July 28, 1936. F. UNGERER 2,049,142

PLATE STRAIGHTENING MACHINE

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Fig. 1.

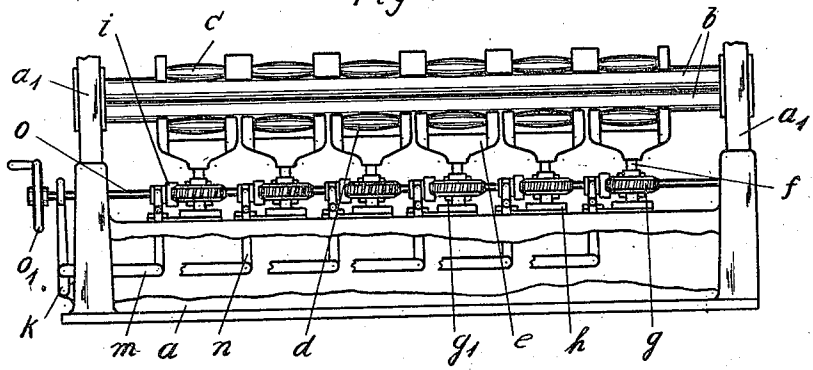


Fig. 4.

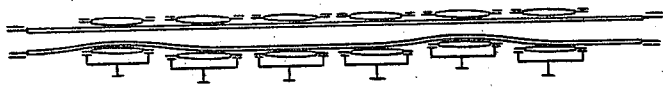


Fig. 2.

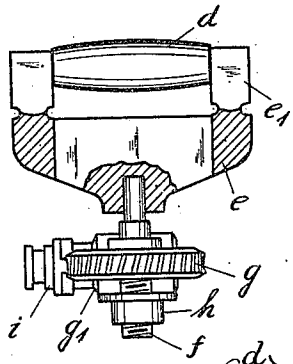
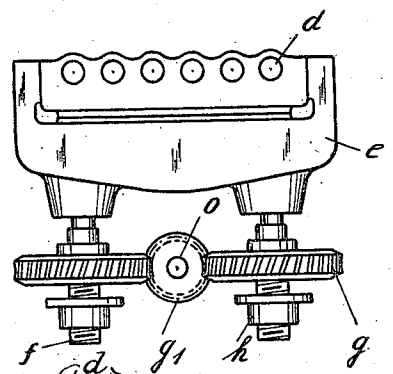


Fig. 3.



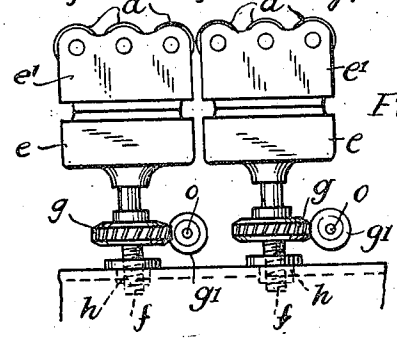


Fig. 11.

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PLATE STRAIGHTENING MACHINE

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Fig. 5.

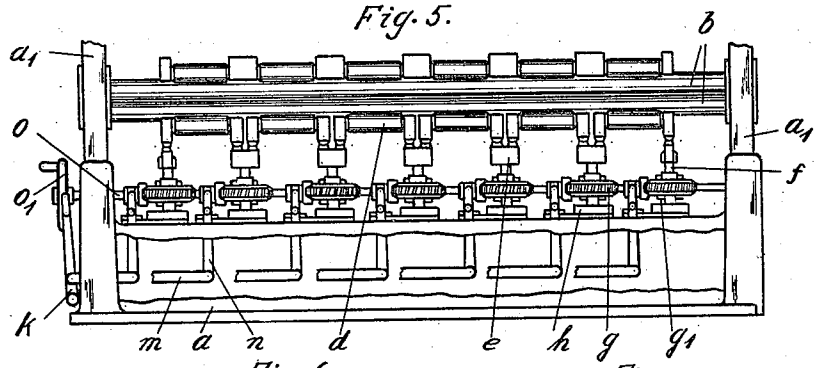


Fig. 6.

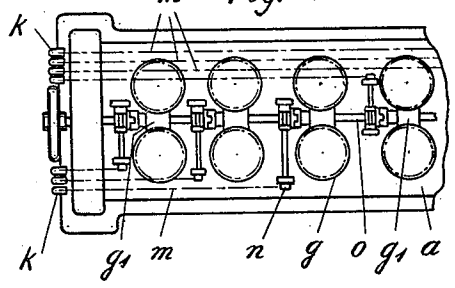


Fig. 9.

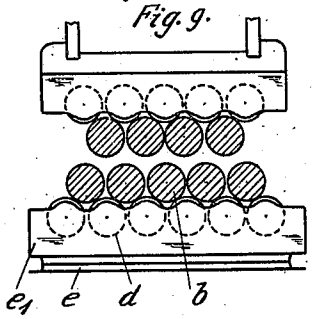


Fig. 10.

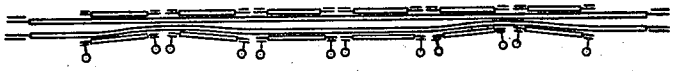


Fig. 7.

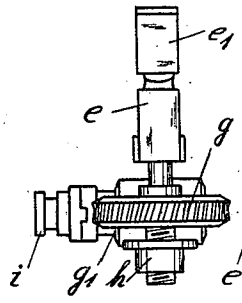
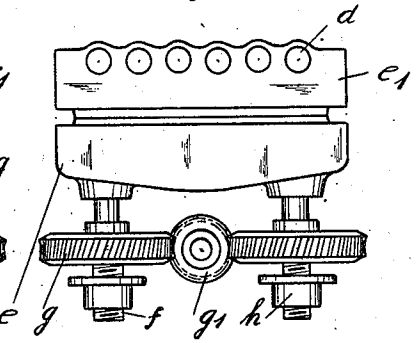


Fig. 8.



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UNITED STATES PATENT OFFICE

2,049,142

PLATE STRAIGHTENING MACHINE

Fritz Ungerer, Pforzheim, Germany

Application August 31, 1934, Serial No. 742,265
In Germany September 14, 1933

REISSUED

5 Claims. (Cl. 153—54)

This invention relates to an adjustable supporting device for the straightening rolls of plate straightening machines, in which the adjusting means for the supporting rollers provided along the straightening rolls for deflecting these rolls towards or away from the material to be straightened can travel into the supporting position along paths of different lengths.

The invention relates to a supporting device of this type but with the improvement that the adjusting means for the supporting rollers can be brought into the supporting position separately and independently from other existing rollers whilst the machine is running, and that further the supporting of the row of straightening rolls to be deflected is effected not only by a single pair of rows of supporting rollers arranged symmetrically to the middle of the straightening rolls but by more than two rows of supporting rollers situated as close as possible side by side along the row of straightening rolls.

By the invention it is possible, without interruption of service, to act on the straightening rolls at more points than heretofore and to any desired degree so that the shape of these rolls can be much better adapted to the straightening requirements of the individual plates.

Two embodiments of the invention are illustrated by way of example in the accompanying drawings in which:—

Fig. 1 shows in front elevation a plate straightening machine with supporting rollers adjustable in rows.

Fig. 2 shows in front elevation a row of supporting rollers according to the first form of construction, with adjusting means.

Fig. 3 is a side elevation of Fig. 2.

Fig. 4 is a diagrammatic view showing the effect of the adjusting means of the first form of construction.

Fig. 5 shows in front elevation a straightening machine with supporting rollers adapted to be adjusted in rows at an angle.

Fig. 6 is a top plan view of the adjusting means of the second form of construction.

Fig. 7 shows in front elevation a bearing member for the supporting rollers with adjusting means.

Fig. 8 is a side elevation of Fig. 7.

Fig. 9 is a cross section through the straightening rolls with supporting rollers and

Fig. 10 is a diagrammatic view showing the effect of the adjusting means of the second form of construction.

Fig. 11 shows in side elevation a row of supporting rollers divided into sections with separate adjusting means for each section.

Uprights a_1 are mounted on a box base a and upper and lower straightening rolls b are journaled in these uprights. These rolls are supported by supporting rollers c and d, the upper rollers c being carried in known manner in a yoke member not shown in the drawings, so that they participate in the adjusting movements of the member, whereas the lower rollers d are mounted in rows in bearing members e_1 resting on slide surfaces of the bearing feet e (Figs. 2 and 7). These bearing feet are mounted directly on screw spindles f, which can be turned by means of worm gearings g, g_1 in the nuts h supported on the box base a. The worm gearings g, g_1 are driven by means of a shaft o which is rotated by a hand wheel o_1. Each worm gearing g, g_1 can be coupled with the driving shaft o independently of the others. For this purpose a system of levers k, m, n is provided for engaging and disengaging claw clutches i. According to the direction in which the shaft o rotates the screw spindles f coupled therewith are screwed into or out of the nuts h and consequently the bearing feet e and bearing members e_1 are lowered or raised.

In the example illustrated in Figs. 1 to 4 the lowering or raising of a bearing foot e causes at the same time a horizontal lowering or raising of a whole row of supporting rollers on every bearing foot e, as the bearing members e_1 of the same row of supporting rollers rest. The effect of this form of construction is therefore that any desired row of supporting rollers can be raised or lowered any desired distance independently of the other rows of supporting rollers by engaging its associate clutch i. Thus, for example in the diagram of Fig. 4, the first and fifth rows of supporting rollers, counted from the hand wheel side of the machine are raised relative to the remaining rows of supporting rollers, resulting in a deflection of the row of straightening rolls in the shape indicated in an exaggerated manner.

In the form of construction illustrated in Figs. 5 to 10 the raising and lowering of a bearing foot e does not cause a horizontal but a one sided lowering or raising of one of the two outer or of the two inner rows of supporting rollers, as two bearing members e_1 of two adjacent rows of supporting rollers always rest on the inner bearing feet e. It is therefore possible, to adjust in roof-shape or in pattern shape every two adjacent rows of

supporting rollers relative to the rows of straightening rolls. Thus, for example in the diagram shown in Fig. 10, the outer pairs of supporting rollers are always adjusted in roof shape, thus causing during the straightening of a plate a stretching of two lateral longitudinal sections. The clutch controlling mechanism *k* for coupling the adjusting means *f* separately or jointly with the common hand wheel shaft *o* for these means is advantageously arranged laterally on the machine frame *a*, a_1 preferably near the handle o_1 of the shaft *o*.

It is not necessary to act with one and the same adjusting means upon a whole row of supporting rollers but the rows of supporting rollers may be subdivided and the parts thereof supported individually by separate adjusting means as shown in Fig. 11.

I claim:—

1. An adjustable supporting device for the straightening rolls of plate straightening machines, in which the adjusting means for the supporting rollers arranged for the purpose of flexing towards or away from the material to be straightened, along the straightening rolls, can move into the supporting position along paths of different length, comprising in combination with the rows of supporting rollers and the rows of straightening rolls, means for adjusting some of these supporting rollers during the service and without interrupting the passage of the plates separately and independently of the other supporting rollers, the supporting of the row of straightening rolls to be flexed being effected by more than two rows of supporting rollers situated close together.

2. An adjustable supporting device for the straightening rolls of plate straightening machines, in which the adjusting means for the supporting rollers arranged for the purpose of flexing towards or away from the material to be straightened, along the straightening rolls, can move into the supporting position along paths of different length, comprising in combination with the rows of supporting rollers and the rows of straightening rolls, means for adjusting some of these supporting rollers during the service and without interrupting the passage of the plates separately and independently of the means for adjusting the other supporting rollers, the supporting of the row of straightening rolls to be flexed being effected by more than two rows of supporting rollers situated close together, each of the several rows of supporting rollers arranged side by side along a row of straightening rolls being separately raised and lowered any desired distance relative to its associate row of straightening rolls.

3. An adjustable supporting device for the straightening rolls of plate straightening machines, in which the adjusting means for the supporting rollers arranged for the purpose of flexing towards or away from the material to be straightened, along the straightening rolls, can move into the supporting position along paths of different length, comprising in combination with the rows of supporting rollers and the rows of straightening rolls, means for adjusting some of these supporting rollers during the service and without interrupting the passage of the plates separately and independently of the means for adjusting the other supporting rollers, the supporting of the row of straightening rolls to be flexed being effected by more than two rows of supporting rollers situated close together, each of the several rows of supporting rollers situated side by side along a row of straightening rolls being adjusted in roof-shape and in gutter shape relative to its row of straightening rolls.

4. An adjustable supporting device for the straightening rolls of plate straightening machines, in which the adjusting means for the supporting rollers arranged for the purpose of flexing towards or away from the material to be straightened, along the straightening rolls, can move into the supporting position along paths of different length, comprising in combination with the rows of supporting rollers and the rows of straightening rolls, means for adjusting some of these supporting rollers during the service and without interrupting the passage of the plates separately and independently of the means for adjusting the other supporting rollers, the supporting of the row of straightening rolls to be flexed being effected by more than two rows of supporting rollers situated close together, a common shaft for the adjusting means, a hand wheel on said shaft at the side of said machine frame, and means for coupling said adjusting means individually and jointly with said shaft arranged laterally on said machine frame preferably near said hand wheel.

5. An adjustable supporting device for the straightening rolls of plate straightening machines, in which the adjusting means for the supporting rollers arranged for the purpose of flexing towards or away from the material to be straightened along the straightening rolls, can move into the supporting position along paths of different length, comprising in combination with the rows of supporting rollers and the rows of straightening rolls, means for adjusting some of these supporting rollers during the service and without interrupting the passage of the plates separately and independently of the means for adjusting the other supporting rollers, the supporting of the row of straightening rolls to be flexed being effected by more than two rows of supporting rollers situated close together, in combination with the machine frame, a common shaft for the adjusting means, a hand wheel on said shaft at the side of said machine frame, and means for coupling said adjusting means individually or jointly with said shaft arranged laterally on said machine frame preferably near said hand wheel, the adjusting means comprising screw spindles, worm gears adapted to transmit the movement of said common shaft to said screw spindles, claw clutches between said worm gears and said shaft, and a system of levers adapted to engage and disengage said claw clutch to connect said worm gears with said shaft.

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