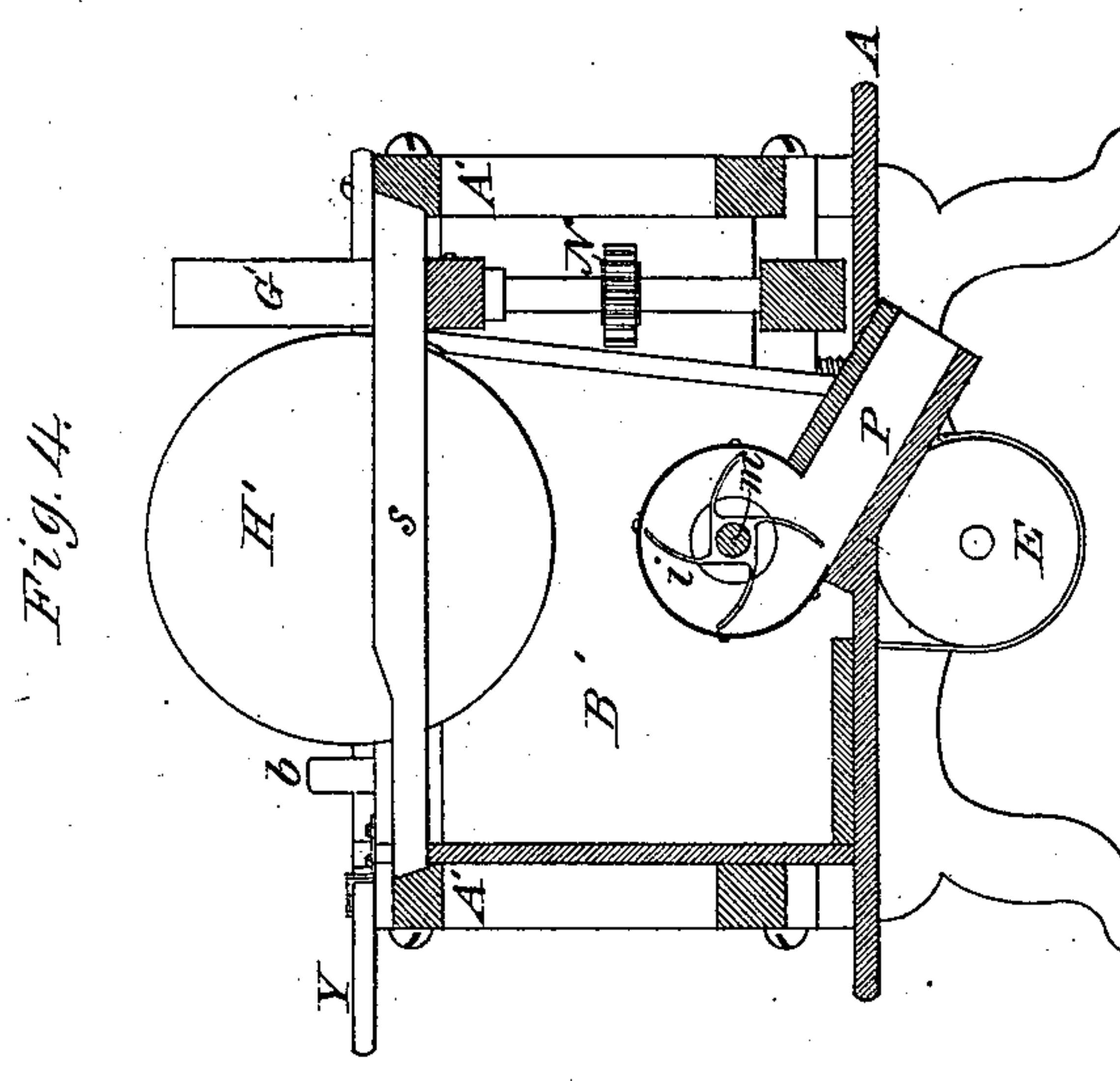
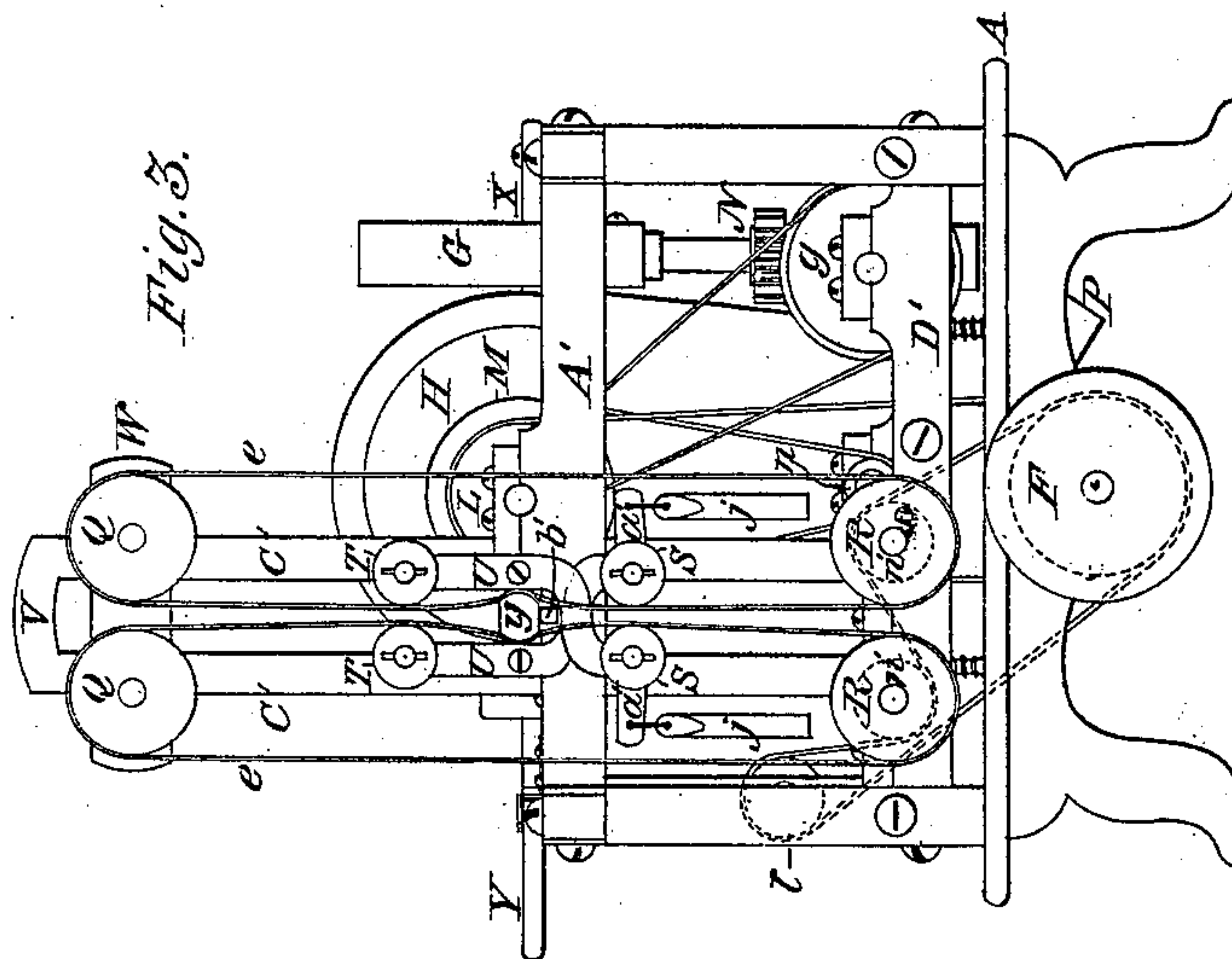
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by Franklin Scott his
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UNITED STATES PATENT OFFICE.

LUCIEN B. BATCHELLER, OF ARLINGTON, VERMONT.

IMPROVEMENT IN MACHINES FOR FINISHING CHAIR-STOCK.

Specification forming part of Letters Patent No. **216,015**, dated June 3, 1879; application filed May 31, 1878.

To all whom it may concern:

Be it known that I, L. B. BATCHELLER, of the town of Arlington, in the county of Bennington and State of Vermont, have invented a new and improved machine for leveling, smoothing, and finishing the constituent parts of furniture and other analogous articles made from wood preparatory to the putting together of said parts; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, which constitute a part of this specification.

Figure 1 is a plan view of said machine. Fig. 2 is a rear elevation of the same. Fig. 3 is a view of the right-hand end of said machine. Fig. 4 exhibits a transverse section of said machine in elevation, taken on the line *x* of Fig. 1, and viewed in the direction of the arrow shown in Fig. 1.

This machine is one of a series of machines of my invention designed more especially to be used in the dressing and preparation of chair-stock preparatory to the construction of the chair, although it is well adapted to many other analogous uses.

It is provided with appliances for dressing or smoothing both level and convex surfaces. The means provided for smoothing level surfaces—such, for instance, as the legs and parts of the seats of the style of chairs known to the trade as “Grecian,” which are not curved or crooked—are of a peculiar character, as will be more fully hereinafter described.

It is well known that belts having their exterior surface coated with sand, so as to constitute a surface analogous to sand-paper, and running at a high rate of speed, are in common use for smoothing rough surfaces of wood; but an insuperable objection to their use on parts where it is necessary or desirable to have a true and level surface from contour to contour consists in the fact that when a piece is applied to such a belt at any point between the pulleys over which it runs, (and where such sand-belts work most effectively,) the belt yields under the pressure and assumes a hollow or concave form, and while running cuts away the material to a corresponding or convex form, or rather buffs off the corners, so that when the middle part of the surface or

face so exposed to the action of the belt is smoothed the whole face has assumed a convex or crowning form. In cases where such surfaces are to be mortised for the reception of tenons having shoulders which should make a close joint against such surface, it is found that when driven up the shoulder first strikes the high or crowning point of the sandpapered surface, and on either side of this the shoulder will fail to drive down or find a seat, thus constituting a defect which impairs the appearance of the work and detracts from the strength of the joint unless specially corrected.

My invention is adapted to finish the surfaces of pieces which may be submitted to its action, so that the corners or contours of the surfaces so smoothed shall be sharp, true, and full, and the surface itself level or slightly concave, if desirable.

I mount my mechanism in a suitable frame, *A A' A'*. The main driving-shaft is shown at *B*, Fig. 2, and carries the main driving-pulley *F*, through which it receives its motion, as well as the pulleys *C*, *D*, and *E*, from which motion is communicated to the other parts of the machine.

Running in suitable bearings upon top of frame *A' A'* are the two shafts *K* and *Z*, driven respectively by the belts *p* and *p'*. Arranged upon shaft *K* are pulleys *h* and *M*. From pulley *h* motion is communicated, through belt *t*, to shaft *f*, upon the inner end of which is a bevel-gear, which engages and actuates bevel-gear *d* upon the lower end of shaft *u*. Shaft *u* runs in stationary bearings, and carries at its upper end the friction feed-roll *G*, and underneath the spur-gear *N*. The latter gear engages its companion *N'*, and thereby drives the companion friction feed-roll *G'*. Feed-roll *G'* runs in laterally-movable bearings, so as to permit material of different thicknesses to pass through between said feed-rolls. Roll *G'* is kept to its work through the agency of spring *O*, provided for that purpose.

Pulley *M*, by means of belt *q*, communicates motion to the fan-blower *i*. (Seen in cross-section in Fig. 4.) This fan-blower or exhaust-fan revolves in an inclosed chamber, *B'*, immediately beneath the bar or rest *S*, upon which the piece lies while being smoothed or finished, and the fine dust which results from the pro-

cess of sandpapering or smoothing the wood is drawn downwardly into chamber B', and by the force of the current of air created by the exhaust-fan *i* is discharged through the chute P.

Extending across the top of the frame is lever X, surmounted by bearing *w''*, through which runs shaft Z. Lever X is pivoted at *v* to frame A'; but its opposite end is free to be moved to and fro by means of handle Y. When not moved up to its work or in the direction of shaft K, it is thrown back by the expansive force of spring *a*, Fig. 1.

Shaft Z is equipped at its outer end with a polishing or sand wheel, I, having a circumferentially fluted or corrugated periphery, although this does not constitute an essential part of my invention.

The inner ends of shafts K and Z are each equipped with a solid substantial disk of peculiar shape and construction, and the true and correct performance of the principal function of this machine—to wit, the sandpapering or smoothing of the sides of a flat piece of material of limited breadth, so that the finished surface shall be true and not rounding or highest in the middle, and shall have the corners left sharp, perfect, and true—depends upon the proper construction, adjustment, and operation of said disks, which are respectively designated H and H'. The faces of said disks are true cones, the apex having but a slight elevation above the perimeter of the base, as seen in Fig. 1.

The axes of the conical sand-disks H and H' are so adjusted and disposed on frame A' in relation to each other as to bring those portions of the cone-faces nearest the operator, and just opposite or above the location of the piece to be smoothed, parallel with each other. This line of parallelism will be a horizontal radial line extending from the apex of the cone backwardly toward guide-piece *b*. Hence the axes of the disks or of the shafts K and Z will occupy divergent rather than parallel positions with reference to each other.

As before stated, shaft Z may be moved axially in bearings *w w* by means of lever X, through which instrumentality the cone-faces of disks H and H' may be brought into close or remote proximity to each other. Between said cone-disks, and situated just below the center thereof, is a bearing-bar or bridge, *s*, which serves to support the piece during the process of smoothing or finishing. On either side of bridge *s* is adjusted a lateral guide, *b*, which assists in the introduction and control of the material during the process of smoothing or sandpapering.

The cone-faces of disks H H' may be covered in a variety of ways, to adapt them for the work which they are designed to perform. A very efficient covering is made by first stretching over the cone-face one or more thicknesses of cloth or felt, and fastening the edges to the outside of the periphery. Over this stretch one or more dampened sheets of

sand-paper, similarly fastened, and allow the same to dry, so that it may adapt itself to the shape of the cone.

In other cases I have prepared a shroud of firm cotton or linen cloth, made large enough to cover the face of the cone and return over the back, when it is drawn up tight by gathering it up with a strong cord and tying it. In the latter case I glue or attach the sand-paper directly to this cloth.

This latter mode of covering the disk is preferable, on account of the facilities it furnishes for changing faces when from any cause it becomes necessary or desirable.

So much of my invention as is hereinbefore described relates to the leveling and smoothing of flat surfaces, and its mode of use is as follows: The machine being put in motion, the operator, with one leg controlling handle Y, inserts between guides *b b* a piece of material—as, for instance, the leg of a chair, set on edge so as to present its flat sides to the cone-faces of disks H H', and its under edge resting on bridge *s*. By means of handle Y, operating through lever X, disk H' is then forced up against the piece, which is thus confined between the two revolving sand-covered cone-faces, which, from the nature of their peculiar shape and adjustment, cut or buff away the surface of the wood in a very slightly concave shape. Thus the piece is treated throughout its entire or any desired portion of its length, and is finally forced out to where it is grasped between the feed-rolls G G', by means of which it is delivered free and clear from the machine. After the piece passes beyond the center of the cone-faces or axis of motion, said faces diverge, as shown, so that there is no further interference with the piece last acted upon by the smoothing or sandpapering apparatus, and no danger of the piece being thrown back toward the operator, as sometimes occurs with circular saws.

Said disks H H' revolve within the fan-chamber B', and all dust resulting from the action of the sand-faces on the wood is by means of the exhaust-fan *i* drawn downwardly into said chamber, and ultimately expelled through chute P.

In this case I have shown two cone-faced disks adapted to smooth both sides of a piece of material at the same time; but the cone-disk is adapted to be used singly, and for certain kinds of work it might be desirable so to use it; hence I do not confine myself to the employment of said disks in pairs. Said disks are capable of being introduced in a great variety of combinations in other machines, either singly or in pairs, and may have a wide range of application. Emery-wheels for finishing metals may be constructed on the same plan, or they may be made solid. Grindstones may be fashioned to this conoidal form, and, either singly or in pairs, made to execute a variety of work hitherto unaccomplished. The essence of this feature of my invention consists in its peculiar conoidal form, which form enables

surfaces to be smoothed or finished without impairing or destroying the integrity of the longitudinal corners of the piece operated upon. Said disks may consist of a body or stock of the proper conoidal form, and mounted on the end of a shaft so that the same shall not protrude beyond the apex of the cone, and faced or coated with any suitable scouring or cutting material, as sand, emery, or quartz; or they may be made of same shape, mounted in same way, and be constructed of solid homogeneous material—as, for instance, emery, grindstone, or even iron or steel.

In cases where it is necessary to smooth but one side of the material, the belt may be thrown off either of the pulleys which drive the disks, thus leaving such disk stationary. It then forms a back-stop, against which the piece submitted to the action of the other disk finds abutment. Hence,

I claim—

1. A disk adapted to smooth or polish the surface of material exposed to its action in the manner described, mounted on the end of a shaft, through which it receives rotary motion, and having its grinding, polishing, or scouring face constructed in the form of a cone, of which the axis of motion is the apex, substantially as described and set forth.

2. In a grinding, scouring, or polishing machine of the character described, the combination of two disks constructed with cone-shaped grinding or scouring faces, so mounted and adjusted in respect to each other that

those portions of the cone-faces which come in contact with the material to be acted upon shall be radially parallel with each other, either or both of which disks shall be axially adjustable, with an interposed bridge or rest for the support of the piece to be acted upon, arranged to be operated by any appropriate mechanism, substantially as described and set forth.

3. The described means for regulating the pressure requisite to be applied to the polishing or scouring disks $H H'$, to secure a proper detrition of the surface of the piece being acted upon, consisting of disk D' upon shaft Z , in combination with lever X and handle Y , arranged and operating substantially as described and set forth.

4. The mechanism described for dressing or finishing level surfaces of chair-stock and other articles, embracing shaft B , disks $H H'$, with the described appurtenances for controlling the axial movement of one of them, feed-rolls $G G'$, bridge s , and rest b' , exhaust-fan i , and chamber B' , mounted in or upon a suitable frame, $A A'$, all combined and arranged to operate substantially as described and set forth.

In testimony whereof I have hereunto set my hand, at Arlington, in the State of Vermont, this 27th day of May, 1878.

L. B. BATCHELLER.

In presence of—

F. WEST,
FRANKLIN SCOTT.