(No Model.) 2 Sheets—Sheet 1.

J. PHILLIPS.

DEVICE FOR TRUING ROLLS.

No. 589,572. Patented Sept. 7, 1897.

Fig. 1.

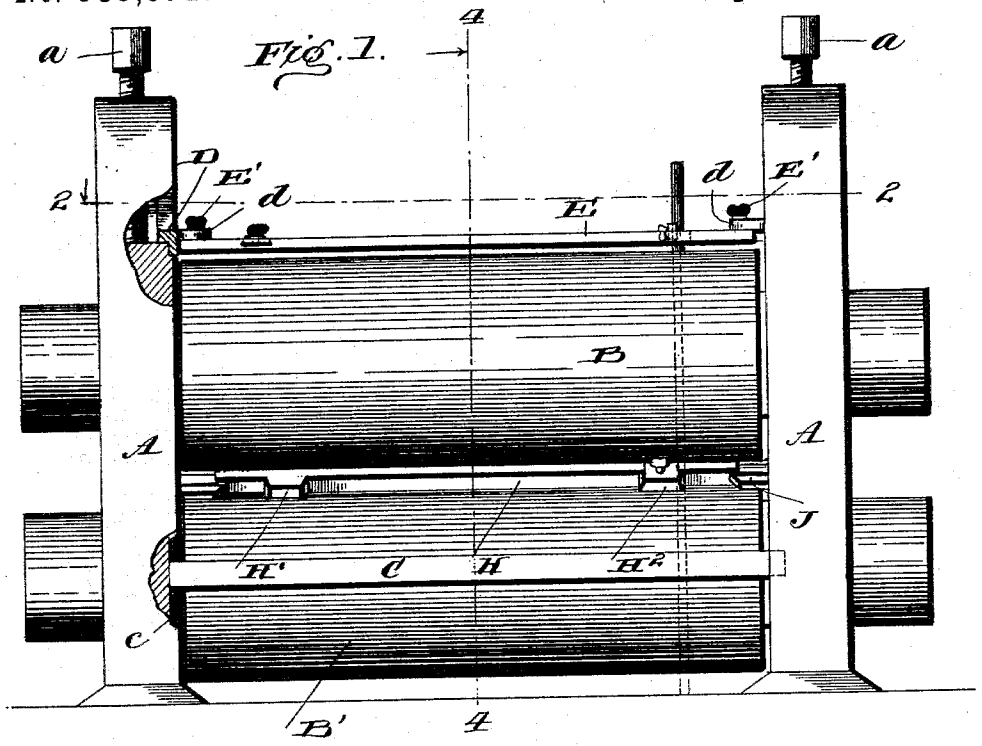


Fig. 2.

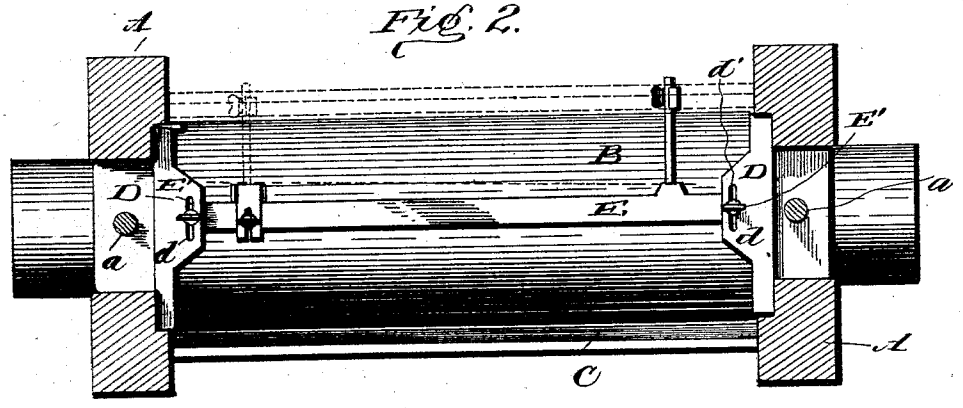
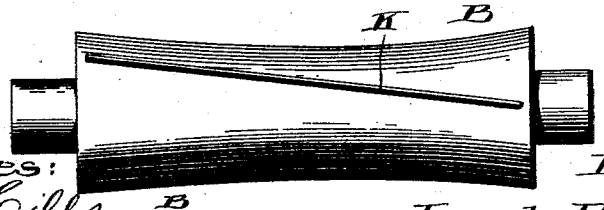


Fig. 3.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

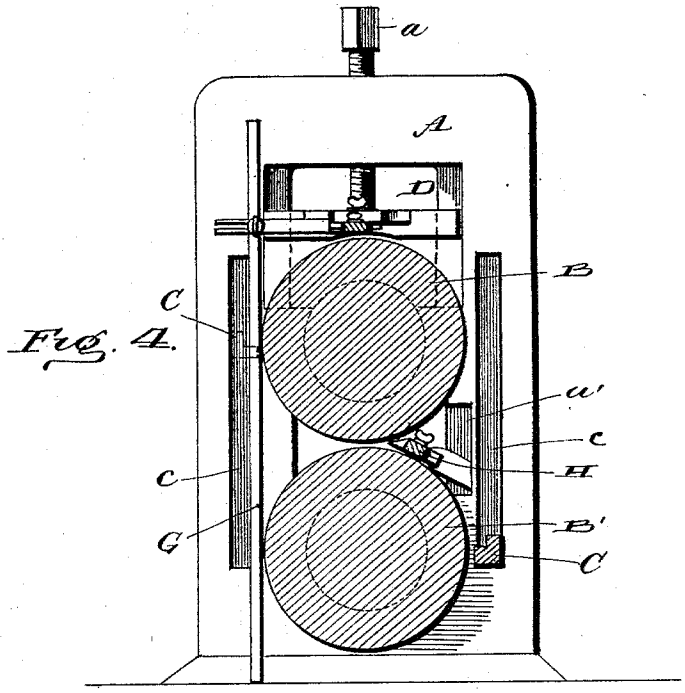
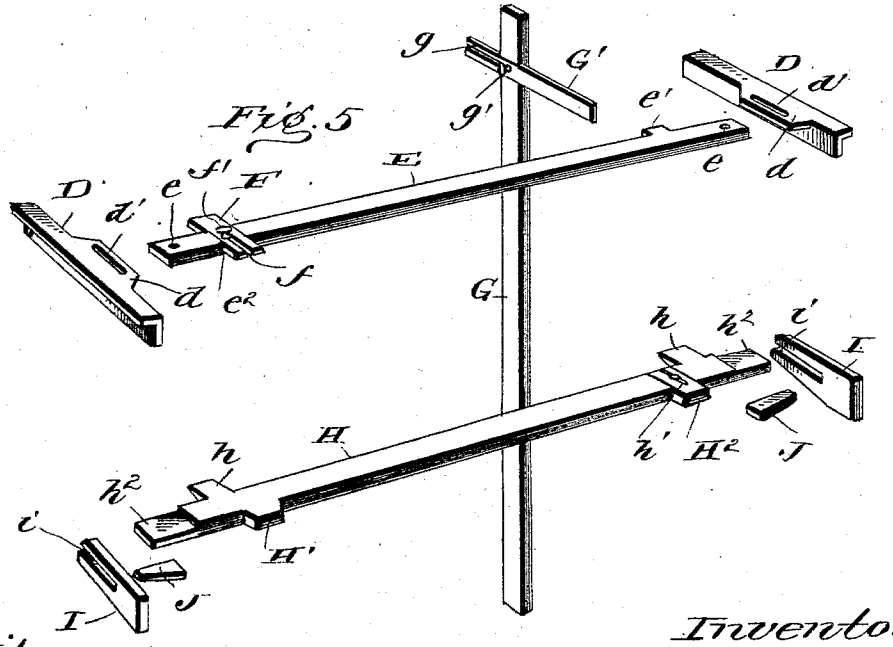


Fig. 5



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UNITED STATES PATENT OFFICE.

JOSEPH PHILLIPS, OF WASHINGTON, PENNSYLVANIA.

DEVICE FOR TRUING ROLLS.

SPECIFICATION forming part of Letters Patent No. 589,572, dated September 7, 1897.

Application filed May 29, 1896. Serial No. 593,628. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH PHILLIPS, a citizen of the United States, residing at Washington, in the county of Washington, State of Pennsylvania, have invented certain new and useful Improvements in Gage Devices for Roll-Turning Mechanisms, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to means for gaging turning-rolls and for governing the application of cutting or grinding devices employed in the act of producing a desired peripheral outline in turning-rolls or rolls employed in sheet or irregular forms of metals.

Primarily this invention has relation to a means for determining the peripheral outline of rolls employed in rolling hot sheets in sheet or tin mills, but it is as well adapted to determining the outline of any form of grooves in rolls intended to roll metal into bar or sheet form. In metal-rolling there is always lateral expansion and in tin mills it is customary to give a concave outline to the periphery of rolls to compensate for said expansion. The concavity of the outline is a matter requiring great skill on the part of the roll-turner, and therefore is attended with much expense. By my invention I provide means whereby a roll-turner of ordinary skill is enabled to produce satisfactory work.

One of the principal features of my invention is the embodiment of the discovery that the application of a true straight-edge to the periphery of a concave roll at a particular angle to the axial line of the roll will, if the concavity be regular in its curvature from end to end of the roll, touch the periphery of the roll throughout the length of said straight-edge. Furthermore, I have discovered that the touching of the straight-edge throughout the length of the concave will exist when the straight-edge is placed at a greater or less angle to the roll in accordance with the greater or less concavity of its periphery. Taking this principle, which may be denominated "a diagonal presentation of a straight-edge to a concave roll," and the relation of its presentation to the axis of the roll in connection with the axial line as a basis, it only remains to provide means whereby the presentation may be governed so as to be alike upon each of a series of rolls in order to produce similar concavity in all of the rolls of the series.

My invention therefore consists in the use of a straight-edge and means for determining its presentation to the periphery of concave rolls in order to determine a desired regularity in the concavity thereof.

My invention also consists in certain advantageous accessories for determining the presentation of the straight-edge for the purpose stated.

Referring to the drawings, Figure 1 is an elevation of a pair of rolls in their housings, with portions broken away and parts in section, showing my invention applied thereto. Fig. 2 is a horizontal longitudinal section on the line 2 2 of Fig. 1. Fig. 3 is a plan of a concave roll with a straight-edge in position to determine the regularity of the concave thereof. Fig. 4 is a vertical cross-section on the line 4 4 of Fig. 1, and Fig. 5 shows in perspective detail the accessories employed with a straight-edge for gaging and determining the concavity of the rolls.

Like letters of reference indicate like parts throughout the several views.

A designates the housing, and B the rolls mounted therein and which it is desired to turn or true while in the housing to thereby avoid the trouble, expense, and delay occasioned by their removal, which procedure is contemplated in the application of my invention, although said invention may be employed in turning, concaving, or testing rolls when removed from their housings to a lathe or other tool to be turned.

a are the usual adjusting-screws of the housing, exerting pressure upon the upper rolls of the stand in the usual manner.

C is a tool-rest. It is designed to be vertically adjustable in any suitable manner in the housings, and in this instance is shown as having its ends extended into vertical grooves *c* of the vertical portions of the housings, as seen in Fig. 1. This rest may be held in its adjusted position in any suitable manner. In Fig. 4 the grooves are shown upon both sides of the rolls, the rest being indicated upon the one side in full lines and the other

in dotted lines, so that it may serve as a bearing for a suitable tool for turning down the face or periphery of the rolls while in their housings.

D are brackets substantially L-shaped in cross-section, as seen best in Fig. 5, and provided with flanges or extensions d, having slots d', as clearly shown in Figs. 2 and 5.

E is the cross-bar, which is designed for the top roll and provided at its ends with openings e for the reception of the thumb-screws E′ or other means by which the said cross-bar is held to the flanges of the brackets D, as seen in Figs. 1 and 2. This cross-bar is provided near one end with a stationary lug e', extending therefrom, while at the other end it is provided with a transverse groove e^2, which may be dovetailed and in which is adjustably held the slide F, having the slot f extending in the direction of its length, while a set-screw f' engages therein and with the cross-bar and holds said slide in an adjusted position.

H, Figs. 1, 4, and 5, is another cross-bar similar to the cross-bar E, but designed for use in connection with the lower roll of a pair and adapted for such use by the provision of two lugs h, preferably wedge-shaped, which may be inserted into the bite of the rolls. The cross-bar H has a lug H′ near one end and a slide H^2 at the opposite end which is adjustable through the medium of a slot h' and a thumb-screw or bolt in a similar manner to the construction of the slide F of cross-bar E.

The cross-bar H is secured in position by means of wedge-shaped plates I, having slots i, adapted to receive the reduced ends h^2 of the cross-bar and to be engaged in the recesses or grooves a' in the housing. The solid ends of the plates I are arranged against the vertical wall of the recesses a', while the reduced ends h^2 of the bar rest in the slots of the plates. A wedge J is inserted in the slot i and against the outer edge of the bar H at each end thereof, and by the introduction of the wedge a greater or less distance the bar H is advanced more or less toward the bite-line of the roll. When adjusted in this position, the slide H^2 is adjusted so as to cause the straight-edge K, Fig. 3, to be presented at the desired angle to the axis of the roll.

G, Fig. 5, is a vertical rod having an arm G′, slotted, as at g, and provided with a thumb-screw, as g', whereby when the rod G stands in contact with the peripheries of the rolls in a housing the arm G′ may be adjusted over the top roll and to a greater or less distance from its axial line, as desired. This rod G is employed in setting the cross-bar E on the upper roll, as clearly shown in Figs. 1, 2, and 4, the cross-bar E being loosely held in brackets D, while the arm G′ bears against the lug e' and slide F.

The arms G′ may be adjusted to bring the edge of the bar E exactly parallel with the axial line, and subsequently the slide F may be moved outwardly from the bar until it projects in excess of the fixed lug e' to cause a straight-edge when placed against the lug and the slide to assume an angle to the axial line of the roll.

From the above description it will be seen that the accessories illustrated and described permit of the placing of a cross-bar having lugs, one of which is adjustable (and for that matter both may be) in such a position with relation to a roll, whether it be an upper or an under roll of a series, that a straight-edge may be applied to the roll at a desired angle to the axis thereof. This being accomplished successively during the operation of turning or shaping the face or periphery of a roll enables a workman to see where more material must be removed in order to bring the periphery to the desired conformation.

It is apparent that there are numerous forms of accessories which may be substituted for those herein shown and numerous mechanisms for temporarily applying and securing such devices and accessories to and in connection with the rolls, in order that a straight-edge may be successfully applied to the rolls for testing and gaging the same. I therefore do not limit my invention in these particulars, but apprehend and include various mechanical details of construction serving the same purpose and included within the spirit of my invention.

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

1. As a means for gaging, testing, and determining the concavity of a roll, a non-rotatable straight-edge, and stops for successively presenting the same at a predetermined angle to the axis of the roll, substantially as specified.

2. As a means for testing, gaging, and determining the configuration of a roll, a non-rotatable straight-edge, combined with means for determining its being successively put in the same position with relation to the axis of the roll, substantially as specified.

3. The combination with the housings of a roll, of a cross-bar supported by the housings and having lugs projecting different distances from the bar, and a straight-edge adapted to be placed against said lugs, substantially as specified.

4. The combination with a cross-bar having a lug and an adjustable slide, of a straight-edge adapted to bear against said lug and slide to determine the position of the edge, substantially as specified.

5. The combination with the housings of a roll, of a cross-bar, means for adjustably supporting the cross-bar on the housings, and a rod provided with an adjustable arm and adapted to rest against the rolls in the housings, substantially as specified.

6. The combination with the housings of rolls, of cross-bars each having a fixed lug

and an adjustable slide, and means for adjusting the cross-bars within the housings, substantially as specified.

7. The combination with the housings of rolls, of a cross-bar having a fixed lug and an adjustable slide, and means for determining the position of said cross-bar with relation to the axes of the rolls, substantially as specified.

8. The combination with the housings of rolls, of a cross-bar having a fixed lug and an adjustable slide, brackets, and means for connecting the bar adjustably with the brackets, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH PHILLIPS.

Witnesses:
SIDNEY PHILLIPS,
D. A. WAID.