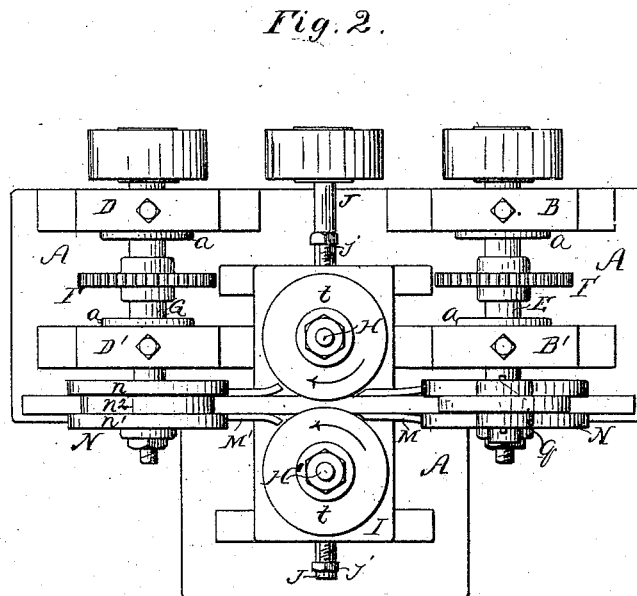
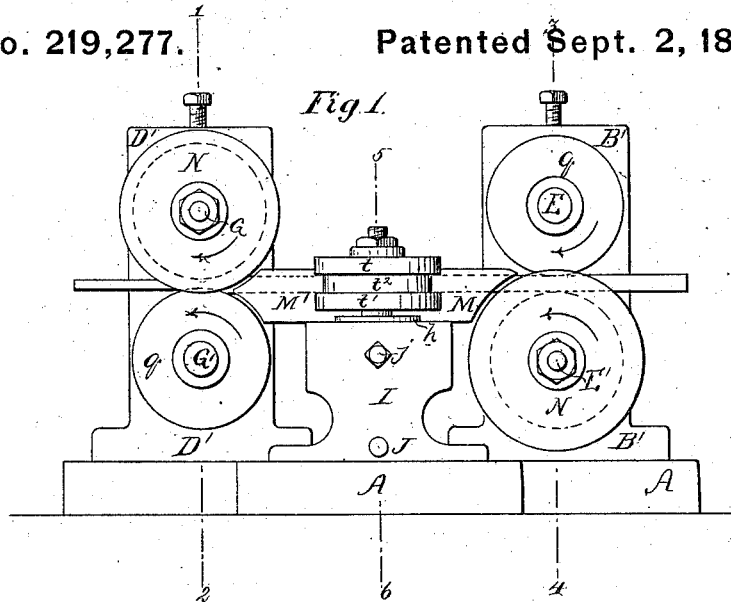


J. N. LAUTH.
Rolling-Mill.

No. 219,277.

Patented Sept. 2, 1879.



Witnesses
Henry Brown Jr.
Harry Smith

Inventor
John N. Lauth
by his Attorneys
Howson and Son

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Fig 3.

Fig 4

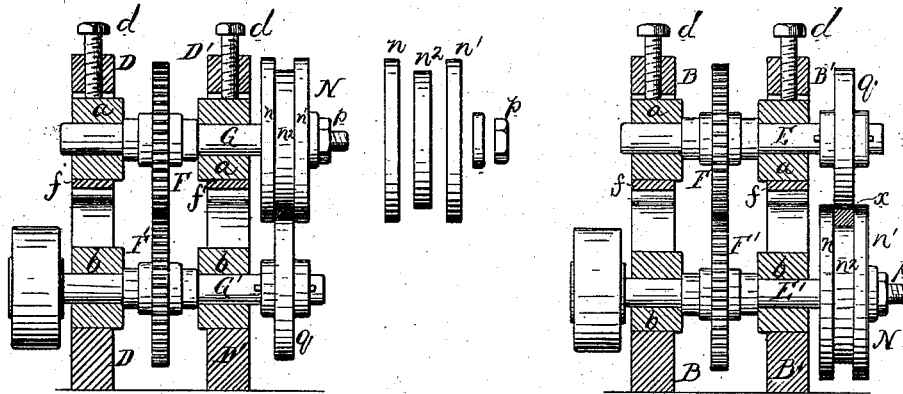
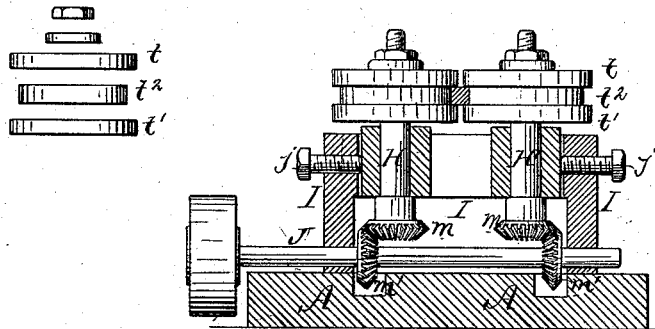


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN N. LAUTH, OF HOWARD, PENNSYLVANIA.

IMPROVEMENT IN ROLLING-MILLS.

Specification forming part of Letters Patent No. **219,277**, dated September 2, 1879; application filed May 15, 1879.

To all whom it may concern:

Be it known that I, JOHN N. LAUTH, of Howard, Centre county, Pennsylvania, have invented a new and useful Improvement in Rolling-Mills, of which the following is a specification.

My invention relates, principally, to that class of rolling-mills in which two or more pairs of rolls operate in unison; and one of the main objects of my invention is to so construct a rolling-mill of this class as to lessen the tendency of the grooves of the rolls to become worn at the sides.

In the accompanying drawings, Figure 1 is a side view of my improved rolling-mill; Fig. 2, a plan view; Fig. 3, a transverse vertical section on the line 1 2, Fig. 1; Fig. 4, a section on the line 3 4; and Fig. 5, a section on the line 5 6.

To a suitable bed-plate, A, are secured the two standards or housings B B' and two similar housings, D D'. A shaft, E, is adapted to bearings *a a*, fitted to the housings B B', and the lower shaft, E', to lower bearings, *b b*, in the same housings, the two shafts being geared together by wheels F F'. The upper bearings, *a a*, are confined to their places by screws *d d* and rest on detachable plates *f f*, which may be removed to make way for thinner or thicker plates, as the desired adjustment of the rolls may demand.

Similar bearings for the shafts G G' are adapted to the housings D D'.

At a point midway, or thereabout, between the two pairs of housings are two vertical shafts, H H', the bearings of which are adapted to horizontal guides on a frame, I, secured to the base-plate A, screws *j j* passing through the ends of the said frame, and serving to adjust the bearings when necessary. To the lower end of each of the vertical shafts is secured a bevel-wheel, *m*, each wheel gearing into a like bevel-wheel, *m'*, on a horizontal shaft, J, which has its bearings in the ends of the frame I.

The several shafts are caused to revolve simultaneously and in unison in the directions pointed out by the arrows by belts, or by any suitable system of gearing.

All the shafts E E' and G G' project beyond the housings, and the vertical shafts H H' above their bearings.

To the projecting end of the shaft E' is secured the grooved roll N, composed of three plain disks, *n*, *n'*, and *n''*, the latter of less diameter than and intervening between the disks *n n'*. The disks are confined to a collar on the shaft by a nut, *p*, on withdrawing which the disks may be removed or reversed, or replaced by new disks, as circumstances referred to hereinafter may require.

A single disk, *q*, of such a width as to fit snugly but freely between the disks *n n'* of the lower roll, is so fitted to the projecting end of the shaft E that, while it must turn with the latter, it can slide on the shaft, its position on the latter being determined by the two disks *n n'* of the lower roll. Precisely similar rolls are adapted to the projecting ends of the shafts G G', the upper roll, however, being composed of three disks, and the lower roll of one disk, similar to those described above.

To each of the vertical shafts H H' is secured a roll composed of two disks, *t t'*, and an intervening disk, *t''*, of less diameter than the others.

The heated bar is first passed between the rolls of the shafts E E', then directed by the guide M to the vertical rolls, and from them along the guide M' and between the rolls of the shafts G G'.

Rapidly-revolving rolls, such as are used for light bar and hoop iron, are liable to wear rapidly, and this is especially the case with the sides of the grooves in the lower roll shown in Fig. 4. For instance, the inner faces of the two disks *n n'* are more liable to wear at and near the points *x x* than elsewhere. These disks are made with perfectly plain surfaces, so that when either of the disks *n* or *n'* has become worn all that is necessary is to reverse it, so as to present a new surface in the groove. It is not until both surfaces of both disks have been worn that they become useless, and in such cases worn disks can be renewed by refacing them.

In order to carry this feature of my invention properly into effect, there must be no projecting portion of one disk fitting into a recess of an adjoining disk—a plan which has been resorted to. All the disks, as before remarked, must have perfectly plain faces.

I have found that there is a diminution in

the wear of the disks when the disk *q*, composing the upper roll, depends for its position longitudinally on its shaft entirely upon the two disks *n n'* of the lower roll, for in this case any end play of either of the shafts cannot cause any undue lateral bearing of the disks against each other.

The arrangement of all the rolls outside the housings insures accessibility to the rolls, and affords the best facilities for removing, replacing, or renewing the disks of which the rolls are composed.

It will be observed in Figs. 1 to 4 that on the shafts *E E'* the disk is above and the grooved roll below, while in the shafts *G G'* the arrangement is reversed, the disk being below and the grooved roll above. By this means any fin that may be formed on the up-

per edge of the strip in its passage through the first set of rolls is flattened out on the passage of the strip through the last set.

I claim as my invention—

The combination, in a rolling-mill, of a grooved roll secured to one shaft with a disk carried by another shaft, the longitudinal position of the disk on its shaft being dependent upon the grooved roll with which it engages, all as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN N. LAUTH.

Witnesses:

DOLPHUS TORREY,
I. S. HENRY.