(No Model.) 2 Sheets—Sheet 1.

J. D. BOWMAN.

MACHINE FOR BENDING AND WELDING CAR COUPLING LINKS.

No. 342,858. Patented June 1, 1886.

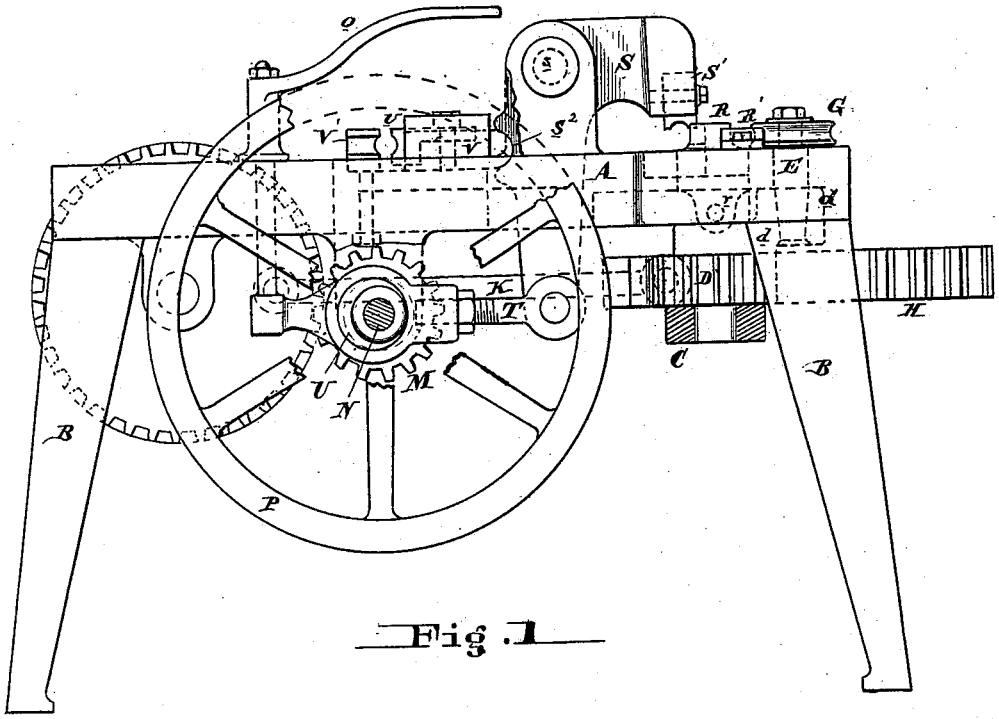

Fig. 1

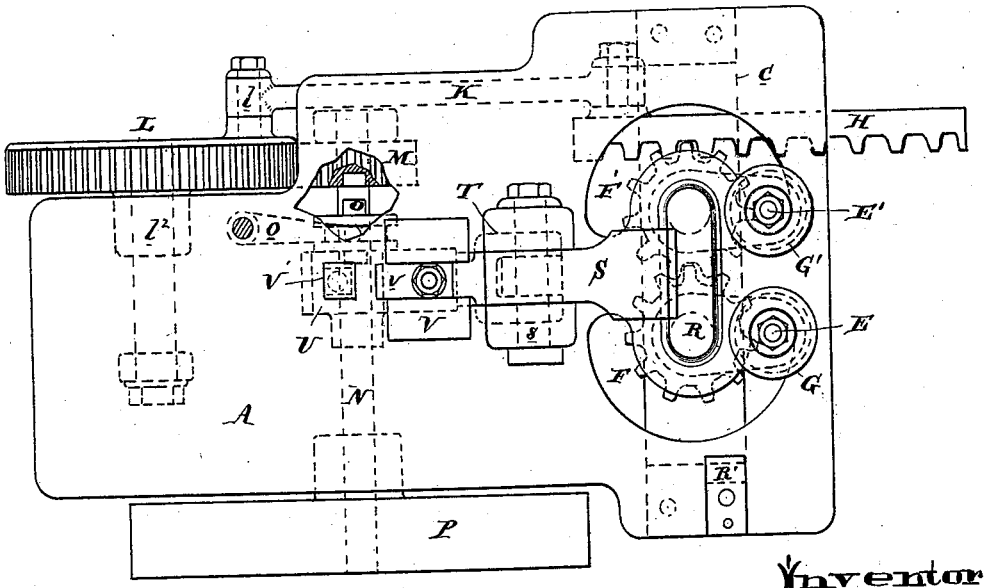

Fig. 2

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(No Model.) 2 Sheets—Sheet 2.

J. D. BOWMAN.

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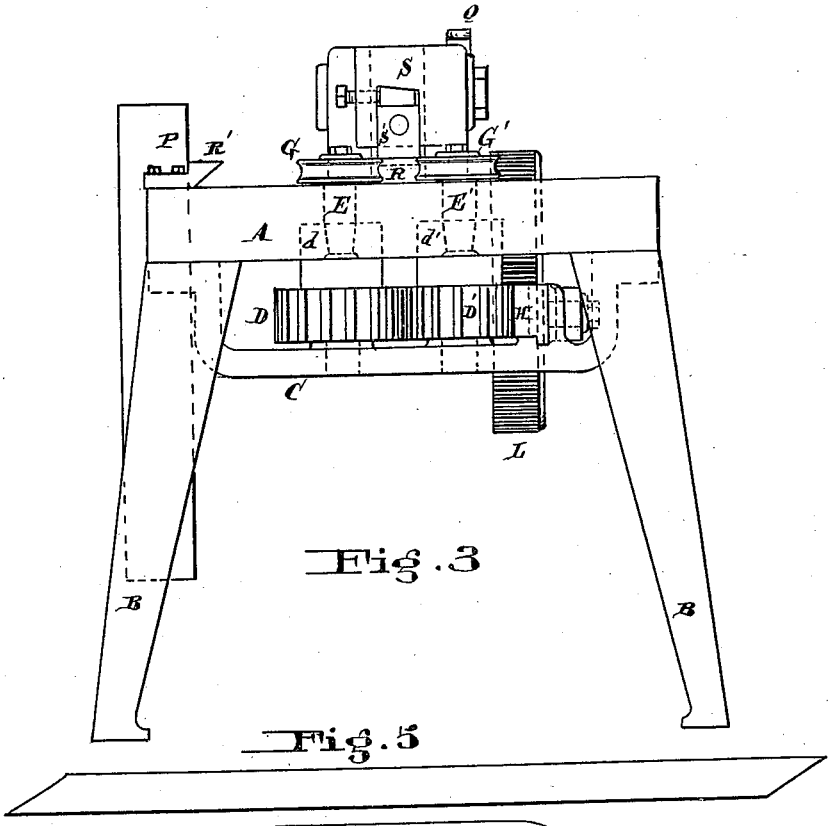

Fig. 3

Fig. 5

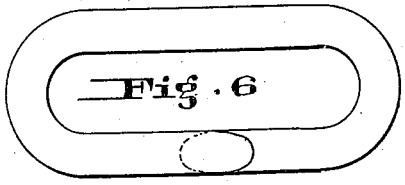

Fig. 6

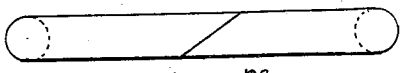

Fig. 7

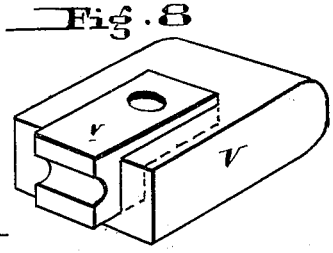

Fig. 8

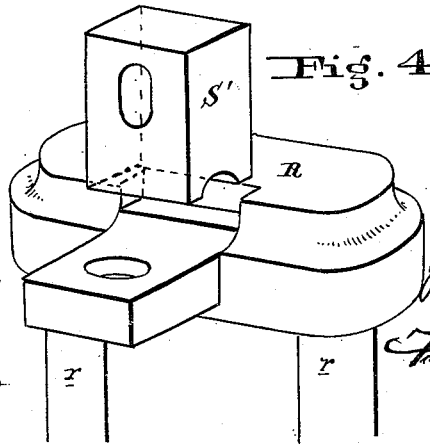

Fig. 4

Attest
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Francis T. Chambers

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN D. BOWMAN, OF ALTOONA, PENNSYLVANIA.

MACHINE FOR BENDING AND WELDING CAR-COUPLING LINKS.

SPECIFICATION forming part of Letters Patent No. 342,853, dated June 1, 1886.

Application filed December 7, 1885. Serial No. 184,954. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. BOWMAN, of Altoona, Blair county, and State of Pennsylvania, have invented a new and useful Machine for Bending and Welding Car-Coupling and other Links, of which the following is a full, true, and accurate description, reference being had to the drawings, which form part of this specification.

The object of my invention is to provide a machine by which coupling-links for railway and other uses may be cheaply and efficiently bent and welded, and which is especially adapted to make such links with a scarf-weld at the side of the oblong link, instead of at the end, as is usual, reference being had to the drawings, which illustrate the construction of of a machine embodying my improvements, and in which—

Figure 1 is a side elevation of the machine, the hub of the driving-wheel being cut away so as to show the devices for actuating the welding-die; Fig. 2, a plan of the top of the machine; Fig. 3, a front end elevation; Fig. 4, a perspective view of the former around which the link is bent and of the die for welding the ends of the link. Fig. 5 shows a bar with scarfed ends ready to be made into a link. Figs. 6 and 7 are plan and side views of the completed link, showing the scarfed side weld; and Fig. 8 a perspective view of the die used for shaping the weld.

The frame of the machine is made up of the table A, its legs B B B B, and the hanger C.

Supported on the hanger C are two gear-wheels, D and D′, gearing into each other and having lugs or arms *d* and *d′*, extending from their upper faces. Into these lugs are secured steel pins E and E′, which project upward through semicircular or annular slots F F′ in the table A, said slots being concentric with the gear-wheels D and D′, respectively.

To the ends of the pins E E′, as bearings and above the surface of the table, are secured the grooved rollers G G′.

H is a rack gearing into the gear-wheel D′ and supported by suitable bearings under the table A. It is connected by means of a connecting-rod, K, to the crank-pin *l* of a large gear-wheel, L, supported on a shaft, l^2, having its bearings secured to the rear of the machine. The large gear-wheel L is driven by means of the small pinion M, which runs loosely on the main shaft N, from which it receives motion through the movable clutch O, which is secured to the shaft by a feather and actuated by a lever, *o*.

On the end of the main shaft N, which is supported on suitable bearing, is the driving-pulley and balance-wheel P.

R is the die or former, made with its upper rim of the exact form and size of the inside of the link to be made. It is secured and fits in an opening in the table A midway between the slots F F′, and is raised and lowered in this opening by a lever or other suitable mechanism acting on the downward-projecting lugs *r r*. The ends of the former R are semicircular and when in place concentric with the gear-wheels D and D′.

R′ is a stop secured to the table A and tapered, as shown, on its under side to correspond to the scarf cut in the bar.

S is the welding-hammer. It is a bell-crank lever in form, fulcrumed at *s* on strong upright supports secured upon the table A and is provided with a steel die, *s′*. The bell-crank lever S receives its motion through the forked connecting-rod T from the eccentric U, which, like the pinion M, runs loosely on the driving-shaft N and receives motion from it by engaging with the movable clutch O.

V is a shaper sliding in suitable guides on the table A and receiving its motion from the back of the bell-crank lever S, as shown at s^2. It is provided with a steel die-face, *v*, and works against a stationary die, V′, bolted to the table.

In using the above-described machine three distinct operations are successively performed. The scarfed bar is first bent into the form of a link, next its ends are welded, and then the weld is forged into uniform shape with the rest of the bar. The bar-iron is cut into proper lengths for a link by holding it diagonally across the shear-blades, the amount of lap or scarf being regulated by the angle at which it is held to the blades. The short bars are then heated, preferably in a furnace having parallel rectangular openings, through which the flame and heat strike only the ends of the bar, not heating its central part to the welding-heat. When the ends of a bar are at the welding-heat, it is passed between the grooved rollers

G G′ and the former R, which are in the position shown in Figs. 1 and 2, and shoved well up against the stop R′, which centers the bar properly, and by means of its tapered shear brings the scarfed ends into the proper position to lap over each other ready for welding.

The clutch O is then moved along the driving-shaft N till it engages with the pinion M, which actuates the large gear-wheel L, and through it and the connecting-rod K the rack H. This rack is geared into the gear-wheel D′, and its motion is such, during a half-revolution of the wheel L, as to cause the wheel D′, and through it the gear-wheel D, to make a half-revolution on their bearings, each of course in opposite directions. The pins E E′, secured to the wheels D D′, of course have also a semicircular revolution through the annular slots F F′, and the rollers G G′ bend the bar around the semicircular ends of the former R and cause its scarfed ends to overlap each other under the die *s*′. The second half-revolution of the gear-wheel L brings the rollers G G′ back to their first position, and the clutch O is then disengaged from the pinion M and moved along the driving-shaft N till it engages with the eccentric U, which, through the forked connecting-rod T, sets the bell-crank hammer S in operation to weld the scarfed ends of the bar together. When the weld is complete, the clutch O is thrown out of gear and the former R lowered by a suitable lever till it is flush with or below the surface of the table A. The link is then removed and the welded joint placed between the shaper V and stationary die V′. The clutch O is then again engaged with the eccentric U, and the welded joint shaped and made to take a proper configuration.

The link made by this machine not only has the advantage of having a scarf-weld, but is better adapted for railway and other uses than the ordinary link, by reason of its weld being at the side instead of, as usual, at the end. These side-welded joints are not so liable to break, and if they do the link will still have a firm grip on the cars coupled by it by reason of its hooked ends, which must be again broken or straightened out before the cars can part.

It is of course evident that my devices for bending, welding, and shaping the links may be used independently of each other or in connection with other devices for performing some of the operations. Changes in structure may also be made—as, for instance, the lugs *d d*′ may in some cases be dispensed with and the pins E E′ secured directly to the top of the gear-wheels D D′.

The shaping-die V may, if desired, be held against the back of the bell-crank lever S by a spring or link, and the clutch O may be made to automatically loose the pinion M at the completion of each revolution of the wheel L.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making links, substantially as described, the combination, with a former having semicircular ends, of grooved bending-rollers secured to bearings having a reciprocating semicircular movement around the same centers as those of the ends of the former, whereby both ends of the bar are simultaneously bent to the required shape.

2. In a machine for making links, substantially as described, the combination, with a former and bending-rollers, of a stop with tapered projecting side, whereby the scarfed bar is centered and held in proper position to insure the lapping of the scarfed ends.

3. In a machine for making links, substantially as described, the combination of the gear-wheels D D′, having pins E E′, and rollers G G′, journaled thereon, of the reciprocating rack H and means for actuating the same.

4. In a machine for making links, substantially as described, the combination, with the former and devices for bending a bar to the required link shape, of the bell-crank hammer S, having die *s*′, and adapted to weld the scarfed ends of the bar upon the former without removing or reheating the same.

5. In a machine for making links, substantially as described, the combination, with the bell-crank hammer S, of the movable shaper V and stationary stop-die V′.

6. In a machine for making links, substantially as described, the combination, with the driving-shaft N, of the loosely-journaled pinion M, connected with the link-bending mechanism, the loosely-journaled eccentric U, connected with the welding mechanism, and the clutch O, turning with the driving-shaft but movable along the same.

7. In a machine for making links, substantially as described, the combination, with the frame A and hanger C, of the former R, gear-wheels D D′, having pins E E′, and rollers G G′, journaled thereon, the rack H, connecting-rod K, gear-wheel L, having crank-pin *l*, the pinion M, clutch O, and driving-shaft N.

8. In a machine for making links, substantially as described, the combination, with the frame A and hanger C, of the former R, gear-wheels D D′, having pins E E′, and rollers G G′, journaled thereon, the rack H, connecting-rod K, gear-wheel L, having crank-pin *l*, the pinion M, eccentric U, connecting-rod T, and bell-crank hammer S, clutch O, and driving-shaft N.

9. In a machine for making links, substantially as described, the combination, with the frame A and hanger C, of the former R, gear-wheels D D′, having pins E E′, and rollers G G′, journaled thereon, the rack H, connecting-rod K, gear-wheel L, having crank-pin *l*, the pinion M, eccentric U, connecting-rod T, and bell-crank hammer S, the shaper V, and stop-die V′, clutch O, and driving-shaft N.

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A. B. SWOPE.