(No Model.) 2 Sheets—Sheet 1.

J. H. WRIGHT.

FEED ACTUATING MECHANISM.

No. 312,058. Patented Feb. 10, 1885.

Fig. 1.

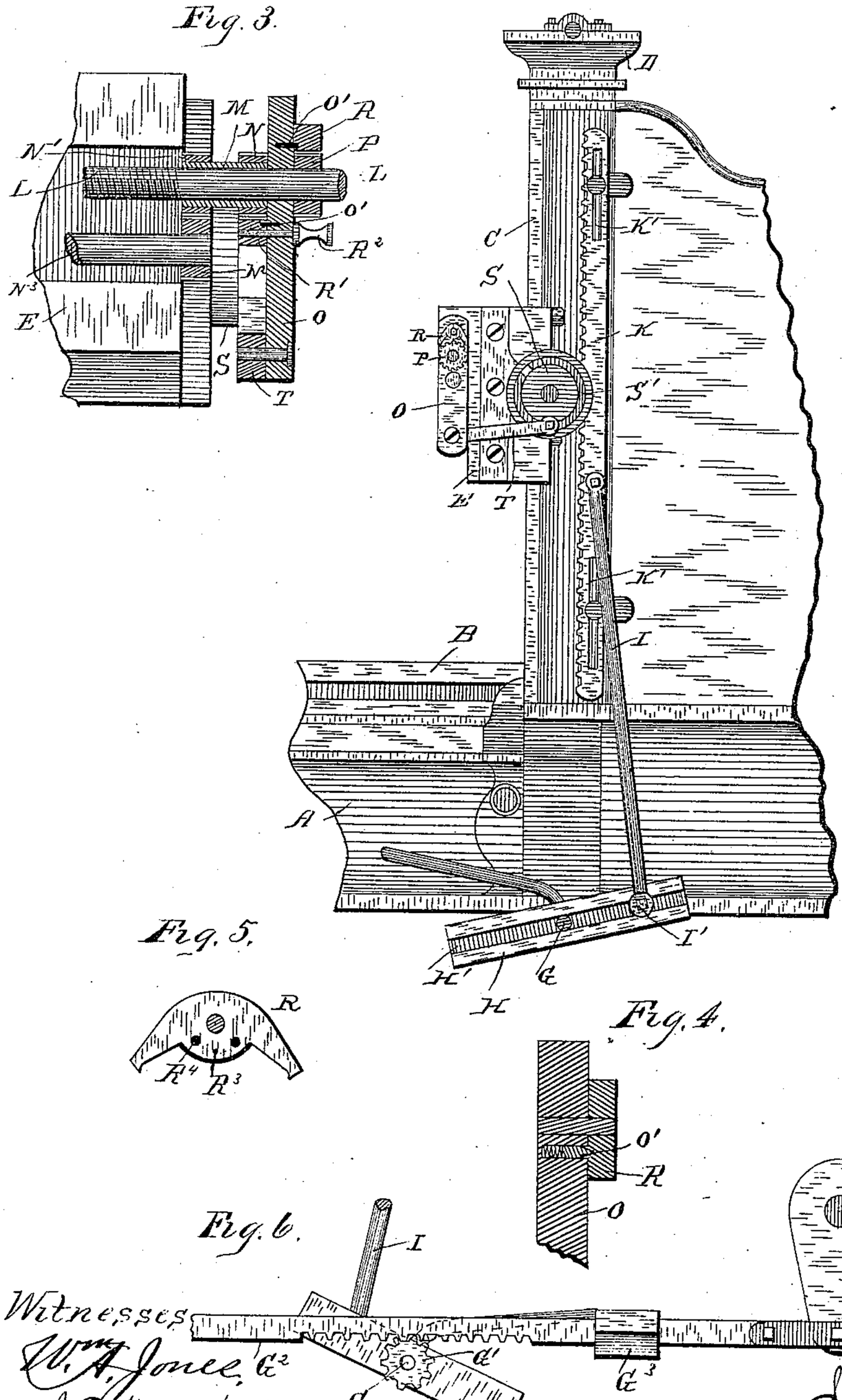


Fig. 3.

Fig. 9

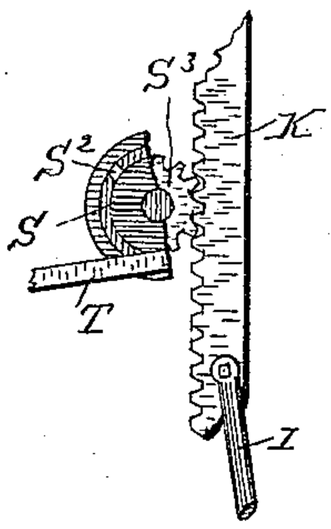


Fig. 5.

Fig. 4.

Fig. 6.

Witnesses,
W. A. Jones,
J. T. Wooster

Inventor
John H. Wright
By atty
A. Bullwooster

(No Model.) 2 Sheets—Sheet 2.

J. H. WRIGHT.

FEED ACTUATING MECHANISM.

No. 312,058. Patented Feb. 10, 1885.

Fig. 2.

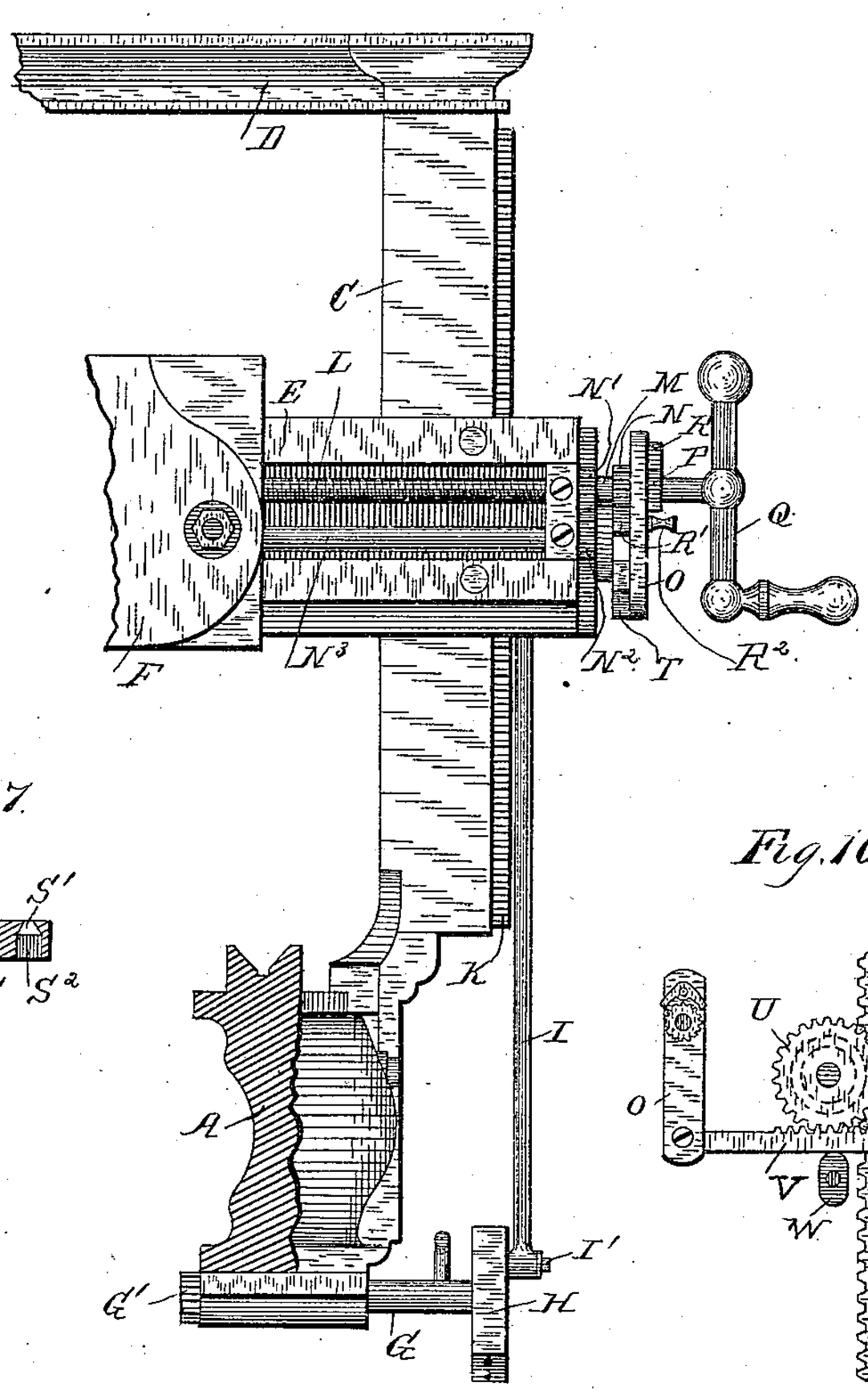


Fig. 7.

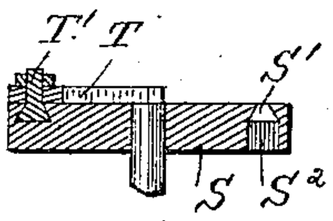
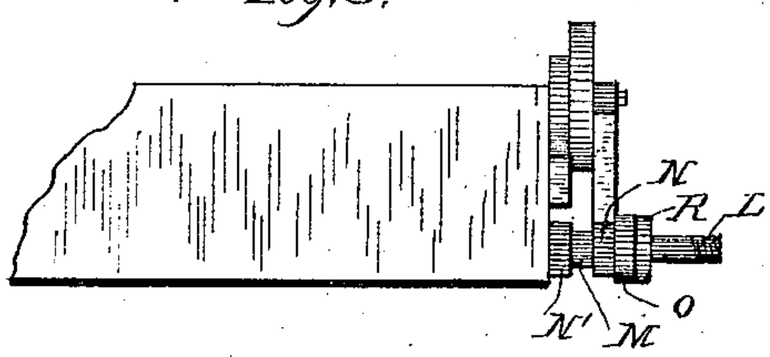


Fig. 10.

Fig. 8.



Witnesses
W. A. Jones.
J. D. Wooster

Inventor
John H. Wright
By atty F. A. Wilcoxen

UNITED STATES PATENT OFFICE.

JOHN H. WRIGHT, OF BRIDGEPORT, CONNECTICUT.

FEED-ACTUATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 312,058, dated February 10, 1885.

Application filed March 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. WRIGHT, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Feed-Actuating Mechanism for Metal-Working Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to simplify and improve the construction of this class of mechanism; and with this end in view it consists in the construction and combination of elements, as hereinafter fully described, and then pointed out in the claims.

In order that others may understand my improved construction, I will proceed to describe the same, referring by letters to the accompanying drawings, forming part of this specification, in which I have shown my invention as applied to a metal-planer.

Figure 1 is a side elevation of a portion of a planer, showing the feeding mechanism in front elevation. Fig. 2 is a section of one side of the bed, with one of the standards and a portion of the cross-head and tool-carrier in elevation, and also showing the feeding mechanism in side elevation. Fig. 3 is a detail central section of the operating-gears with the feed-shafts in elevation. Fig. 4 is a detail central section of the pawl or click and the carrying-arm. Fig. 5 is a back view of the click. Fig. 6 is an inside detail view of the rack and pinion which actuate the connecting-rod. Fig. 7 is a detail central section of the grooved operating-wheel, the bolt, and the link. Fig. 8 is a detail plan view of the parts shown in Fig. 3. Fig. 9 is a detail showing the pinion back of the operating-wheel which meshes with the rack; and Fig. 10 is a modification of the operating-wheel, a rack and gear being substituted for the grooved wheel and link.

Similar letters indicate like parts in all the figures.

In order to make my description clearer, I shall refer to certain portions of a metal-planer. These, however, are of ordinary construction and form no part of my invention.

It will of course be understood that my improved feeding mechanism is equally applicable to other classes of machinery.

A represents one side of the bed of a planer, B the table, C one of the standards, D the cap-piece, E the cross-head, and F the tool-carrier, all of ordinary construction.

G is a rock-shaft, to which an oscillatory movement is imparted each time it is desired to actuate the feed. In the present instance shaft G is actuated in one direction or the other at the instant the motion of the table is reversed.

In Fig. 6 I have illustrated means which I have found thoroughly practical for imparting motion to shaft G.

G′ is a pinion at the inner end of said shaft which engages rack G^2. The rack is held in place upon the inner side of the bed by one or more supports, G^3, and reciprocatory movement is imparted thereto in any desired manner. The particular means by which this result is accomplished is immaterial so far as my present invention is concerned. I preferably use, however, the mechanism claimed in my application of even date herewith, Serial No. 122,569.

H is a cross-piece secured to the outer end of shaft G, which is provided with a groove, H′.

I is a connecting-rod, the upper end of which is pivoted to a sliding rack, K, and the lower end adjustably secured to cross-piece H. I have shown the connection as made by means of a nut and bolt, I′, the head of the bolt sliding in groove H′; but any ordinary connection may be substituted, if preferred. This rack is provided with slots K′, and is held in place by headed bolts which pass through the slots and into the standard, thus permitting the rack to slide freely.

Turning now to Figs. 2 and 3, L is a threaded rod or shaft which passes entirely through the cross-head, and is journaled in its opposite ends. This shaft extends through and outside of the cross-head upon one side of the machine, and carries a sleeve, M, to which gears N N′ are rigidly secured, said sleeve and gears being capable of rotation independently of shaft L. Outside of these gears the pawl or click lever O is journaled upon shaft L, and outside of this lever is a gear, P, rigidly secured to the shaft.

Q is the ordinary hand-lever for operating the feed by hand when it is not desired to use the automatic feed. Above gear P is a click or pawl, R. Fig. 4 is a detail cross-section of this click and a portion of the click-lever, and Fig. 5 is back view of the click. Upon its in-

ner side the click is provided with three recesses or shallow holes—one, R^3, at the center near the bottom, and one, R^4, on each side higher up. A spring-actuated pin, O′, recessed in the click-lever, engages with any one of these holes. The central hole is shallowest, and when the pin is in engagement therewith the click is lightly held out of engagement with gear P. When the pin engages either of the other holes, rotary movement in one direction or the other is imparted to shaft L, as will presently be more fully explained.

R′ is a click, similar to the one just described, upon the inner side of the click-lever, which engages with gear N, for a purpose presently to be explained. The inner click is operated by a thumb-piece, R^2, on the outside of lever O.

S is a wheel journaled in the end of the cross-head. This wheel is provided with an annular dovetailed groove or slot, S′, upon its outer face, said slot being widest at the bottom. Directly back of this wheel is a small gear, S^3, rigidly attached to the same shaft which engages with rack K. Thus it will be seen that the reciprocatory movement of rack K imparts reciprocal rotary movement to wheel S.

T is a link, one end of which is pivoted to the lower end of the click-lever, and whose other end is adjustably secured to wheel S by means of a nut and bolt, T′. The head of the bolt is made to correspond in shape with the slot in wheel S.

In connecting the link and wheel the bolt is put through from the back of the wheel, an aperture, S^2, being provided for that purpose. (See Fig. 7.) This construction enables me to adjust the link without detaching any of the parts when the adjustment of the cross-head has been changed. The cross-head is vertically adjusted in the ordinary manner, the mechanism therefor not being shown, as it is not of my invention. It will of course be understood that when it is desired to adjust the cross-head clicks R R′ are turned out of operative position, so that no movement can be imparted to either of the shafts L or N^3. As the cross-head is moved up or down, rack K being in engagement with the gear back of wheel S, it follows that link T and the click-lever will be thrown out of their proper positions. The click-lever should be vertical and the link pivoted at the lowest point in the circular groove or slot S′. To restore the parts to this position, as in Fig. 1, it is only necessary to loosen the nut on bolt T′ and adjust the parts. Upon tightening the nut the machine is ready for use.

The operation is as follows: Rack G^2 is arranged, in connection with the operative parts of the machine, in such a manner that at the instant the table reaches either extreme of its throw a partial rotation is imparted to shaft G, which carries cross-piece H with it. It will be understood that the connecting-rod I oscillates freely on bolt I′, and that said bolt is readily adjustable in groove H′ by simply loosening the nut. It follows, therefore, that the amount of movement imparted to rack K, and through the intermediate parts to the tool-carrier, depends upon the distance from the center of the cross-piece at which the connecting-rod is adjusted. For instance, if the connecting rod is adjusted at the center of the cross-piece no movement will be imparted to the rack.

The connecting-rod may be adjusted either side of the pivotal point of the cross-piece; but the adjustment shown is deemed preferable in ordinary use. When it is desired to shorten the feed, the connecting-rod is moved nearer to the center. To lengthen the feed the rod is adjusted farther from the center of the cross-bar. Whatever may be the amount of motion imparted to rack K, a corresponding motion relatively thereto is imparted to wheel S by means of gear S^3, which meshes with the rack. The movement of wheel S is imparted to the click-lever by link T. When the pins O′ in the click-lever are in engagement with the central holes in the clicks, as in Figs. 1 and 4, no movement will be imparted to the tool-carrier, no matter what may be the throw of rack K. To impart movement to the tool-carrier one of the clicks must be turned into operative position, which will be when one of the pins O′ is in engagement with one of the side holes, R^4, in either of the clicks. Suppose the outer click, R, to be in engagement with gear P. This gear being rigid on the threaded shaft L, motion will be imparted thereto each time rack K is actuated, and as the screw-thread engages with the tool-carrier F each movement of shaft L will impart slight forward or backward movement to the tool-carrier, thus giving the cross-feed of the machine. When it is desired to feed in the opposite direction, it is merely necessary to engage the other arm of the click. For instance, in the position shown in Fig. 1, if the right arm of click R were in engagement with gear P, the cross-feed would be toward that side of the machine. To reverse the feed the left arm of click R should be engaged with gear P, instead of the right. The engagement of the left arm would rotate shaft L in the opposite direction, and therefore cause the tool-carrier to move away from that side of the machine. To produce a vertical feed click R is thrown out of operative position—that is, into the position shown in Fig. 1—and click R′ is placed in operative position by means of thumb-piece R^2. No movement is now imparted to shaft L, but instead the movements of the click-lever are imparted to gears N and N′ upon sleeve M, which latter turns freely on shaft L. Gear N′ meshes with a gear, N^2, which is rigidly secured to shaft N^3. This latter shaft imparts motion to suitable gears (not shown) by which the vertical feed is produced. The direction of vertical feed, produced by placing either arm of click R′ in engagement with gear N, is a matter of adjustment merely. The reverse vertical feed is produced in pre-

cisely the same manner as the reverse cross-feed—*i. e.*, by disengaging the engaged arm of click R′ and placing the disengaged arm in engagement with gear N.

I have not illustrated the details of the vertical feed mechanism, as it forms no part of my present invention.

In the modification shown in Fig. 10 the principle of operation is identical with that shown in Fig. 1, a gear, U, being substituted for the grooved wheel, and a rack, V, for link T. This construction is exceedingly simple, and where the machine is intended for coarse work is equally desirable with the form illustrated in Fig. 1. It will be observed that teeth are placed at the center of the rack only, both ends being clear. I thus avoid any danger of too much movement being imparted to the tool-carrier in the event of any accident to the feed mechanism. Rack V is held in engagement with gear U by means of an elliptical button, W, the long diameter of which holds the rack in engagement; but the short diameter allows it to drop out of reach of the teeth on gear U. I thus accomplish the same purpose when it is desired to adjust the cross-head that is accomplished by means of bolt T′ and slot S′ in the preferred form.

I do not desire to limit myself to the exact construction shown, as it is evident that the details may be varied, mechanical equivalents being used, without in any way departing from the spirit of my invention.

Having thus fully described my improved construction, I claim as my invention—

1. The combination, with the tool-carrier and shafts which move the same, of a pivoted lever having two reversible spring-clicks, one of which engages a gear upon one of the shafts, the other engaging a gear upon a sleeve mounted on said shaft, a second gear upon said sleeve engaging a gear upon the other shaft, and the mechanism for imparting oscillatory motion to the lever, whereby either shaft may be rotated in either direction, or both may remain stationary.

2. The combination, with the tool-carrier and its actuating-shaft, having a gear secured thereto, of a lever carrying a reversible pawl or click, a wheel, and mechanism, as a rack and pinion, for oscillating the same, and a link connecting said wheel with said lever, as set forth.

3. Shaft N^3, having gear N^2, in combination with gears N N′ on sleeve M, pivoted lever O, carrying a reversible click or pawl, and the mechanism for oscillating the lever, as described, and for the purpose set forth.

4. The combination, with the tool-carrier and its actuating-shaft L, having gear P secured thereto, of the lever O, journaled on said shaft and provided with a reversible pawl or click, an oscillating wheel, a link connecting said wheel with said lever, a rack and pinion for oscillating said wheel, and mechanism, as the cross-piece and connecting-rod, for reciprocating said rack.

5. In a metal-working machine, a pivoted lever carrying reversible clicks, and shafts actuated thereby, which move the tool-carrier, in combination with a link, one end of which is pivoted to the lever, and whose other end is pivoted to wheel S, whereby when said wheel is oscillated corresponding motion is imparted to the lever.

6. The combination, with the cross-head, the pivoted lever, and wheel S, having groove S′ and aperture S^2, of link T and bolt T′, whose head corresponds with the groove, whereby the link and lever may be adjusted after readjustment of the cross-head.

7. In a metal-working machine, wheel S, having an annular groove in its face, said groove being widest at the bottom, and having an opening at the back corresponding with the bottom of the groove, in combination with a bolt having a head corresponding with the groove, a link pivoted to the wheel by said bolt, and the mechanism for oscillating said wheel, substantially as described.

8. The feeding mechanism consisting of the shafts, the gears, the double-pointed clicks, the pivoted lever, and link T, in combination with wheel S and the mechanism whereby reciprocal rotary movement is imparted thereto.

9. In a metal-working machine, the click-lever, link T, wheel S, gear S^3, and sliding rack K, in combination with the rock-shaft carrying a cross-piece, and connecting-rod I, pivoted to the rack and adjustably pivoted to the cross-piece, whereby the amount of movement imparted to the click-lever may be regulated.

10. Operating-rack G^2 and rock-shaft G, having pinion G′ and grooved cross-piece H, in combination with the connecting-rod pivoted in the groove of the cross-piece, feed-shafts L and N^3, and connecting mechanism—for example, the sliding rack, gears, link, click-lever, and double-pointed clicks.

11. The combination, with the feed-shafts and connecting mechanism—for example, the sliding rack, gears, link, clicks, and click-lever—of rock-shaft G, having cross-piece H, with groove H′, pivoted to its outer end, and connecting-rod I, pivoted in said groove, whereby the amount of feed is increased or decreased in accordance with the adjustment of the connecting-rod relatively to the pivotal point of said cross-piece, substantially as described.

12. The pivoted lever, the link, the grooved wheel, and pinion S^3, in combination with rack K, the connecting-rod, shaft G, having pinion and cross-piece, and rack G^2, all as described, and for the purpose set forth.

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

JOHN H. WRIGHT.

Witnesses:
WM. A. JONES,
A. M. WOOSTER.