

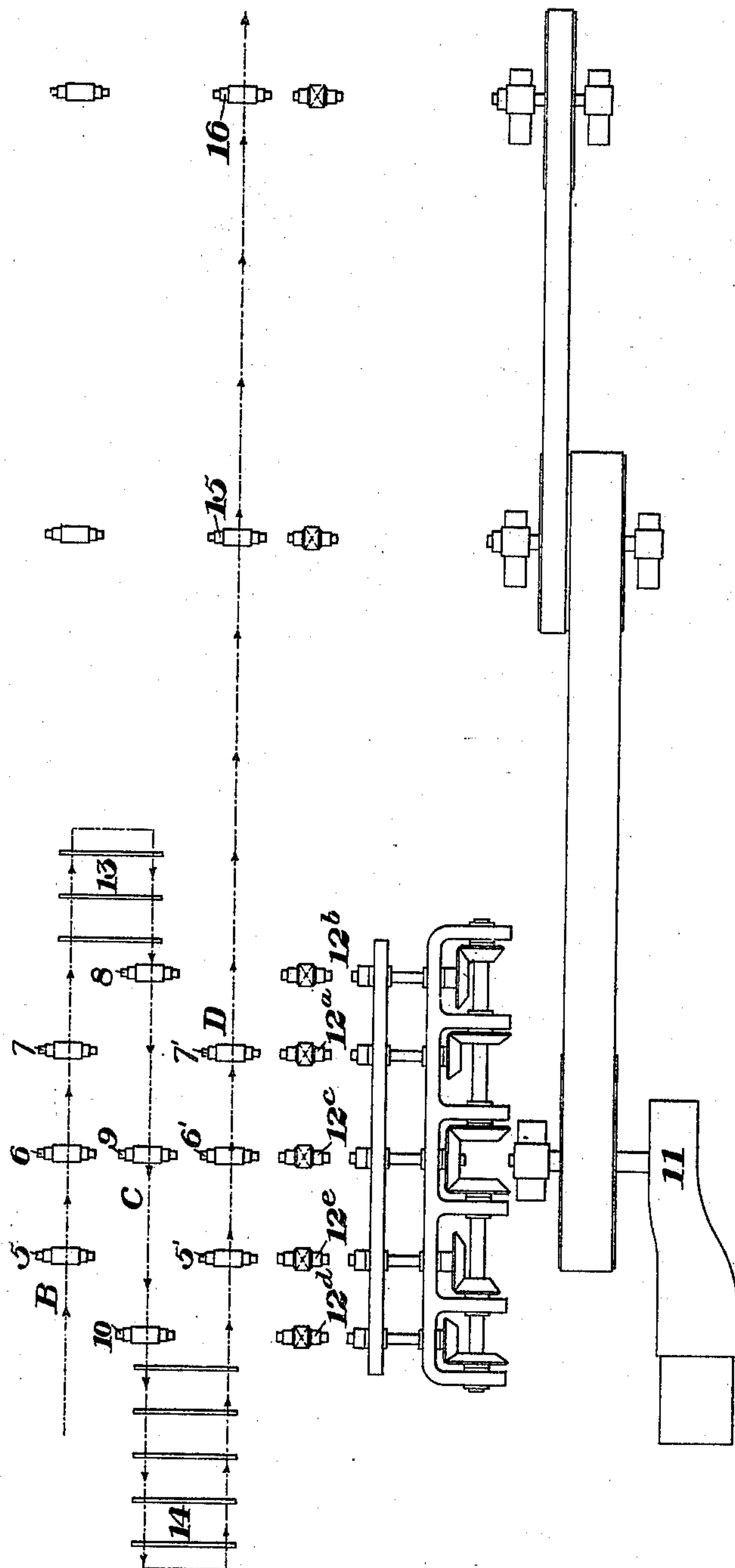
No. 647,087.

Patented Apr. 10, 1900.

**W. GARRETT.
ROLLING MILL.**

(Application filed Sept. 3, 1898.)

(No Model.)



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM GARRETT, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO
JOHN C. CROMWELL, OF SAME PLACE.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 647,087, dated April 10, 1900.

Application filed September 3, 1898. Serial No. 690,186. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GARRETT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Rolling-Mills, of which the following is a specification, reference being had to the accompanying drawing, which is a diagrammatic view of my improved apparatus.

10 The object of my invention is to provide a rolling-mill compact in construction and adapted to roll most economically such kinds of metal as tin-plate bars, skelp for making tubes, flat bars, angles, billets of small cross-
15 section, &c.

It consists in a mill comprising lines of three or more sets of rolls each side by side, one set (a middle set) of one line being connected with the rolls of the corresponding set of
20 another line and the end sets of the several lines being driven at respectively different rates of speed. I am enabled thus to avoid setting the rolls far apart with intermediate feed-rollers, so as to allow the metal to leave
25 one set of rolls before entering the next, and to provide that the metal shall be at once in two or more rolls of the same line. The rolls are successively speeded up, as in continuous mills; but the division of my rolls into groups
30 or lines and the driving of them in the manner above stated obviates the difficulty which would pertain to ordinary continuous mills wherein each successive roll must be speeded up in proportion to the degree of reduction
35 which it effects and wherein the last set of a line of ten or twelve rolls would have to be driven at an unduly-high rate of speed. I thus keep within practical limits the increase in speed required in continuous trains of
40 rolls and can place the rolls so near together as to avoid the use of different engines for each line or group. The arrangement is such that the blooms rolled in the mill do not interfere in any way with the rolling of the fol-
45 lowing blooms.

Referring now to the drawing, 3 are the shears, and 4 a line of conveying mechanism. These parts are not of my invention. By their use an ingot having been rolled at
50 roughing-rolls (not shown) may be sheared into blooms of proper length before being in-

troduced into the rolls of my improved mill. This mill comprises lines of rolls B, C, and D set side by side, the line B having sets of rolls 5, 6, and 7, the line C having set of rolls 8, 9, 55 and 10, and the line D having sets of rolls 5', 6', and 7', though each line may have more rolls, if desired.

11 is the driving-engine, and 12^a, 12^b, 12^c, 12^d, and 12^e are pinions connected therewith and in
60 line with the rolls. The rolls 6 and 6' are connected with pinions 12^c and are driven thereby in unison, as are also rolls 9, though in opposite directions—say at a rate of fifty-six revolutions per minute, though the speeds
65 here stated are merely illustrative and may be varied. The first set of the line B—namely, the set 5—is driven at a less rate of speed than the set 6—say at forty-two revolutions per minute—and the last set 7 of the line B is
70 driven at a higher rate than the middle set 6—say at seventy-five revolutions per minute. The sets 7 and 7' are connected with the pinions 12^a and the set 8 with the pinions 12^b, the set 10 being connected with the pinions 12^d 75 and the sets 5 and 5' with the pinions 12^e. The first set 8 of the line C is driven at a less rate of speed than the middle set 9—say at forty-two revolutions—which is also less than the speed of the set 7, while the set 10 is driven
80 at a greater speed than the set 9—say at seventy-five revolutions per minute.

In practice the metal bloom is introduced into the rolls 5 of the line B and thence passes through the rolls 6 and 7, which are driven at
85 successively higher rates of speed, as in a continuous mill, the increase of speed corresponding to the reduction of the metal at the respective rolls. When the metal emerges from the rolls 7 at the end of the line, it is
90 carried by a lateral transfer-table 13 of ordinary construction to a position in front of the end roll 8 of the line C. It then traverses in succession the rolls 8, 9, and 10, whence it may be carried by a transfer-table 14 opposite
95 the rolls 5', and may then pass in succession through the rolls 5', 6', and 7'. From the rolls 7' it may be carried by feed-rollers through bull-head rolls 15 and 16, whence it is conveyed to the hot-beds, as in ordinary
100 mill practice.

It will be readily understood that within

the scope of the invention as defined in the claim the arrangement and construction of the rolls may be modified in various particulars, since

5 What I claim is—

A mill comprising lines of rolls B, C, D, the middle rolls of the three lines being geared together and rotatable at the same speed, the end rolls of the lines B and D being also geared

together, and the end rolls of the line C being driven independently of the rolls of the other two lines; substantially as described.

In testimony whereof I have hereunto set my hand.

WILLIAM GARRETT.

Witnesses:

THOMAS W. BAKEWELL,

G. I. HOLDSHIP.