UNITED STATES PATENT OFFICE.

ROBERT SLEETH, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO BAGALEY, YOUNG & CO., OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE OF METALLIC ROLLS FOR ROLLING IRON, STEEL, &c.

Specification forming part of Letters Patent No. 115,649, dated June 6, 1871.

To all whom it may concern:

Be it known that I, ROBERT SLEETH, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Manufacture of Metallic Rolls, Pinions, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof.

In the manufacture of rolls for rolling metals great difficulty has been experienced in combining strength, such as will resist a heavy breaking strain, with the hardness required in the face to insure durability, at a reasonable cost. For ordinary use in rolling-mills steel rolls are too expensive, since, in addition to the cost of the material and of the casting there is superadded the expense of welding up the porous faces, turning and tempering, and even then the grooved rolls are very liable to break. An ordinary cast-iron roll has too soft a face to be durable. Resort has hence been had to chilled cast-iron rolls, made from the best qualities of cast-iron. While such rolls are a great improvement on what was before known or used, they still combine but imperfectly the qualities desired.

After sundry experiments and tests I have found that a roll made of cast-iron and cast-steel combined is a great improvement on the chilled cast-iron roll; and herein consists my invention.

The proportions which seem best adapted to the purpose are about one-sixth, by weight, of cast-steel, preferably scrap-steel, old Bessemer steel, &c., to five-sixths, by weight, of cast-iron. The two metals, in about these proportions, are melted or fused in any suitable furnace, after which the casting is done in a sand or chill mold in the usual way.

The roll thus made possesses a tensile strength far above that of cast-iron alone, and a working-face apparently as smooth, hard, and perfect as steel itself. Any suitable kind of steel may be employed, but I prefer to use steel—which is now regarded as of comparatively little value, on account of the difficulty of reworking it—such as scrap-steel, old Bessemer steel, railroad rails, &c.; and this composition enables me to make an excellent and superior roll from the common and cheaper qualities of cast-iron.

I do not limit myself to the proportions above specified, since these may be varied considerably without departing from the scope of my invention, according to the quality of roll desired and the quality of metals employed. With soft iron more steel should be used, and to increase the hardness of the roll the quantity of steel should be increased, the quality of iron remaining the same.

I have thus far described my improvement with reference to the manufacture of metallic rolls. The same difficulties exist in the manufacture and use of such kindred articles as roll-pinions, and hammer or swaging and rolling dies; and the same advantageous results are secured by making the articles named from the compound of iron and steel, as already described. Hence,

What I claim as my invention, and desire to secure by Letters Patent, is—

The manufacture of metal rolls, dies, and roll-pinions from a mixture of cast-iron and steel, substantially as set forth.

In testimony whereof I, the said ROBERT SLEETH, have hereunto set my hand.

ROBERT SLEETH.

Witnesses:

W. N. HOWARD,

G. H. CHRISTY.