

(No Model.)

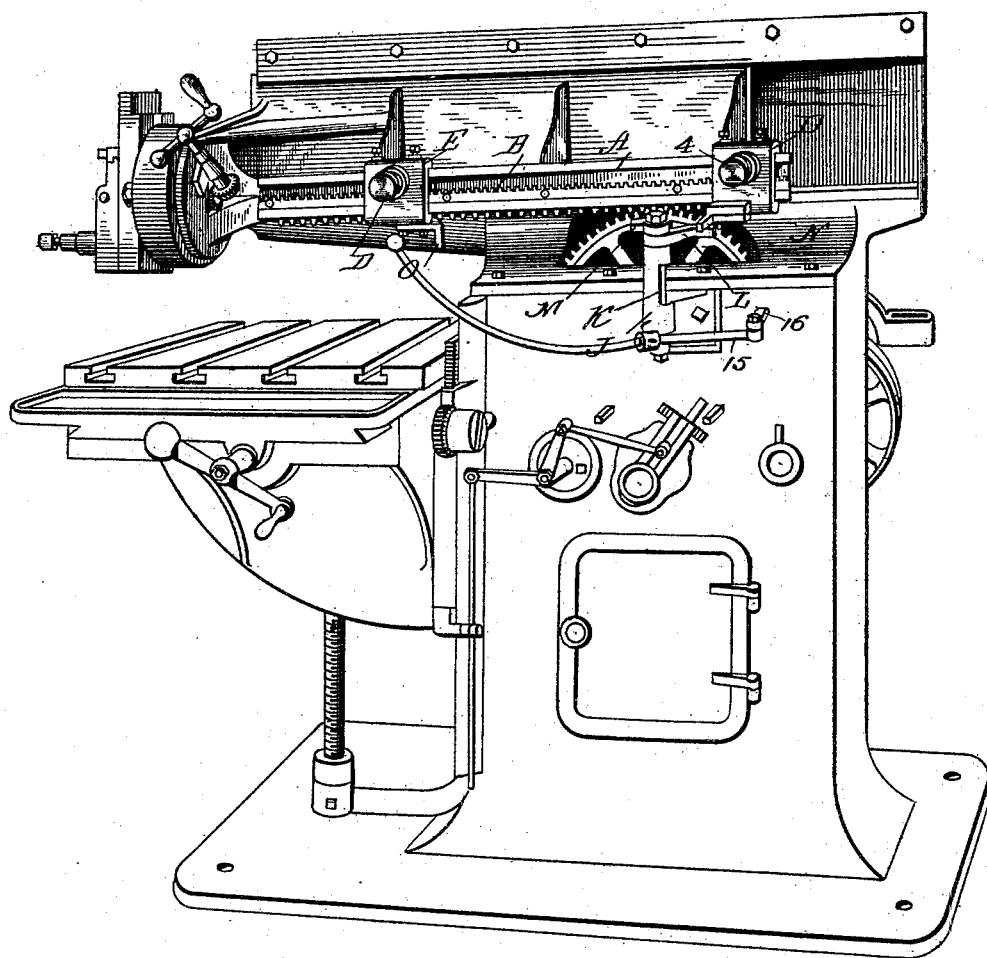
2 Sheets—Sheet 1

W. R. FOX.
METAL PLANING MACHINE.

No. 489,734.

Patented Jan. 10, 1893.

Fig. 1.



Attest
William R. Fox
F. L. Middleton

Inventor
William R. Fox
by Ellis Spear
Att'y.

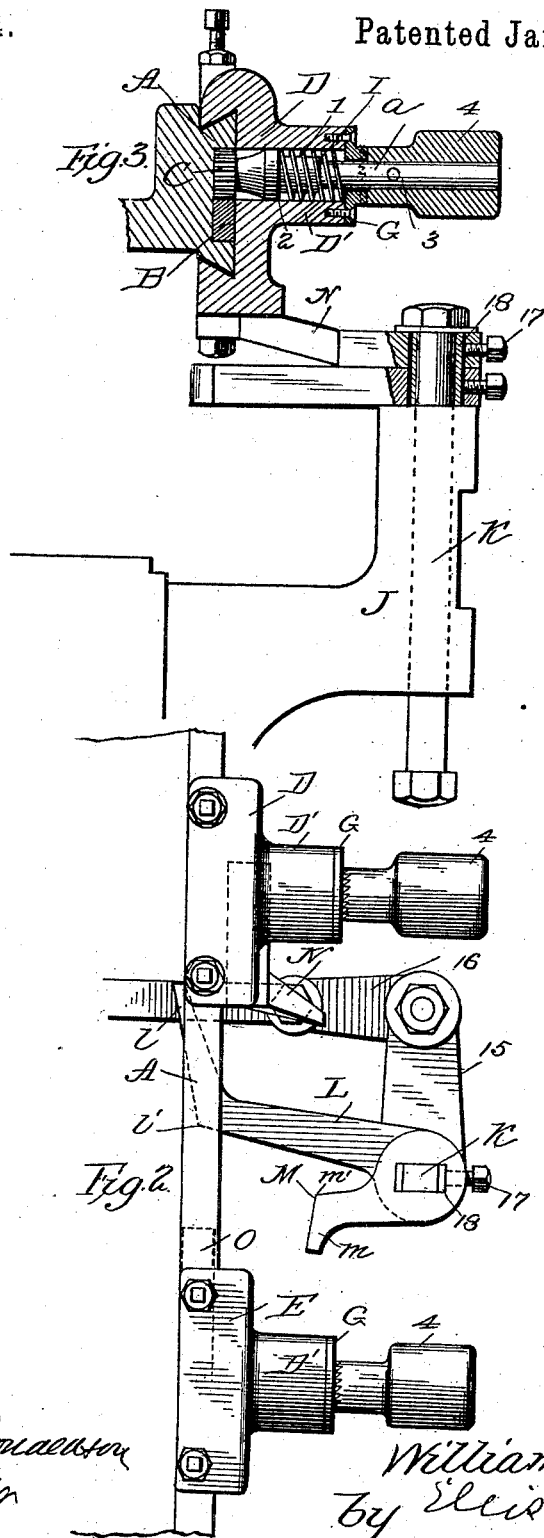
(No Model.)

2 Sheets—Sheet 2.

W. R. FOX.
METAL PLANING MACHINE.

No. 489,734.

Patented Jan. 10, 1893.



Attest
William R. Fox
J. L. Middleton

Inventor
William R. Fox
by Ellis Spear
Att'y.

UNITED STATES PATENT OFFICE.

WILLIAM R. FOX, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO THE FOX MACHINE COMPANY, OF SAME PLACE.

METAL-PLANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 489,734, dated January 10, 1893.

Application filed February 8, 1892. Serial No. 420,664. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. FOX, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Metal-Planing Machines, of which the following is a specification.

It is the object of my invention to produce a machine of increased efficiency with respect to the means for varying the stroke of the ram or like moving part of metal planing machines, it being highly desirable in this class of machines designed for rapid work that the stroke of the ram or like moving part be changed quickly and accurately without necessitating the stopping of the machine.

My invention therefore consists of automatic dogs and arrangement of the slides which carry the dogs for operating the shifting mechanism and in the means whereby said slides and dogs may be speedily and accurately adjusted and securely held in their adjusted position without the use of a wrench or other tool.

The invention also includes other features hereinafter pointed out.

In the drawings: Figure 1 is a perspective view of the entire machine with the doors in place. Fig. 2 is a detail plan view of the dogs a portion of the ram and the operating connections to the belt shifting mechanism. Fig. 3 is a sectional view through the dog and part of the ram.

In the form of machine herein shown the moving part is what is called a ram which is arranged to reciprocate in its way in the usual manner. It is provided along its front side with a guiding rib or way A having beveled edges and a channeled face which are shown as representative of any suitable means for holding and guiding the part. In the lower part of this channel a rack or locking bar B is fixed and on the beveled edges of the guide way the slides D, E which carry the dogs are supported and guided. An opening is formed through each slide and the boss D' thereon, and through these openings the shafts *a* extend. These shafts carry the pinions C meshing normally with the rack bar and held in

engagement by springs 1 bearing against shoulders 2 on the shafts and against the cap plates G which are secured by screws over the open ends of the bosses. The reduced portion 3 of the shaft extends through the opening in the cap plate, which is smaller than the bore of the boss, and upon this reduced shaft a handle 4 is secured, its inner end being provided with serrations or ratchet teeth meshing with corresponding teeth on the cap piece. By pulling outward upon the handle the shaft is moved longitudinally and the pinion is drawn within the opening in the slide and consequently out of engagement with the rack bar, this movement being limited by the shoulder I coming against the inner face of the cap plate. In this position the pinion is just disengaged from the rack and the slide with its dog O or N can then be quickly and accurately adjusted to any position and when in position, the release of the handle will permit the spring to force the pinion into engagement with the rack or locking bar and the ratchet teeth of the cap and handle together thus forming a rigid lock, automatically.

Instead of withdrawing the pinion entirely from the rack the slide with its dog may be adjusted by drawing upon the handle sufficiently to disengage the ratchet teeth of the handle from the cap and then the pinion will simply turn as the slide is shifted and upon release of the handle the secure locking of the parts will be effected again. The left hand slide E carries the dog O which projects downwardly and is in line with the long finger L on the vertical shaft K journaled in the bracket J secured to the frame of the machine. The right hand slide carries the dog N which projects outwardly and in line with the short finger M secured to the shaft K above the finger L. When either dog N or O comes in contact and moves its corresponding finger L or M the shaft K is turned and the connections 15, 16, to the shifting mechanism are operated to shift the belt and thus reverse the motion of the ram in a manner similar to that described in my former United States Patent No. 459,629, dated September 15, 1891.

The finger M is about one and seven-eighths inches long from the center of the shaft K

while the finger L is on a radius of four inches. The ram in moving forward travels at the rate of about twenty feet a minute and when reversed it moves backward at the rate of sixty feet a minute. The short finger M is struck on the slow or forward stroke while the long finger L is operated on the backward rapid stroke consequently the difference in the lengths of the fingers compensates for the difference in speed and the shifting mechanism and the connections thereto are operated at a uniform rate whether on the slow or rapid stroke of the ram.

The amount of movement of the fingers depends upon the arc of contact and in order that this may be accurately adjusted the fingers are provided with slots fitted to the square or flattened upper end of the shaft K which allows the fingers to be adjusted toward and from the path of the dogs to obtain greater or less contact and at the same time the fingers are held securely against lateral displacement by the said flattened sides of the shaft and a set screw 17 combined with gibs 18 introduced on each side of the shaft. The fingers and gibs are held in place by the cap nut 18 screwed on the upper end of the shaft.

In order to prevent the dogs from getting on the wrong side of the fingers angular extensions *l, m*, are formed on the fingers so that when the dog having made contact with the finger and moved it in the arc of a circle until the extreme point *l'* or *m'* has been acted upon by the dog and moved to the extremity of the fingers' movement the dog will then (after passing this point) move along on the straight face of *l* or *m* until the motion is checked and the ram begins its return movement.

From the above it will be seen that the dogs may be shifted to change the stroke to any desired degree without stopping the motion of the machine and the rigid fixing of the dog in any position is effected automatically and instantly upon release of the operating handle. The amount of adjustment may be only the distance equal to the width of one ratchet tooth.

In a machine of this character it is often desirable to follow an irregular outline with the tool, for instance the carriage of a miter cutter requires that the shaping tool have a stroke of fourteen inches to begin with and a stroke of six inches at the finish. By having the slides with the dogs so that they can be easily and quickly moved the stroke can be narrowed down as the work proceeds so that there is no waste of time each stroke being varied if need be to conform to the shape of the carriage required.

While I prefer the rack as a locking bar I do not wish to be understood as limiting myself strictly to this form.

I claim as my invention:—

1. In combination the ram, the shifting mechanism, the dog slides, the automatic locking means carried thereby, the said ram hav-

ing a series of notches arranged side by side and extending longitudinally of the ram to receive the locking means, said locking means being arranged to drop into the notches automatically when released, substantially as described.

2. In combination the moving part, the dog slides carried thereby and adjustable thereon, the rotary locking means between the slides and moving part, and engaging the latter to move longitudinally thereof when rotated and thereby adjust the slide, the clutch device for preventing rotary movement of the said locking device and means for operating the said clutch device to engage and disengage and thereby control the movement of the rotary locking means, substantially as described.

3. In combination the moving part, the dog slides adjustable thereon, the rotary locking device carried by the slides and engaging the moving part, to move along the same when rotated, the handle for turning the rotary locking device and thereby adjusting the slide along the moving part, and the means for holding the handle in any adjusted rotary position, substantially as described.

4. In combination with the movable part, the bar provided with teeth, the dog slide movable over said bar, a pinion engaging said bar a shaft for said pinion journaled in the slide, and means for locking the pinion substantially as described.

5. An adjustable slide carrying a dog in combination with the movable part of a metal planer, said slide being provided with a locking device for locking it to the said part, a spring for throwing said locking device into engagement and a handle carried on the slide for moving the locking device out of engagement substantially as described.

6. An adjustable slide held and guided on the moving part, having a pinion mounted on a rotatable shaft in said slide and adapted to engage with the movable part also having limited longitudinal movement, devices for locking said shaft against turning, and a spring for holding the pinion in engagement with the movable part.

7. In combination with the ram the bar extending longitudinally thereof and having teeth, the dog slides movable over said bar, the pinion engaging the bar, the pinion shaft journaled in the slide and movable longitudinally therein, the spring for forcing the pinion normally inward into engagement with the bar, and the means for locking the pinion against rotary movement consisting of a handle having teeth and the teeth on the slide substantially as described.

8. In combination with a slide movable thereon, a bar having teeth, a pinion engaging therewith, a shaft on which the pinion is mounted capable of rotary and limited reciprocating longitudinal movement, a handle to draw the pinion out of engagement with the bar having inclined teeth on its inner end, teeth reversely inclined on the opposing face

of the slide and a spring to return the pinion into engagement with the bar all substantially as described.

9. In combination the ram having the rib projecting from its side and extending longitudinally thereof, said rib having a channeled face, the toothed bar counter sunk in the said channel and filling only a portion of the same, the slides embracing said rib and extending over the channel and the bar therein, and the locking means carried by the slides and extending into the free part of the channel to engage the bar, substantially as described.

10. In combination a ram having the channeled guide on its side, the toothed bar fixed in said channel the adjustable slides and the locking means including the pinion engaging the bar and extending into said channels substantially as described.

11. In combination the ram the adjustable

dogs thereon, the shaft K having the squared upper end, and the fingers L, M, having slots and adjustably secured to said squared end of the shaft substantially as described.

12. In combination, in a shaping machine the moving part, the dogs carried thereby, the fingers to be engaged by the dogs, the supporting shaft for the said fingers and the connections therefrom to the shifting mechanism, the said fingers projecting across the line of movement of the dogs and having angular extensions at their free ends, projecting substantially in the direction of the dogs' movement, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM R. FOX.

Witnesses:

JOHN DUFFY,
BESSIE JONES.