B. LAUTH.

ROLLS FOR ROLLING HOOP-IRON.

No. 172,457. Patented Jan. 18, 1876.

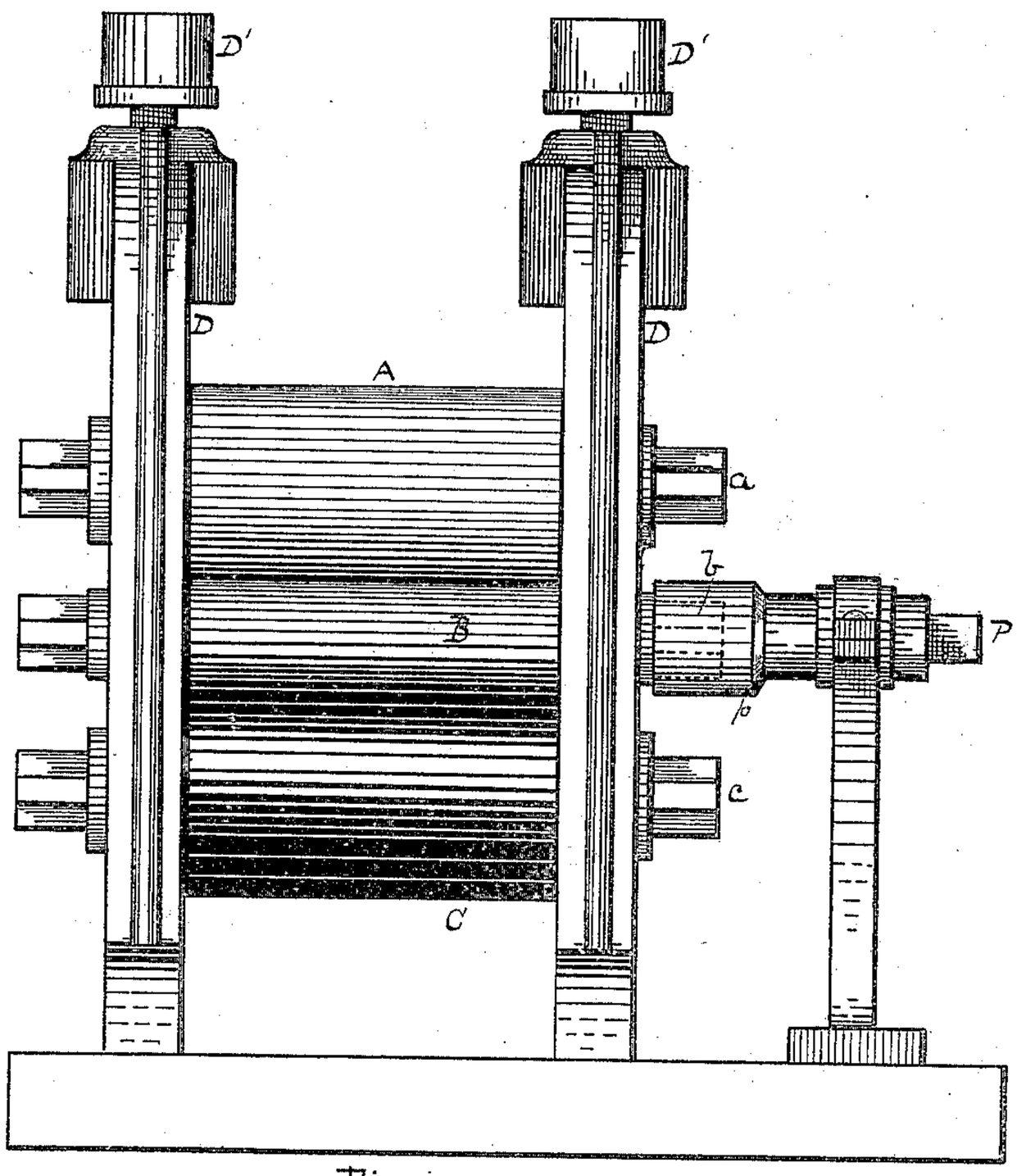

FIG. 1.

Witnesses.

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UNITED STATES PATENT OFFICE.

BERNARD LAUTH, OF HOWARD, PENNSYLVANIA.

IMPROVEMENT IN ROLLS FOR ROLLING HOOP-IRON.

Specification forming part of Letters Patent No. **172,457**, dated January 18, 1876; application filed December 18, 1875.

To all whom it may concern:

Be it known that I, BERNARD LAUTH, of Howard, county of Centre, State of Pennsylvania, have invented or discovered a new and useful Improvement in Hoop-Rolling Mill; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a side elevation illustrative of my improvement.

My present invention relates to an improvement in the three-high-roll mill patented to me January 19, 1864, No. 41,307, by means of which such mill is adapted to the rolling of hoop and other narrow strips of iron.

The three-high rolls, as used prior to the present improvement, were driven by power applied to the lowest roll, the usual coupling-connection being made only with the neck of such roll. I have found that in using such rolls so coupled up there is a tendency in the middle roll to work endwise, so that in rolling hoop-iron the bearings or housings will frequently be broken by such endwise pressure. This difficulty is not experienced in rolling broad sheets, and I can only account for the difference in result by the fact that in rolling broad sheets the frictional contact is so great as to overcome such endwise tendency; whereas, in rolling hoop-iron, the resistance to endwise motion caused by the bite is so small that the difficulty manifests itself with injurious results. I can account for this endwise tendency of the middle roll only on the theory that it is practically impossible to bring the axial lines of three such rolls mathematically in the same plane, and, as the two upper rolls, when coupled as described, run by frictional contact alone, any divergence of the axial line of the middle roll from such plane will result in one end being driven with more power than the other, which latter will result in the endwise tendency referred to; also, the entering of a hoop or other narrow sheet on either side of the middle point of the rolls will increase the same tendency. But whatever may be the cause of such endwise tendency it frequently results, when the coupling-connection is made with the lower roll, as is usually the case, and the rolls are used for rolling hoop-iron, in the breaking of the bearings or housings; but I have found that by making the coupling-connection with the middle roll, so as to apply the driving-power to that roll alone, I am enabled so to steady or hold such roll in its action as to overcome such tendency and make the roll run true.

A, B, and C represent the rolls of the ordinary three-high rolling-mill, mounted in any suitable housing, D, and held to their work by the usual pressure-screws D′, or equivalent weights. As shown in the drawing, each of these rolls may have the usual coupling-neck *a b c*, for convenience in changing the connection with the driving-power when changing from hoop to sheet, or vice versa; but for the purposes of my present improvement I couple the driving-shaft P, by any suitable form of coupling, *p*, to the coupling-neck *b* of the middle roll B. The lower roll is firmly supported in its bearings. The upper roll is held in place by the pressure-screws, in the usual way, and the strain on the middle roll, or the gripe of the coupling thereon, operates in such way as practically to prevent the lateral motion referred to to any such extent as to act injuriously on the machinery or on the product.

Such has been the result of practical experiment, and, as a consequence of this improvement, the three-high rolls are adapted to the rolling of hoops, as well as sheets and plates, not limiting myself, however, to hoop-iron, but including, also, other metals and mixtures of metals as to which a narrow, thin product is desired.

The operation described is intended chiefly for finishing and planishing the hoop, which has hitherto been done usually in a two-high mill; but I have found that with a small roll, smaller than can be safely used in a two-high mill for this purpose, I can produce a better article. For some reason or other a small roll will spread the hoop less than a large one; and as spreading is one cause of ragged edges the lessening of this tendency is a material matter; also, a small roll, perhaps from having a shorter bite in the direction of the feed, will give a smoother and better finish to the product.

Another advantage in coupling to the mid-

dle roll is this: that when the coupling is made with the lowest roll only, the two upper rolls run by friction alone, and in rolling narrow iron the frictional contact is often not sufficient to effect their rotation, particularly when the endwise tendency of the middle roll manifests itself, as above stated; but by coupling to the middle roll there is but one roll above and one below to be run by friction, and the endwise tendency being obviated, as above described, no difficulty on this account is experienced.

I claim herein as my invention—

In a three-high rolling-mill, the upper and lower rolls A C, in combination with an intermediate roll, B, of less diameter, through which intermediate roll the driving-power is communicated by a coupling-connection from the driving-shaft, substantially as set forth.

In testimony whereof I have hereunto set my hand.

BERNARD LAUTH.

Witnesses:
A. H. PEACOCK,
JOHN N. LAUTH.