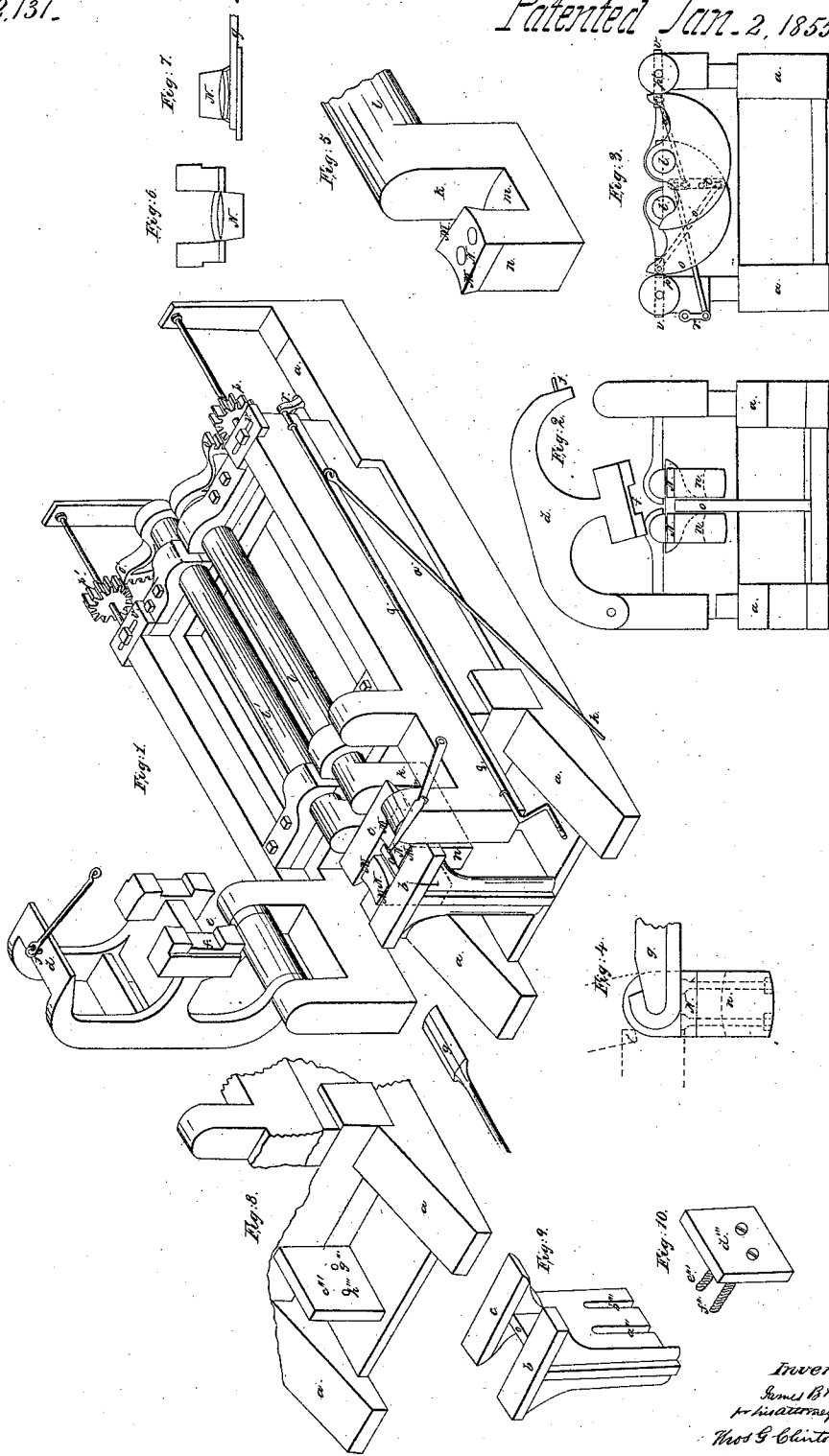


*J. B. Harris*

*Making Railroad Chairs*

*No. 12,131.*

*Patented Jan. 2, 1855.*



*Inventor:*  
*James B. Harris*  
*per* *W. H. H. H. H.*  
*Thos. G. Clinton*

# UNITED STATES PATENT OFFICE.

JAMES B. HARRIS, OF CINCINNATI, OHIO.

## MACHINERY FOR MAKING WROUGHT-IRON RAILROAD-CHAIRS.

Specification of Letters Patent No. 12,131, dated January 2, 1855.

*To all whom it may concern:*

Be it known that I, JAMES B. HARRIS, of Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Machinery for Making Wrought-Iron Railroad-Chairs; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawings, making part of this specification.

My invention has especial reference to the cutting, bending and setting the clips of railroad chairs, without impairing the strength of the material used to any appreciable extent, such action being given to the bending parts, as tends to avoid as much as possible, the dragging and tearing action, which machines of this class usually have upon the surface of the metal. I also correct the tendency of the clip to assume the convex or bellying form upon its under surface, which form it is liable to acquire, from the bulging of the metal before the dies, as the latter press forward in cutting and bending the clips. This correction I effect, by curving inwardly the faces of the cutting dies, from the line of one cutting edge to the line of the other cutting edge.

In the accompanying drawings, Figure 1 is a perspective view of the cutting and bending apparatus. Fig. 2 is a front elevation of the same. Fig. 3 is a back elevation thereof. Fig. 4 is a diagram illustrating the bending action. Fig. 5 is a perspective view of one of the shearing and bending jaws. Figs. 6 and 7 are diagrams illustrative of the action of the hollowed face to correct the bellying. Fig. 8 is a perspective view of so much of the front of the frame of the machine as is necessary to illustrate the form and position of the vertical plate (firmly fixed to or forming a portion of said frame) to which the table or rest (when adjusted lengthwise the crank-cutter-shafts and vertically in relation to the crank cutters) is fastened. Fig. 9 is a perspective view of the table or rest showing the adjusting slots. Fig. 10 is the block or plate carrying the screws which pass through the adjusting slots of the table or rest and are screwed into the vertical holding plate seen in Fig. 8.

(a) are the different portions of a suitable frame.

(b c) is a table or rest, composed of two separate rectangular leaves, having between

them an interval sufficient to receive the heads of the shearing and bending jaws. These leaves and interval occupy in the aggregate a square space, corresponding to that of the plate of which the chair is to be made. These two leaves are at their middle united together by a rib (o). The rib (o) is pierced as seen in Fig. 9 by two adjusting slots (a'' b''). The slots (a'' b'') also admit of the vertical elevation of the table to suit the wear or the condition of the faces of the two crank-cutters. This arrangement maintains the centers of curvature of the chair-clips in coincidence with the centers of motion of the crank-cutters by the vertical motion, the shearing power is maintained, so that a clean cut and the curvature of the clip without tearing or straining it are effected though the metal prove, as usual with rolled metal to be of various shades of thickness and toughness.

Fig. 10 is the block or plate (d''') which carries the screws (f''' e''') which screw into the holes (g''' h''') Fig. 8.

The chair plate, being placed upon the rest, is held fast by the clamp (d), the external dimensions of whose bearing faces correspond with those of the plate. The clamp face, is intersected rectangularly by two channels, one of which (e), is formed to permit the sweep of the shearing and bending jaws; the other channel (f) is designed to permit the insertion of the mandrel (g) of similar form and dimensions to the base of the rail; and about which the lips are to wrapped.

The bearing surface of the clamp, is, by the channels (e, f,) divided into four square studs, one at each corner. The clamp has a hinge attachment to the frame, and is raised and lowered by means of the lever (h), and when brought down upon the plate, is held fast to its position by means of the catch (i) upon the pin j. The jaws perform at one and the same time, two distinct operations, namely; that of severing the edges of the clip from the plate, and that of bending the portion so detached into the proper form for embracing the base of the rail.

The jaws, having from their peculiar construction and arrangement, a very complete action in forming the clip, will now be particularly described.

(k k') are crank arms, fixed rectangularly to the front ends of shafts (l l'), and extending to a sufficient length from them, to per-

mit the vibration of the wrists (*m*) just clear of the edge of the leaf (*c*). From the wrists, project the inverted jaws (*n*) terminating each of them in a face or die (N) whose two transverse edges (M, M,) stand, when the crank is in its lowest position, flush or nearly flush with the upper surface of the rest. These edges are left slightly salient, by the hollowing of the face between them as represented, and are somewhat wider apart at the end which forms the base of the clip than at that which forms its point. The adjacent edges of the clamp are made parallel with those just described and in such superposition as to act therewith on the principle of shears, and therefore also converge toward the outside. The axes of vibration of the jaws, are so disposed as to be coincident with the edges of the mandrel, when the latter is placed in its proper position upon the rest, and this is also coincident with the proper center of curvature of the clip shoulder. This precise position for the axis of vibration is of material importance, inasmuch as it is that which enables the jaws to form the clip by simply folding it over upon the mandrel, with a pressing rather than a dragging action, and avoids checking the surface and straining the substance of the clip, which not only impairs its effective strength but adds to the labor imposed upon the machinery.

The hollowing of the face between the two cutting edges, counteracts the tendency of the chair plate to bend before the said face, so as to impart to the inner side of the clip, a bellying form; and when the jaw is brought so as to press the clip tightly between the jaw face and the mandrel, these salient edges of the face, bring the margins of the clip flush with the middle, and thus enable the clip—when in use—to bear across its entire width upon the base of the rail. Fig. 6 represents the form which the clip tends to assume at the commencement of the

process, and Fig. 7, the final action of the salient edges.

By the means just described, both the rounded shoulder and the flat points of the clips are formed by the simple rotation of the jaw, and the instant that the points of the clips are completely folded onto the mandrel, the advancement of the jaws ceases, by the disengagement of the end tooth of the gravitating arcs (*o o'*) from the pinions (*p p'*) on the rear ends of the shafts; and the jaws swing back again to their first position. The pinions, having a sliding attachment to the frame, are alternately brought into and out of gear with the arcs, by means of the crank rod (*q*), which extends from the crank (*r*) at the rear end, to the handle (*s*) at the front end, so as to be convenient to the hand of the operator. The crank (*r*) is connected with the vibrating bar (see dotted lines *t*) each extremity of which is connected by a rod (*u*) with the slide bearings (*v*) of the pinion journals. The clips being completed, the clamp is lifted, and the chair is then withdrawn by means of the mandrel (*g*).

I claim herein as new and of my invention, and desire to secure by Letters Patent—

1. I claim the holding plate (*e'''*) Fig. 8 and the leaf (*o*) with the slots (*a''' b'''*) Fig. 9 and the block (*d'''*) with the screws (*f''' e'''*) in combination with the crank cutters (N) the whole being arranged as described and for the purpose described.

2. I claim the cutter with salient cutting edges, thus making the cutter (see N Figs. 5, 6 and 7) concave in its length substantially in the manner and for the purpose described.

In testimony whereof, I hereunto set my hand before two subscribing witnesses.

JAMES B. HARRIS.

Witnesses:

GEO. H. KNIGHT,  
N. MARCHANT.