

(No Model.)

J. JARDINE.
ROLLING MILL.

No. 451,934.

Patented May 12, 1891.

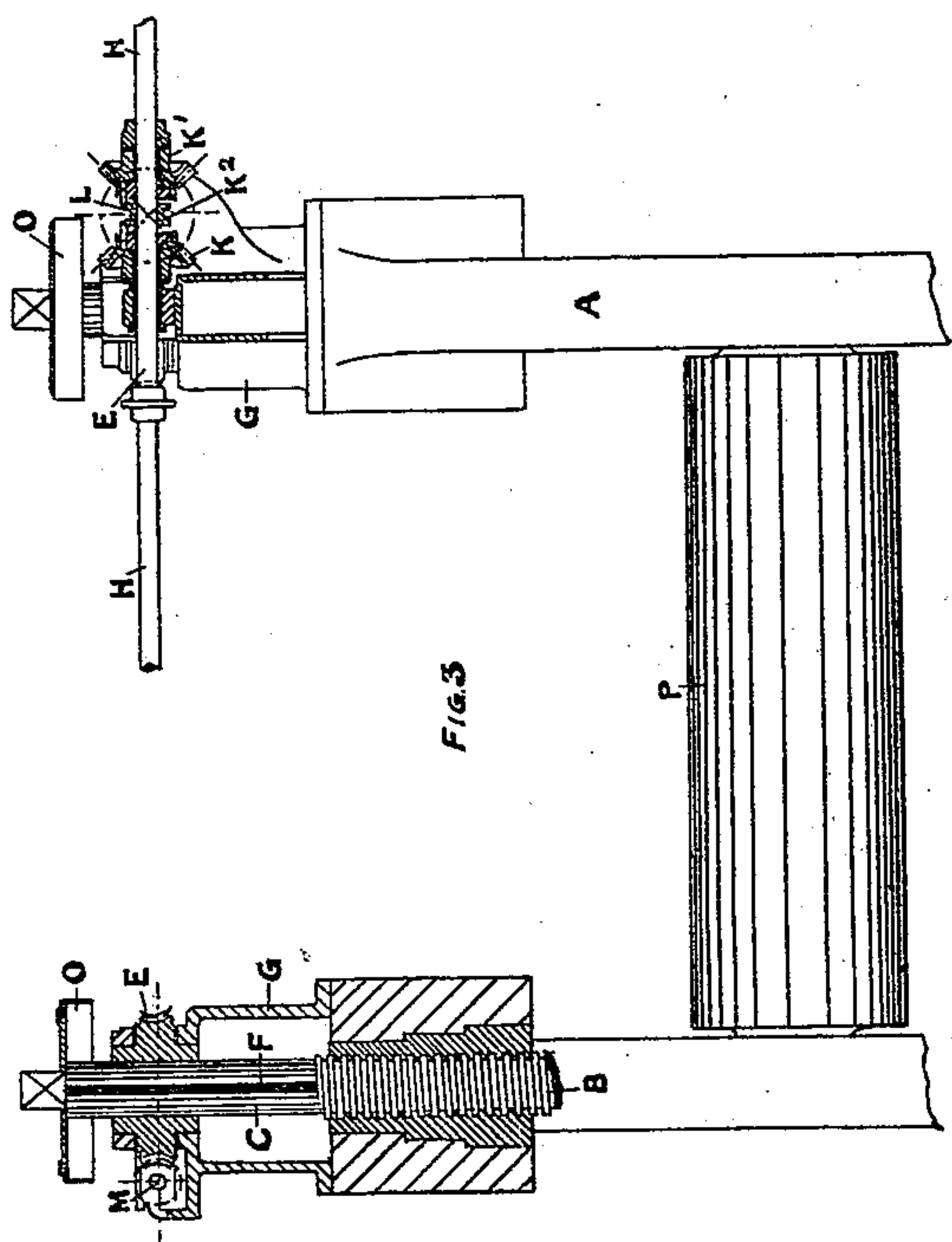


Fig. 3

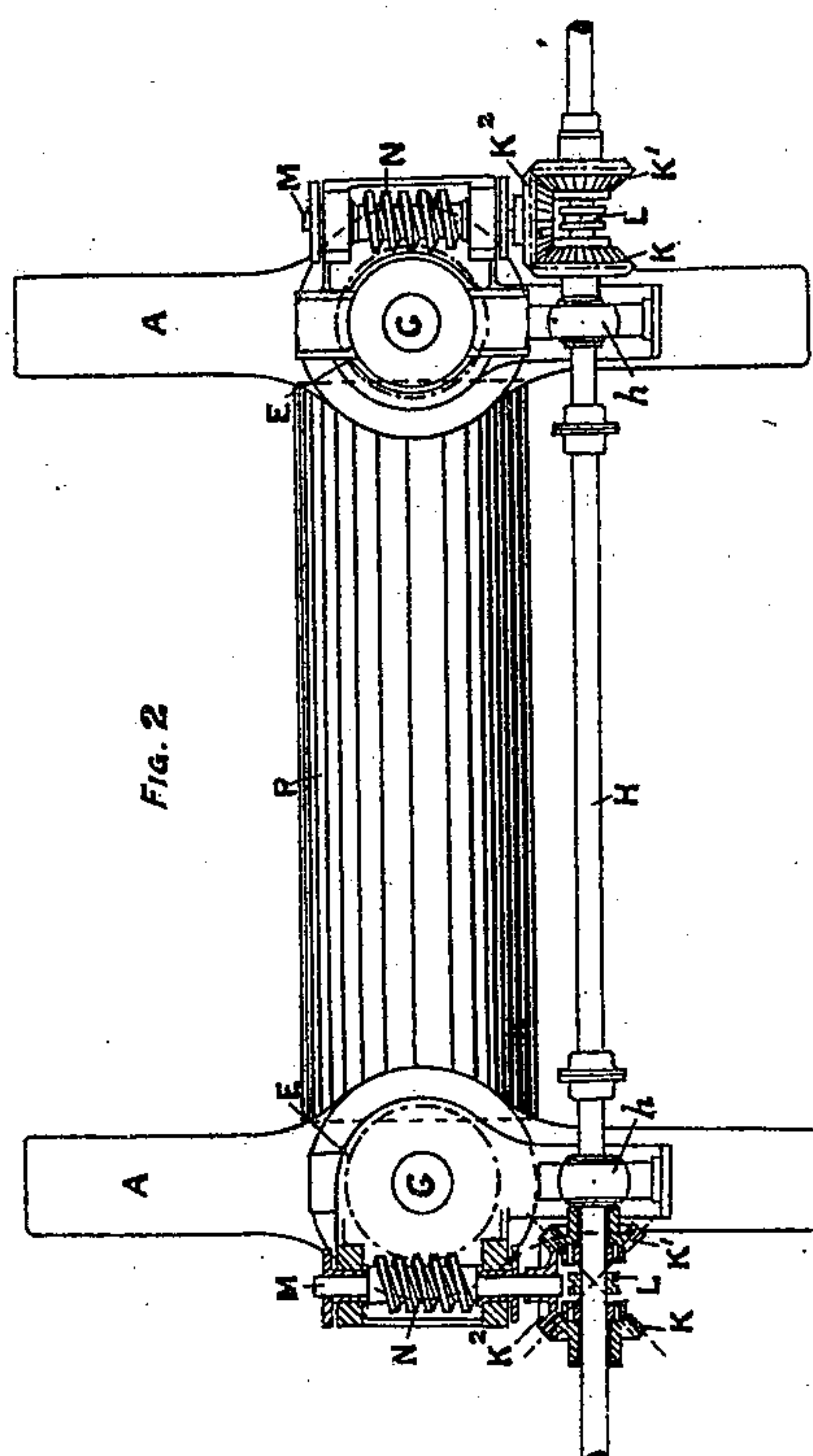


Fig. 2

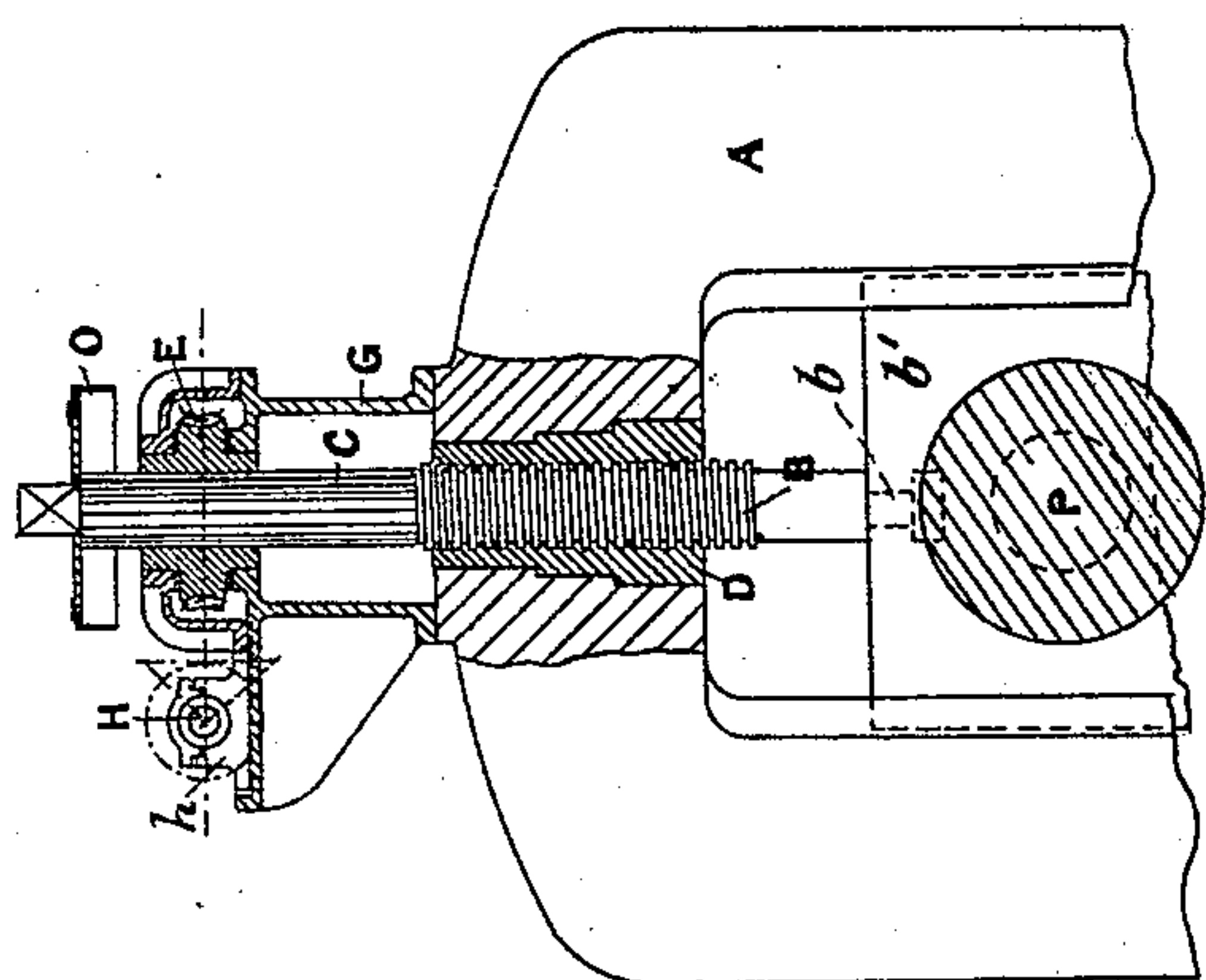


Fig. 1

Witnesses:
Walter E. Allen.
R. Jay B. ain

Inventor
John Jardine.
by Herbert W. Jenner. Attorney.

UNITED STATES PATENT OFFICE.

JOHN JARDINE, OF MOTHERWELL, COUNTY OF LANARK, SCOTLAND.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 451,934, dated May 12, 1891.

Application filed August 23, 1890. Serial No. 362,910. (No model.) Patented in England October 12, 1888, No. 14,695.

To all whom it may concern:

Be it known that I, JOHN JARDINE, residing at Motherwell, in the county of Lanark, Scotland, have invented certain new and useful
5 Improvements in and Relating to Rolling-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make
10 and use the same.

Letters Patent have been granted for this invention in Great Britain, No. 14,695, dated October 12, 1888.

This invention relates to rolling-mills; and
15 it consists in the novel construction and combination of parts hereinafter fully described and claimed, whereby the vertical pressure-screws required in rolling-mills are adjusted by power instead of by manual labor, as usual.
20 Figure 1 is an end elevation, partly in section, of an ordinary sheet-metal rolling-mill; and Fig. 2 is a corresponding plan, also partly in section, both showing one arrangement of my improved gearing and motive power mechanism for actuating the main screws B in the
25 upper part of their housing-frames A, all in accordance with the improvements of the said invention. Fig. 3 is a side elevation showing a section at right angles to Fig. 1 of one of
30 the screws B and the screw and worm-wheel gearing mounted on the top for actuating the same.

Referring to the drawings, vertical spindles are shown passing through the housing-frames
35 A, which have their lower portions B screwed to work in corresponding nuts or bushings D in the housing-frames A, and their upper portions C pass through worm-wheels E. The lower ends *b* of the spindles below the screw-threaded portions B are operatively connected to the blocks *b'*, in which the top rolls are journaled. This may be accomplished, as shown in Fig. 1, by forming grooves in the ends *b* and journaling the said ends in cor-
40 respondingly-shaped holes in the upper sides of the blocks *b'*. The upper portions C of the spindles have fitted upon them a feather or feathers F, Fig. 2, which pass through corresponding grooves or keyways in the worm-
45 wheels E. Thus the spindles are free to slide up and down in the worm-wheels, but they are constrained to rotate with them.

The worm-wheels C are carried upon frames or brackets G, which are mounted upon the top of the housing-frame. The frames G also
55 carry a horizontal shaft H, working in suitable bearings *h*, which shaft passes across from one housing-frame to the other and is driven continuously in one direction by a belt or other suitable means. Upon this shaft H
60 and in suitable positions are mounted bevel-wheels K K'. These bevel-wheels are loose upon the shaft H, but can be made to rotate with it by means of a friction-clutch L, sliding on a feather, which is also carried upon the
65 shaft H between the bevel-wheels K K'. These bevel-wheels are in gear with a third bevel-wheel K², which is mounted on a shaft M at right angles to the shaft H, and which carries a worm N, gearing into the worm-wheels
70 E. The direction of rotation of the bevel-wheel K², and consequently that of the worm N and the worm-wheel E, depends upon which of the bevel-wheels K K' is driving it. Thus when the clutch is in the bevel-wheel K that
75 wheel will be driving it, and when the clutch is midway between the wheels neither is being driven, and consequently the wheel K² remains at rest. The clutches L are controlled independently by hand, and thus both
80 the clutches could be drawn in the same direction to put the same bevel-wheels in gear, and thus drive the worm-wheels in the same direction to raise or lower the spindles
85 C at both ends simultaneously, which are attached to the roll-housings in the usual ordinary manner, or the clutches could be put independently to depress or release one end of spindles C, and consequently the roll. The
90 rolls, one of which is shown at P, are thus perfectly adjustable and independent and can be made to rise simultaneously and parallel or individually and differently, as required, to suit the thickness or angle or different thickness of the plate to be rolled at the op-
95 posite sides.

Upon the upper part of the spindles C, or in any other convenient position, is placed a graduated index-wheel O, having a fixed pointer to show the exact draft of the rolls.
100 The bevel-wheels K K' K² and the worm N and their attachments may be covered with suitable casings to prevent them becoming injured or dirty and for safety's sake, and the

shaft H may extend over a whole row of mills in line without departing from the essential feature of the invention.

What I claim is—

- 5 In a rolling-mill, the combination, with the screw-threaded spindles for adjusting the upper roll, of worm-wheels splined on the said spindles, worms gearing into the said worm-wheels, beveled toothed wheels K^2 , secured
10 on the worm-shafts, a continuously-revolving shaft, beveled toothed wheels journaled in pairs on the said shaft and gearing into the

wheels K^2 , and clutches splined to the shaft between each said pair of wheels, whereby the ends of the roll may be moved singly or 15 simultaneously and in either direction, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN JARDINE.

Witnesses:

JOHN THOMAS BRASSINGTON,
M. M. AULTMAN.