(No Model.)

T. REED & J. HOLLOWAY.

ROLL FOR ROLLING MILLS.

No. 344,403. Patented June 29, 1886.

FIG. 1.

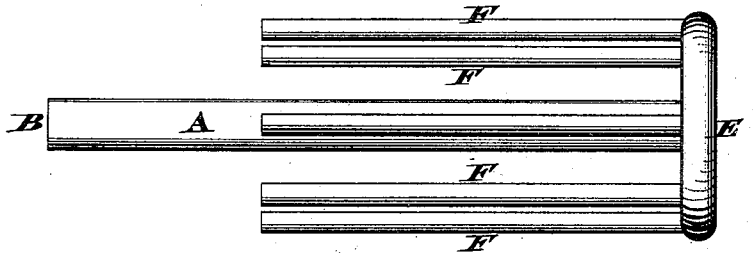


FIG. 3.

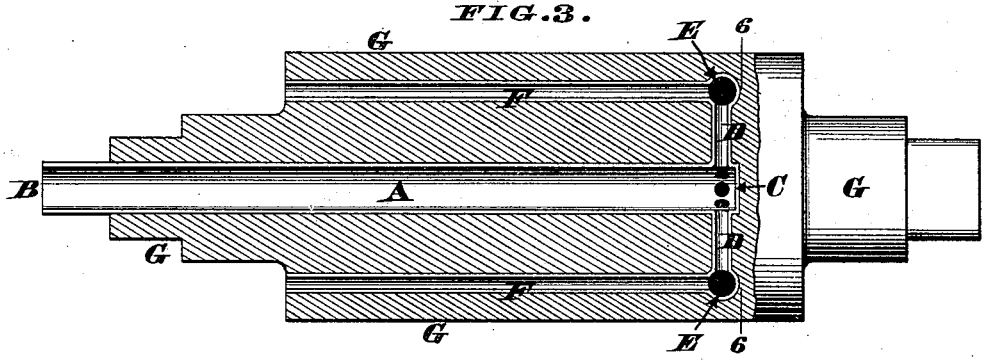


FIG. 2.

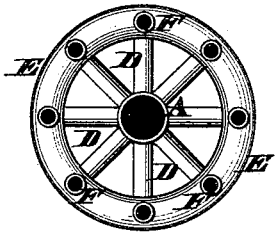


FIG. 4.

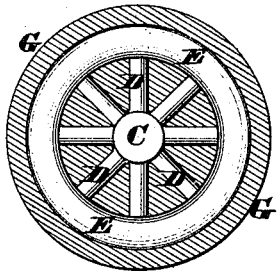
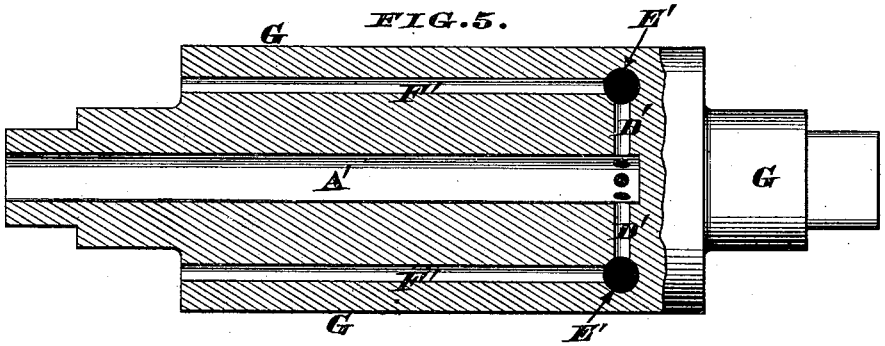


FIG. 5.



Attest.
S. S. Carpenter
L. C. Layman

Inventors.
Thomas Reed & Jeremiah Holloway
by James H. Layman
atty.

UNITED STATES PATENT OFFICE.

THOMAS REED AND JEREMIAH HOLLOWAY, OF COVINGTON, KENTUCKY.

ROLL FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 344,403, dated June 29, 1886.

Application filed March 20, 1886. Serial No. 196,040. (No model.)

To all whom it may concern:

Be it known that we, THOMAS REED and JEREMIAH HOLLOWAY, both citizens of the United States, residing at Covington, in the county of Kenton, State of Kentucky, have invented certain new and useful Improvements in Rolls, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to those rolls which are provided with internal channels for the passage either of air, steam, or water, wherewith the casting is maintained at any suitable temperature; and the first part of our improvements comprises a novel arrangement of such channels. Of these channels our main or inlet passage occupies the axis of the roll and is open at one end, but closed at the other end, where a series of radial or lateral passages communicate with said inlet. These radial passages lead into an annular chamber, and the latter communicates with a series of return or branch channels running longitudinally of the roll and as near its periphery as the strength of the metal will permit. By this arrangement the tempering-current is first introduced along the axis of the roll, is then dispersed outwardly, and finally escapes through the return or discharge passages, as hereinafter more fully described.

The second part of our improvements consists in forming these various channels, passages, &c., by a series of connected pipes or tubes, which pipes are placed in a mold, and the roll is then cast around them, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a side elevation of the aforesaid system of connected pipes. Fig. 2 is an enlarged end elevation thereof. Fig. 3 is an axial section of a roll cast around the pipes. Fig. 4 is a transverse section of said roll, taken at the line 6 6 of the preceding illustration. Fig. 5 is an axial section of a modification of our invention.

A represents a main pipe or tube open at the end B, but closed at the opposite end, C, where a series of smaller tubes, D, radiate from said main pipe. These radial tubes D communicate with a hollow ring or annulus, E, provided with branch pipes F. These branches are about parallel with the main pipe A, but somewhat shorter than the latter, and their exposed ends are open, as seen in Fig. 3. Of these branches, as many may be used as circumstances suggest, from eight to twelve being employed for an ordinary sized roll. After these pipes have been securely fastened together, they are hung vertically within a suitable mold, and the roll G, (seen in Fig. 3,) is cast around them. As a result of this procedure, the main pipe A occupies an axial position within the roll, while the hollow ring E is located near one end of the same; but the branch pipes F are comparatively near the periphery of the roll, and the exposed ends of said pipes are seen at the end of the latter most remote from the hollow ring E. Furthermore, Fig. 4 shows that the metal composing the roll completely surrounds the ring and the radial arms, thereby rendering the casting as rigid as though it were solid.

After the roll has been properly turned down it is journaled in a pair of housings in the usual manner, and it is at once ready for use as soon as a hose or other suitable connection is coupled to the open end B of pipe A.

If the weather should be very cold, a current of steam or warm air can be first admitted through the pipe A for the purpose of gradually heating the roll preparatory to using the same; but as soon as the hot bars, plates, or sheets are passed between the rolls the steam or heated air can be shut off and cold air or water be discharged through the various channels to prevent the casting becoming too highly heated. Whether hot or cold air or steam or other vapor be employed the action is the same—that is to say, the air or water first traverses the axial pipe A, then flows through the radial tubes D into the hollow ring E, from which latter it escapes along the branch pipes F, and is finally discharged at the exposed ends of the latter. It will thus be seen that the cooling or warming of the roll first begins at the very axis of the same, and then proceeds toward its periphery, thereby rendering the process a gradual and uniform operation and preventing the casting from becoming injured by suddenly changing the temperature of the same.

The above is a description of the preferred construction of our rolls; but it is evident the

details may be modified without departing from the spirit of the invention.

An obvious modification is seen in Fig. 5, where all the pipes, &c., are omitted, and channels A′, D′, E′, and F′ are substituted therefor, said channels being formed by casting the roll around cores which latter are subsequently removed.

We claim as our invention—

1. A roll provided with an axial inlet-channel, A′, open at one end, but closed at the other end, where a series of passages, D′, proceed from said inlet and lead into an annular chamber, E′, with which latter communicates a series of longitudinal branch channels, F′, located comparatively near the periphery of the casting, by which arrangement the tempering-current is caused to enter at one end of the axis of the roll and then be conducted almost to the opposite end of said axis, whence it is deflected outwardly, and finally returns through the branch channels and escapes at the receiving end of said roll, as herein described.

2. As a new article of manufacture, a roll formed by casting metal around a main pipe, A, radial tubes D, hollow ring E, and branches F, which branches are located comparatively near the periphery of the casting, as herein described.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS REED.
JEREMIAH HOLLOWAY.

Witnesses:
JAMES H. LAYMAN,
SAML. S. CARPENTER.