

(No Model.)

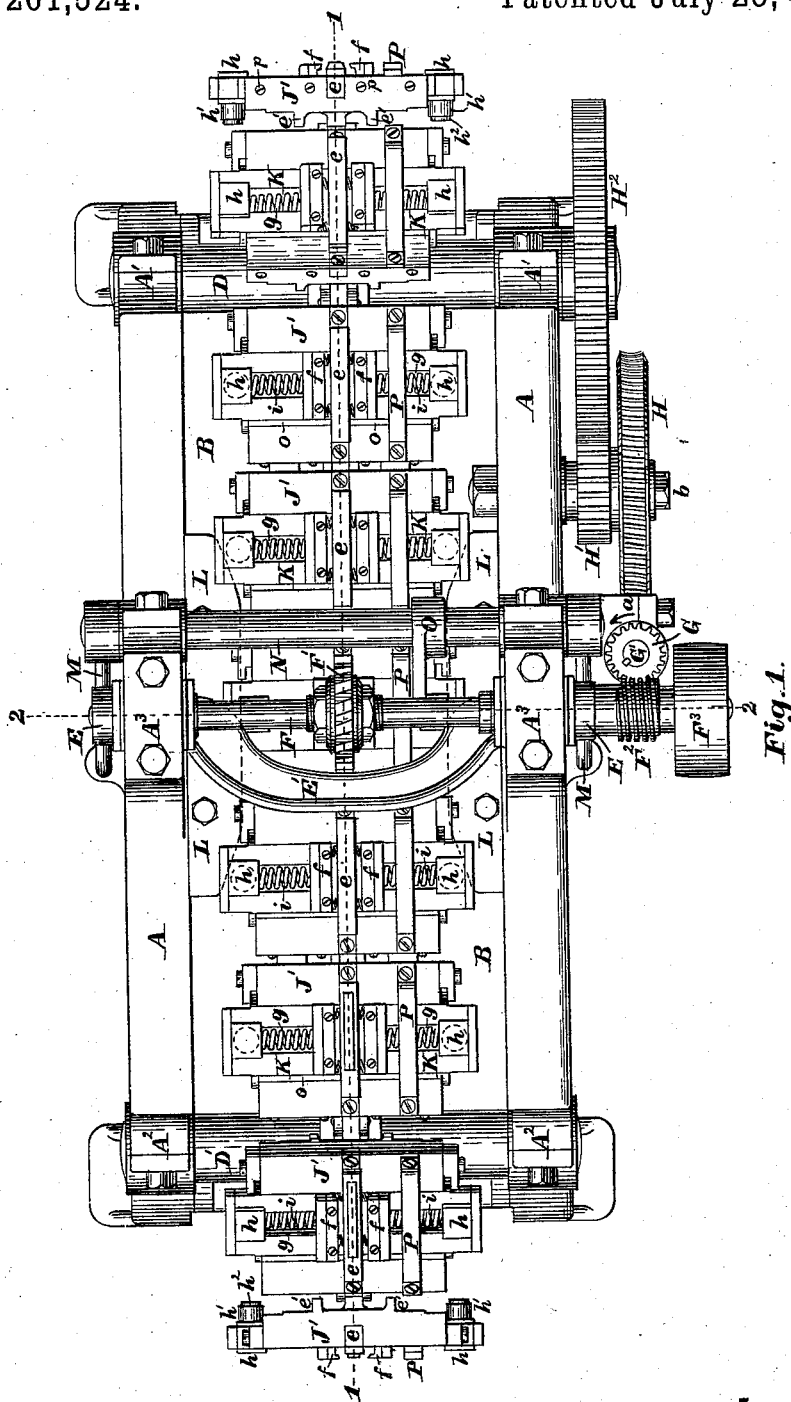
5 Sheets—Sheet 1.

M. BRAY.

MACHINE FOR SHAPING AND DRESSING REEDS AND REED PLATES.

No. 261,524.

Patented July 25, 1882.



Witnesses:

*E. A. Kemmureway*  
*Walter E. Lombard*

Inventor:

*Mellen Bray*  
by *N. C. Lombard*  
Attorney.

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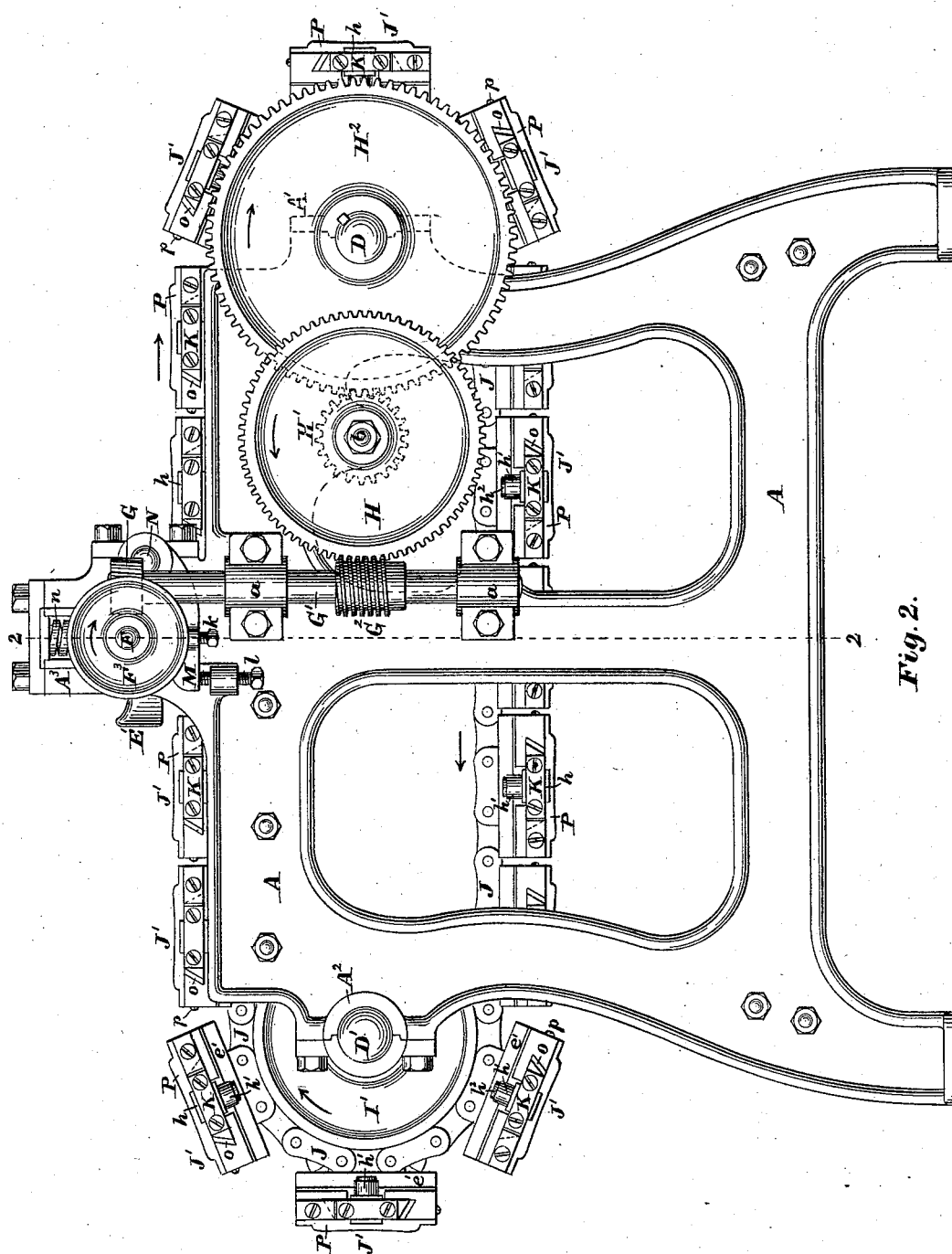


Fig. 2.

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(No Model.)

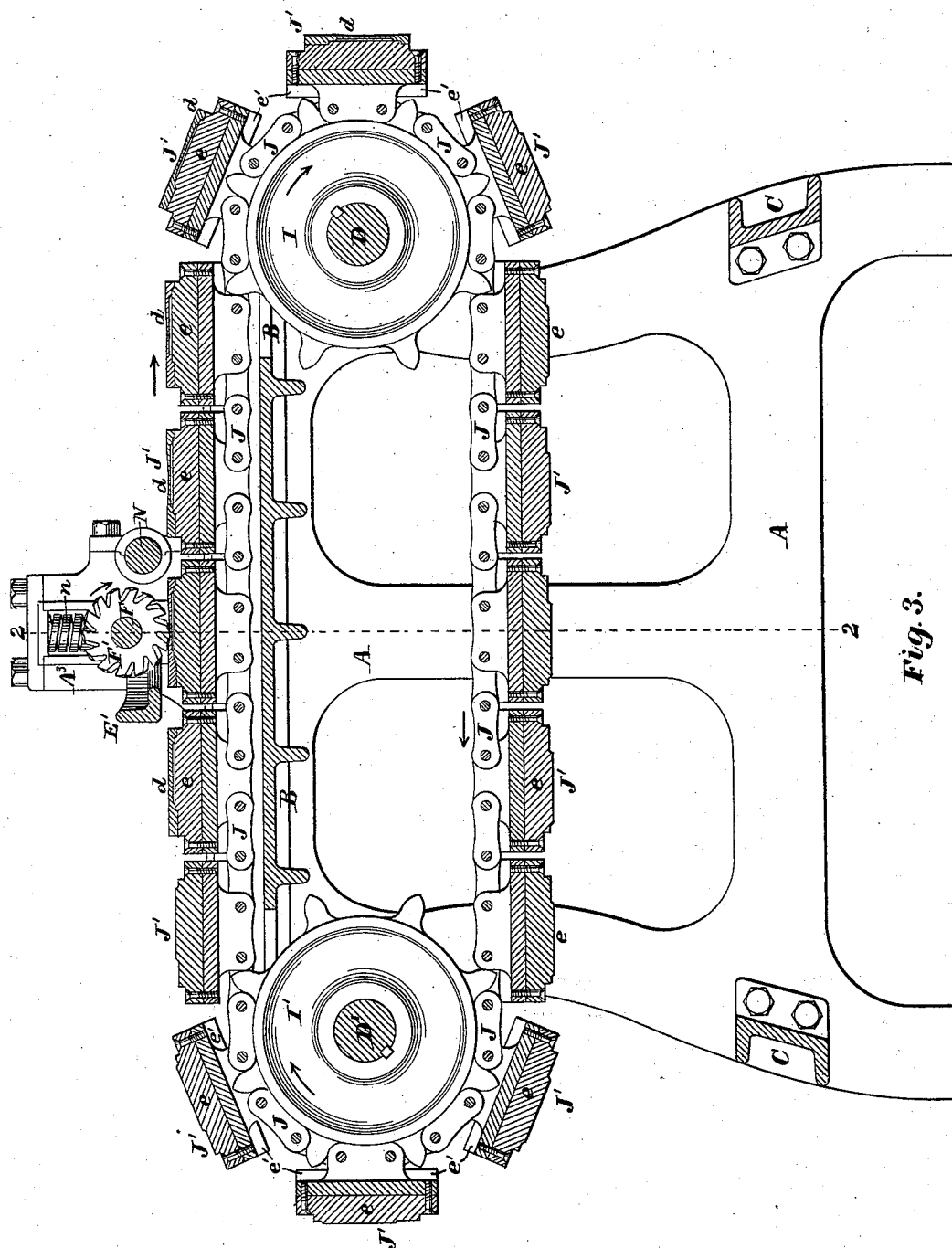
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Patented July 25, 1882.



Witnesses:

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(No Model.)

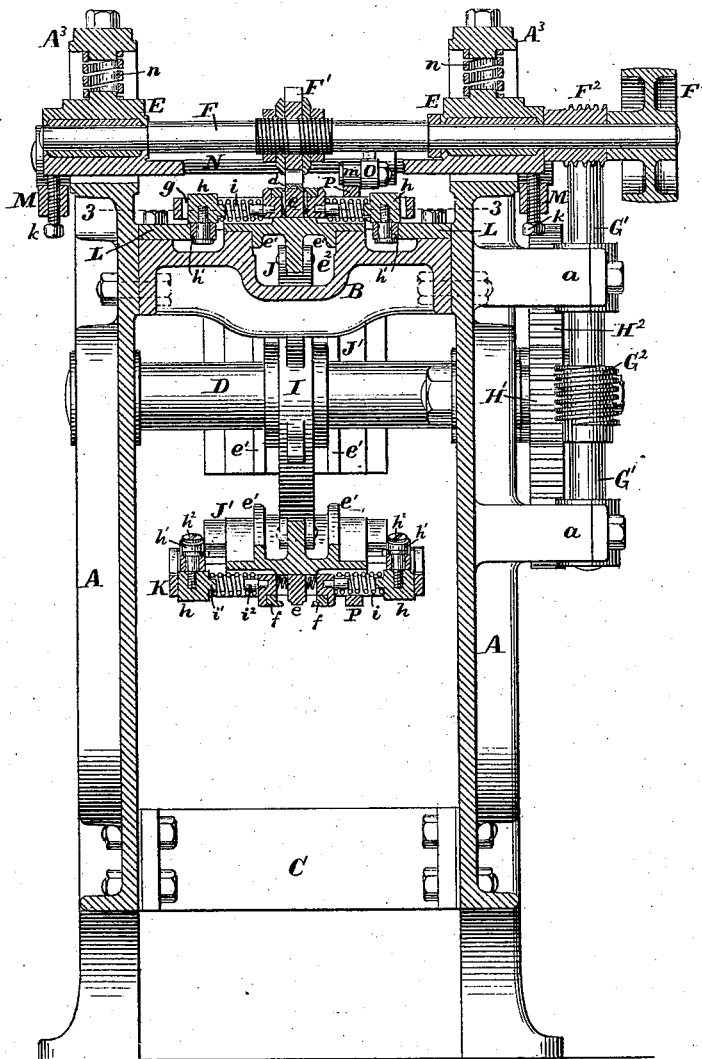
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*Fig. 4.*

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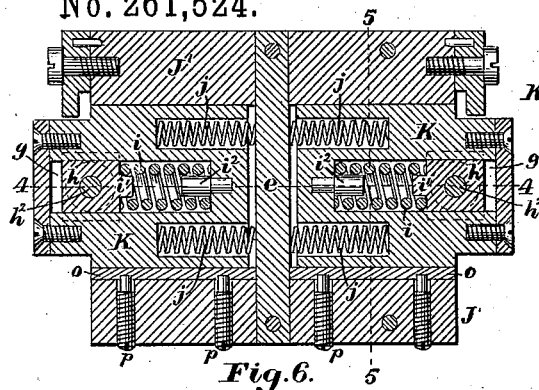


Fig. 6.

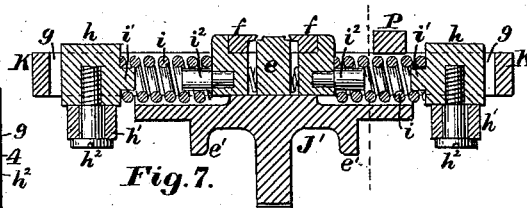


Fig. 7.

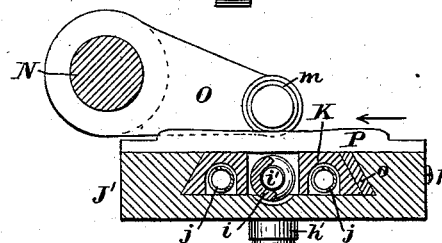


Fig. 8.

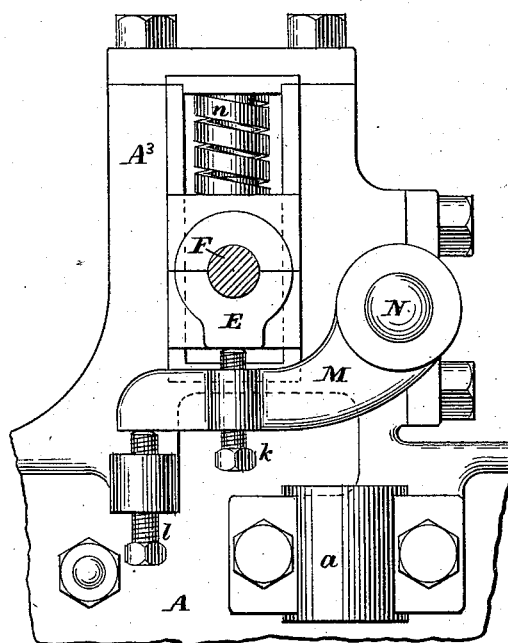


Fig. 5.

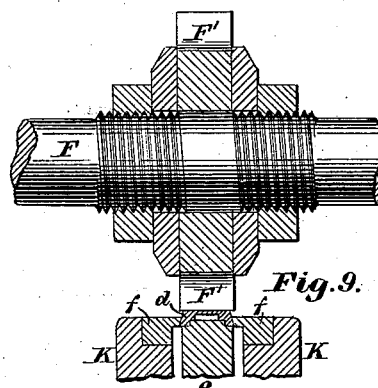


Fig. 9.

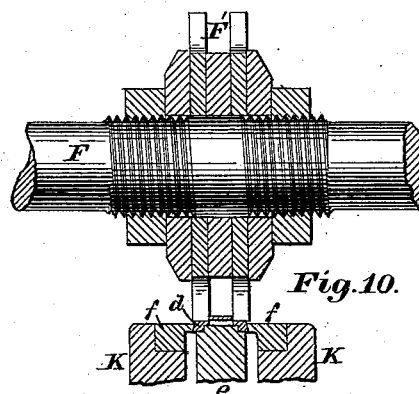


Fig. 10.

Witnesses:

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Walter E. Lombard

Inventor:

McAllen Bray  
by N. C. Lombard  
Attorney.

# UNITED STATES PATENT OFFICE.

MELLEN BRAY, OF NEWTON, MASSACHUSETTS.

MACHINE FOR SHAPING AND DRESSING REEDS AND REED-PLATES.

SPECIFICATION forming part of Letters Patent No. 261,524, dated July 25, 1882.

Application filed February 13, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, MELLEN BRAY, of Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Milling-Machine for Shaping Reeds and Reed-Plates for Musical Instruments, and for other purposes, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a machine for milling reeds and reed-plates for musical instruments, and may be advantageously used in milling other small articles of which a large number are required to be made of uniform shape; and it consists, first, in the combination, with a rotary milling-tool, of a series of carriages to receive the articles to be milled, mounted upon or secured together in the form of an endless chain, and each provided with means of firmly securing the article to be milled thereto, and mechanism for moving said series of carriages in succession in a straight line beneath the rotary cutter.

It further consists in the combination, with a rotary milling-tool, of an endless chain or belt arranged to move in a straight line past the cutting-tool, a series of carriages mounted upon and carried by said chain or belt, and mechanism for automatically clamping an object to be milled upon each of said carriages, as will be more fully described.

It further consists in the combination, with a rotary milling-tool, of an endless chain or belt arranged to move in a straight line past the cutting-tool, a series of carriages mounted upon and carried by said chain or belt, and each provided with means of clamping an article to be milled thereto, a pattern-cam, and mechanism connected with the shaft of the milling-tool and adapted to be acted upon by said pattern-cam to raise or lower said shaft, and thus cause the tool to cut to a greater or less depth, according to the shape that it is desired to give to the object being milled.

It further consists in certain novel combinations and arrangements of mechanical devices, which will be best understood by reference to the description of the drawings, and to the claims to be hereinafter given.

Figure 1 of the accompanying drawings is a plan of a machine embodying my invention.

Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal section on line 1 1 on Fig. 1. Fig. 4 is a transverse section on line 2 2 on Figs. 1, 2, and 3. Fig. 5 is a partial elevation of one side of the machine, with the driving-pulley cut away, drawn to an enlarged scale. Fig. 6 is a horizontal section through the carriage on line 3 3 on Fig. 4, also drawn to an enlarged scale. Fig. 7 is a vertical section through the carriage on line 4 4 on Fig. 6. Fig. 8 is a vertical section on line 5 5 on Fig. 7. Fig. 9 is a vertical section through the rotary cutting-tool and a portion of the carriage and the clamping-jaws, adapted to milling the whole upper surface of the reed-plate; and Fig. 10 is a similar section, illustrating a modified tool for milling the outer portions of the upper surface of the reed and separating the sides of the reed-tongue from the reed-plate.

A A are the side frames of the machine, connected together by the bed B and the tie-girts C C, and provided at their opposite ends with the boxes A' and A<sup>2</sup>, in which are mounted the shafts D and D', respectively, and at their upper sides with the housings A<sup>3</sup>, in which are fitted so as to move up and down therein the boxes E E, connected together by the tie-bar E'. (Shown in Figs. 1 and 3.)

F is the cutter-shaft, mounted in the boxes E E, and carrying the cutting-tool F', the worm F<sup>2</sup>, and the driving-pulley F<sup>3</sup>. The worm F<sup>2</sup> engages with and imparts motion to the worm-wheel G, mounted upon the upper end of the vertical shaft G', mounted in the boxes a a, and carrying the worm G<sup>2</sup>, which meshes into and imparts motion to the worm-wheel H, mounted upon a stud, b, and having secured thereto the pinion H', which in turn imparts motion to the spur-gear wheel H<sup>2</sup>, mounted upon the end of the shaft D, as shown.

I and I' are sprocket-wheels, mounted respectively upon the shafts D and D', and adapted to carry and impart motion to the endless chain J, upon certain of the links of which are formed or firmly secured the carriages J' J', upon each of which may be placed and clamped a reed-plate, d, or other object to be milled, just before said carriage passes beneath the cutting-tool. The carriage J' has formed in its upper side a dovetailed groove or bearing, extending across the same at right

angles to the line of motion of the chain J, but divided into two parts by the bar *e*, which extends across said dovetailed groove in the center of its length, as shown in Figs. 1, 4, and 6, and serves to support the object to be milled. The carrier J' rests at its sides upon the bed B, and is guided in its forward movement by the lips *e' e'*, formed upon its under side, and the vertical walls of the slot *e<sup>2</sup>*, formed in bed B, as shown in Fig. 4.

K K are two plates fitted to slide in the dovetailed groove formed in the carriage J', one upon each side of the bar *e*, and each having secured upon its inner upper corner the steel lip or jaw *f*, arranged and adapted to bear against the edge of the reed-plate, as shown in Figs. 9 and 10. In the outer end of each of the plates K is cut the rectangular slot *g*, within which is fitted, so as to slide therein, the block *h*, carrying upon its under side the anti-friction roll *h'*, mounted upon the stud *h<sup>2</sup>*, said block *h* being pressed outward by the spiral spring *i*, placed between the block *h* and the inner end of the slot *g* and supported upon the pins or bosses *i'* and *i<sup>2</sup>*, as shown in Fig. 7, the rolls *h'* being so situated as to be acted upon by the cam-plates L L, secured to the bed B, so as to move the plates K K inward toward the bar *e* till the edges of the jaws *f f* are pressed hard upon the reed-plate *d*, as shown in Fig. 4. The plates K K are pressed outward by the spiral springs *j j*, interposed between said plates and the bar *e*, till intercepted by the stops *j' j'*, as shown in Fig. 6, so that when the rolls *h'* pass beyond the cam-plates L L the jaws *f f* will be moved away from the reed-plate *d*, and thus release it after the cutter has done its work thereon. The spring *i* must be of sufficient stiffness to overcome the tension of both the springs *j j* and to clamp the reed-plate with sufficient force to prevent the action of the cutter upon the reed-plate, throwing it out of position, the office of said spring *i* being to allow the jaws *f f* to adapt themselves to slight variations in the widths of the reed-plates, and also to compensate for any wear of the cams L L and the trucks or rolls *h' h'*.

The reed-tongues vary in thickness from one end to the other, some being thinnest at the point or movable end and gradually increasing in thickness toward the root, or that point where they are attached to the reed-plate, while others are thinnest at or near the point of attachment to the reed-plate and increase in thickness toward their movable ends; and one of the objects of this machine is to reduce the reed to the desired variable thickness by milling as distinguished from filing. To this end I mount the boxes E E, which carry the cutter-shaft F, in the housings A, in which they may be moved up and down, and support them upon the adjustable set-screws *k*, set in the levers M, mounted upon the rocker-shaft N, and resting at their movable ends upon the adjustable screws *l*, as shown in Fig. 5. The

shaft N also has secured thereon the lever O, carrying at its movable end the truck *m*, as shown in Figs. 4 and 8.

P is a cam-bar removably secured upon each carriage J', and having its upper edge shaped to correspond to the desired curve to be given to the upper or milled surface of the reed, said cam-bar P being so arranged that its cam-shaped upper edge will act upon the truck *m* to raise the boxes E E, and through them the cutter F', so as to vary the depth of the cut, and thus impart to the upper surface of the reed the desired curve, said cutter being forced by means of the spiral springs *n n*, placed between the boxes E E and the caps of the housings A<sup>3</sup>, said downward movement being limited by the cam-bars P, or, in their absence, by the levers M M coming in contact with the set-screws *l*, as shown in Fig. 5. The cam-bars P must be made to suit the particular case in hand, and changed for a different pattern when a different size or kind of reed is to be milled.

This machine is designed more especially for milling a reed and reed-plate made in one piece, and in which the recess in the under side of the plate and the under surface of the reed-tongue has been previously formed by compression in suitable dies, as described in Letters Patent No. 253,262, granted to me February 7, 1882, for reed for musical instruments.

In the operation of finishing the upper surface of the reeds and reed-plates after they have been partially formed in the dies, they are first passed beneath the broad cutter shown in Fig. 9, with the appropriate cam-bar P upon each carriage, and acting upon the truck *m* to raise and lower the cutter, so as to give the desired curve to the upper surface and reduce that portion which is immediately above the recess in the under side of the plate to the requisite thickness to form a reed-tongue without further reduction by filing, except what is due to the tuning of the reed. When all of the reeds and reed-plates of a given size have thus had the desired shape imparted to their upper surfaces, the cutter shown in Fig. 10 is substituted for the one shown in Fig. 9, and the truck *m* is removed from the lever O, when the plates are again passed through the machine to reduce the side portions of the upper surface of the reed-plate to a lower level and to an even thickness, and at the same time to separate the reed from the reed-plate along its sides, as shown in Fig. 10. If a smaller or larger reed is to be milled, a pattern-cam suited to the reed to be milled must be substituted for the one on the carriage, and then the operation will proceed as before.

A gib, *o*, operated by screws *p*, is applied to each of the dovetailed bearings in which the plates K slide, for the purpose of taking up the wear and keeping at all times a firm bearing for said plates.

I am aware of the existence of Letters Patent No. 69,303, granted to Charles Austin, Oc-

tober 1, 1867, for a machine for making sock-  
eted reed-plates, and therefore I do not claim  
anything shown or described therein; but

What I claim as new, and desire to secure  
by Letters Patent of the United States, is—

1. In a milling-machine, the combination of  
a rotary cutter, an endless chain or belt, a se-  
ries of carriages mounted upon said chain or  
belt and each provided with means of clamp-  
ing the article to be milled thereon, and mech-  
anism for moving said series of carriages in  
succession in a straight line beneath the rotary  
cutter, substantially as described.

2. The combination, in a milling-machine, of  
a rotary cutting-tool, an endless chain or belt  
arranged to move in a straight line while pass-  
ing beneath the cutting-tool, a series of car-  
riages mounted upon and carried by said chain  
or belt, a pair of clamping-jaws mounted upon  
each of said carriages, and a fixed or stationary  
cam-plate for operating one of said jaws, sub-  
stantially as and for the purposes described.

3. In a milling-machine, the combination of  
a rotary cutting tool, an endless chain or belt,  
a series of carriages mounted upon and carried  
by said chain or belt, means of clamping the  
object to be milled thereto, a pattern-cam se-  
cured to each of said carriages, and mechanism  
connected with the shaft of the cutting-tool and  
arranged to be operated upon by said pattern-  
cam to raise or lower the cutter, substantially  
as and for the purposes described.

4. The combination of an endless chain or  
belt, one or more carriages mounted thereon  
and carried thereby, the supporting-bar *e*, se-  
cured in a fixed position on said carriage, the  
plates *K K*, provided with the jaws *f f*, the  
blocks *h h*, having mounted thereon the trucks  
*h'*, the springs *i i* and *j j j j*, and the stationary  
cam-plates *L L*, all constructed, arranged, and  
adapted to operate substantially as and for  
the purposes described.

5. The combination, in a milling-machine, of  
a rotary cutter mounted in movable bearings,  
an endless chain or belt, a series of carriages  
mounted upon said chain or belt, and each pro-  
vided with means of clamping thereto an ar-  
ticle to be milled, mechanism for moving said  
carriages in succession in a straight line be-  
neath the cutting-tool, and a pattern-cam con-  
structed and arranged to raise and lower the  
cutting-tool as each carriage is passed beneath  
said cutter, for the purposes specified.

6. The combination, in a milling-machine, of  
the cutter-shaft *F*, the boxes *E E*, levers *M M*,  
set-screws *k k* and *l l*, the rocker-shaft *N*, the  
lever *O*, the truck *m*, and the pattern-cam *P*,  
all arranged and adapted to operate substan-  
tially as and for the purposes described.

Executed at Boston, Massachusetts.

MELLEN BRAY.

Witnesses:

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WALTER E. LOMBARD.