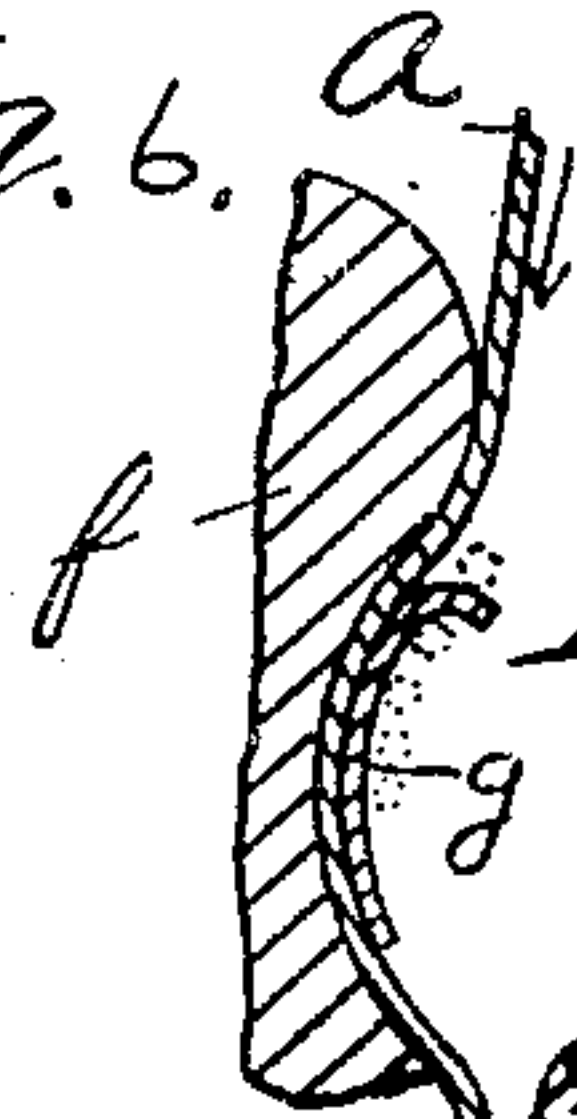
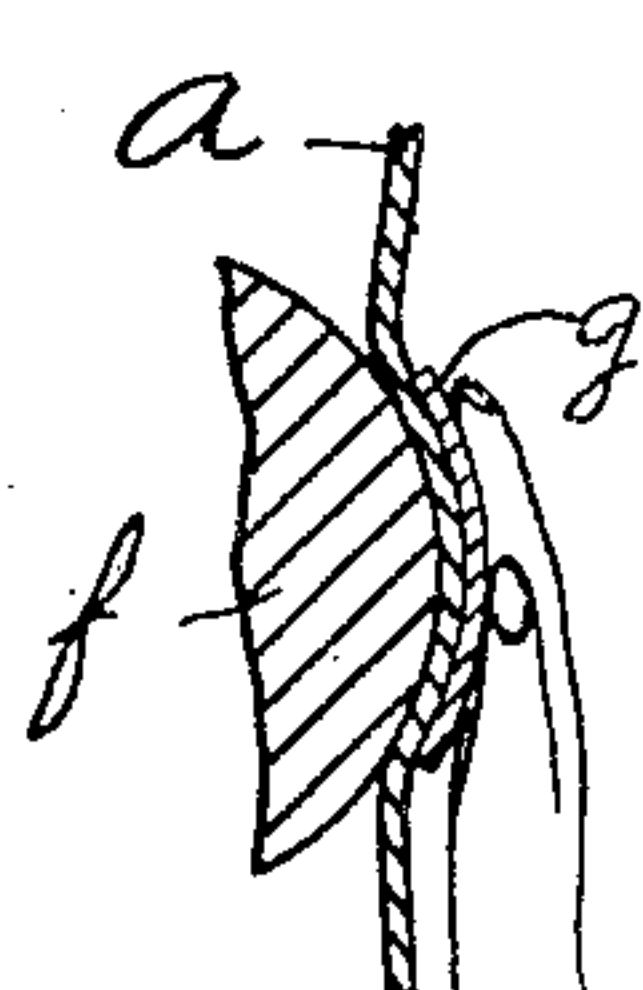
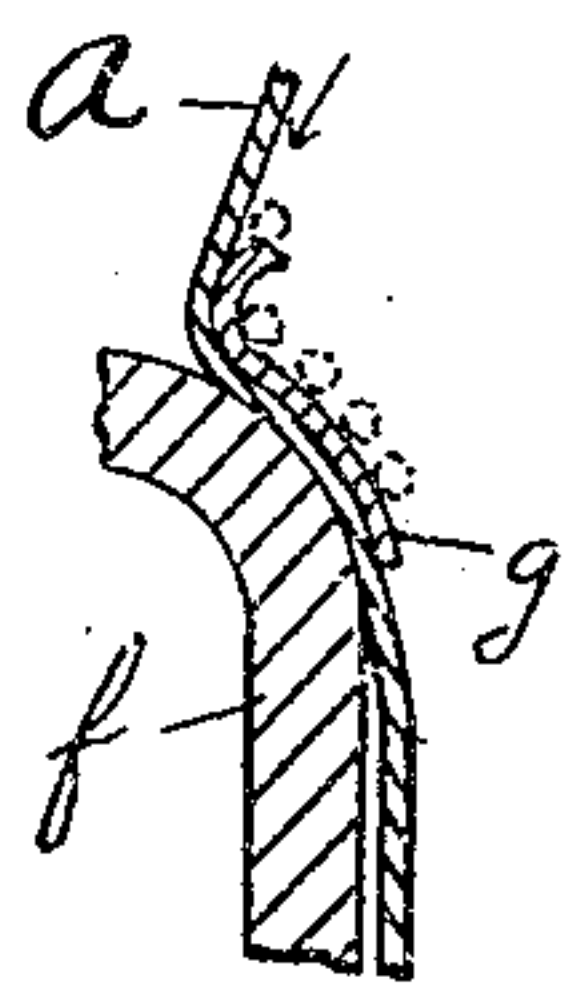
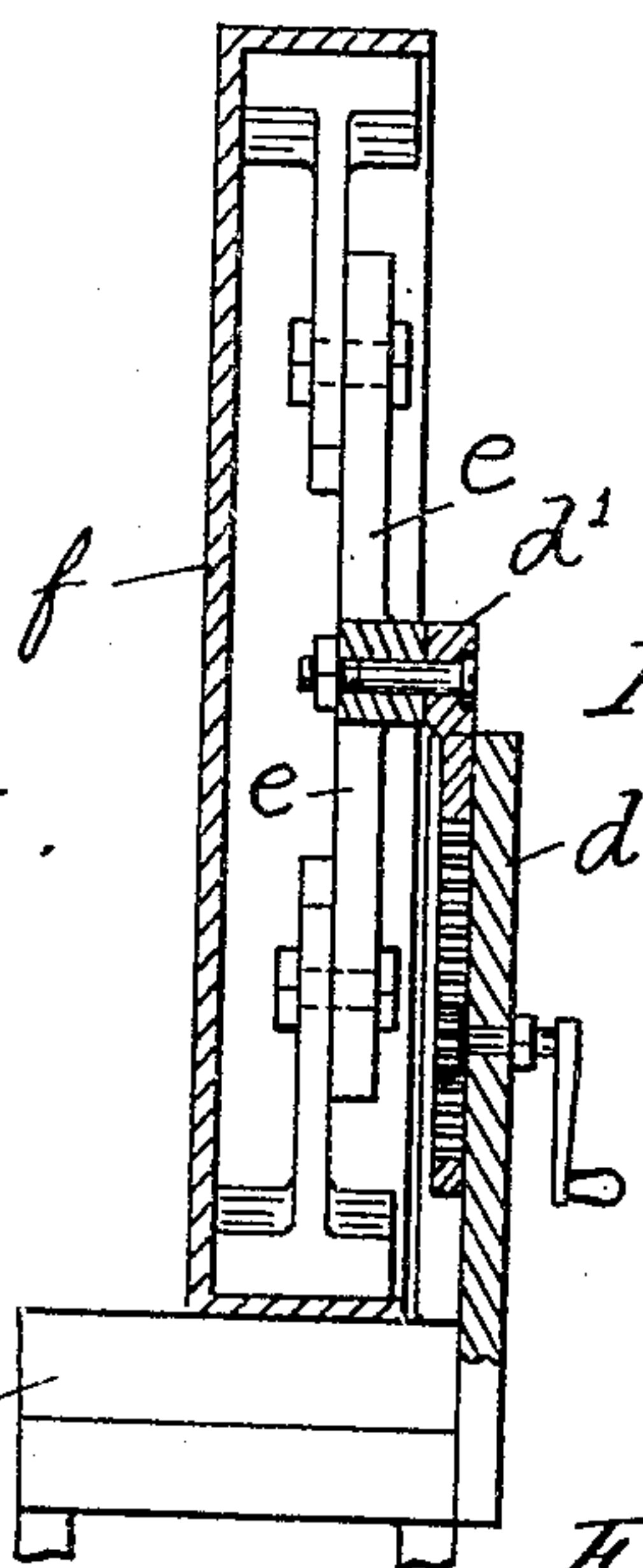
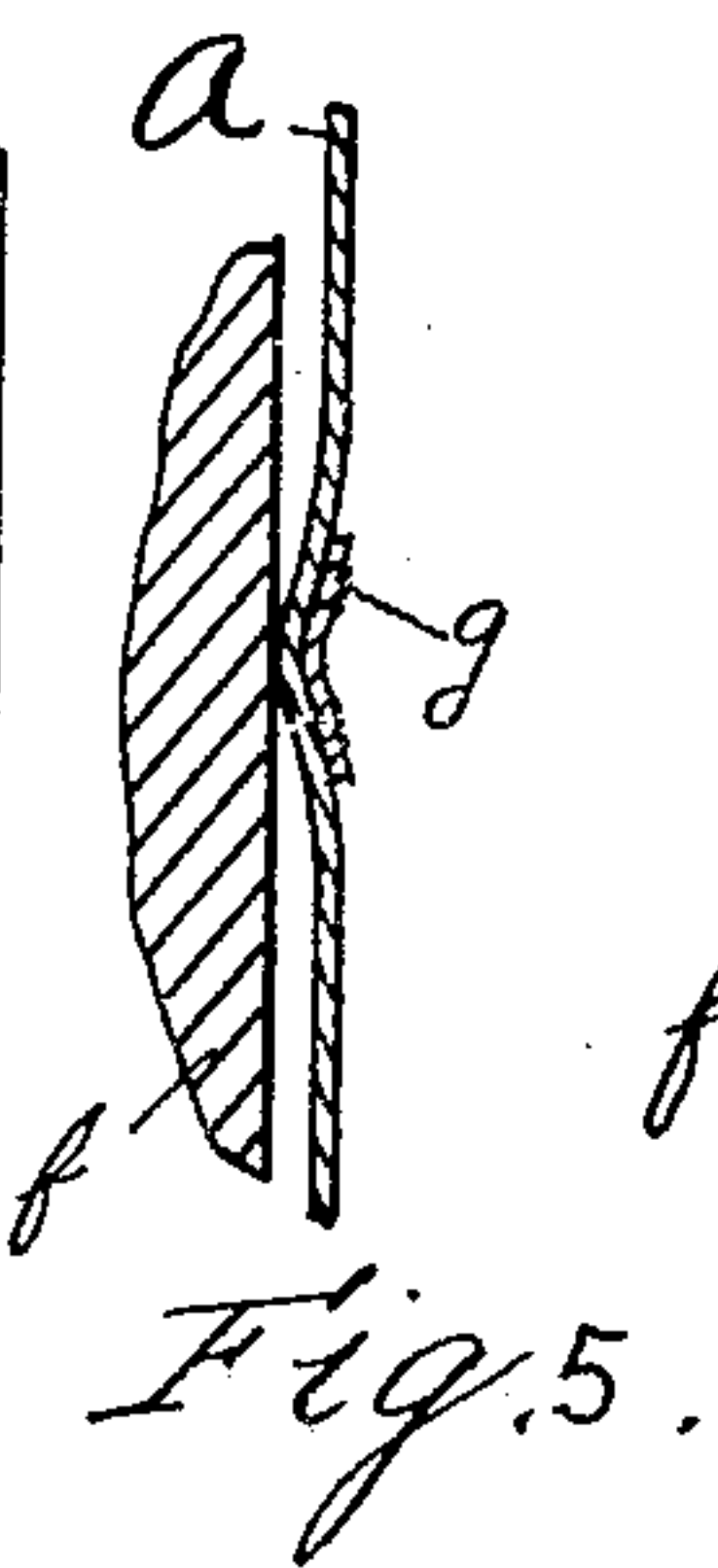
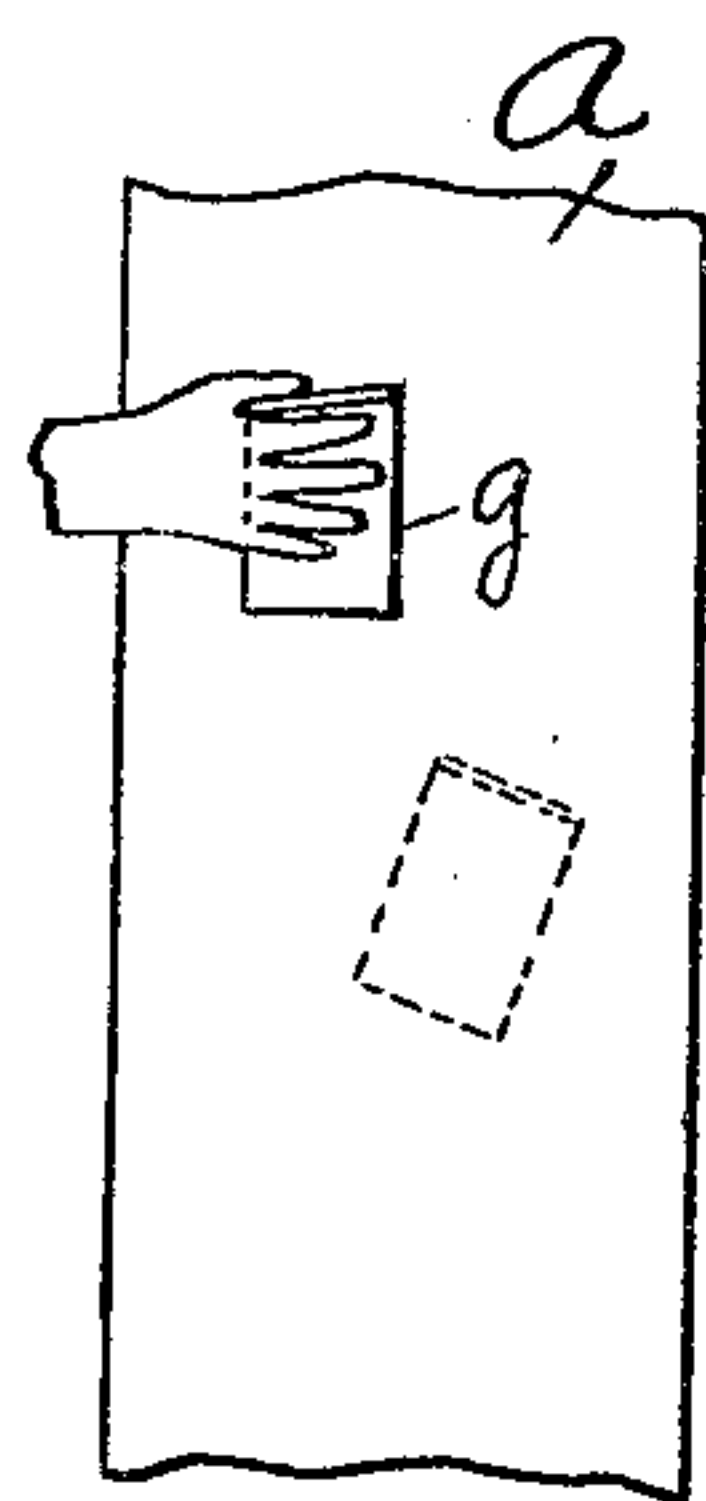
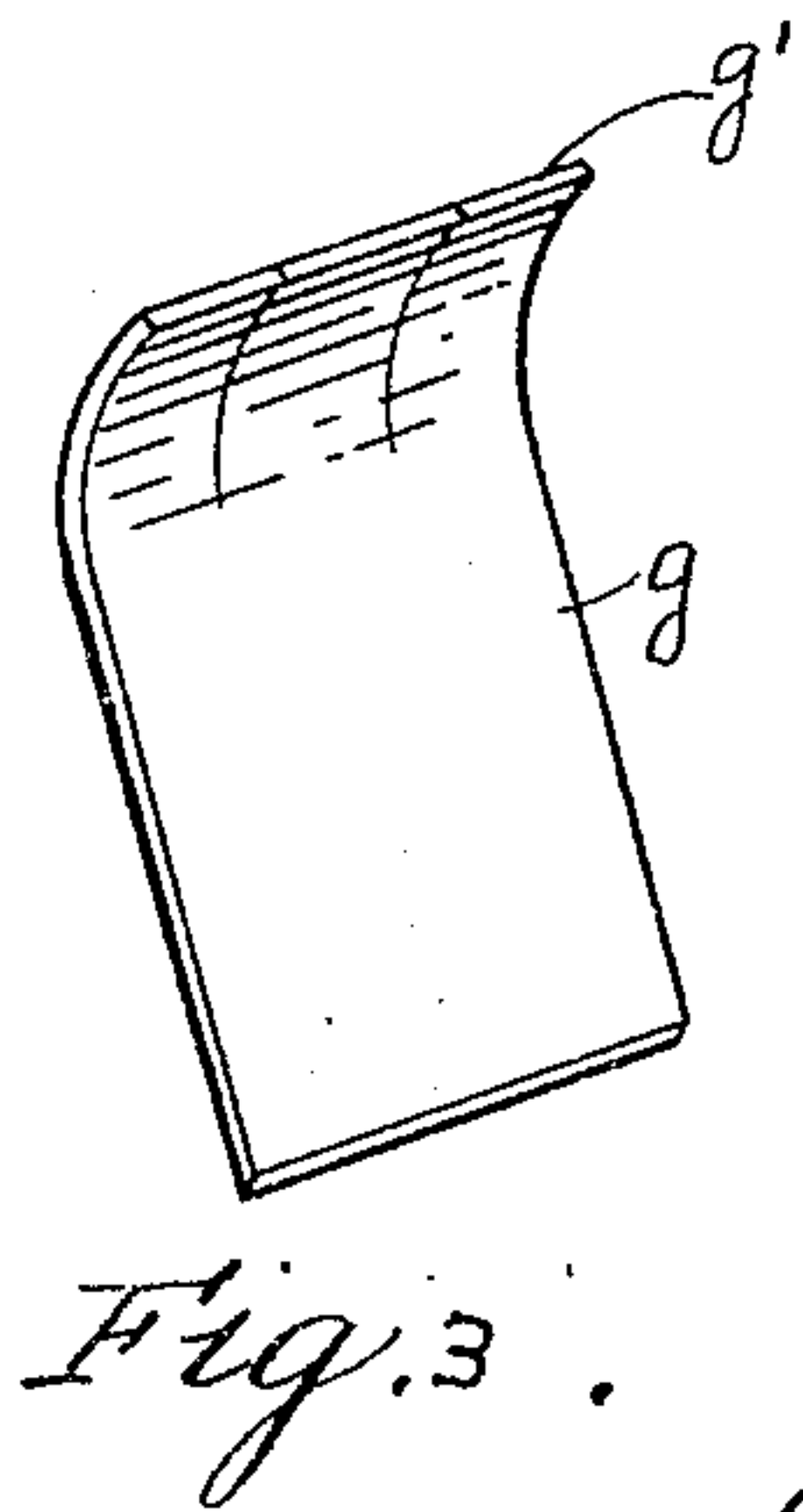
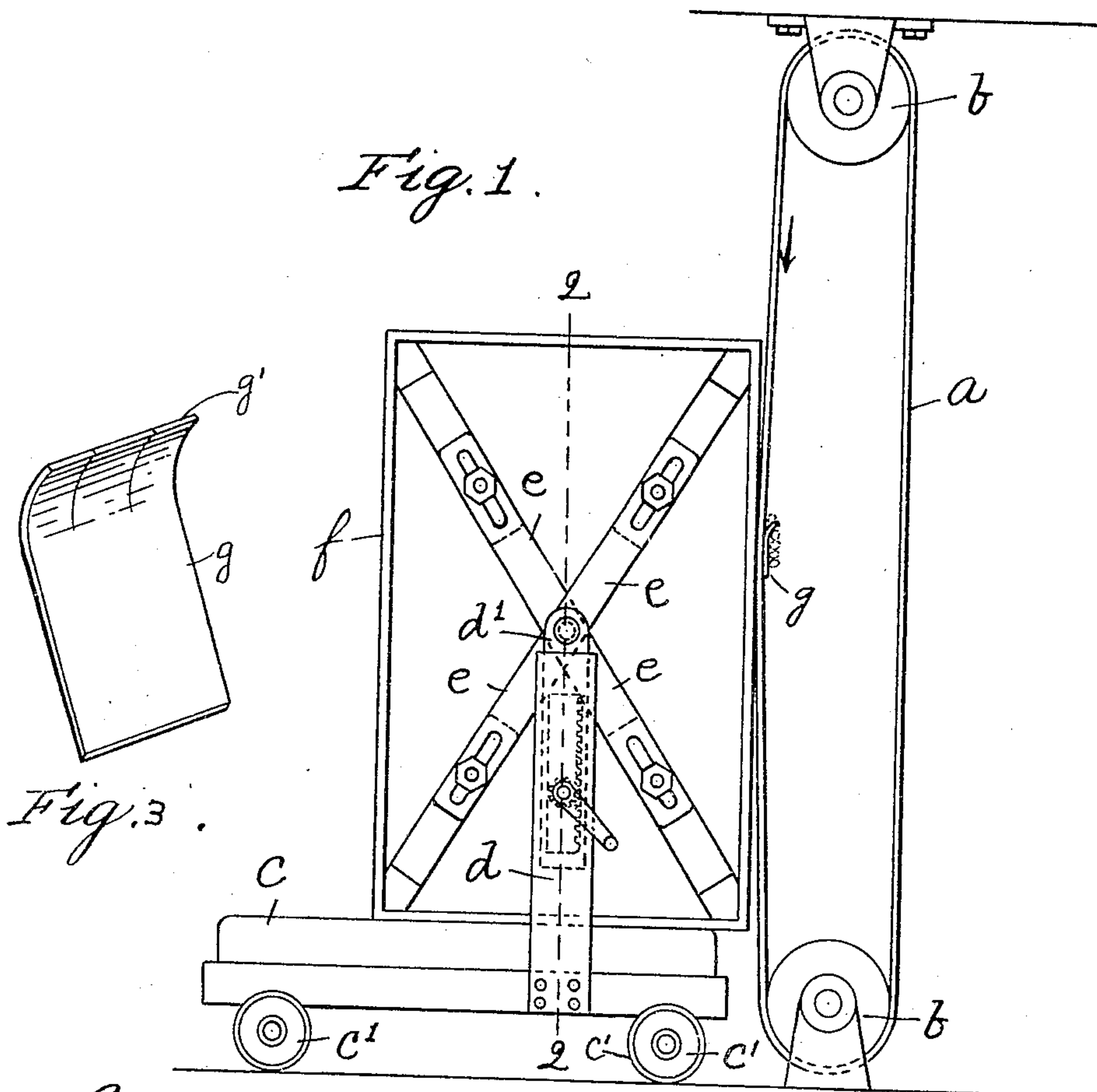


E. W. M. BAILEY.  
POLISHING BELT DEFLECTOR.  
APPLICATION FILED DEC. 8, 1904.



Witnesses:  
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Attys



# UNITED STATES PATENT OFFICE.

EDWIN W. M. BAILEY, OF AMESBURY, MASSACHUSETTS.

## POLISHING-BELT DEFLECTOR.

No. 803,800.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed December 8, 1904. Serial No. 235,918.

*To all whom it may concern:*

Be it known that I, EDWIN W. M. BAILEY, of Amesbury, county of Essex, State of Massachusetts, have invented an Improvement in Polishing-Belt Deflectors, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to that class of polishing-machines employing an endless polishing-belt and in which the belt is deflected from its normal course so that it is brought into contact with the surface to be polished.

In prior devices of this character various adjustable mechanical belt-deflecting devices have been provided which act to press the belt against the surface of the work; but while these devices may be suitable for sandpapering and rough work, which requires no especial care or skill in its performance, yet they are, so far as I am aware, impracticable for such work as rubbing down a varnished surface so as to produce a smooth dull finish.

In polishing varnished surfaces, particularly where fine work is required—as in carriage-bodies, panels, and the like—in order that the desired results may be secured it is necessary that a considerable degree of skill, care, and delicacy of touch be exercised on the part of the workman and that he may be enabled to adapt the polishing appliance readily to the requirements of the different parts of the same surface. It is further necessary that the convex or higher portions of the surface be not rubbed materially more or less than the concavities, that solid particles in the varnished surface causing roughness be removed without injury to the rest of the surface, and that certain patches or portions of the varnished surface—as, for instance, where the varnish has been too heavily applied—be rubbed or polished much longer than other portions. The extent to which careful hand manipulation plays a part in performing this work is so great that after a long series of experiments I have reached the conclusion that mechanical belt-deflecting devices, even though somewhat under the control of the operator by reason of various adjustable controlling and operating devices, are entirely unsuited for this especial purpose.

My invention has for its object to provide, in connection with a traveling polishing-belt and a work-supporting table, a hand manipulated and supported belt-deflecting device

which is adapted to be applied to any portion of the inner side of the belt and which is of such a nature that the operator may manipulate the belt in a manner similar, so far as the direct pressure on the surface and the extent of the surface operated upon is concerned, to that which he would employ with the ordinary hand-pad, so that he may know by the sense of touch how much force is being applied to the surface operated upon, so that he may readily vary the area of the work-engaged portion of the belt and cause it to conform to the convexities or concavities of the surface which he is polishing and so that he may remove small particles of matter which make the surface rough without injury to the adjacent surface and in general cause the polishing-belt to be adapted to the special requirements of the various portions of the surface, thereby enabling him to produce an evenly and smoothly polished surface when the work is finished.

For an understanding of my invention reference is now made to the accompanying drawings, in which—

Figure 1 is a side elevation of a polishing-machine, showing the parts in the position of use. Fig. 2 is a central vertical section of the carriage on the line 2 2 of Fig. 1. Fig. 3 is a perspective view of my belt-deflecting device. Fig. 4 is a view showing a portion of the inner side of the polishing-belt. Figs. 5, 6, 7, and 8 illustrate the manner in which the belt may be adapted to different conditions with my belt-deflecting device, Figs. 5 and 7 being horizontal sections and Figs. 6 and 8 being vertical sections.

In the drawings, *a* indicates an endless polishing-belt, of felt, which passes loosely over two pulleys *b b*, said pulleys being of the same diameter and rotating upon horizontal axes which are in the same vertical plane, so that the belt normally runs vertically. A carriage *c* is provided, said carriage being mounted upon suitable trucks *c'*, which preferably roll on tracks, so that it may be moved readily toward and from the belt. Said carriage is also provided with a standard *d*, having a vertically-adjustable bar *d'* mounted therein. Any suitable means for raising and lowering said bar may be provided—as, for example, the rack and pinion shown.

Four extensible arms *e* are pivotally connected to bar *d'*, said arms being adapted to be extended to engage a carriage-body *f* in



the corners thereof, as indicated. Any suitable means for varying the length of the arms  $e$  may be provided—as, for instance, the slot-and-bolt connection shown.

5 The important and vital part of my invention, however, resides in the belt-deflecting device  $g$ . (Illustrated in detail in Fig. 3.) Said belt-deflecting device may be in various forms; but it preferably consists of a thin sheet or  
10 plate of smooth-surfaced flexible material, such as celluloid, said sheet preferably being normally convexly curved longitudinally to provide a convex belt-engaging face and an upturned end portion  $g'$ , which is adapted to  
15 be grasped between the thumb and first finger while the fingers are pressed against the main portion thereof.

The portion  $g'$  may be slitted longitudinally of the sheets, as indicated, to permit the main  
20 portion thereof to be bent more readily in different directions.

In operation the felt belt is saturated with water, and a suitable rubbing pumice is applied to its surface. The wagon-body is se-  
25 cured upon the carriage  $c$  in such a position that the side to be operated upon projects beyond the end of the carriage. The carriage is moved so that the side of the body to be polished is held parallel to and close to, but a  
30 short distance from, the normal run of the belt, which is driven downwardly on the side next to the carriage, as indicated in Fig. 1, the work being held so that the grain of the wood runs with the belt. The operator then  
35 holds the deflecting device  $g$  in his hand, as indicated in Figs. 1 and 4, and presses its convex side with more or less force against the inner surface of the belt, deflecting the same outwardly to a suitable extent and pressing  
40 the outer surface thereof against the work. The pressure with which the belt is applied to the work is under the immediate and positive control of the operator, so that he is always aware of exactly the force with which  
45 the belt is being pressed against the work and can vary it instantly at will.

The smooth face of the deflecting device permits the belt to slide easily thereunder, so that it is necessary for the operator to exert but  
50 little strength in holding the deflector in place.

The flexibility of the deflecting device enables the operator to vary the area of the belt-engaging surface thereof both longitudinally and transversely by varying the positions of  
55 the fingers on the back thereof, and consequently the length and width of the surface of the work engaged by the belt at one time, and it also enables him to shape the belt or press it in such a way that it will follow the  
60 surface of the work closely, as if he held the polishing-felt in his hand. For example, in polishing a convexly-curved surface in which the grain runs with the curve the deflector will be bent so that its engaging surface is  
65 concave transversely, as shown in vertical sec-

tion in Fig. 6, or if the grain runs transversely of the curve, as shown in horizontal section in Fig. 7, then the deflector will be bent so that its engaging surface will be concave longitudinally. If a concave surface is to be pol-  
70 ished, the deflector will be bent convexly longitudinally or transversely, according to the special requirements—as shown, for example, in Fig. 8. If the belt is to be applied to  
75 a small portion only of the surface, as in removing small particles therefrom, pressure will be applied to the back of the deflector with one finger only, causing the belt to be deflected in the manner shown in Fig. 5. A  
80 deflecting device is thus provided having belt-engaging faces of different or variable areas, some or all of which are of less width than the width of the belt.

It will be apparent from the foregoing that the area engaged by the belt may be varied  
85 without varying the pressure of the belt on the work, and while some of the above-described results may be accomplished with a belt-deflecting device of non-flexible material having a convexly-curved belt-engaging sur-  
90 face, particularly if the convexity is greater at some portions than at others, yet far superior results are secured if the deflecting device or plate is thin and flexible. However, I consider either form to be within the spirit  
95 and scope of my invention. As the carriage may be moved easily in either direction, the extent to which the belt is deflected may be readily varied, and the carriage may be moved  
100 back easily, so that the work may be readily washed, wiped, and examined.

The combination of the vertically-running belt with the hand-supported belt-deflecting device is of especial advantage and impor-  
105 tance, for it enables me to run the belt very loosely without having it move out of its normal course unless deflected, and thereby to manipulate and guide the belt and vary its work-engaging surface to far better advantage than if it were run horizontally. By  
110 this means results which are superior to hand-work may be obtained with much greater rapidity and with less effort on the part of the workman than is possible with the ordi-  
115 nary hand method.

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

1. A deflecting device for a polishing-belt having a hand-support, and a belt-engaging  
120 face of materially less width than the belt, adapted to engage the inner side of the belt between its edges and its supporting-pulleys, substantially as described.

2. A deflecting device for a polishing-belt,  
125 consisting of a flexible plate having a hand-support, and a belt-engaging face, adapted to engage the inner side of the belt between its edges and its supporting-pulleys, substantially  
130 as described.

3. A deflecting device for a polishing-belt,  
consisting of a transversely and longitudinally  
flexible plate having a hand-support, and a  
belt-engaging face, adapted to engage the in-  
5 ner side of the belt between its edges and its  
supporting-pulleys, substantially as described.  
In testimony whereof I have signed my name

to this specification in the presence of two sub-  
scribing witnesses.

EDWIN W. M. BAILEY.

Witnesses:

LOUIS H. HARRIMAN,  
M. M. PIPER.