(No Model.)

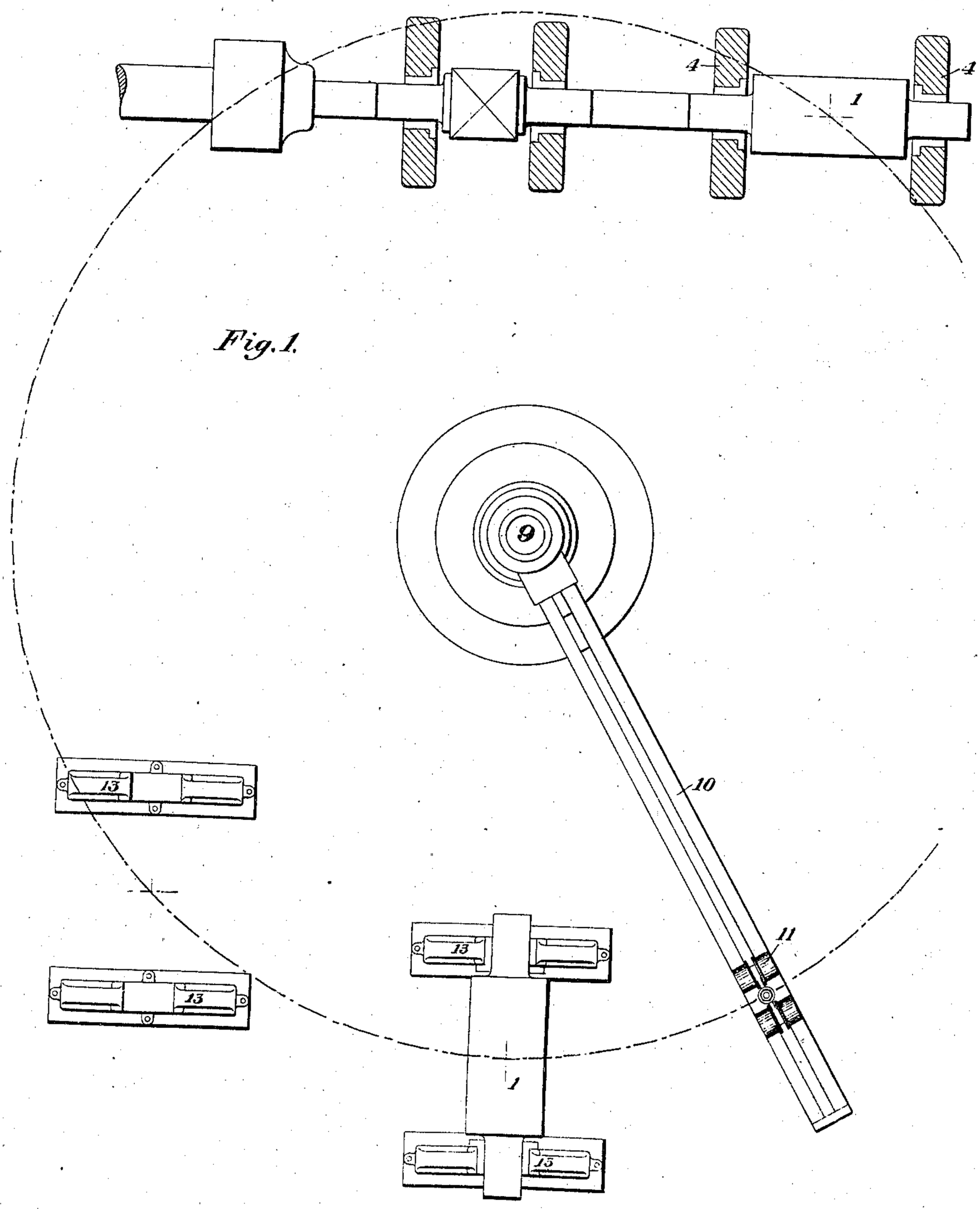
2 Sheets—Sheet 1.

W. R. JONES.

APPARATUS FOR REMOVING AND SETTING ROLLS.

No. 385,058. Patented June 26, 1888.

Fig. 1.



WITNESSES.

Thomas W. Bakewell.

W. W. Sawyer,

INVENTOR.

William R. Jones

(No Model.)

2 Sheets—Sheet 2.

W. R. JONES.

APPARATUS FOR REMOVING AND SETTING ROLLS.

No. 385,058. Patented June 26, 1888.

Fig. 2.

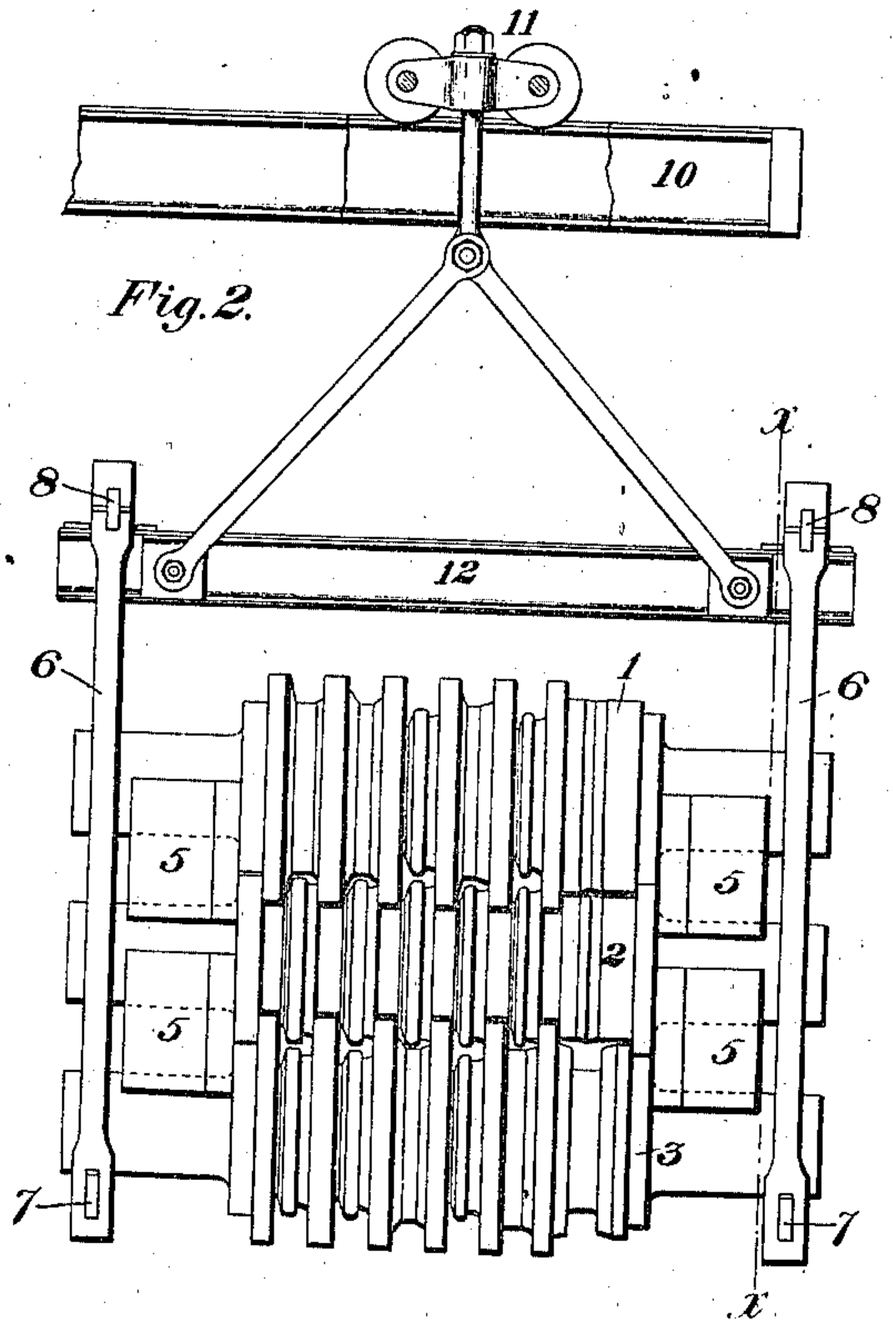


Fig. 3.

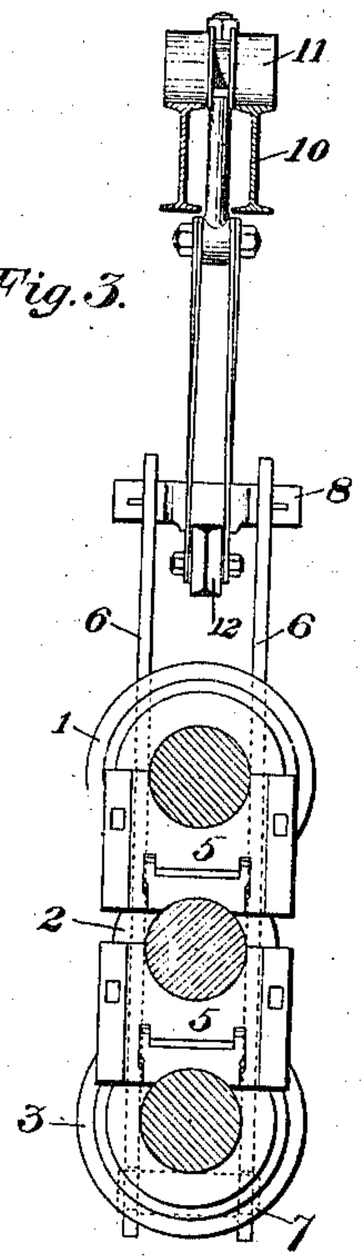


Fig. 4.

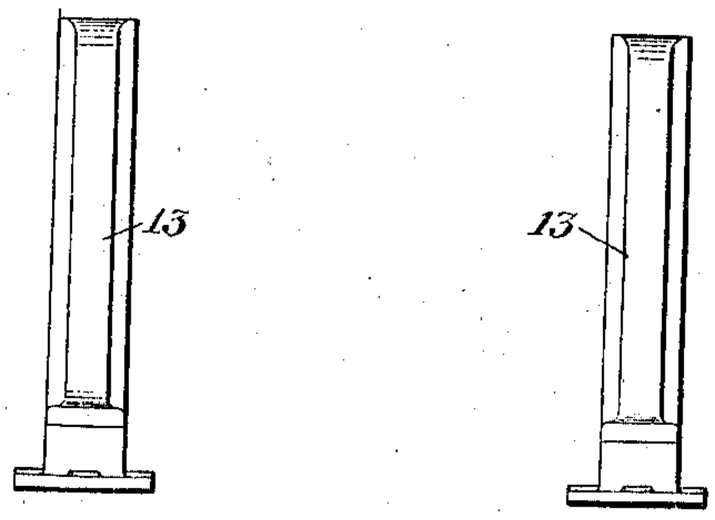
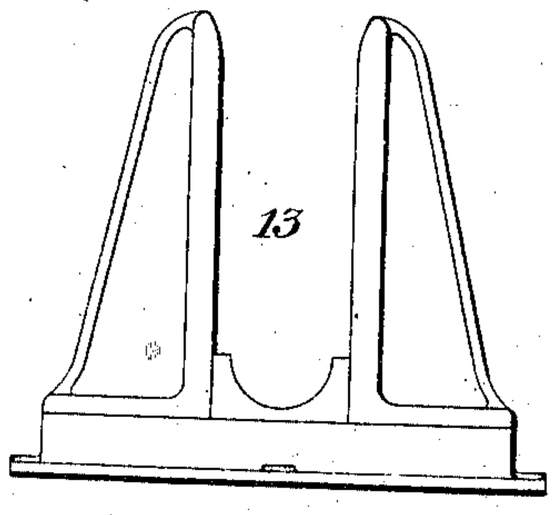


Fig. 5.



WITNESSES.

Thomas W. Bakewell.

W. N. Bowman

INVENTOR.

William R. Jones

UNITED STATES PATENT OFFICE.

WILLIAM R. JONES, OF BRADDOCK, PENNSYLVANIA.

APPARATUS FOR REMOVING AND SETTING ROLLS.

SPECIFICATION forming part of Letters Patent No. 385,058, dated June 26, 1888.

Application filed April 10, 1888. Serial No. 270,238. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. JONES, of Braddock, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Removing and Setting Rolls; and I do hereby declare the following to be a full, clear, and exact description thereof.

The object of my invention is to provide means for the easy removal of rolls from their housings and for resetting them or replacing them with a new set of rolls. This operation must be performed quite frequently in rolling-mills, and hitherto it has been the practice to lift the rolls one by one from the housings and to reset them in the same manner. The amount of time necessarily spent in this operation is considerable, and of course until the rolls are altogether removed and the new set placed in position the mill must be stopped. It is to avoid this loss and to effect a direct saving to the owners of rolling-mills that I have designed my present improvement, which has been put in practical and successful use. Instead of removing the rolls singly from the housings, as hitherto, I lift all the rolls with their bearings at once by means of stirrups or frames, which fit underneath the necks of the lower rolls and are elevated by a crane or other suitable lifting device, and having thus raised all the rolls out of the housings I carry them by the crane to a stand or temporary housing, into which they are placed, and from which they may be afterward removed at the convenience of the workmen. Another set of rolls and bearings may then be lifted by stirrups from a second stand or housing in the same way, and having been conveyed to a point directly over the roll-housings are lowered into place therein. In setting the rolls in place for use, instead of setting them one by one in the roll-housings, I first set them with their interposed bearings in the temporary stands or rests. They can there be properly set and adjusted while the mill is in operation, so that no time is lost in adjusting the rolls after they are placed in the housings proper of the train. By thus handling the rolls time and labor are saved, to the advantage both of the mill-owner and of the workmen.

I will now describe my improvement with reference to the accompanying two sheets of drawings, forming part of this specification, in which—

Figure 1 is a plan view, in diagram, of the rolls, the lifting-crane, and the stands which are designed to receive the rolls temporarily after their removal from the housings or before they are set in place therein. Fig. 2 is a front elevation of a set of three rolls, shown as being supported by the stirrups from the jib of a crane. Fig. 3 is a vertical sectional view thereof on the line *x x* of Fig. 2. Fig. 4 is a front view of the stand or temporary housing for receiving the rolls. Fig. 5 is an end view thereof.

Like symbols of reference indicate like parts in each.

In the drawings, 1, 2, and 3 represent the rolls, which are set in the housings 4 in the usual way, and 5 are the bearing-blocks, which are interposed between the necks of the rolls.

The device which I employ for lifting the rolls consists of open frames or stirrups, composed of vertical side bars, 6, connected at their lower ends by removable cross-pieces 7 and at their upper ends connected by cross-pieces 8. The side bars fit closely to the necks of the rolls, so that when they are lifted there may not be any danger of their being displaced; and in order to prevent spreading of the side bars during lifting of the rolls I provide the cross-pieces 7 with projections or lugs *b*, which engage the sides of the slot in which the cross-piece fits. The stirrups may, however, be differently constructed without involving a departure from my invention, the only essential being that they shall be lifting devices which are adapted to fit under the necks of the lowest roll, and thus to lift all the rolls together from the housings. I desire, however, to cover specifically the form of stirrups which I show in the drawings, since these form convenient means for supporting one or more rolls when being shifted from one place to another.

The carrying device which I show in the drawings consists of a crane, 9, on the jib 10 of which is mounted a trolley, 11, from which is suspended a horizontal bar, 12. In lifting the stirrups the ends of the bar 12 fit under and support the cross-pieces 8.

The mode of operation of my device is as

follows: In order to take a set of rolls from their housings, I first remove the housing-cap and disconnect the rolls from their driving-gear, and having drawn back the guide-rests out of the way of the rolls, and having removed the bearing-blocks on the top of the necks of the upper roll, I fit the stirrups to the rolls by adjusting their lower cross-pieces, 7, to the under side of the necks of the bottom rolls, 3, as shown in Fig. 2. This can easily be done, because the stirrups, being suspended from the bar 12, can be spread laterally, so that they may be placed on the sides of the housings, and can then be swung inwardly, so as to fit under the necks of the rolls, as before explained. In thus adjusting them the cross-piece 7 of the stirrup at the outer end of the rolls need not be removed; but the cross-piece of the inner stirrup should be removed, in order to clear the driving-connections of the rolls. The stirrups being suspended from the jib of the crane, a vertical motion of this crane will lift the lowest roll 3 from its bearings on the housings, thus raising all the rolls, together with their interposed bearings 5. Having been thus lifted entirely out of the housings, the rolls are moved by the crane and deposited in some convenient place. I have provided a convenient and novel device for the reception of the rolls. (Illustrated in Figs. 1, 4, and 5.) It consists of a stand or temporary housing, composed of separated uprights or end pieces, 13, the bases of which are bolted to the floor of the mill. These end pieces are set at a convenient distance apart to afford a rest or receptacle for the rolls, the necks of which project therefrom when they are set in place, as shown in Fig. 1. The rolls, when held by the stirrups, are conveyed by the crane to a point directly above one of these stands, and are then lowered into place therein. The stirrups being then disengaged, a new set of rolls may be lifted thereby from another stand and carried to the housings of the rolls, wherein they may be set at once by lowering them into place therein. By these means I am enabled to remove the rolls from the housings and to replace them very rapidly and with little labor. I thus secure the advantages which I have named above.

In Fig. 1 I show the preferable relative arrangement of the rolls, the crane, and the stands. The crane is rotary on its axis 9, and the roll housings and stands are placed relatively thereto so that the central points of the housings and of the stands shall be equidistant from the axis of the crane. I show two of the stands thus arranged; but more may be used if it is desirable. The advantages of having the housings and stands thus set in a circle whose center is the axis of the crane is that the rolls may be brought into position over the housings from either of the stands, or over the stands from the housings, without shifting the trolley on the jib. This is a convenient labor-saving device; but I do not wish to limit myself thereto, since the stands may be otherwise arranged and other forms of lifting and conveying apparatus may be used instead of the crane.

My invention is applicable both to two and three high sets of rolls and is susceptible of other modifications besides those which I have noted. In connection with the devices which I have described, I prefer to provide the housings with the arrangement of rest-bars and guides which I have described and claimed in a separate application for Letters Patent, filed April 10, 1888, Serial No. 270,239, since I am thereby enabled without disturbing the rolls to draw the rest-bars out of the path of the rolls and to leave the rolls free to be removed from the housings.

I claim as my invention—

1. An improvement in apparatus for removing or setting rolls from or in their housings, which consists in lifting-stirrups adapted to engage the lower roll and to suspend the same together with the roll or rolls above, substantially as and for the purposes described.

2. An improvement in apparatus for removing or setting rolls from or in their housings, which consists in lifting-stirrups adapted to engage the necks of the lower roll and to suspend the same together with the roll or rolls above, said stirrups having side bars which constitute a frame inclosing the necks of the rolls, substantially as and for the purposes described.

3. An improvement in apparatus for removing or setting rolls from or in their housings, which consists in lifting-stirrups adapted to engage the lower roll and to suspend the same together with the roll or rolls above, in combination with a stand or temporary housing for supporting the rolls temporarily, and a lifting device, such as a crane, whereby the rolls are transferred from the housings to the stand or from the stand to the housings, substantially as and for the purposes described.

4. The combination, with roll-housings, of a stand or temporary housing adapted to support the rolls and their bearings temporarily, and a lifting device, such as a crane, for removing the rolls from one to the other, substantially as and for the purposes described.

5. The combination, with roll-housings, of a stand or temporary housing for supporting the rolls temporarily, and a rotary crane for removing the rolls from one to the other, said housings and the stand being equidistant from the axis of the crane, substantially as and for the purposes described.

6. An improvement in apparatus for removing or setting rolls, which consists in stirrups composed of open frames having side bars and cross-pieces at the bottom, said stirrups being adapted to be suspended from a crane or lifting device, substantially as and for the purposes described.

7. An improvement in apparatus for removing or setting rolls, which consists in stirrups composed of open frames having side bars and removable cross-pieces at the bottom, said stir-

rups being adapted to be suspended from a crane or lifting device, substantially as and for the purposes described.

8. The combination, with roll-housings, of a stand or rest for supporting the rolls temporarily, said stand consisting of separated uprights 13, adapted to receive the necks of the rolls and their interposed bearings, and a lifting device, such as a crane, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 9th day of April, A. D. 1888.

WILLIAM R. JONES.

Witnesses:
THOMAS W. BAKEWELL,
W. B. CORWIN.