(No Model.)

E. COCKFIELD & J. HOWE.

RADIUS LINK PLANER.

No. 264,628. Patented Sept. 19, 1882.

Fig: 1.

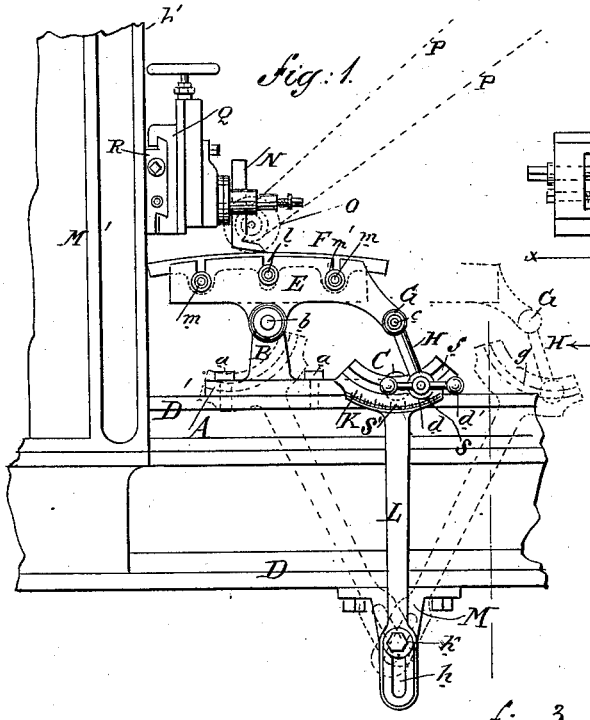


Fig: 2.

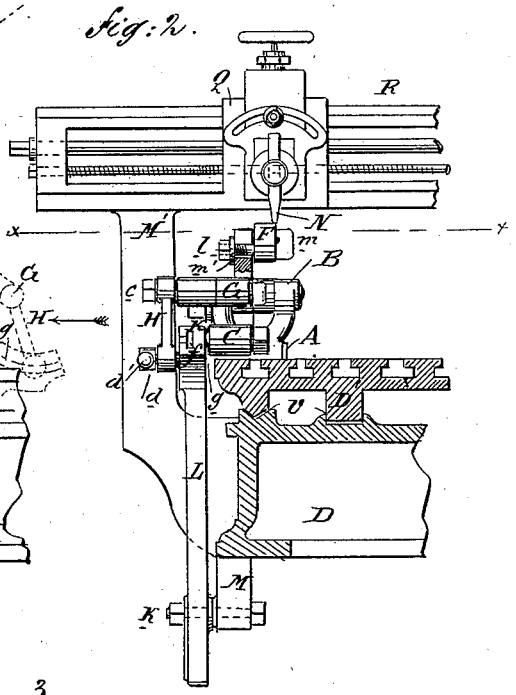


Fig: 3.

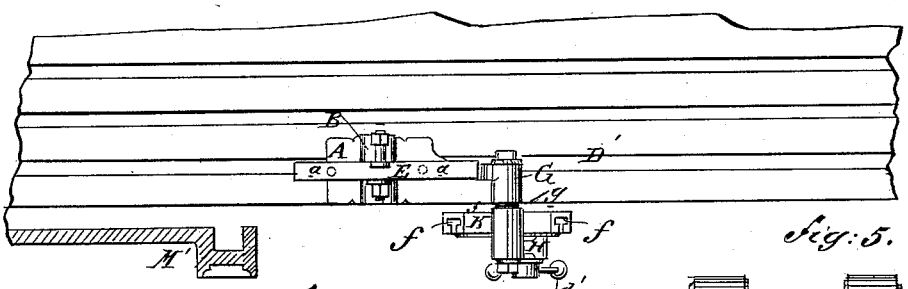
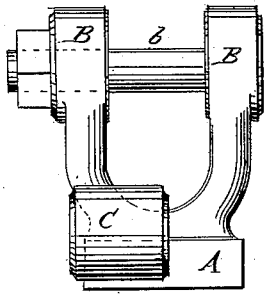
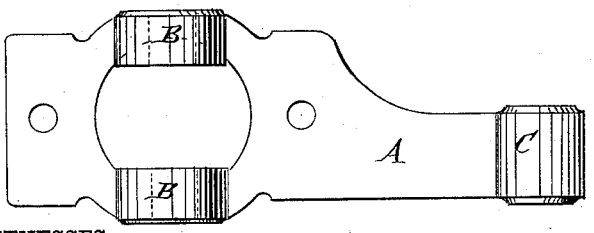


Fig: 4.

Fig: 5.





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ERNEST COCKFIELD AND JOHN HOWE, OF ST. JOSEPH, MISSOURI.

RADIUS-LINK PLANER.

SPECIFICATION forming part of Letters Patent No. 264,628, dated September 19, 1882.

Application filed August 23, 1881. (No model.)

To all whom it may concern:

Be it known that we, ERNEST COCKFIELD and JOHN HOWE, of St. Joseph, in the county of Buchanan and State of Missouri, have invented a new and Improved Radius-Link Planer, of which the following is a specification.

This invention relates to a machine for planing locomotive-links and link-blocks.

The invention consists of a novel combination of devices capable of attachment to an ordinary metal-planer, whereby reciprocating motion of the planer-table is made to impart a circular or curved motion to the holder that carries the link or block to be planed. This is accomplished by means of a connecting-rod and a sliding quadrant-lever, arranged for operation between the holder or rocking plate on which the link or link-block is carried and the planer-bed.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a planer with our improved device applied thereto. Fig. 2 is a partly-sectional end elevation of the same. Fig. 3 is a partly-sectional plan of the same on the line *x x*, Fig. 2. Fig. 4 is an enlarged plan of the jaw-plate. Fig. 5 is an enlarged end elevation of the same.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents a jaw-plate, having a jaw, B, formed on one end, and a boss, C, on the other end, which is securely fastened by bolts *a a* to the reciprocating table D′ of the planer. To the said jaw B the rocking plate E is pivoted on the stud *b*, and upon this rocking plate E the link or link-block F to be operated upon is designed to be secured, as shown.

At one end of the rocking plate E is formed a boss, G, in which is fixed a cross pin or bolt, *c*, that holds one end of the short connecting-rod H, whose other end is pivoted by means of the bolt *d* and hand-nut *d′* in the T-slot *f* in the quadrant or segmental head K of the arm or lever L, that reaches up the side of the planer-bed D. This segmental or quadrant head K is struck on a radius that is governed by the length of the rod H mentioned from the center of the boss G. This head K is centrally pivoted by a stud, *g*, on its back to the boss C of the plate A, and rocks upon said stud *g*.

The tail or lower end of the arm or lever L is loosely held through its longitudinal slot *h* by a bolt or stud, *k*, to the hanger or bracket M, which is suitably attached on the bottom of the planer-bed D.

The link F to be operated upon is held upon the rocker-plate E by means of a bolt, *l*, passed through the central hole of said link F, that is designed for its saddle-bolt, and through the central slotted hole of said plate E, and by L-shaped bolts *m* passed through the ends of said link F and plate E. This arrangement secures a ready method of setting the link-work square with the planing-tool or emery-wheel, as by slackening the bolts *m* and tapping the link F at the ends when hung on the bolt *l* the said link F will be moved into position, and then fixed there by turning the bolts *m*. The bolt-holes *m′* in the socket-plate E are vertically slotted to facilitate this adjustment of the link F.

For grinding or smoothing the face of the link F, an emery-wheel, O, driven by a belt, P, as shown in dotted lines, Fig. 1, may be used in place of the tool N, the said wheel O being pressed with any desired force upon the face of the link F as the latter is in position on the rocking plate E.

The operation of the machine is as follows: As the planer-table D′ reciprocates in the ways *v* of the bed or frame D it carries with it the jaw-plate A, having the pivot *b* of the rocking plate E and the pivot *g* of the segmental head K of the quadrant arm or lever L. The lower end of this quadrant-lever L, being held to the brackets M by the stud or pivot *k*, that passes through the lever-slot *h*, rises and falls as the head K moves back and forth with the jaw-plate A, and the resultant of this compound motion of the said lever L is the rocking of the lever-head K on its pivot *g* as the said head K is bodily reciprocated in a horizontal plane by the jaw-plate A, as indicated in dotted lines, Fig. 1. This rocking motion of the lever-head K is transmitted to the connecting-rod H, causing the latter to swing on its pivot *c*, as indicated in dotted lines, Fig. 1, its lower end being at the same time fixed at any desired point of adjustment by means of the bolt *d* and hand-nut *d′* in the slot *f* of the quadrant-head K.

It will be seen that the pivoting or central

point at *g* of the lever-head K moves only in a horizontal line parallel with the reciprocating table D′, and hence if the lower end of the rod H be made fast at that point said rod H would preserve a perpendicular position during the reciprocation of the jaw-plate A, and consequently would transmit no motion to the rocking plate E. When the lever L is in a perpendicular position, as shown in full lines, Fig. 1, the extremities of its quadrant-head K are in the same horizontal plane; but their relative positions are changed when said lever L is moved to the right or left.

In presenting the link F to the cutting-tool N the movement of the jaw-plate A is from right to left, as indicated by the arrow, Fig. 1, and when the lever-head K is at the extreme right for the commencement of the cut its right extremity is depressed to its extreme position, as indicated, and when at the extreme left, at the end of the cut, its right extremity is elevated to its extreme position. Hence it is evident, if the lower end of the rod H be fixed in the lever-head K to the right of its center *g*, as shown in Fig. 1, and the planer be put in operation, that the rocking plate E and its attached link F will be tilted upward from right to left, and that the resultant of the two movements (the horizontal and tilting movements) will be the movement of the link F in an upward curved or convex line, presenting its convex face to the cutting or planing tool N. If, on the contrary, the rod H be secured at the left of the center *g* of the lever-head K and the machine be put in operation, the rocking plate E and link F will be tilted downward from right to left, and the plate E and link F will consequently be moved in a downward-curved or concave line, presenting its concave face to the cutting or planing tool N.

The degree of convexity or concavity given to the link F is regulated by the distance from the center of the lever-head K at which the connecting-rod H is secured—the nearer the connection to the center the less the curve, and the farther from the center the greater the curve. The face of the head K is graduated, as shown at *s′*, and a pointer, *s*, is formed on the lower end of the connecting-rod H, whereby the various radii are indicated for setting the said rod H.

R represents the slide-plate, secured to the uprights *h′* in the usual manner, and Q represents the usual slide-head moving on said plate R, and carrying the planing-tool N or the grinding or polishing wheel O, as the case may be.

This device is simple in construction and accurate in its working. It is not a combination with a chuck designed for various kinds of work, but is intended only for links and their blocks, and it possesses advantages over other machines designed for this purpose in its adjustable lever and connecting-arm, by which any radius may be given to the work operated upon; and with this device the cross or transverse feed of the cutting-tool or emery-wheel may be used.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a radius-link planer, the combination, with a reciprocating table, of a pivoted link carrier or holder and an oscillating lever provided with a segmental head pivoted to the reciprocating table and connected to the link-carrier, substantially as and for the purpose set forth.

2. In a radius-link planer, the combination, with a reciprocating table, of a link-carrier pivoted upon the said table, and a lever having its lower end loosely pivoted to the planer-bed and its upper end provided with a segmental head pivoted to the reciprocating table and adjustably connected to the link-carrier, substantially as and for the purpose set forth.

3. In a radius-link planer, the combination, with the planer-bed D, the reciprocating table D′, the pivoted link-carrier E, and the connecting-rod H, of the lever L, having its lower end slotted and its upper end provided with the segmental head K, substantially as and for the purpose set forth.

4. In radius-link-planing machines, the combination, with the rocking link-carrier E, provided with slotted bolt-holes *m′*, of the bolt or stud *l* and adjustable bolts *m*, substantially as herein shown and described, whereby the work may be centrally supported, conveniently positioned, and firmly secured to the carrier, as set forth.

5. In a radius-link planer, a centrally-pivoted link-carrier provided with a boss at one end and with slotted bolt-holes for adjustably securing the link therein, in combination with the means, substantially herein shown and described, for rocking the same, as set forth.

6. In a radius-link planer, the combination, with the link-carrier E, of the horizontally-reciprocating jaw-plate A, quadrant-lever L, and adjustable connecting-rod H, substantially as herein shown and described.

7. In a radius-link planer, as a means for transmitting the rocking motion of the quadrant-lever head K to the link-carrier E, the connecting-rod H, having one end adjustably held in the slot of the lever-head and the other pivoted to the end of the link-carrier, substantially as herein shown and described.

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