

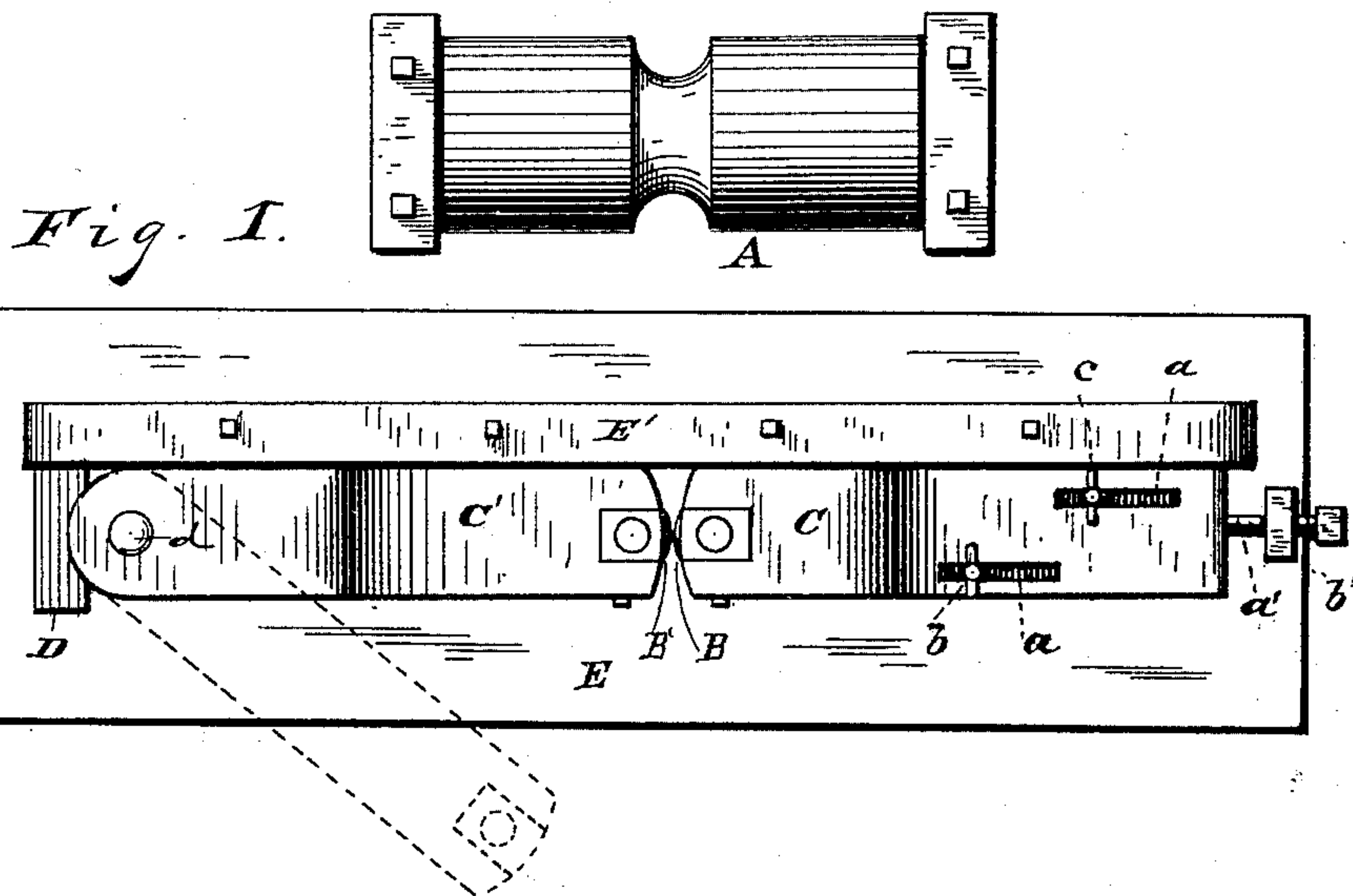
(No Model.)

J. BEAVIS.

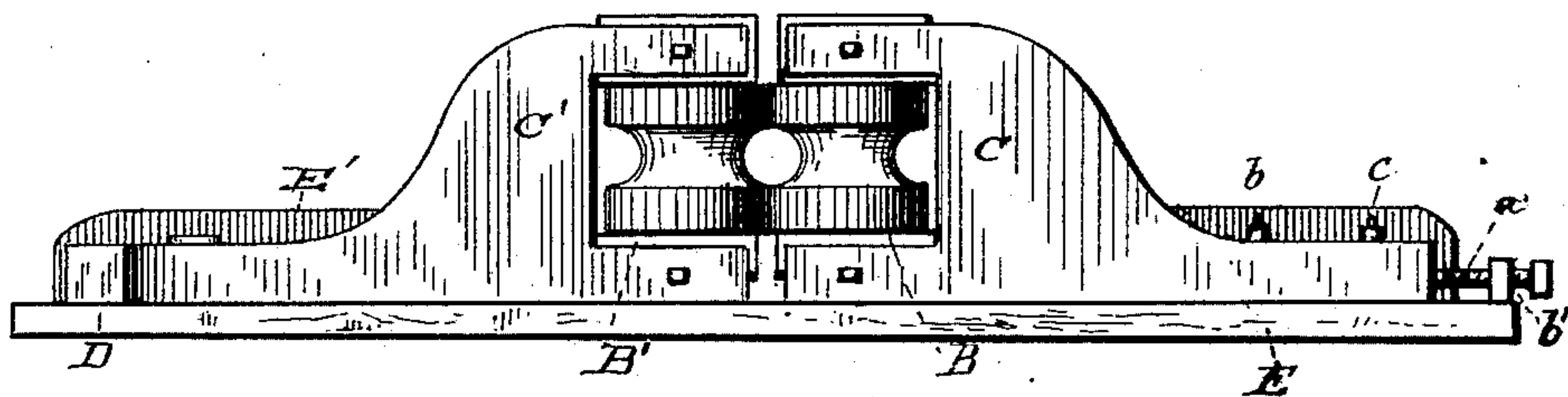
MACHINE FOR ROLLING RODS OF METAL.

No. 353,116.

Patented Nov. 23, 1886.



*Fig. 2.*



Witnesses

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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR ROLLING RODS OF METAL.

SPECIFICATION forming part of Letters Patent No. 353,116, dated November 23, 1886.

Application filed February 25, 1886. Serial No. 193,165. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN BEAVIS, a citizen of the United States, residing at Cleveland, county of Cuyahoga, and State of Ohio, have  
5 invented certain new and useful Improvements in Machinery for Rolling Metal; and I do hereby declare the following to be a description of the same and of the manner of constructing and using the invention in such full,  
10 clear, concise, and exact terms as to enable any person skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, forming a part of the specification, the principle of the invention being herein explained  
15 and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

In the rolling of metal as ordinarily practiced there is the serious objection of the formation of fins. These fins are formed on the last end of a rolling piece of metal rather than on its first end, and are due to the following facts: As the metal is run through the different  
25 passes in the rolling of any desired form of product it necessarily becomes cooler for each successive pass in the course, and by the time it gets through the last pass it is the most cool. As it cools it correspondingly grows  
30 harder, and becomes less subject to the action of the rolls, until, as it makes the last pass or two, it is quite liable to afford great resistance to them. This resistance develops itself in a tendency to press the two companion rolls of  
35 a pass apart from one another. It also develops itself in a tendency to keep the two longitudinal portions of the metal, which are in the same plane with the meeting portions of the rolls, from entering the grooved faces of the rolls. These two tendencies co-operate to  
40 produce the fins, and such co-operation is the strongest in the last one or two passes. The fins do not form alike or with equal tendency on all the different pieces of metal; but, on the contrary, it is the exception and not the  
45 rule to have a piece "finned."

With the foregoing facts in view, I have devised an auxiliary set of rolls having their grooves or rolling-faces located in a plane at  
50 right angles to the plane in which the grooves or rolling-faces of the train of rolls are located, said auxiliary set of rolls located in front of the last or the last but one or two roll-stands in

the train, and adapted to permit one or both of its companion rolls being adjusted during  
55 the operation of rolling a piece of metal, so as to cause said auxiliary rolls to thereupon catch the metal at any desired point in its length and subject the remaining portion of it to their action. By reason of the rolling-faces of the  
60 auxiliary stand being in a right-angular plane of the rolling-faces of the train-stand the rolling metal is compressed in a line of direction at right angles to the compression of the train-rolls, thereby reducing the sectional dimension of the metal in the plane in which the  
65 fins are liable to form by the train-passes, and thus counteracting all tendency to such finning. By reason of the adjustment of one or both the rolls of the auxiliary set to and from  
70 each other said rolls may be maintained in inoperative position while metal is passing which is not liable to fin, and may be adjusted in operative position when the attendant sees a piece or portion of a piece coming which is  
75 liable to fin.

In the accompanying drawings, which are only intended to represent one of the different forms in which my invention may be embodied, Figure 1 is a plan view, and Fig. 2 is a front  
80 elevation.

A represents a stand of horizontal rolls in a roll-train. Located at any suitable distance—say three feet, more or less—in front of said  
85 train-stand is the auxiliary set of rolls consisting of the two vertical rolls B B', each mounted in an independent housing, respectively lettered CC'. Housing C has its rear end portion provided with two longitudinal slots, a, in each of which is fitted a set-screw, b, having its lower end rigid with the bed-plate E,  
90 and its upper end having thumb-clamp c threaded thereon. A pinching-screw, a', mounted in a bearing, b', rigid with the bed-plate, is located in rear of said housing, said  
95 screw serving to adjust the housing longitudinally, and also aiding the clamps c in maintaining it in adjusted position. Housing C' has its rear end portion pivoted at d to the bed-plate, its rear end being horizontally convex and fitting against a corresponding concave end piece, D. A bar, E', is located along the sides of both housings adjacent to the train,  
100 and is secured to the bed-plate. It provides lateral bearing for the housings when in use, and resists the tendency of the rolling metal  
105



to move the housings in the direction of the feed.

In the operation of rolling, the attendant normally keeps the swinging roll-housing open and permits the metal to pass free between the two auxiliary rolls as long as he sees that the metal is not likely to fin; but when he observes a piece or portion of a piece coming which looks as if it would fin, he throws to the swinging roll-housing, and the metal is then caught between the two auxiliary rolls and becomes subject to their reducing action. Thus without stopping the mill or interfering with the constant rolling of the metal the attendant may subject any portion of the working metal to the action of these auxiliary rolls. As soon as the bad piece, or piece having a bad section, has passed through the auxiliary stand, the attendant then throws the pivotal housing open again, as before. Should occasion require, he may adjust housing C nearer to or farther from housing C', to suit the degree of reduction to which he wishes any piece of metal brought. These vertical rolls reduce the sectional dimension of the metal in a plane right angular to that in which the sectional dimension is reduced by the horizontal rolls A. The metal is thus prepared to enter the pass of the latter rolls normally and be operated upon thereby without finning.

It is apparent that many modifications of the principle of invention as herein illustrated may be devised, and without attempting to canvass them all I desire to specify one or two.

Instead of roll-housing C' being pivoted, it may be adapted to have a rectilinear adjustment to and from its companion housing, and in such instance any suitable means may be employed to make such adjustment—such as a hydraulic press or a pinching-screw.

Instead of roll-housing C being adjustable, it may be made stationary.

Instead of the rolls in the roll-train being horizontal, they may be vertical, and in such instance the auxiliary rolls would be horizontal.

I may place one or more auxiliary sets of rolls at any desired point or points in connection with a train of rolls; but I now think it is sufficient if one such auxiliary set be located in front of the last pass or the last pass but one of the train.

The drawings are only intended to illustrate the principle of my invention, and hence the parts are not shown with practical working accuracy.

It will also be understood that the roll A, together with its groove, is drawn on a larger scale than the other parts of the drawings, and is shown located relative to rolls B B' without regard to the distance which in practice will govern. So, too, the form of the roll-pass formed by the rolls B B' may differ very decidedly from that shown in the drawings. In fact, I prefer to make said rolls B B' with very shallow grooves, and my invention is independent of the grooving of said rolls, so that,

if desired, the said rolls B B' may be plane-faced.

Other forms of embodying and using the principle of my invention may be employed in substitution for the specific form herein shown. It will therefore be understood that omissions, substitutions, and changes may be made as regards the forms and parts herein set forth provided the principles of construction embraced in the following claims are retained and employed.

I therefore particularly point out and distinctly claim as my invention—

1. The combination, with a pair of rolls and two housings independent of each other, in which said rolls are respectively and independently mounted, of adjusting mechanism which moves one or both said roll-housings to and from its companion housing, substantially as set forth.

2. The combination, with a train of metal-reducing rolls, of auxiliary reducing-rolls mounted in housings external to the train and adjacent thereto, one or both of said auxiliary roll-housings being arranged to be slid on ways or otherwise to be movable into the pathway of the working metal, substantially as set forth, whereby said auxiliary rolls are caused to grip the metal, so as to compress and reduce it at any portion of its length as it passes through the train, substantially as set forth.

3. The combination, with a set of rolls, of an auxiliary set of rolls having their rolling-faces located in a plane angular to the plane in which the rolling-faces of the other set of rolls is located, the two rolls of the auxiliary set mounted in independent housings, one of which is pivoted and has swinging movement to and from its companion housing, substantially as set forth.

4. The combination, with a set of rolls, of an auxiliary set of rolls having their rolling-faces located in a plane angular to the plane in which the rolling-faces of the other set of rolls is located, the two rolls of the auxiliary set mounted in independent housings, one of which is pivoted and has swinging movement to and from its companion housing, together with a support against which said pivotal housing has lateral bearing when in operative position, substantially as set forth.

5. The combination, with a set of rolls, of an auxiliary set of rolls having their rolling-faces located in a plane angular to the plane in which the rolling-faces of the other set of rolls are located, one of said auxiliary rolls having pivotal movement and the companion roll having rectilinear adjustment, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 23d day of February, A. D. 1886.

JOHN BEAVIS.

Witnesses:

T. B. HALL,  
J. G. HALL, Jr.