No. 676,027. Patented June 11, 1901.

A. N. CAMERON.

METAL ROD BENDING MACHINE.

(No Model.) (Application filed Nov. 26, 1900.)

3 Sheets—Sheet 1.

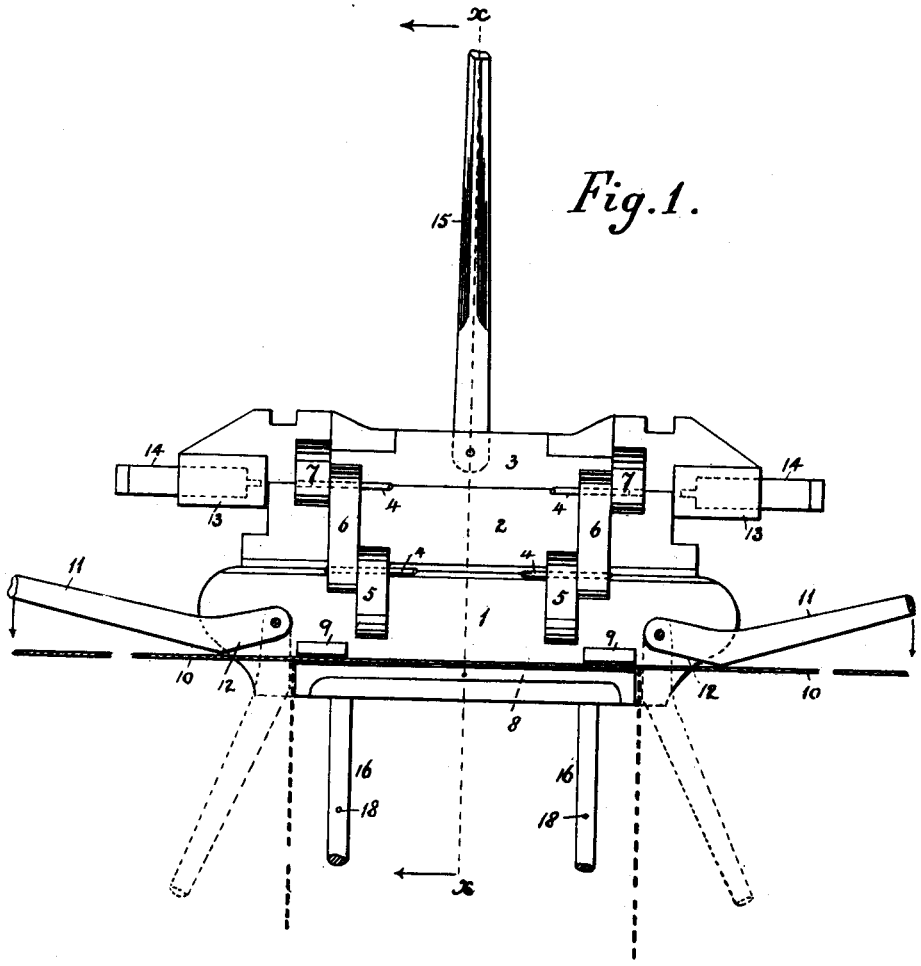

Fig. 1.

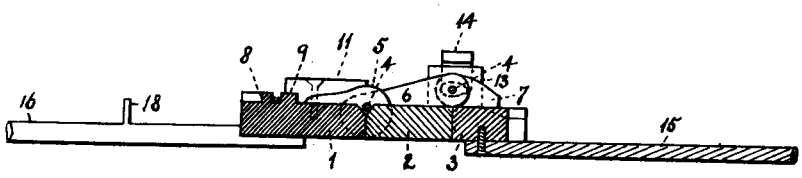

Fig. 2.

Witnesses.

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Fig. 3.

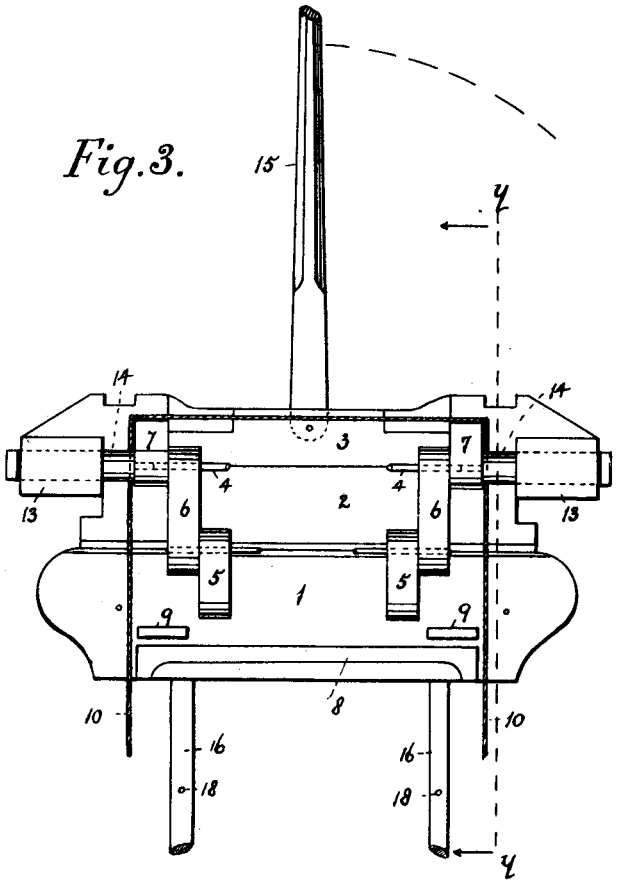


Fig. 4.

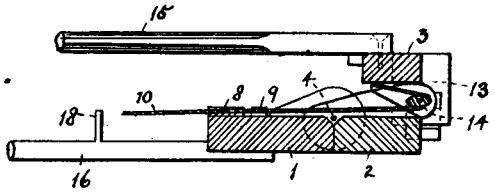
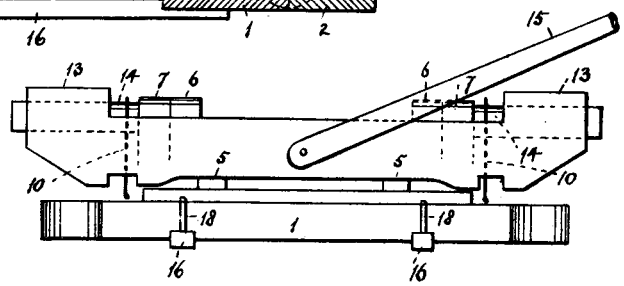


Fig. 5.



Witnesses.

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Fig. 7.

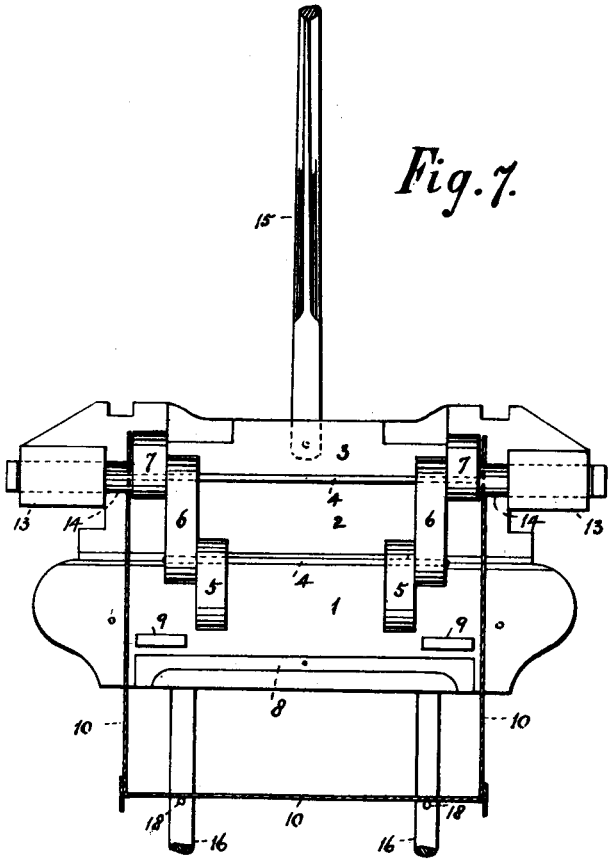


Fig. 6.

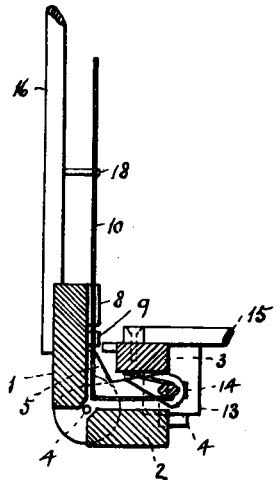
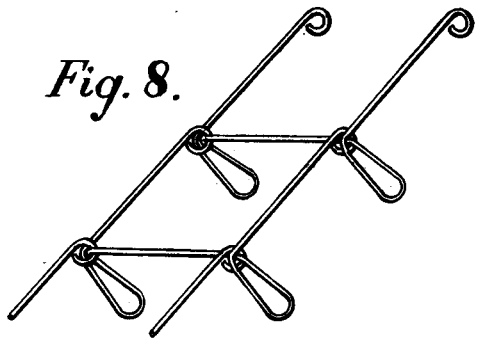


Fig. 8.



Witnesses.

James Gould Montgomery

Thomas Alston Baird

Inventor.

Alexander Morris Cameron

UNITED STATES PATENT OFFICE.

ALEXANDER NORRIS CAMERON, OF PERTH, CANADA, ASSIGNOR OF ONE-HALF TO HERBERT RAMSDEN, OF PHILADELPHIA, PENNSYLVANIA.

METAL-ROD-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 676,027, dated June 11, 1901.

Application filed November 26, 1900. Serial No. 37,854. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER NORRIS CAMERON, a subject of the Queen of Great Britain, residing at Perth, in the county of Lanark, in the Province of Ontario, in the Dominion of Canada, have invented a new Metal-Rod-Bending Machine, of which the following is a specification.

My invention relates to improvements in metal-rod-bending machines, and has for its object the bending of rod-iron in a cold state to form the sections composing a flexible ladder.

My invention consists of a machine comprising three sections hinged together, having shaping-blocks, levers, &c., so that a rod of the given length is placed in position longitudinally with one section and bent at the desired distance from its ends to right angles by levers pressing the rod against the ends of a shaping bar or block. The levers are then removed, and the bent rod is removed and placed in position in another section of the machine having sliding bolts or bars crossing the rod, so that by folding the sections one upon the other the loops or feet of the ladder-section will be formed. Then by straightening out the sections and withdrawing the bolts or bars the bent rod is removable and is readjusted by placing the ends so that said bolts or bars when pushed will slide over the rod, and the section is folded upon the other section to form the hooks at the ends of the rod or ladder section, the eyes being made by closing the hooks with a hammer.

I attain the objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan or top view of my machine, showing the rod in the first position to be bent and in dotted lines the rod and the levers after the first bending has been accomplished. Fig. 2 is a section of the same on line $x\,x$. Fig. 3 is a plan of the machine, showing the partially-bent rod in the second position to make the second bending. Fig. 4 is a section of the same, showing the position of the machine-sections after performing the first part of the second bend. Fig. 5 is an end elevation of Fig. 4. Fig. 6 is a section of the same after completing the second bending to form the loops or feet. Fig. 7 is a plan of the machine, showing the placing of the rod prior to final bending to form the eyes at the ends of the rod, the final bending being performed by bringing the end section of the machine to the position shown in Fig. 4; and Fig. 8 is a perspective view of the ladder-sections.

Similar figures refer to similar parts throughout the several views.

1 and 3 are the end sections of the machine, hinged to an intermediate section 2 by pintles 4 4, passing through knuckles 5 5 on one section and 6 6 on another section and 7 7 on another section, all the sections being approximately flat. Section 1 has a shaping bar or block 8, squared at the ends and provided with grooves near the ends formed by blocks 9 9, in which grooves the rod 10 to be bent is centrally placed. 11 11 are removable levers fulcrumed to said section 1 and placed so that a flat portion 12 will bend the bar against the squared ends of bar 8 when the levers are operated by hand or machine power. This operation of the levers and bending the rod is shown by dotted lines in Fig. 1, the central portion of the bent rod forming the tread of the ladder-section. The levers and the bent rod are then removed from section 1 of the machine.

Referring to section 3 of the machine, 13 13 are tubular boxes in which slide shaping bars or bolts 14 14, and the knuckles 7 7 are distanced apart corresponding to the length of bar 8 and are shaped square to conform to the rod as primarily bent. When the slide bars or bolts 14 14 are withdrawn or partly pulled out of their boxes, the bent rod 10 is removed from section 1 and placed in the position shown in Fig. 3, so that the angles of the rod will lie close against the squared portions of the knuckles 7 7, the ends of the rod crossing the other sections of the machine. The sliding bolts 14 14 are then pushed inwardly and slide over and cross the rod. 15 is a handle-bar or lever pivoted at one end to section 3, by which lever section 3 is folded or turned over or upon section 2, thereby bending the rod to form a portion of the loops or feet of the ladder-section. The lever 15 is

then moved out of the way and section 1 of the machine turned up at right angles with section 2 and close against section 3, as shown in Fig. 6, thus bending the rod to complete the loops or feet. Section 1 is provided with arms or hand-bars 16 16, by which it is operated as a member of a hinge when bending the rod. The sliding blocks or bolts 14 14 are then withdrawn, thereby freeing the bent rod, when the machine-sections are returned to their flat or plane position. The sliding bars or bolts 14 14 are again projected and the ends of the bent rod placed under them, the tread of the ladder-section resting against gage-pins 18 18, inserted in the hand-bars 16 16. Lever 15 is then brought to right angles with section 3, and said section 3, by means of said hand-bar, is turned over or upon section 2, thereby bending the ends of the rod to form the hooks which connect the sections by hooking onto the tread-bars. The hooks are closed by hammering to form the eyes to keep the sections of the ladder from becoming disconnected.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A metal-rod-bending machine, comprising approximately flat sections 1, 2 and 3, pintled together; section 1 having a shaping bar and blocks, 8, 9 and removable levers 11, 11; and section 3 having sliding bars or bolts 14, 14, gage blocks or knuckles 7, 7, and a handle-bar 15, as set forth.

2. The combination of three bending-sections, 1, 2, 3 hinged together; section 1 having shaping bar and blocks 8, 9, levers 11, 11, and arms 16, 16, provided with gage-pins, 18, 18; and section 3 having sliding bars or bolts 14, 14, gage blocks or knuckles 7, 7, and a handle-bar 15, substantially as set forth, for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER NORRIS CAMERON.

Witnesses:

THOMAS ALSTON BAIRD,

JAMES GOULD MONTGOMERY.