Jan. 24, 1939. F. UNGERER 2,144,783

APPARATUS FOR STRAIGHTENING HOT PLATES

Filed Jan. 14, 1935

Fig. 1.

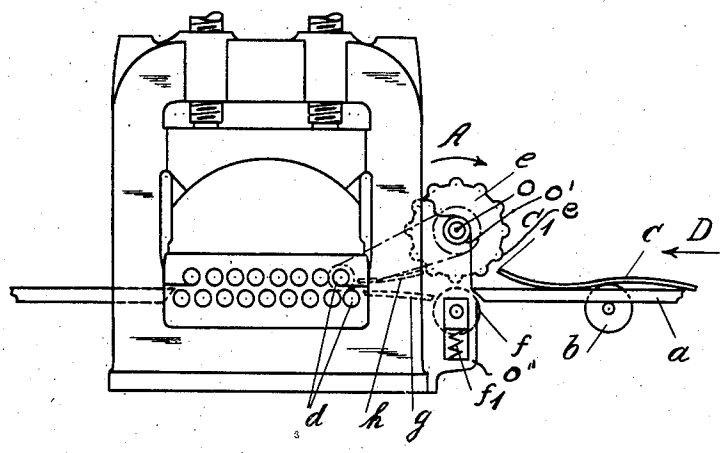



Fig. 3.

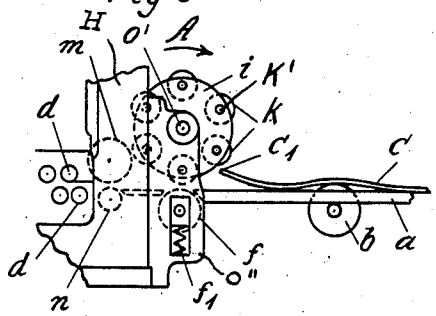



Fig. 2.

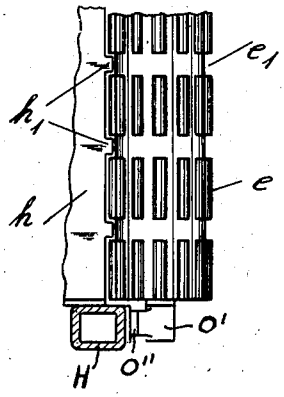
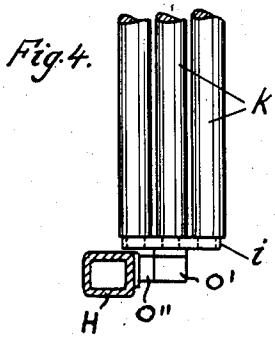



Fig. 4.




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Patented Jan. 24, 1939

2,144,783

# UNITED STATES PATENT OFFICE

2,144,783

## APPARATUS FOR STRAIGHTENING HOT PLATES

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Application January 14, 1935, Serial No. 1,831
In Germany February 20, 1933

5 Claims. (Cl. 153—54)

This invention relates to an apparatus for straightening hot plates.

When straightening hot plates in roller straightening machines the introduction of the plate between the rollers is mostly accompanied by great difficulties, as the hot plate often arrives at the straightening machine in strongly undulated condition the edge to be introduced often standing up with the result, that the plate is folded in undesirable manner when running into the machine.

This difficulty is overcome according to the invention.

In the apparatus according to the invention a roller having projections for flattening the plate spaced along its perimeter—which projections may be teeth or antifriction rollers—is mounted to rotate ahead of a straightening machine.

Fig. 1 is an end view of a machine embodying a roller for flattening the advancing edge of the work as it is fed to the machine.

Fig. 2 is a top plan view of 1.

Fig. 3 is a partial end view of a machine of modified construction.

Fig. 4 is a top plan view of Fig. 3.

The plate *c* to be straightened is conveyed to the rollers *d* of the plate straightening machine on a table *a* through which feed rollers *b* project. The rollers *d* of the straightening machine are mounted in housings H one of which only is shown, it being understood that the arrangement at the other side of the machine is quite similar. The upstanding end $c_1$ of the plate *c* often prevents the material from running in smoothly and automatically between the rollers *d*. In order to overcome this hindrance a roller $e_1$ having rows of teeth *e* spaced along its perimeter and plain spaces between the rows, as shown in Fig. 2, is, according to Figs. 1 and 2, mounted on a shaft *o* in bearings *o'* of bracket *o''* secured to the housings H at the entrance side of the plate straightening machine and rotates in the direction A when the machine is in operation. The teeth *e* successively strike the upstanding end $c_1$ of the plate *c* and thus bend it downwards towards the inlet point of the straightening machine. This method of preliminarily flattening results in that the material will pass between the roller $e_1$ and the roller *f* situated thereunder, without assistance of the operator, so that the plate runs into the machine between two guides *g* and *h* in the correct shape. The roller *f* may yield downwardly against the action of springs $f_1$ in recesses of the brackets *o''*, so that in the event of any differences in the thickness of the plates no interruption of the feeding of plate will occur. To prevent the edge $c_1$, after it has moved through the rollers $e_1$ and *f*, from penetrating between the upper end of guide plate *h* and the roller $e_1$, this end is serrated and its projections or serrations $h_1$, Fig. 2, enter between the rows of teeth *e*.

Friction between the teeth and the plate is considerable. To reduce it, the teeth are replaced by antifriction members in the apparatus illustrated in Figs. 3 and 4. The shaft *o* is mounted for rotation in the direction of arrow A, as described with reference to Fig. 1, end plates *i* are placed on the shaft *o* and rollers *k* are mounted on pivots *k'* in spaced relation between end plates *i* so as to partly project beyond them. The action of the rollers *k* is similar to that of the teeth *e*, Figs. 1 and 2, but the friction is reduced. The guide plates *g*, *h* are here replaced by a pair of guide rollers *m*, *n*.

I claim:—

1. An apparatus for straightening hot plates, comprising in combination with a hot plate straightening machine, means for feeding the plates to the straightening machine, and a preliminary straightening device on the front side of said straightening machine above said plate feeding means, said preliminary straightening device consisting in a preliminary straightening roller rotatable in the direction of travel of the work and arranged above said feeding means, projections on said roller adapted to strike upon and preliminarily straighten the plate and particularly to bend down the upstanding front end of the plate, a counterroller arranged under side preliminarily straightening roller adapted to cooperate with said straightening roller to guide the plates thereunder, and springs supporting said counterroller to enable said counterroller to yield downwardly in the case of plates of irregular thicknesses.

2. An apparatus for straightening hot plates, comprising in combination with a hot plate straightening machine, means for feeding the plates to the straightening machine, and a preliminary straightening device on the front side of said straightening machine above said plate feeding means, said preliminary straightening device consisting in a preliminary straightening roller rotatable in the direction of travel of the work and arranged above said feeding means, projections arranged at uniform distances apart in the width of said roller adapted to strike upon and preliminarily straighten the plate and particularly to bend down the upstanding front end

of the plate, the gaps between said projections forming annular grooves, a guide plate leading from said preliminarily straightening roller to the admission point of the straightening machine, and projections on the front edge of said guide plate engaging in said grooves, a counterroller arranged under said preliminarily straightening roller adapted to cooperate with said straightening roller to guide the plates thereunder, and springs supporting said counterroller to enable said counterroller to yield downwardly in the case of plates of irregular thicknesses.

3. An apparatus for straightening hot plates, comprising in combination with a hot plate straightening machine, a substantially cylindrical element mounted to rotate ahead of the machine, said element having at intervals protrusions projecting from the periphery of said element for flattening the plates, a counterroller arranged under said straightening roller to guide the plates thereunder, and springs supporting said roller to enable it to yield downwardly, in the case of plates of irregular thicknesses.

4. An apparatus for straightening hot plates, comprising in combination with a hot plate straightening machine, a substantially cylindrical element mounted to rotate ahead of the machine, said element having at intervals protrusions projecting from the periphery of said element for flattening the plates, said element being composed of a cylindrical body and of antifriction members spaced along and projecting beyond the periphery of said body, a counterroller arranged under said straightening roller to guide the plates thereunder, and springs supporting said roller to enable it to yield downwardly, in the case of plates of irregular thicknesses.

5. An apparatus for straightening hot plates, comprising in combination with a hot plate straightening machine, a substantially cylindrical element mounted to rotate ahead of the machine, said element having at intervals protrusions projecting from the periphery of said element for flattening the plates, said element composed of a shaft, two end plates on said shaft, and antifriction rollers journalled in said end plates spaced apart in a circle coaxial to said shaft and projecting beyond the periphery of said plates, a counterroller arranged under said straightening roller to guide the plates thereunder, and springs supporting said roller to enable it to yield downwardly, in the case of plates of irregular thicknesses.

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