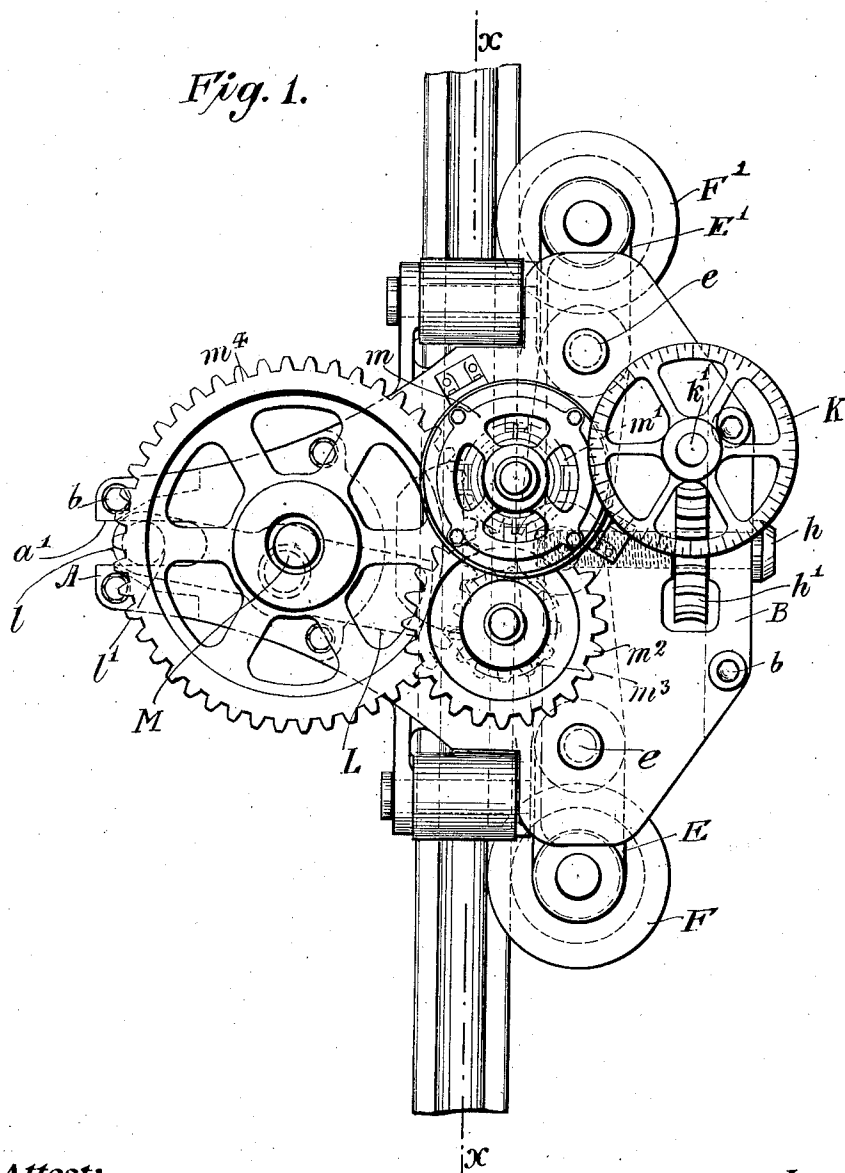


E. RHODES.
BENDING MACHINE.
APPLICATION FILED SEPT. 18, 1912.

1,062,033.

Patented May 20, 1913.

3 SHEETS—SHEET 1.



Attest:

E. M. Gelfues
Solicitor.

Inventor:
by Edgar Rhodes
Alfred W. Kiebler
Atty

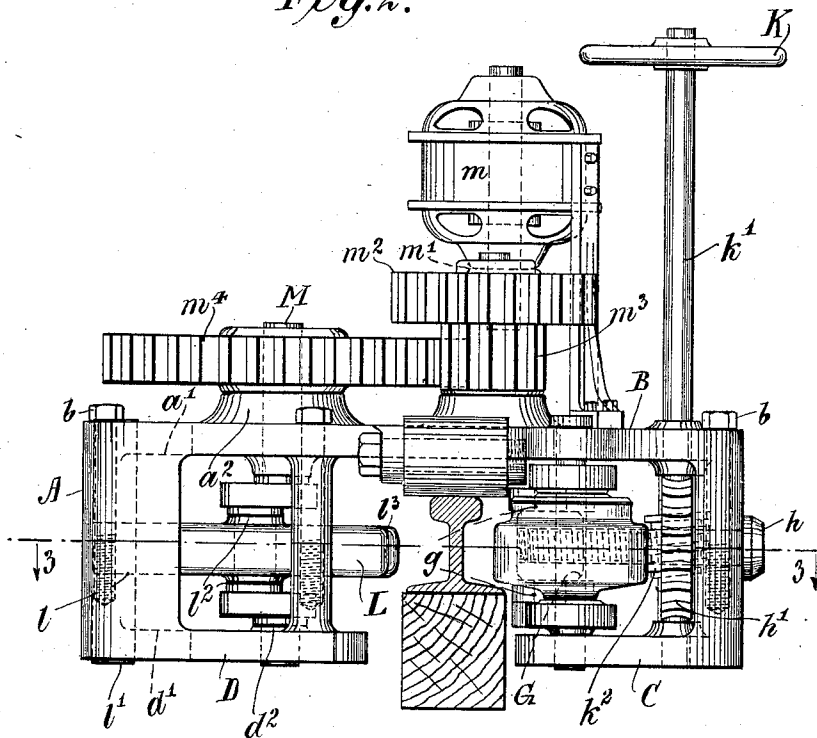
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3 SHEETS—SHEET 2.

Fig. 2.



Attest:

E. M. Guilford
Lafayette.

Inventor:

by

Edgar Rhodes

Alfred W. Kessler

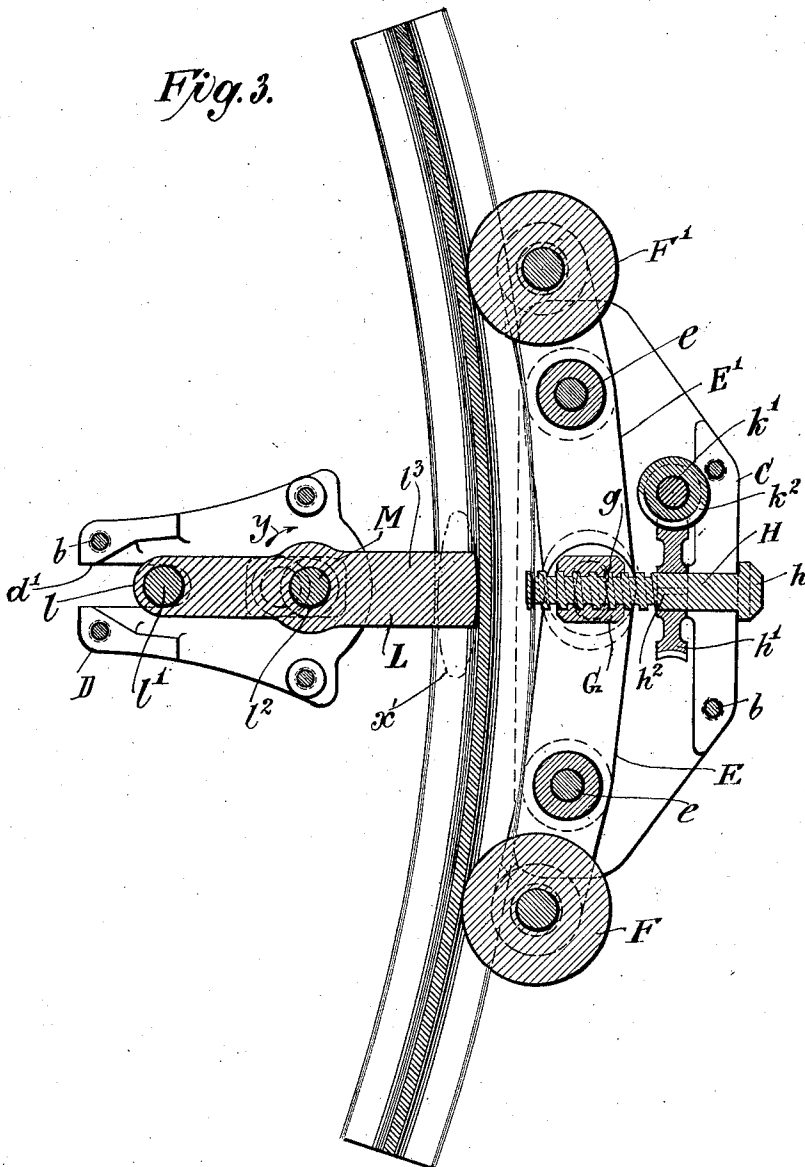
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3 SHEETS-SHEET 3.



Attest:

E. M. Geilfues
Geilfues

by

Inventor:
Edgar Rhodes
Alfred W. Kidder
Atty

UNITED STATES PATENT OFFICE.

EDGAR RHODES, OF SCHOLÉS, LEEDS, ENGLAND, ASSIGNOR TO CONTINUOUS RAIL COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

BENDING-MACHINE.

1,062,033.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed September 18, 1912. Serial No. 720,919.

To all whom it may concern:

Be it known that I, EDGAR RHODES, a subject of the King of Great Britain and Ireland, residing at The Briars, Scholes, Leeds, Yorkshire, England, have invented certain new and useful Improvements in Bending-Machines, of which the following is a specification.

The invention relates to metal bending machines.

One of the objects of the invention is to provide a portable machine for bending comparatively heavy pieces of work at or adjacent to the place where the same is to be utilized.

Another object of the invention is to construct a machine that can be placed over the top portion of or in position on a rail and which is also constructed so that it will be automatically fed along the rail and progressively perform a bending operation thereupon.

A further object of the invention is to construct a rail bending machine with rollers which normally support the machine on the rail during the bending operation, with movable resisting rollers that engage the rail at one side thereof and with a pressing member which engages the rail on the other side thereof between the points engaged by the resisting rollers with sufficient pressure and which also moves relative to the resisting rollers in such a manner as to effect a bending of the rail and simultaneously therewith a feeding longitudinally of the machine.

As showing a specific embodiment of the invention, reference is made to the drawings forming a part of this specification, and in which—

Figure 1 is a plan-view of a metal bending machine, Fig. 2 is an end-view of the same, and Fig. 3 is a horizontal sectional view, taken on the line 3—3 of Fig. 2, looking in the direction of the arrows.

The longitudinal direction of the machine is arbitrarily taken on the line $x-x$, Fig. 1, which is the direction that the work piece extends when in the machine.

The main frame A of the machine comprises the upper member B which extends the full width of the machine and the lower members C and D which are secured to the upper member by the screws b . At one side of the machine between the upper member

B and the lower member C there is pivotally mounted at e , e the levers or arms E, E' which respectively carry at the outer ends thereof the resisting rollers F, F'. The inner ends of the levers are slotted and receive the projecting pins g that are on the nut G which receives the screw H. The screw H is provided with a head h which presses against the main frame. This screw H is operated from the hand-wheel K, above the frame, by means of the vertical shaft k' having at the lower end thereof the worm k^2 which meshes with the worm-wheel k' that is keyed at k^2 to the screw-threaded member.

It will be noted that the rollers F, F' are arranged longitudinally along the frame and that the mechanism just described provides a means for readily adjusting the position of said resisting rollers transversely to the frame of the machine whereby the curvature to be imparted to the work piece can be controlled. At the other side of the machine between the upper member B and the lower member D there is mounted a transversely reciprocating pressing member or plunger L. The outer end l of this plunger is provided with trunnions or pins l' which slide in the slotted portions a' and d' of the upper and lower frame members A and D. These same frame members are also provided with bearings a^2 and d^2 for the crank-shaft M which passes at l^2 through the pressing member L. This crank-shaft is driven from the reversing motor m through the chain of gears m' , m^2 , m^3 , and m^4 . It will be noted that as the shaft M is rotated it will cause the inner end l^3 of the plunger to move in an orbital path as is indicated by the dotted line x' in Fig. 3. In other words, the end l^3 of the plunger has a compound movement one transverse to the machine and to the work and the other longitudinally of the frame of the machine.

The operation of the machine is as follows: An elongated work piece, for example a rail, is placed in the machine or the machine is placed on the rail and the motor M started so as to turn the crank-shaft in the direction, for example, indicated by the arrow Y in Fig. 3. The pressing member will first force the work piece against the resisting rollers and while in engagement with the work piece will continue to move inwardly transversely to bend the work

piece and also longitudinally of the frame to effect the automatic feeding operation. During the actual bending operation the end 7^s and the resisting roller F' relatively re-
 5 cede from each other and the same end 7^s and the roller F relatively approach each other in a longitudinal direction. The crank-shaft M continues to move in the same direction, and it will be noted that after
 10 the actual bending has ceased, the end 7^s moves from the roller F toward the roller F' to a position where said end can engage the work piece at another point along its length in order to effect another bending
 15 and feeding operation.

It will thus be apparent from an inspection of the drawing that if the rail is supported as is shown in Fig. 2 and the machine is supported thereupon that the machine will be automatically fed along the
 20 rail as the actual bending of the rail is taking place. Since the motor is reversible, it will be apparent that if desired the machine can be alternately fed along the work
 25 in opposite directions.

From an inspection of Fig. 3 it will be observed that the rollers F and F' engage the work piece at one side thereof at different points along its length, and that the
 30 end 7^s of the plunger L engages the work piece at the other side thereof at a point intermediate the points which are engaged by the rollers and as the latter are mounted on the outer ends of the movable arms E' and E² it will be apparent that the degree of
 35 curvature of the work piece can be varied at will by adjusting the screw H.

The expression "reversing motor" as used in specification and claims is to be
 40 construed broadly so as to cover any means which can drive the pressing member in reverse directions.

The improvements herein set forth are not limited to the precise construction
 45 shown and described, as they may be embodied in various forms and modifications without departing from the spirit and scope of the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a bending machine of the class described, the combination of a frame, resisting rollers carried thereby and arranged
 55 to engage one side of a longitudinally extending workpiece, a pressing member for engaging the other side of the workpiece at a point intermediate of the place where the workpiece is engaged by the resisting
 60 rollers and means for forcing the pressing member in a transverse direction against the work and for causing that portion of the pressing member which engages the work and one of the resisting rollers to relatively approach each other in a longitudinal
 65 direction when the latter is in engagement with the workpiece.

2. In a bending machine, a frame, levers pivoted thereto, each of the levers having at one of the ends thereof resisting rollers arranged to engage one side of a longitudinally extending workpiece, a reciprocating pressing member that moves transversely to the workpiece when the latter is in operative position in the machine, and means between the frame and the lever to adjust the position of the resisting rollers whereby the curvature of the workpiece may be controlled.

3. In a bending machine, the combination of a frame, levers pivoted thereto having the adjacent ends connected to a nut, resisting rollers carried on the levers and arranged to engage one side of a longitudinally extending workpiece, a reciprocating pressing member arranged to engage the other side of the workpiece, and a screw connected to the frame and seated in the threaded portion of the nut for positioning the resisting rollers.

4. In a bending machine the combination of a frame, movable resisting members arranged to engage one side of a longitudinally extending work piece at different places along its length, a transversely moving pressing member arranged to engage the opposite side of the longitudinally extending work piece, and means for moving the pressing member so that a portion thereof will engage and bend the work piece and so that said portion of the pressing member will move in a longitudinal direction relative to the frame.

5. In a bending machine the combination of a frame, levers pivoted thereto carrying resisting rollers thereupon, means between the levers and the frame for adjusting the position of the resisting rollers, a pressing member which is movably supported on or by the frame, a motor carried by the frame and means between the motor, the frame and the pressing member for reciprocating the pressing member in a direction transversely to the resisting rollers which are arranged longitudinally along the frame.

6. In a bending machine the combination of a frame, movable resisting means thereupon arranged at different positions along the frame, a pressing member pivotally and slidably connected to the frame, a crank shaft carried in the frame and having the crank portion thereof connected to the pressing member whereby the work engaging end thereof will have an orbital movement, the work engaging end of the pressing member being arranged so that it engages the work piece at a point intermediate of the place where the work piece is engaged by the movable resisting members.

7. In a bending machine, the combination of a longitudinally extending frame, adjust-

able resisting rollers arranged along the frame, a reciprocating pressing member and a reversing motor for operating the same, the work engaging end of the pressing member being driven both transversely to and longitudinally of the frame.

8. In a bending machine of the class described, a longitudinally extending frame, workpiece engaging rollers arranged along the frame and a pressing member whose workpiece engaging end reciprocates when operating both transversely to and longitudinally of the frame.

9. In a bending machine, the combination with the frame of resisting members ar-

ranged longitudinally along the frame, a pressing member, means for imparting compound movement to the work engaging end of the pressing member whereby said end can move transversely to bend the workpiece and longitudinally of the frame to effect a feeding operation and a reversing motor for operating the pressing member actuating means.

This specification signed and witnessed this 13th day of September A. D., 1912.

EDGAR RHODES.

In the presence of—

ANNA MALLOY,

WALTER DEL MAR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
