A. R. BOLUSS.

Rolls for Rolling Metal.

No. 167,734. Patented Sept. 14, 1875.

FIG. 1.

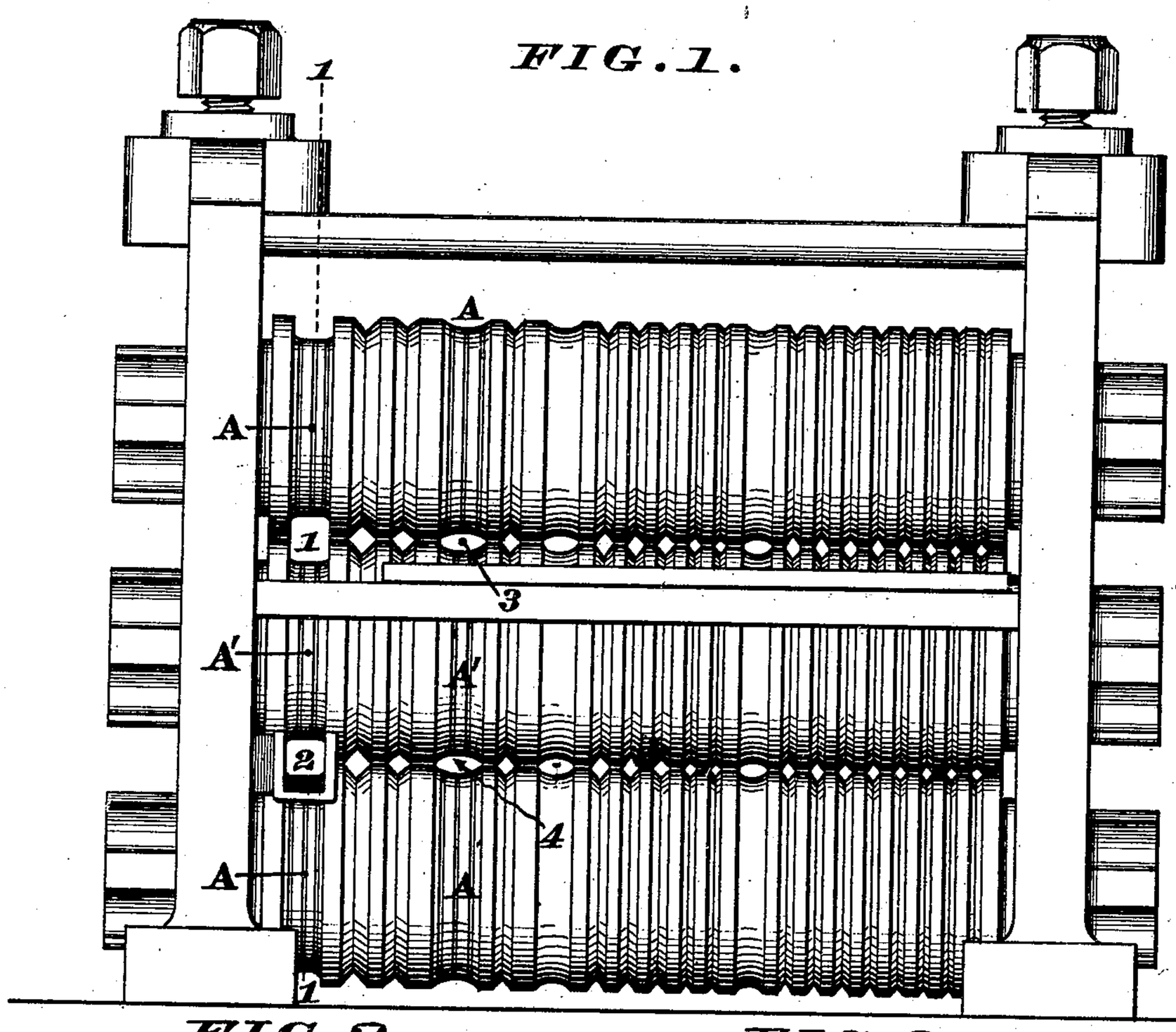



FIG. 2.

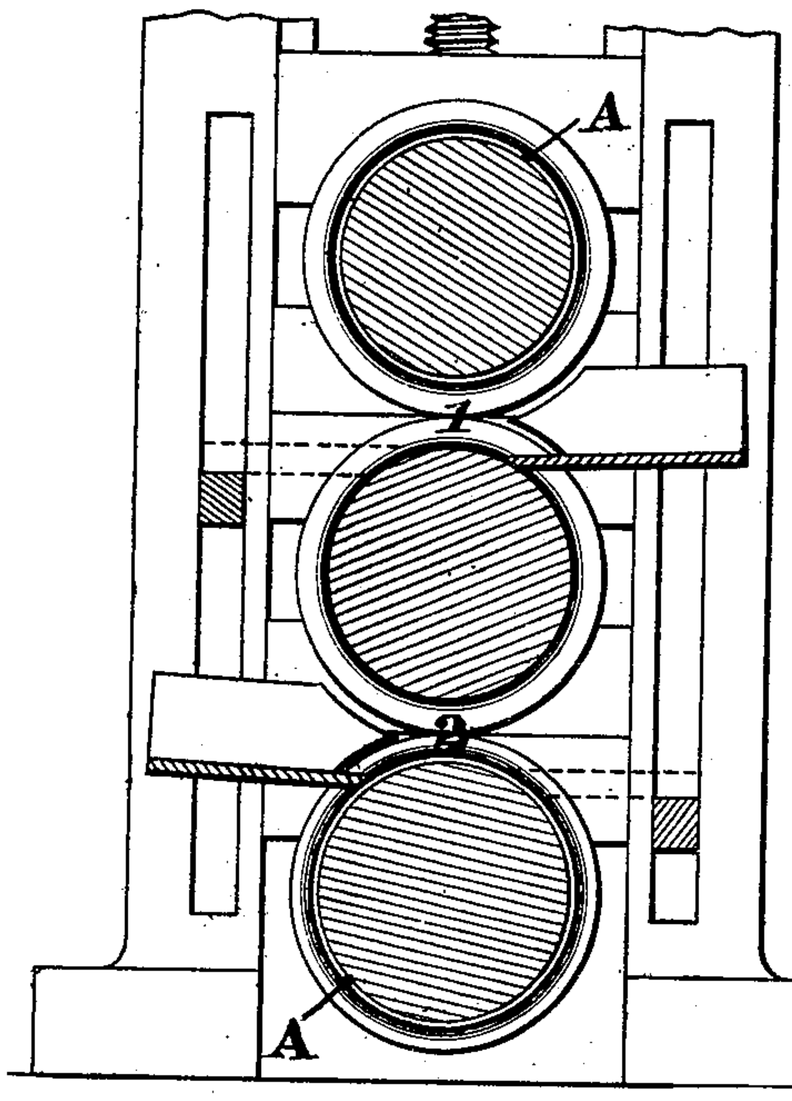
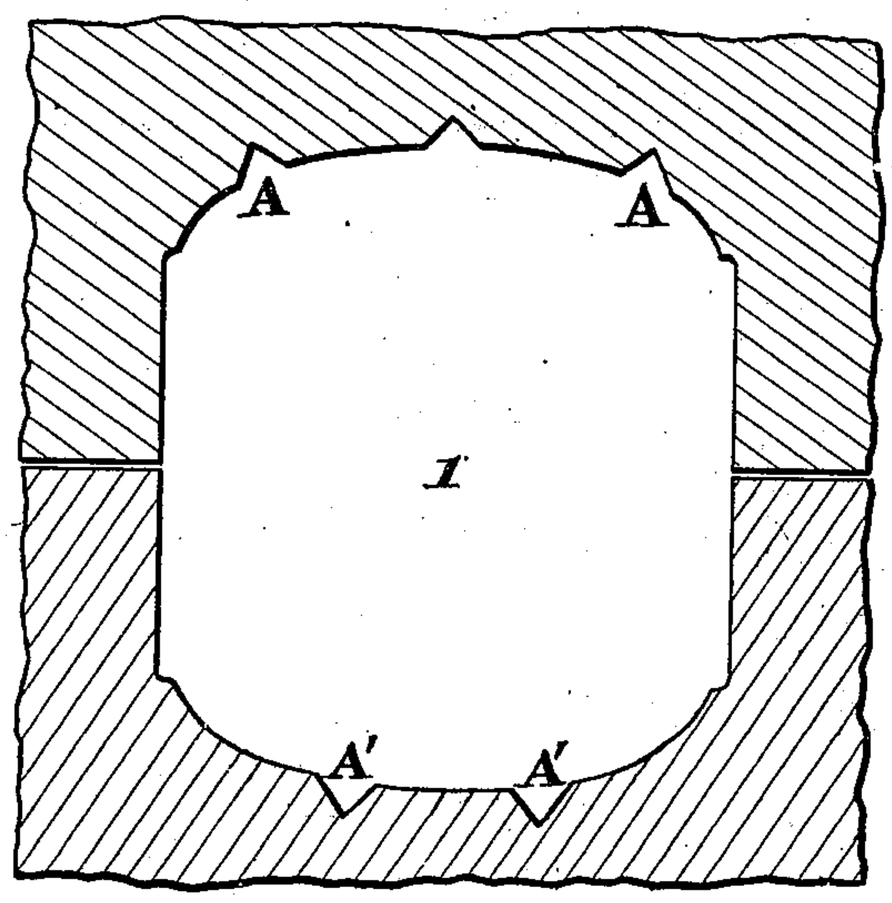



FIG. 3.




Attest.
Jas. H. Layman.
Chas. J. Booch

Alfred R. Boluss
By Knight Bros. Att'ys.

# UNITED STATES PATENT OFFICE.

ALFRED R. BOLUSS, OF CINCINNATI, ASSIGNOR TO WILDER, BOLUSS & CO., OF CINCINNATI, OHIO.

## IMPROVEMENT IN ROLLS FOR ROLLING METAL.

Specification forming part of Letters Patent No. **167,734**, dated September 14, 1875; application filed June 21, 1875.

*To all whom it may concern:*

Be it known that I, ALFRED R. BOLUSS, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Process of Rolling Iron, of which the following is a specification:

My invention consists in a new and improved apparatus for manufacturing bar, rod, and hoop iron, of any desired form, directly from a "muck-bar" whose width or depth, in a vertical direction within the rolls, is largely in excess of its thickness.

For this purpose I prepare a muck-bar of dimensions proportionate to the article to be made, and, having heated the same in a suitable oven or furnace to customary rolling-heat, I insert said heated bar, edge up, into a three-high mill, whose roughing-passes are grooved circumferentially, and I continue to roll it on edge by drawing it to and fro through such passes, until reduced nearly to the desired shape and dimensions. Said bar is then finished in proper flat or other passes, according to the ultimate form required, whether of hoop, bar, rod, guide iron, or other form.

In the accompanying drawing, Figure 1 is a side elevation of a set of three-high rolls, such as I employ for the above purpose. Fig. 2 is a section at line 1 1. Fig. 3 is a longitudinal section, to a larger scale, representing one of my roughing-passes.

These roughing-passes have grooves A and A′, which alternate in the manner shown, so that in traversing pass 2 the tendency is to obliterate the ridges formed by pass 1, a similar action taking place between passes 3 and 4. The grooves A A′ operate to hold the bar to its proper path, and to prevent any lateral spread or draft of its substance in passing through, and the portions of the periphery which intervene between said grooves, by penetrating the substance of the heated bar, operate to expel any dross or adventitious matters, and to compact the metal more effectually than said periphery would be capable of doing if not so grooved. The opposing peripheries of the rolls in each respective pass being of equal pitch or diameter, there is an equal and uniform draft on both upper and under surfaces of the bar, and consequently the action of the rolls is such as to lengthen without thickening the bar.

By this system of rolling I save the time, heat, and labor, and much of the material now wasted in the operations of piling, reheating, and removal of the "crop" or laminated ends of the bars. The quality of the iron is also found to be sensibly superior to that produced by the old and comparatively costly and wasteful processes, the iron manufactured by my process being tougher and more homogeneous, with higher malleability and tensile strength. These results are believed to due, in part, to the on-edge rolling of the muck-bar, and, partly, to the act of completely finishing, under one heat, while every portion of the metal is in an equal condition of semi-fusion, instead of, as in the old way, where the exterior is more or less burned and scaled, while the central portion is short of welding-heat.

I am aware that iron has been rolled on edge, but not—so far as I believe or am aware—directly from the muck-bar.

I claim as new and of my invention—

The three-high rolls, having the alternately-grooved passes 1 2 3 4 for the purpose of rolling iron on edge from a muck-bar, in the manner set forth.

In testimony of which invention I hereunto set my hand.

ALFRED R. BOLUSS.

Attest:

GEO. H. KNIGHT,

S. L. WILARE.