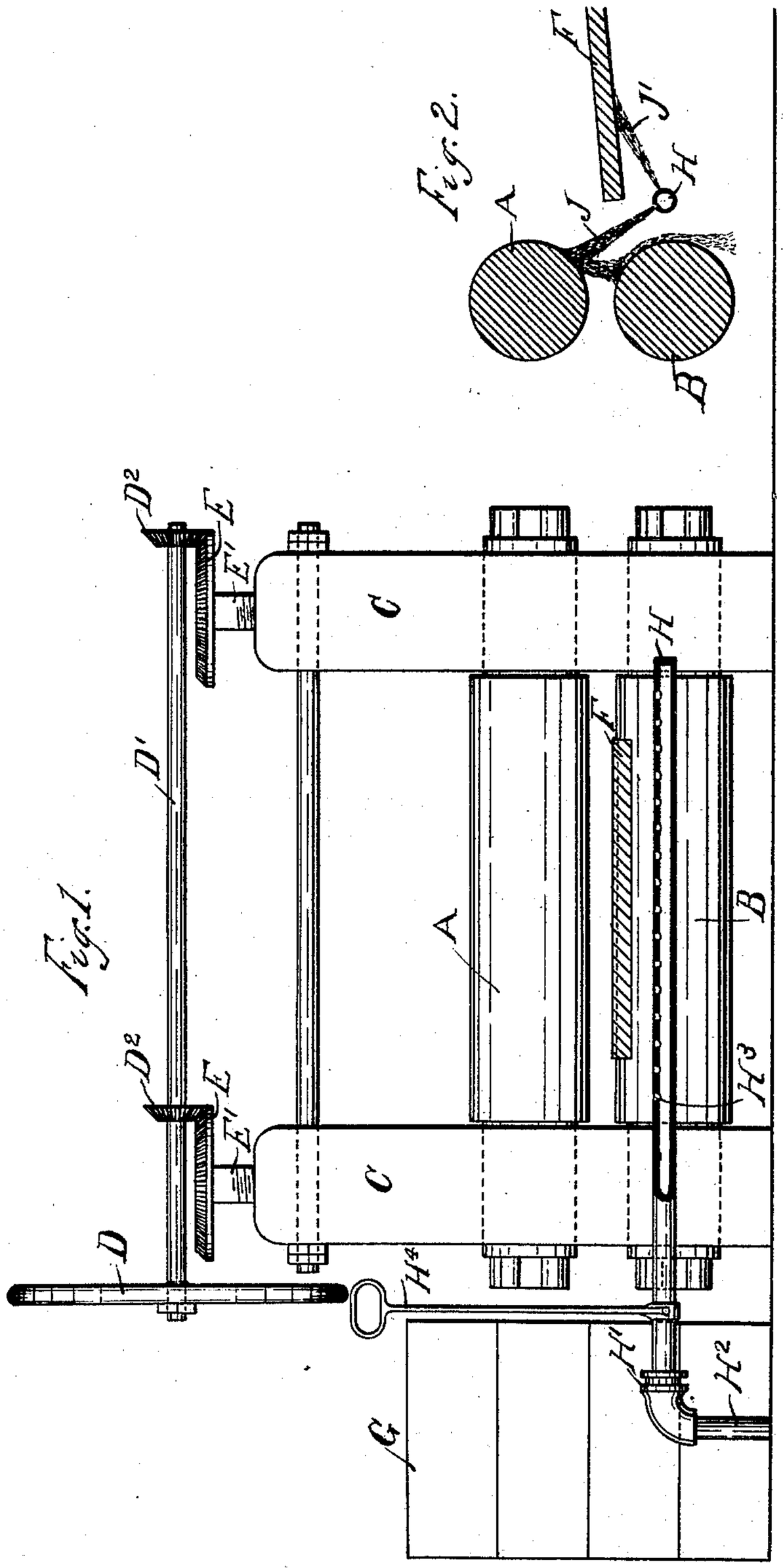
(No Model.)

F. NEWLIN.

METAL ROLL COOLING DEVICE.

No. 395,713. Patented Jan. 8, 1889.



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FRANKLIN NEWLIN, OF POTTSTOWN, PENNSYLVANIA.

METAL-ROLL-COOLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 395,713, dated January 8, 1889.

Application filed July 7, 1888. Serial No. 279,298. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN NEWLIN, a citizen of the United States, residing at Pottstown, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Metal Rolling; and I do 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 and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to the cooling of the rolls of two-high rolling-mill trains, the object being to accomplish this in such a way as to avoid the frequent cracking of the surface of the rolls incident to the usual method of cooling by means of water directed upon the top of the upper roll, and also to avoid the rapid cooling of the plates by the water, which cannot be prevented when it is employed in the above manner.

My improved method of accomplishing the purpose aimed at is fully described herein, the accompanying drawings showing a preferred arrangement of mechanism for carrying it into effect.

Figure 1 is a front elevation of a pair of rolls, showing my cooling apparatus in position. Fig. 2 is a section through A B of Fig. 1.

A represents the top roll, and B the bottom roll, of one set of an ordinary two-high train for rolling plates. They are journaled in the usual manner in the housings C and rotated continuously in opposite directions. The space between the rolls, which determines the thickness to which the plate is reduced at each successive pass, is regulated by turning the wheel D on the shaft D′, bevel-wheels D^2 on the latter gearing with those marked E on the vertical adjusting-screws E′.

In operating an ordinary rolling-mill such as is described above the heated iron is placed upon the fore-plate F, and is quickly drawn between and through the rolls, seized on the opposite side, and returned over the top roll, A, the rotation of which carries it toward the fore-plate for another pass, the rolls being meanwhile closed somewhat by an operator on the platform G turning the wheel D. The continual passage of the hot iron between and over the rolls would soon compel the stoppage of work to allow the rolls to cool if means were not provided to effect this during the operation. The usual methods employed include a constant flow of water directed upon the top roll. While the heated iron is passing through the rolls this water is caught upon its upper surface from the top roll. While it is being returned over the top roll after being reduced in thickness and increased in length the whole body of this water strikes it directly, spreading over and remaining upon it. This not only cools the plate, so as to materially reduce the number of passes which can be made at one heat, but, what is still more objectionable, prevents to a great extent the accomplishment of the very purpose for which the water is employed, for it cannot touch the rolls at all during the return of the iron, which is decidedly the best time to effect the cooling of the rolls. The method I employ in order to overcome this great disadvantage involves the use of very simple means. A pipe, H, closed at one end and preferably supported in a stuffing-box, H′, at the other and communicating with an outlet-pipe, H^2, is perforated with a line of holes, H^3. This pipe is secured in position under the fore-plate F and in front of the lower roll, B, and is provided with a lever, H^4, by means of which the operator on the platform G may turn the pipe sufficiently to direct the jets of water which issue from the perforations H^3 either against the under surface of the top roll, A, as indicated by the jet J, or against the under side of the fore-plate F, as shown by the jet J′. When the iron is passing through the rolls, the jet J would strike its under side, but would be instantaneously deflected from it and fall upon the lower roll, B. After it had passed through the rolls, however, and during the whole of the time taken up in returning it for another pass, the water would strike the under surface of the roll A and then fall upon the roll B and effectually cool them both after each pass of the iron. If the pipe is turned during the pass so as to direct the water against the fore-plate, as shown at J′, the water will never touch the heated iron at all; but even if not so turned the loss of heat to the iron would be of little consequence compared with that

occasioned by the usual method, before referred to, of allowing it to strike the top of the plate. A double saving is therefore effected by employing my method of cooling. The rolls are so thoroughly cooled after each pass of the metal that there is no necessity for intermitting the work, and the surface of the roll is not rendered unserviceable by reason of cracking. The changing of the rolls, which is a source of great expense, is thus required much less frequently, and at the same time a greater number of passes can be made with one heating and with less wear and tear of machinery.

What I claim as my invention is as follows:

The method herein described of cooling the rolls of a two-high train while rolling, which consists in projecting water upwardly against the top roll, so as to strike below its center line and be deflected upon the top of the lower roll, substantially as set forth.

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

FRANKLIN NEWLIN.

Witnesses:
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P. A. BUSHONG.