

D. I. Jones, 2. Sheets, Sheet 1.

Rolling Mill.

No. 106063.

Patented Aug. 2. 1870

Fig. 1.

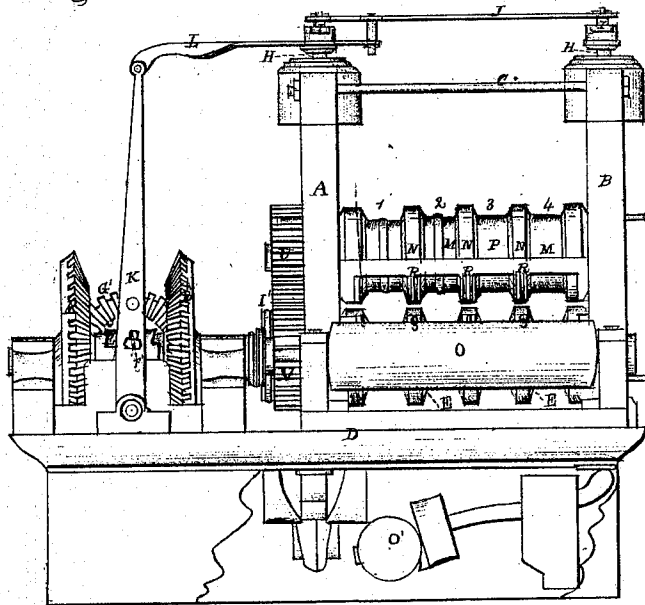
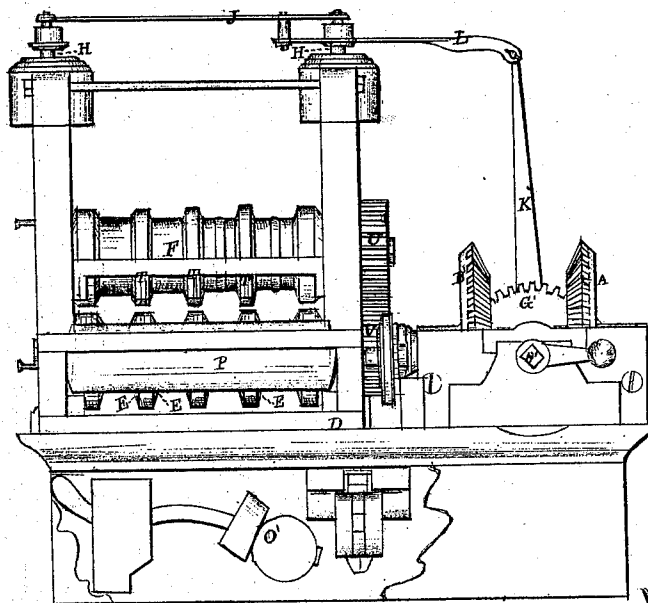


Fig. 2.



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Fig. 3.

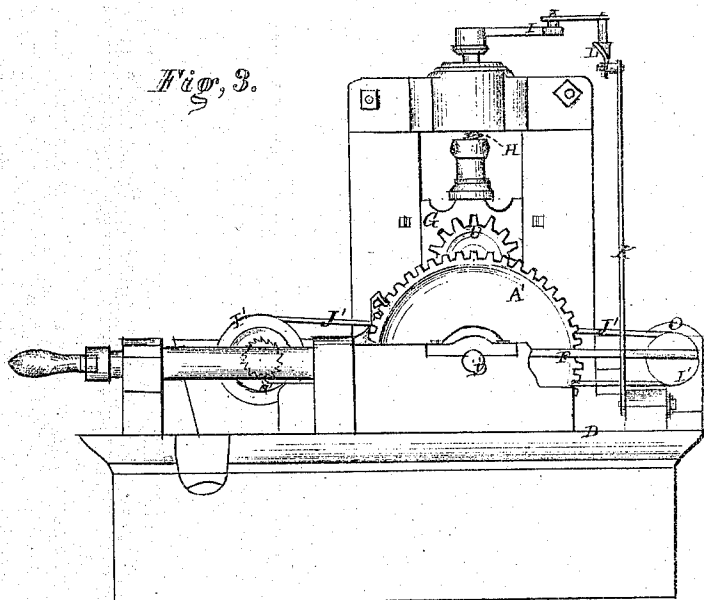
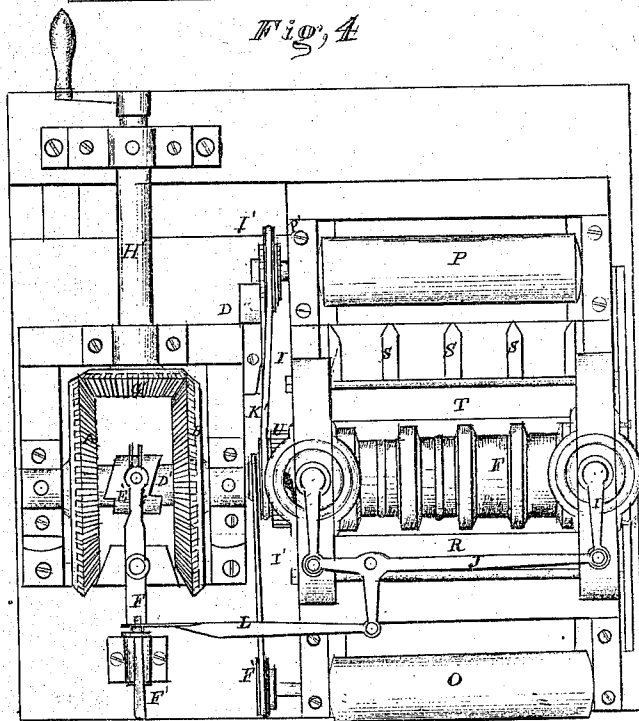


Fig. 4.



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DAVID I. JONES, OF NEWBURG, OHIO.

Letters Patent No. 106,063, dated August 2, 1870.

IMPROVEMENT IN ROLLING-MILLS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, DAVID I. JONES, of Newburg, in the county of Cuyahoga and State of Ohio, have invented a certain new and improved Blooming-Mill; and I do hereby declare that the following is a full, clear, and complete description of the same, reference being had to the accompanying drawing making part of this specification, in which drawing—

Figure 1 is a front elevation of the mill.

Figure 2 a view of the opposite side of fig. 1.

Figure 3, a side elevation.

Figure 4, a view of the top.

Like letters of reference refer to like parts in the several views.

Objective.

This invention relates to a mill for rolling ingots into blooms, by the employment of a pair of rollers arranged one above the other, and reversible in their rotating movement, and adjustable in their vertical relation to each other, so that the ingot, having been run through from one side of the mill, is returned through the same groove by a reverse rotation of the rollers, as hereinafter described.

Descriptive.

In the drawing, fig. 1—

A B represent a pair of stays or frames, secured to each other at the top by brace-bolts, C, and at their base by a bed or frame-work, D.

In the base of said frames is journaled a roller, E, in stationary seats, immediately above which is journaled a corresponding roller, F, in movable blocks G, fig. 3, whereby said roller may be adjusted in its relation of distance to the roller E, by adjusting-screws H, for a purpose hereinafter shown.

To each of the screws referred to is attached an arm, I, fig. 4, whereby they are connected to each other, and operated simultaneously by a link, J, said link being connected to a vertical lever, K, by means of a link, L, whereby it is actuated for operating the screws, for the purpose above mentioned.

Each of the rollers E F is alike divided into passes or grooves, M, by means of collars N. The diameters of said grooves increase in regular order from one to four, thereby producing a corresponding decrease in the distance of the two rollers from each other.

On each side of the roller E (rear and front) is journaled a plain roller, O P, fig. 4.

It will be observed that the faces of said rollers are even horizontally with the face of the roller E, and that in front of said rollers E F is a guide, Q, immediately above which is a corresponding guide, R.

On the opposite side of said rollers are similar guides, S T.

Said guides are denominated upper and lower guides and consist of short ribs, equal in thickness to the collars of the rollers, and are arranged in line therewith, but are not of the same depth of the collars; hence, when the rollers or the collars thereof are in contact, the guides will not be.

U and V, fig. 2, are cog-wheels secured to the shafts of the rollers E F, whereby they are driven, the wheels receiving motion from the spur-wheels A' B', loosely fitted to the shaft D', and made to revolve therewith by means of a sliding clutch, E', operated by the lever F', projected through the vertical lever K.

The spur-wheels A' B' receive motion from the intermediate spur-wheel G', connected to the driving-power by the shaft H'.

To the outer end of each of the plain rollers O P is secured a pulley, I', whereby motion is obtained to them by the belts J', from the pulley K' on the shaft D', by the spur-gearing and roller.

By this arrangement of the pulleys and belts, the above said plain roller O has a common rotating movement with the roller E, and in the same direction, whereas the roller P rotates only on the reverse movement of the roller, but remains idle during the direct or positive movement thereof.

The practical use and operation of this machine are as follows, viz:

As above said, this mill is for rolling ingots into bars or blooms. This is ordinarily done by passing the ingot between a pair of rollers of a certain distance between them. The ingot, after being passed through the rollers from the front, is returned to the front over the upper roller, to be again run through the second pass or groove, and so on for each time that the ingot is run through from the front. It is returned from the rear to the front over the upper roller by an attendant for that purpose.

This matter of returning the ingot is a work requiring great exertion and strength, and occupying much time, during which the ingot is rapidly cooling, thereby requiring either increased pressure or more repeated rollings to reduce it to the required sized bloom. To save this labor and time, or repeated rolling of the ingot, is the purpose of this mill, which, on being put in motion, the ingot is inserted between the rollers at the pass or groove 1, from the side shown in fig. 1, by laying it upon the roller D, which, revolving in the same direction as the compressing-rollers, carries it toward them between the guides Q. The distance between the rollers is supposed to be seven inches; hence, the ingot, on passing through them, will be of that thickness.

Now, instead of returning the partially-rolled ingot to the front of the machine over the upper roller, as required in the ordinary mill, it is returned through

the rollers, and through the same pass, by reversing the revolution of the rollers. This is done by the lever F', whereby the operator shifts the clutch from its engagement with the spur-wheel A' to the spur-wheel B', thereby reversing the movement of the rollers, and which, at the same time, operates the adjusting-screws H, by the vertical lever K and links above described.

This simultaneous movement of the screws with the reaction of the rollers will set the upper roller closer to the under, some three-eighths of an inch. With the now reversed movement of the rollers, the roller P will be actuated by a ratchet-wheel and pawl, P', fig. 4, whereby the roller is made to engage the pulley I, on the rotating reaction of the pressing-roller E F, but which remains stationary on the first or positive movement. The roller P carries the ingots to the rollers, through which it repasses, and is reduced three-eighths of an inch, equal to the distance that the roller F was adjusted by the screws. The ingot, on being thus returned through the rollers to the front of the mill, is now turned one-quarter around, and run through the second groove or pass, 2.

The movement of the rollers is reversed for this purpose to the first or direct movement, by shifting the clutch again from the wheel B' to the wheel A'.

By this shifting of the clutch from the wheel B' to the wheel A', the adjusting-screws are turned back, thereby allowing the upper roller to recede from the lower one, by means of the counterbalance-weights O', figs. 1 and 2, attached to the roller for that purpose.

The ingot, on being run through the second pass, is returned therein by again reversing the rotating movement of the rollers, by means of the clutch, which, in so doing, will operate the adjusting-screws in the same way, and to the same extent, as before described.

The now actuated roller P will carry the ingot to the rollers, through which it runs, and is reduced thereby in thickness three-eighths of an inch, as in the first instance, and so on through the whole number of the passes.

Thus, each time that the ingot is run through from the front to the rear of the mill, it is reduced in thickness by the increased diameters of the rollers, which, as a consequence, lessens the depths of the passes, or the vertical distance between the grooves, and so on the return of the ingot from the rear to the front side, the vertical distance between the grooves or passes

is shortened three-eighths of an inch by the adjustment of the upper roller in the manner above described, the adjustment of the roller being made simultaneously with the shifting of the clutch for the reaction of the rollers, to cause the return of the ingot.

It will be obvious that, in rerolling the ingot by repassing it through the same groove, the labor of lifting it over the upper roller is avoided, and that it is being rolled during the time required to pass it over the roller in the ordinary way; hence, there can be no loss of time, and a consequent loss of heat, while rolling the ingot, or while the ingot is from between the rollers.

Mills in ordinary use are provided with guides some three-fourths as high as the ingot, on the front or positive side, only to prevent the ingot from entering the groove crosswise, but have more guides at the top or either side. Owing to the great height of the guides, in proportion to the thickness of the ingot, they would offer an obstruction to the repassing of the ingot, as the pins or spraws on the side of the ingot would strike against them, and either prevent the ingot from entering the groove, or divert it from a direct passage through; hence, the guides are made much lower than the thickness of the ingot, and, placing one above and one below, the ingot is guided straightly into the pass, while the pins, should there be any, will pass between the guides without interfering therewith.

Claims.

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

1. The combination of the reversible adjustable roller F and adjusting device, consisting of the screws H, arms I, links J L, and lever K, all arranged to operate simultaneously, and in combination with the reversing-lever F' for operating the clutch, for reversing the rollers, in the manner substantially as and for the purpose set forth.

2. The guides R Q and S T, arranged in relation to the rollers E F, in the manner as described, and for the purpose specified.

DAVID I. JONES.

Witnesses:

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