(No Model.) 2 Sheets—Sheet 1.

H. B. STILLMAN & W. F. PATTERSON.

PLANING MACHINE.

No. 327,346. Patented Sept. 29, 1885.

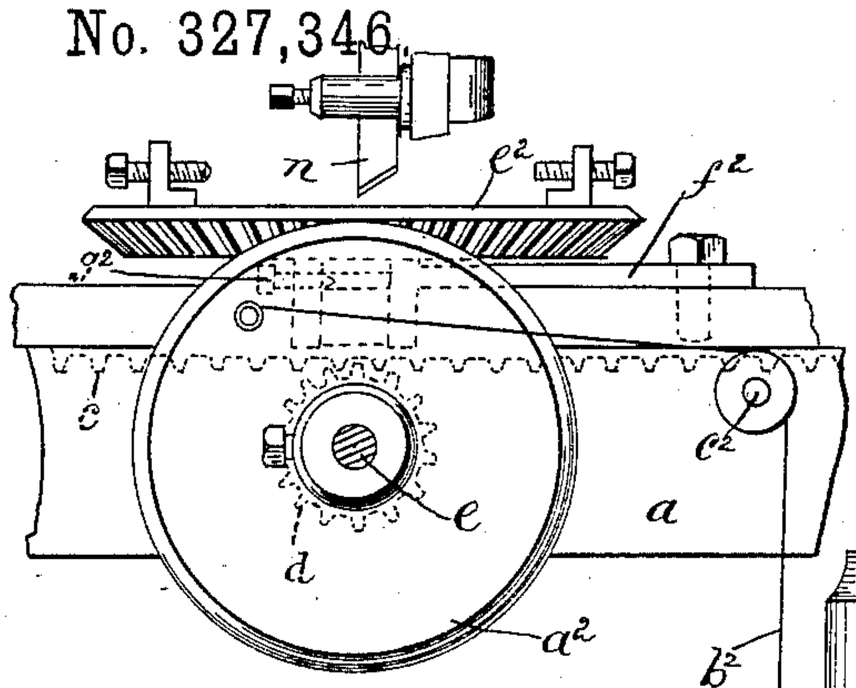

Fig. 4.

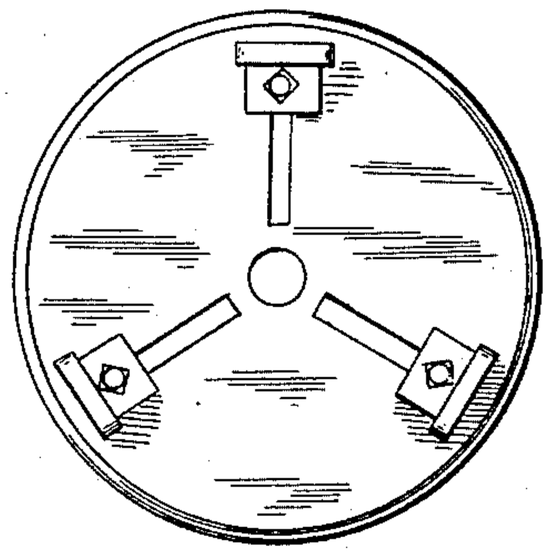

Fig. 5.

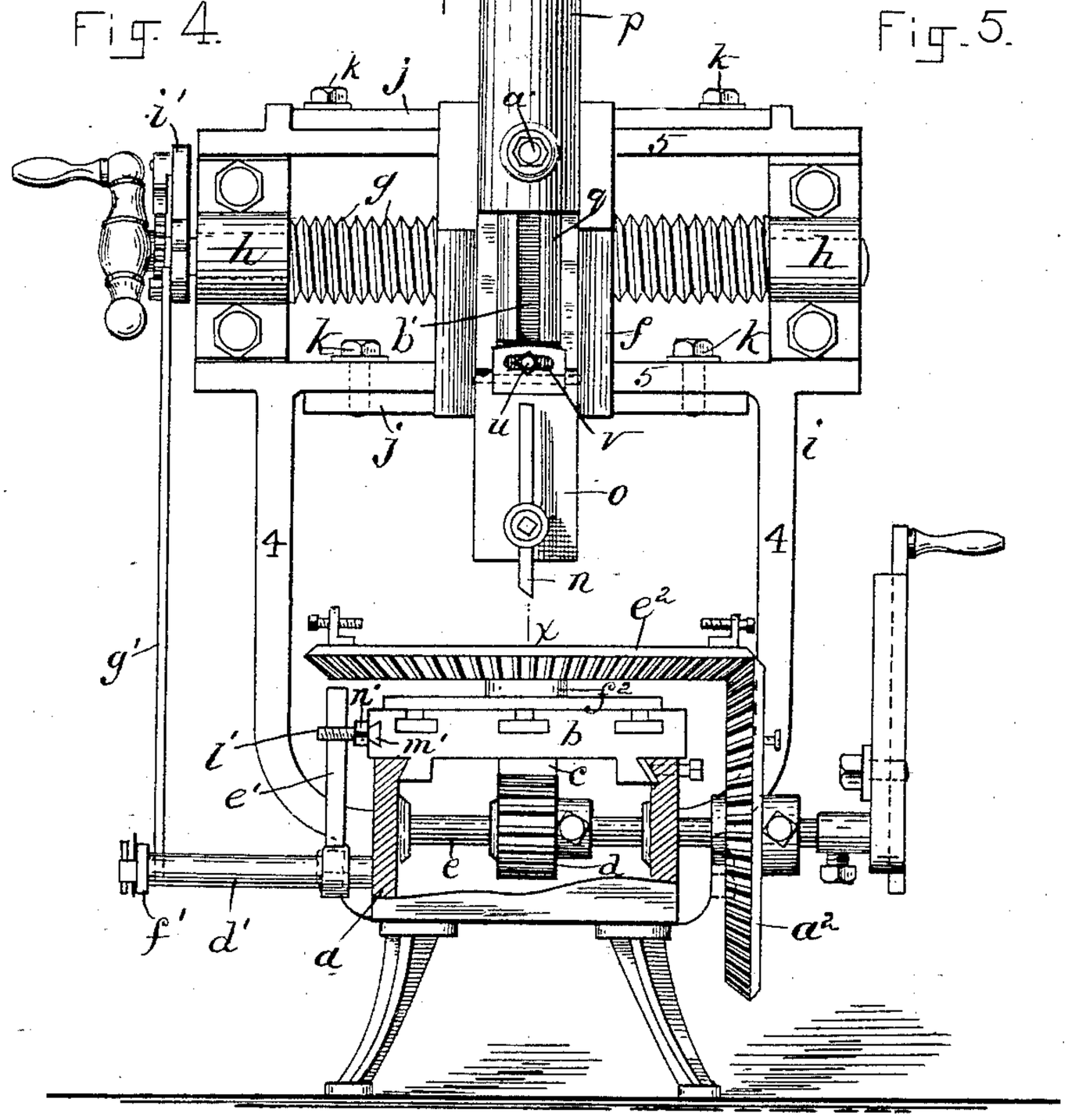

Fig. 1.

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Fig. 3.

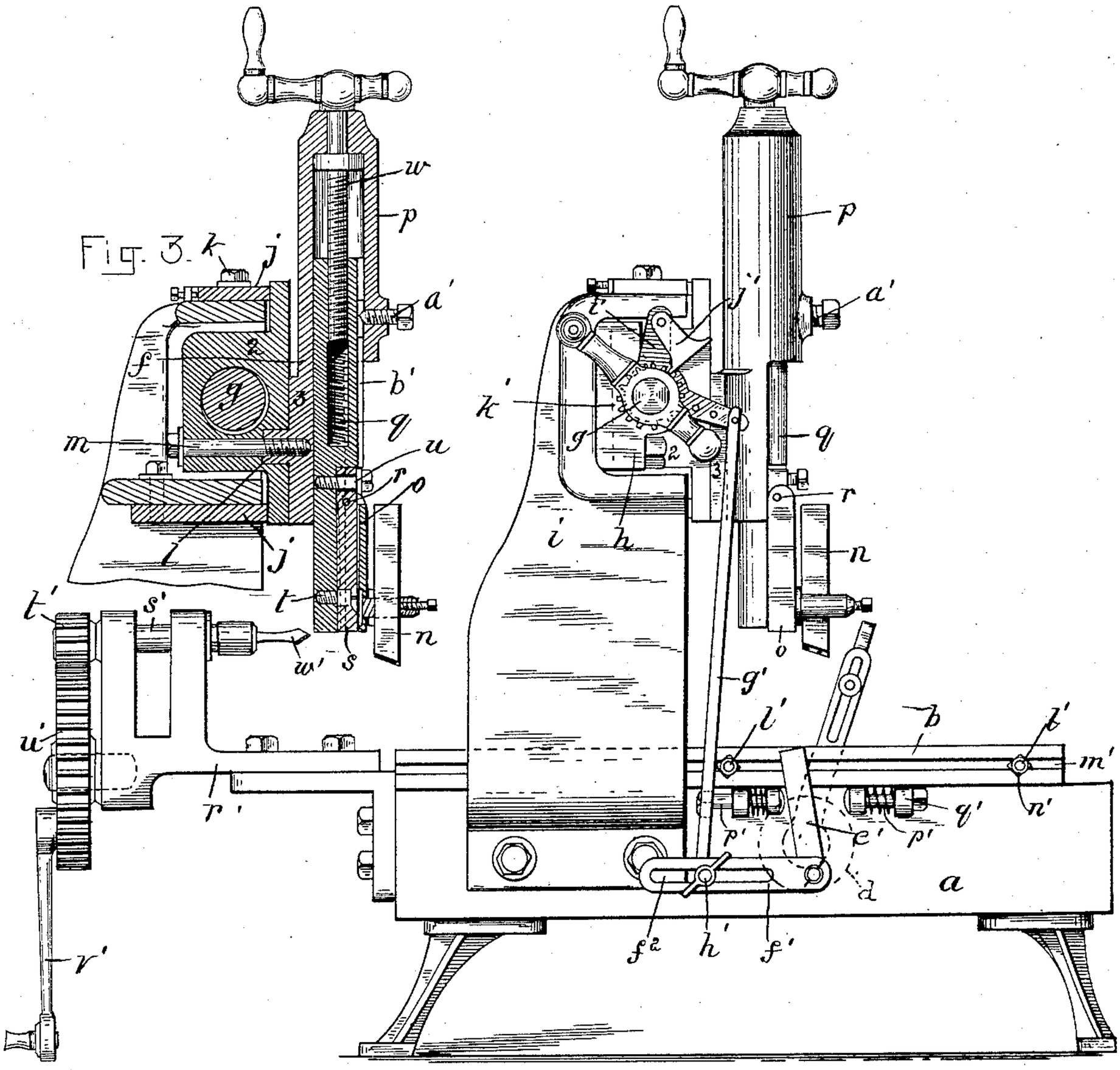

Fig. 2.

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UNITED STATES PATENT OFFICE.

HENRY B. STILLMAN AND WILLIAM F. PATTERSON, OF BOSTON, MASS.

PLANING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 327,346, dated September 29, 1885.

Application filed October 25, 1884. (No model.)

To all whom it may concern:

Be it known that we, HENRY B. STILLMAN and WILLIAM F. PATTERSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Planing-Machines, of which the following is a specification.

This invention has for its object to improve the construction of machines for planing or dressing metal or stone surfaces with regard to economy of construction and convenience and efficiency of operation.

It also has for its object to provide an attachment whereby a circular body may be either bored centrally or dressed on its periphery by the tool of a planing-machine, and also an attachment whereby a body supported by the platen of a planing-machine may be pressed thereby against a horizontal drill.

To these ends the invention consists in the improvements which we will now proceed to describe and claim.

Of the accompanying drawings forming a part of this specification, Figure 1 represents an end elevation of a planing-machine provided with our improvements. Fig. 2 represents a side elevation of the same. Fig. 3 represents a section on line *x x*, Fig. 1. Fig. 4 represents a side elevation of a portion of the platen and bed, showing the attachment for rotating the article to be dressed. Fig. 5 represents a top view of the rotary support or attachment adapted for use as a chuck.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the bed of a planing-machine, and *b* represents the platen thereof, which is movable on guides on the bed, as usual, the platen being provided with a rack, *c*, on its under side with which meshes a pinion, *d*, on an arbor, *e*, to which power may be applied by hand or otherwise to propel the platen in either direction.

f represents a tool-carriage, which is composed of two sections, 2 3. The carriage is mounted on a screw, *g*, which passes through a tapped socket in the section 2, and is journaled at its ends (which are not threaded) in bearings *h h* on a frame, *i*, which is secured to the bed *a*. The screw *g* serves both to support and move the tool-carriage.

To the frame *i* are attached two gibs, *j j*, which bear against flanges on the section 2 of the tool-carriage above and below the screw *g*. Said gibs are adjustable, being attached to the frame *i* by means of set-screws *k*, passing through slots, so that the gibs may be moved forward against the flanges on the section 2. The gibs, therefore, keep the tool-carriage in a vertical position on the screw, and compensate for the wear of the screw and of the section of the tool-carriage through which it passes, so that the carriage will be at all times supported steadily, the gibs being kept properly adjusted.

The screw *g*, serving both as a means of support and a means of adjustment of the tool-carriage, and the gibs *j j*, operating as described, constitute important parts of our invention.

The section 3 of the tool-carriage has a cylindrical boss, *l*, projecting into a socket in the section 2, and is secured to the section 2 by a single screw, *m*, passing from the back side of the section 2 through the boss and into but not through the section 3, the latter being adapted to be adjusted at any desired angle by loosening the screw *m*, and secured at any angle to which it may be adjusted by tightening the screw, the boss *l* serving as a pivot on which the section 3 may turn when the screw *m* is loosened.

The tool *n*, secured to the apron *o*, which is pivoted as usual to the tool-holder, may be thus adapted to act on or form a surface having any desired bevel or inclination, as the side of a dovetail groove.

The section 3 of the tool-carriage is vertically elongated and formed as a tubular socket, *p*, receiving a cylindrical spindle, *q*, which supports the tool, the apron *o*, to which the tool is attached, being pivoted at *r* to a plate, *s*, which is connected to the lower end of said spindle by a pivot, *t*, and secured at its upper end to the spindle by a screw, *u*, passing through a curved slot, *v*, in the plate.

An adjusting-screw, *w*, is journaled in the upper end of the tubular socket *p*, and enters a tapped socket in the spindle *q*, and when rotated moves said spindle vertically. A set-screw, *a'*, in the side of the socket projects into a slot, *b'*, in the spindle *q*, and prevents said spindle from rotating, and also positively holds the spindle against vertical play or movement

such as might be caused by an imperfect fit of the thread of the screw *w* in the tapped socket of the spindle, or by accidental rotation of said screw, such rotation being prevented by the set-screw.

The tool-holding apron *o*, pivoted to the plate *s*, which is pivotally connected to a vertically-adjustable support, as above described, is not a part of our invention, but is a well-known construction.

The cylindrical form of the vertically-adjustable support or spindle *q*, and the tubular socket containing the same and provided with the adjusting-screw, constitute parts of our improvement, the advantage of the described form of said parts being their simplicity and the economy of labor required in making them, the spindle being formed by turning and the socket therefor by boring.

The single screw *m*, which secures the section 3 to the section 2, together with the boss *l*, through which the screw *m* passes, and the socket receiving said boss, constitute a simple, effective, and economical means for pivoting the section 3 and holding it positively in any position to which it may be adjusted, enabling said section to be quickly loosened, adjusted, and secured.

Heretofore two bolts passed through the pivoted section of the tool-holder at opposite sides of its vertical center, and working in segmental slots in the supporting-section, have been required to accomplish the result which we accomplish by the single screw.

Automatic mechanism is provided, as usual, whereby the screw *g* is partially rotated at the end of each forward movement of the platen to move the tool-carriage laterally, and thus present the tool to a different portion of the surface being acted on. In the present instance said mechanism is composed of a sleeve, *d'*, pivoted on a stud attached to the side of the bed *a*, and having an upwardly-projecting arm, *e'*, and a horizontal slotted arm, *f'*, a rod, *g'*, secured to the slotted arm *f'* by a bolt, *h'*, which is adjustable in the slot f^2 thereof, a two-armed lever, *i'*, mounted to swing loosely on the end of the screw *g*, one of its arms being connected to the rod *g'* and the other having a double or reversible pawl, *j'*, pivoted to it adapted to engage with a pinion, *k'*, affixed to the screw *g*. The platen *b* has studs *l' l'* affixed to one side, the arm *e'* being located between said studs, the latter projecting so that one of them will strike said arm as the platen approaches the end of its movement, and thus turn the sleeve *a'* and depress the arm *f'* and turn the two-armed lever *i'*, causing the pawl *j'* to partially rotate the screw. When the platen reaches the end of its backward movement, the other stud, *l'*, strikes the arm *e'* and raises the pawl *j'* through the intermediate parts, thus preparing it for depression by the next forward movement of the platen, as above described. The pawl can be reversed to cause it to rotate the screw in the opposite direction when it is desired to reverse the feed movement.

The studs *l' l'* have beveled heads, which fit in a dovetail groove, *m'*, in the side of the platen *b*. Each stud has a clamping-nut, *n'*, which is screwed up against the side of the platen and secures the stud to the platen. By loosening said nuts the stud may be adjusted laterally in the groove *m'*.

To prevent a shock or jar when either of the studs *l' l'* swings the lever *e'* over, we provide the side of the bed *a* with spring-buffers, arranged so that the lever *e'* will strike one or the other of them in approaching one end or the other in its swinging movement. Each buffer is composed in the present instance of a rod, *p'*, adapted to slide lengthwise in an ear or lug, *q'*, on the bed *a*, and a spring interposed between said lug and the head of the rod. It is obvious, however, that the buffers may be differently constructed, if preferred.

r' represents a bracket or frame attached to the end of the bed *a*, and having a horizontal arbor, *s'*, journaled in it. Said arbor is provided with a pinion, *t'*, meshing with a pinion, *u'*, which is mounted on a stud affixed to said bracket, and is provided with a crank or handle, *v'*, whereby it may be rotated to impart motion to the arbor *s'*. A drill, *w'*, is affixed to the inner end of the arbor *s'*. It will be seen that the drill is arranged to enter an article supported by the platen *b*, so that when the platen with the article secured to it is pressed toward the drill the latter will enter the article horizontally.

To enable the operator to rotate the drill and press the platen toward it, we provide a wheel on the arbor *e* and connect the latter by means of a strap or cord, b^2, with a treadle, (not shown in the drawings,) the cord b^2 passing over a pulley, c^2, on the side of the bed *a*. (See Fig. 4.) The operator by pressing his foot upon the treadle rotates the wheel a^2, thus causing the pinion *d* to move the platen toward the drill.

e^2 represents a rotary bed or work-support, formed as a bevel gear-wheel on its periphery, and journaled in a plate, f^2, which is adapted to be attached to the platen *b*, said plate having a socketed boss at one end, which projects downwardly into an opening formed for it in the platen, and receives a stud or arbor affixed to the rotary support e^2. A set-screw, g^2, inserted in said boss enters a groove in the arbor of the rotary support, and prevents the withdrawal of said arbor without preventing the rotation thereof, excepting when the support e^2 is used as a chuck, as hereinafter described.

When the rotary support e^2 is in place on the platen, its toothed periphery meshes with a bevel gear-wheel, a^2, on the arbor *e*, said wheel a^2 being preferably the one to which the cord or strap b^2 is attached, as shown. When the support e^2 is used to rotate the article to be acted on by the tool *n*, the platen-operating

wheel *d* is loosened so that it will remain idle when the arbor is rotated. The rotation of the arbor *e* will therefore rotate the support e^2 without moving the platen.

It will be seen that a piece of work secured to and rotated by the support e^2 may be bored at its center by a suitable tool on the tool-carriage, or may be dressed to a true circle at its outer margin, or may be provided with annular grooves or depressions in its upper surface, the adjustability of the tool enabling it to act on any desired portion of the rotating article. The support may have any suitable work-holding devices, ears or brackets having set-screws being shown for the purpose in Figs. 1 and 4.

If desired, the support e^2 may be used as a chuck to hold the work upon the reciprocating platen, in which case its upper surface should be provided with radial grooves, as shown in Fig. 5, having adjustable work-holding jaws. When the support is thus used, the wheel a^2 is disconnected from it, and its arbor is held from rotating by turning in the set-screw g^2, so that it will bear against said arbor or enter a depression therein. The platen will be reciprocated as in the ordinary use of the planer.

When the support is not required in either capacity, it may be removed, with the plate f^2, from the platen.

The frame *i*, supporting the tool-carriage and its operating-screw, is made in a single piece or casting composed of two side pieces, 4 4, which are bolted to the bed *a*, and a connecting longitudinal piece, 5, which is recessed to receive the screw *g* and the tool-carriage. This construction of the frame *i* simplifies and cheapens the machine.

This improved machine may be used for dressing metal, stone, and other materials.

We claim—

1. In a planing or dressing machine, the combination of a tool-carriage and a screw, constituting at once a main support and an adjusting device for said carriage, as set forth.

2. The combination of a tool-carriage, a screw constituting a support and an adjusting device for said carriage, and adjustable gibs bearing against the carriage, whereby wear of both carriage and screw may be compensated for, as set forth.

3. The adjustable tool-carriage composed of two sections, 2 and 3, the latter having the tool-holder and being connected to the section 2 by a single screw, as set forth.

4. The combination of the socketed section 2, the section 3, having a boss projecting into the socket of the section 2, and the single attaching-screw passing from the back of the section 2 through the boss and into the section 3, as set forth.

5. The tool-carriage having the tubular socket *p*, combined with the cylindrical tool-holding spindle *q*, inserted in said socket, and a screw constituting the main support and lateral adjustment of the tool-carriage, as set forth.

6. The tool-carriage having the tubular socket *p*, the adjusting-screw *w*, and the binding-screw *a'*, combined with the cylindrical tool-holding spindle entering said socket and receiving the adjusting-screw, as set forth.

7. The combination, with the movable platen, of the fixed drill-supporting bracket or frame, and mechanism, substantially as described, for rotating the drill, as set forth.

8. The combination, with the movable platen, of the fixed drill-supporting bracket or frame, with mechanism for rotating the drill, the arbor *e*, having the pinion *d*, engaged with a rack on the platen, the wheel a^2 on said arbor, and a treadle-connection with said wheel, substantially as described.

9. The combination, with the platen, of the support c^2, having mechanism whereby it may be fixed or rotated, and the plate or holder f^2, in which said support is journaled, as set forth.

10. The combination, with the platen, of the rotary plate or support e^2, formed as a bevel-gear, having mechanism whereby it may be fixed or rotated, means, substantially as described, for detachably securing it to the platen, and the bevel-gear a^2 on the arbor *e*, meshing with the periphery of the rotary support, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 20th day of October, 1884.

HENRY B. STILLMAN.
WILLIAM F. PATTERSON.

Witnesses:
C. F. BROWN,
H. BROWN.