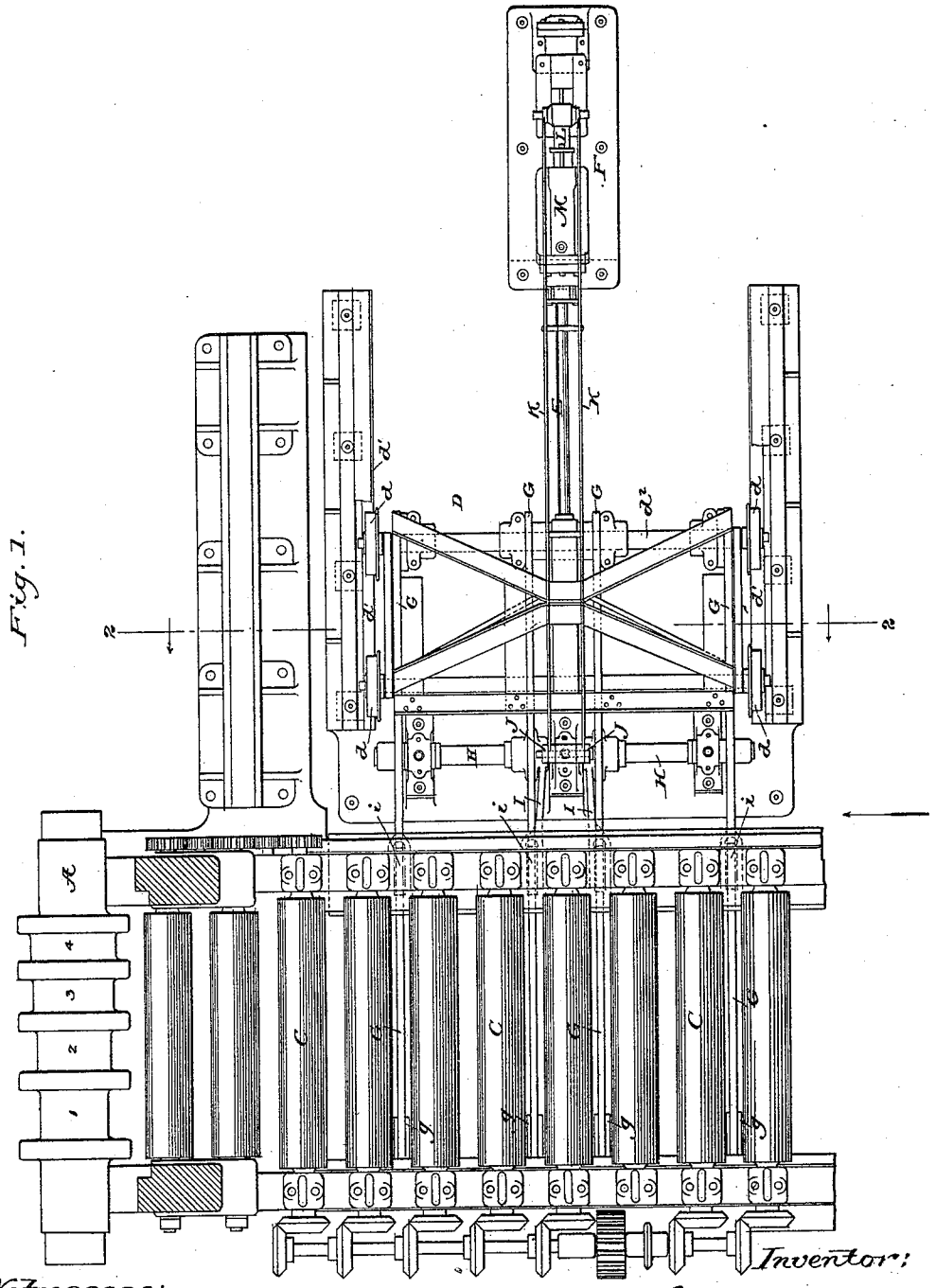
(No Model.) 3 Sheets—Sheet 1.

F. W. WOOD.

METAL ROLLING MILL.

No. 457,946. Patented Aug. 18, 1891.

Fig. 1.



Witnesses:
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W. R. Kennedy

Inventor:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

F. W. WOOD.

METAL ROLLING MILL.

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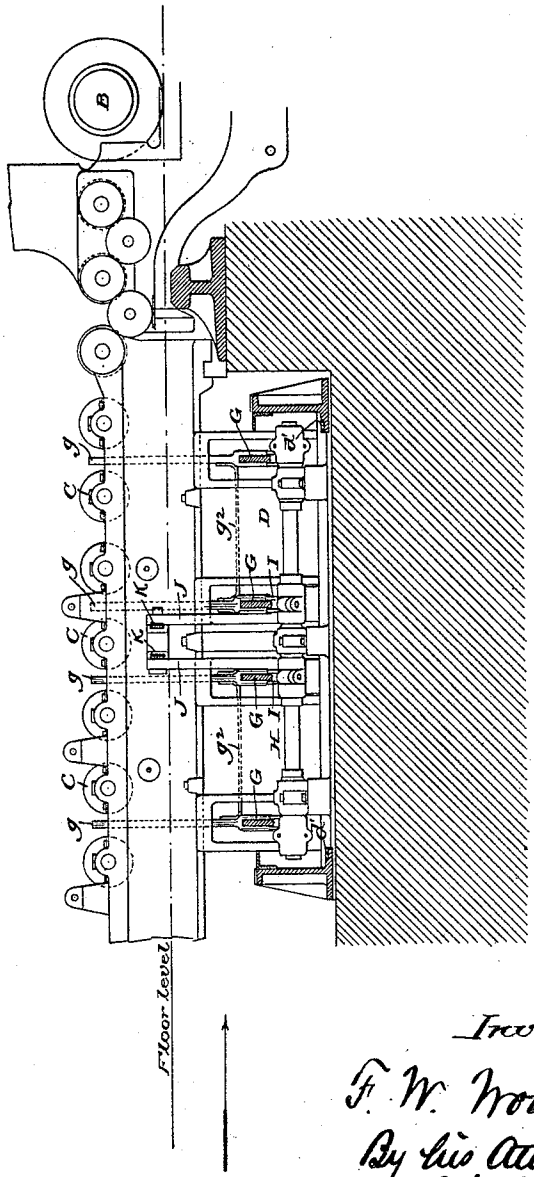


Fig. 2.
on line 2-2

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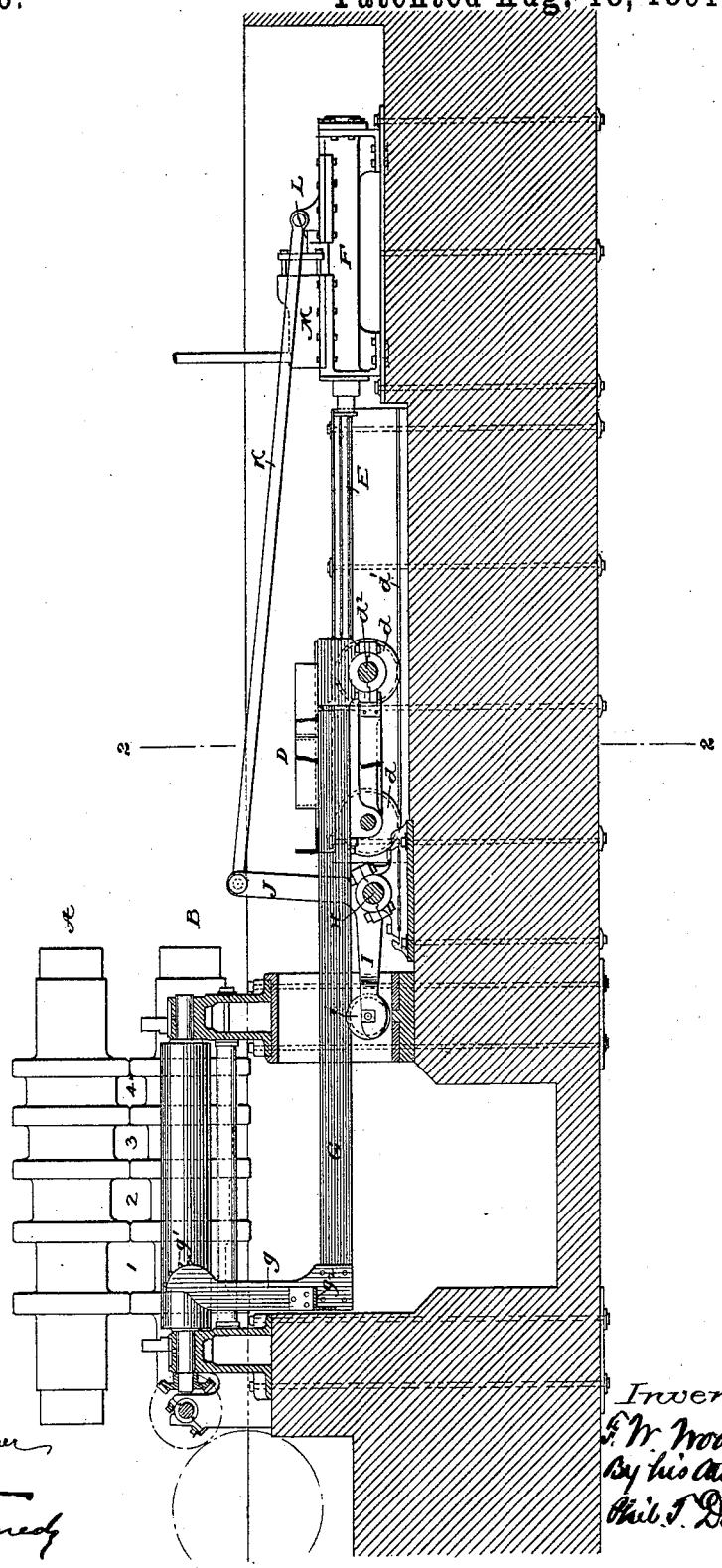
(No Model.) 3 Sheets—Sheet 3.

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METAL ROLLING MILL.

No. 457,946. Patented Aug. 18, 1891.

Fig. 3.



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UNITED STATES PATENT OFFICE.

FREDERICK W. WOOD, OF BALTIMORE, MARYLAND.

METAL-ROLLING MILL.

SPECIFICATION forming part of Letters Patent No. 457,946, dated August 18, 1891.

Application filed March 12, 1891. Serial No. 384,771. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. WOOD, of Baltimore, Maryland, have invented certain Improvements in Metal-Rolling Mills, of which the following is a specification.

This invention relates to that class of rolling-mills in which the rolls are provided each with a series of passes, and more particularly to those having "two-high" rolls; and its object is to provide for laterally shifting and turning the blooms on one side of the rolls in order that they may enter the successive passes in the required positions.

The improved mechanism consists, mainly, of a carriage movable transversely to the length of the bloom, an outreaching arm mounted on the carriage and having its end adapted to act upon the bloom, and means under the control of the attendant for operating the carriage and the arm.

The details of construction may be variously modified without departing from the limits of my invention.

In the accompanying drawings, Figure 1 is a top plan view of the bloom-manipulating mechanism in connection with the rolls and attendant parts. Fig. 2 is a transverse vertical section on the line 2 2 of Fig. 1. Fig. 3 is an elevation looking in the direction indicated by the arrows 3, Figs. 1 and 2.

Referring to the drawings, A and B represent the horizontal blooming or reducing rolls arranged one above the other and provided with a series of passes 1, 2, 3, and 4.

C C represent a series of horizontal power-driven rolls, commonly known as "live" rolls, arranged in fixed bearings in advance of the main rolls to sustain the bloom and direct the same endwise into the various passes. This series of sustaining-rolls is commonly known in the art as a "table."

The foregoing parts and all the attendant mechanisms for operating them may be constructed in the ordinary manner.

Referring now to the subject-matter of the present invention, D represents a strong carriage-frame sustained by rollers d, arranged to travel on horizontal rails d' at one side of the table at right angles to the length of the bloom. The carriage is connected by one end to the piston-rod E, carrying a piston-head within a stationary cylinder F, connected through suitable valves with a source of water or steam supply, whereby the piston may be caused to move the carriage horizontally to or from the table.

G G are a series of strong arms journaled upon the rear axle d^2 of the carriage and extended thence forward beneath the table-rolls C, their outer vertically-movable ends being provided each with an upright arm or standard g, having a series of teeth or studs g' at the top. The arms G lie parallel with each other, and are preferably connected by a cross bar or sill g^2 in order to keep them in line. The standards g stand between and normally below the upper surface of the table-rolls C, as shown in Fig. 2.

Between the carriage and table-rolls is mounted in fixed bearings a rock-shaft H, carrying a series of arms I, which in turn carry a series of rollers i, underlying and supporting the free ends of the arms G. The rock-shaft H is provided with uprising arms J, connected by a rod K to one end of a plunger L, which projects through a gland or stuffing-box into one end of a stationary cylinder M, bolted to the top of cylinder F, but having no internal communication therewith. By the admission of water, steam, or other fluid into the cylinder M the piston L is caused through the rod K and arm J to turn the rock-shaft H and lift the ends of the arms I, which in turn elevate the arms G, so as to lift the toothed standards G' above the table-rolls. It will be observed that the carriage serves to move the standards G' horizontally from one end of the table-rolls to the other, and that the arms I act independently to raise and lower the standards. By properly proportioning and timing these two movements the standards G' are enabled not only to move the blooms sidewise upon the table-rolls, so as to bring them opposite the particular pass desired, but also enabled to act with a lifting effect under the corners of the blooms to turn or roll them over sidewise upon the table-rolls. By means of valve mechanism under the control of the attendant the standards may be so operated as to give complete control over the positions and movements of the bloom. It will of course be understood that as the carriage moves to and fro the arms G slide upon the rollers i.

The carriage, the outreaching arms, and the operating-cylinders are preferably mounted, as shown, below the level of the blooming-mill floor and at one side of the pit beneath the table-rolls, thus leaving a clear and unobstructed space below the table.

The employment of an outreaching or overhanging arm to control the bloom in connection with sustaining and operating devices for said arm located at one side of the frame is a feature of considerable advantage.

It will of course be understood that in place of the rock-shafts and arms other devices of suitable construction may be used to raise and lower the arms G, and that in place of the cylinder and piston any equivalent mechanism known in the art may be used to reciprocate the carriage. In short, it is to be understood that the essence of the invention resides in the combination of the bloom-controlling arms, a carriage for moving them horizontally, and means for moving them vertically, and the skilled mechanic will at once perceive that these parts and their connections may be constructed in many forms the mechanical equivalents of those herein shown.

Having thus described my invention, what I claim is—

1. In combination with a table or like support for a bloom, a carriage movable laterally in relation thereto, an outreaching arm on the carriage to act on the bloom, and means for raising and lowering the arm at will.

2. In combination with a rolling-mill, a bloom-manipulator consisting of a carriage and means for moving the same horizontally at the will of the attendant, a vertically-movable arm attached to the carriage and having an upright arm or standard to act on the bloom, and means under control of the attendant for raising and lowering the arm at will.

3. In combination with the roller-table, the wheeled carriage mounted at one side of the table and movable in a line transverse thereto, the bloom-manipulating arms pivoted on the carriage and extending between the table-rolls, the rock-shaft, and arms to raise and lower the first-named arms.

4. The carriage and its actuating piston and cylinder, in combination with the arms jointed thereto to rise and fall, the rock-shaft and its arms, and the cylinder and plunger to actuate the same.

In testimony whereof I hereunto set my hand, this 16th day of February, 1891, in the presence of two attesting witnesses.

FREDK. W. WOOD.

Witnesses:
WM. ELLIS COALE,
WM. CUNNINGHAM.