2 Sheets—Sheet 1.

E. A. HARVEY.

ROLLER-GAGES FOR ROLLING-MILLS.

No. 195,008. Patented Sept. 11, 1877.

Fig: 1.

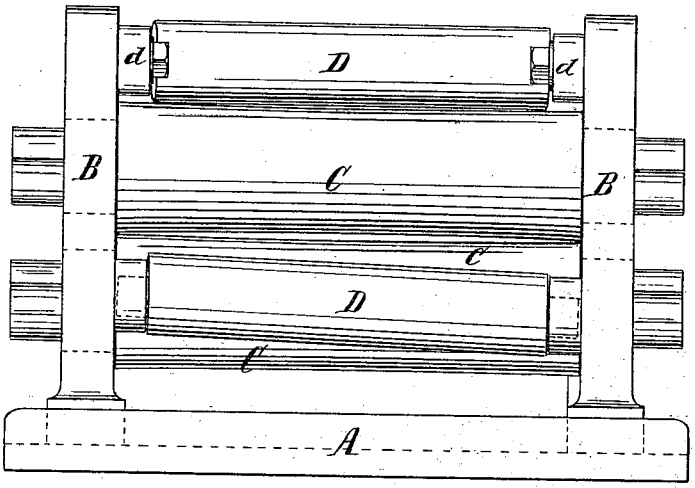

Fig: 2.

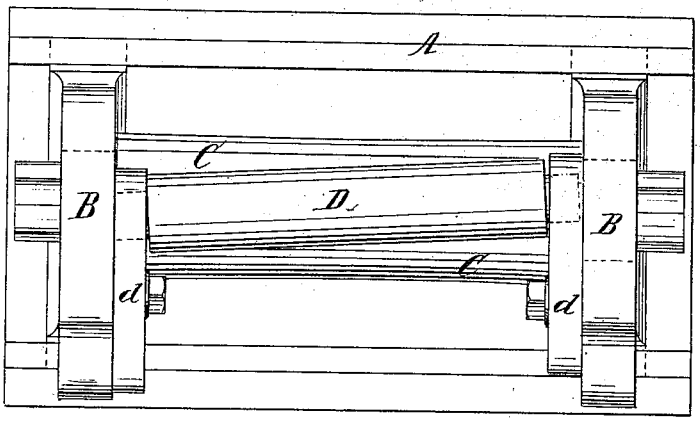

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Fig: 3.

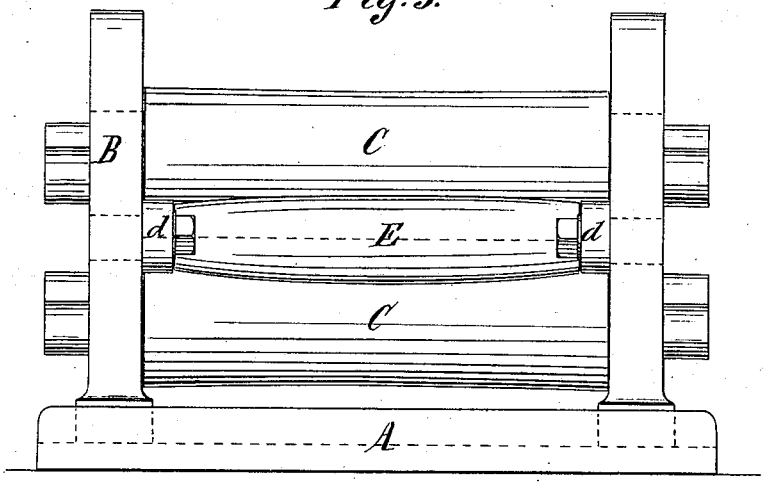
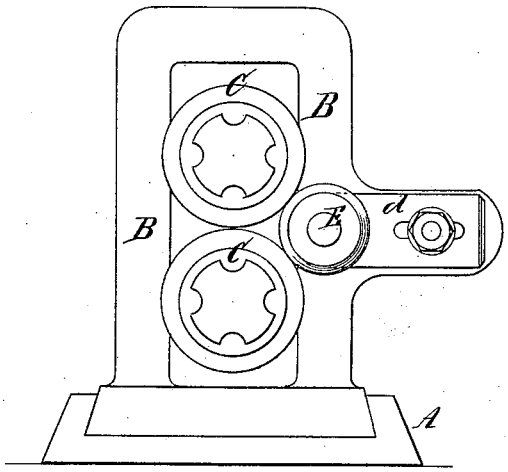


Fig: 4.



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UNITED STATES PATENT OFFICE.

EDMUND A. HARVEY, OF WILMINGTON, DELAWARE.

IMPROVEMENT IN ROLLER-GAGES FOR ROLLING-MILLS.

Specification forming part of Letters Patent No. 195,008, dated September 11, 1877; application filed June 15, 1877.

To all whom it may concern:

Be it known that I, EDMUND A. HARVEY, of the city of Wilmington, county of New Castle, and State of Delaware, have invented a new and useful Improvement in Roller-Gages for Attachment to Rolling-Mills; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a front elevation of a rolling-mill, showing a roller-gage applied to the top of the upper roll and the same applied to the side of the lower roll. Fig. 2 is a plan view. Fig. 3 is a front elevation of a rolling-mill, showing a roller-gage with a longitudinally-curved outline as applied to both rolls; and Fig. 4 is an end view of the same.

In machines for rolling sheet metal the rolls are required to be constructed with a gradually-diminishing diameter from their ends to the middle portion of their length, forming a symmetrical curved outline. The rolls, being longer than the width of the metal to be rolled, are subjected to a high heat at their middle portion, and after several heated plates have been passed between them their diameter is increased by expansion, which renders them, when constructed as described, straight upon their working faces, and in condition for use.

The ordinary wear on the rolls has a great tendency to decrease their diameter in the center, and in rolling sheets of metal of variable widths the surfaces are worn irregular.

To remedy these defects, it is customary to remove the rolls from the frame of the mill, and restore their surfaces to the proper shape by means of a turning-lathe or grinding-machine adapted to the purpose. This operation is often repeated, and much valuable time is lost in removing the rolls from, and returning them to, their positions, and consequently it is found preferable to dress their surfaces without removing them from the mill or disturbing their working bearings. This operation may be accomplished by a suitable rest or support for the turning or grinding tools, arranged in proximity to the surface of the rolls, and adjusted and operated in any well-known way.

To ascertain the proper longitudinal curvature and secure the degree of accuracy necessary in restoring the rolls to shape when dressing the same while in the mill is the object of my invention; and it consists in applying roller-gages to the mill capable of being brought in rolling contact with the surface of the rolls. These roller-gages are usually constructed either in the form of a true cylinder or of a longitudinal outline corresponding to the required longitudinal curve of the roll. When said roller-gage is made of a cylindrical form I mount the same upon adjustable bearings, and arrange it at an angle with the axis of the roll, and when made with a longitudinal curved outline I arrange the same with its axis parallel with the axis of the roll, all as hereinafter fully described and claimed.

To enable others to understand and use my invention, I will proceed to describe a rolling-mill embodying it, reference being had to the accompanying drawings, forming a part of this specification, in which—

A is the bed-plate of the mill; B B, the frame, in which the rolls C C are supported and operated in the usual manner.

D represents a roller-gage, constructed in the form of a true cylinder, and mounted within the adjustable bearings *d d* attached to the frames B B. This roller-gage is shown applied to the top of the upper roll, and is arranged to be adjusted laterally; but it may be attached to any convenient side of either of the rolls, and, if placed adjacent to the side thereof, it may be adjusted vertically, all as shown.

E represents a roller-gage, constructed with a longitudinal convex outline corresponding to the required concave outline of the roll when the reducing operation is completed. This roller-gage is arranged with its axis parallel with the axes of the rolls, and may also be placed at any convenient side of either roll. As shown in Fig. 3, it is arranged so that its surface may impinge upon both rolls, and in this location it serves to detect inaccuracies in either at the same time.

These roller-gages may be constructed of any suitable material; but I prefer to employ chilled iron, and subject them to the improved

grinding-machines now in use for producing the forms required, by means of which a true and durable surface is secured.

The devices for adjusting the bearings of the roller-gages may be of any well-known kind, and said bearings may be attached to a portable frame-work onto any convenient portion of the frame-work of the mill. The gage is applied and set in proper position relatively with the axes of the rolls, and in frictional contact therewith, so that the revolution of the rolls will convey motion thereto.

A thin coating of some suitable material or composition is applied to the surface of the gage, and as it revolves this coating will be transferred to the contact-surface of the rolls, and indicate the irregularities or places to apply the turning or grinding device.

The rolls are reduced until every portion of their surface is met by the roller-gage, which may then be removed from the mill. In practice I have found that a mixture of kerosene-oil and sufficient lamp-black to color the same produces a good coating material to apply to the gage; but any other suitable material may be used.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A surface-coated roller-gage of any required form, mounted in suitable bearings, and adapted to be brought in contact with one or both rolls of a rolling-mill, substantially as and for the purpose set forth.

2. A surface-coated roller-gage constructed in the form of a true cylinder, and mounted in adjustable bearings, and adapted to be brought at an angle with the axes of the rolls of a rolling-mill, substantially as and for the purpose set forth.

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