

(No Model.)

E. N. WALLIS.

MEANS FOR INCREASING ADHESION OF BELTS AND PULLEYS.

No. 566,638.

Patented Aug. 25, 1896.

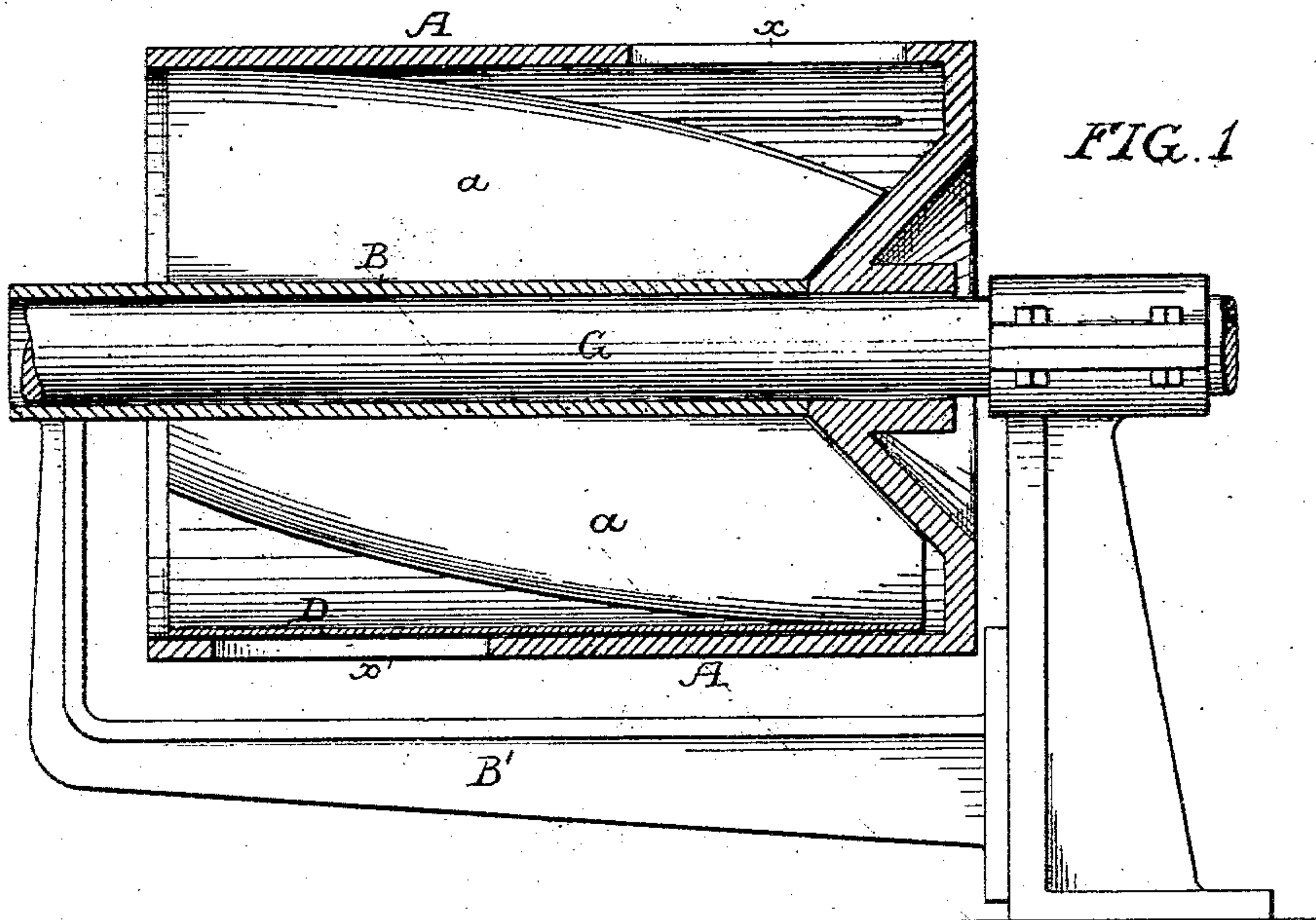


FIG. 2.

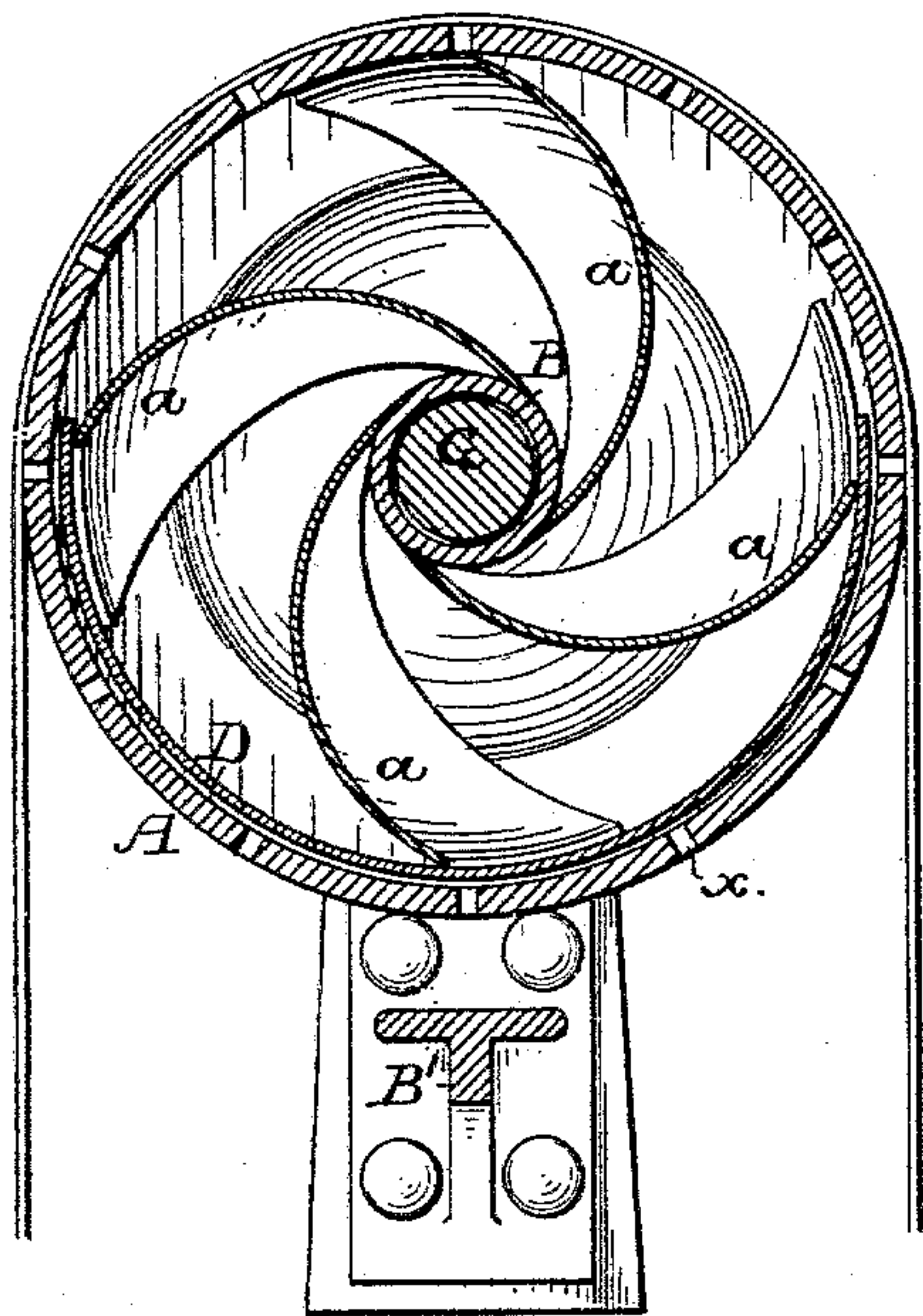
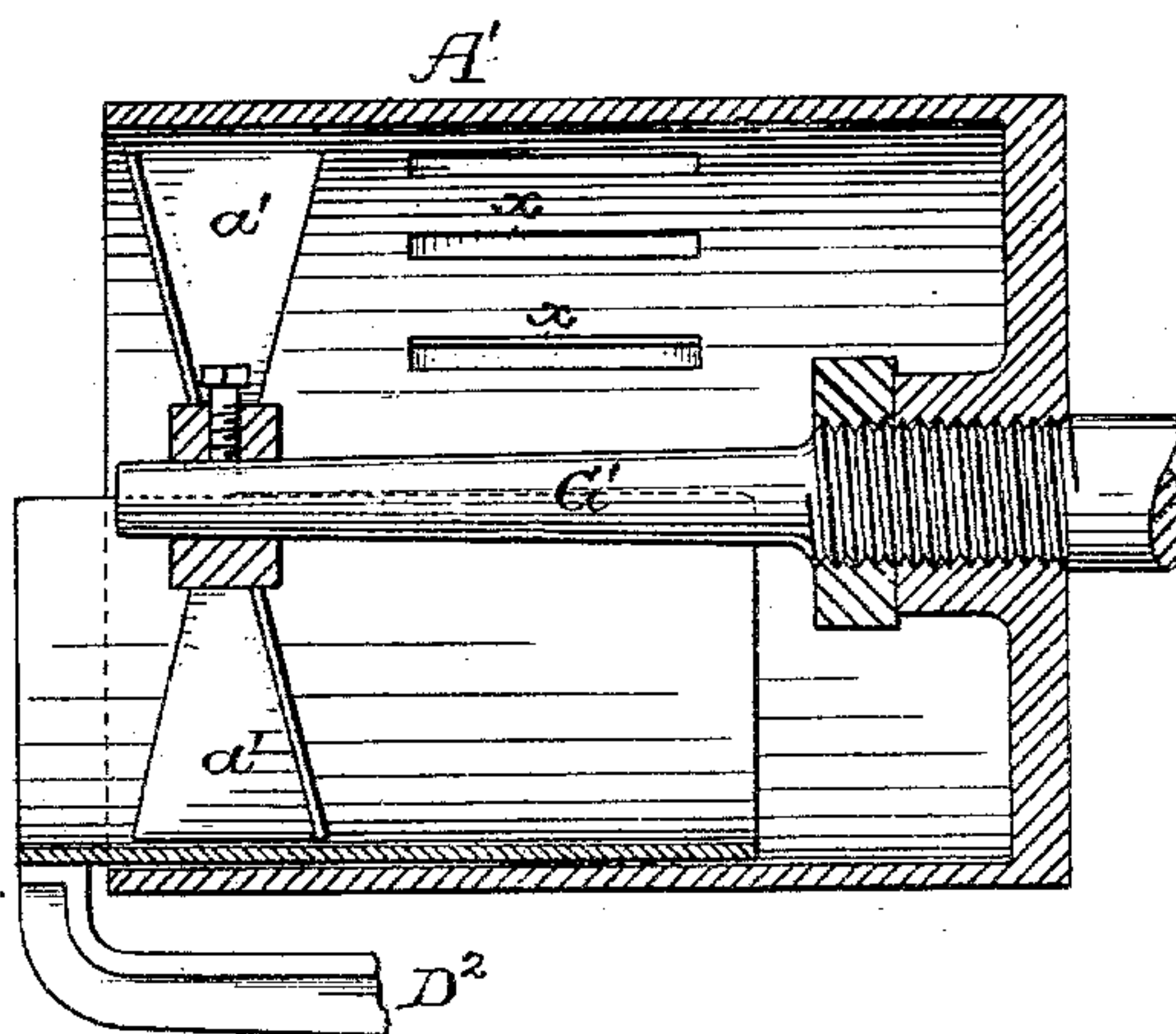


FIG. 3.



Witnesses:  
Charles De Bow  
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Inventor:  
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by his Attorneys  
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# UNITED STATES PATENT OFFICE.

EDWARD N. WALLIS, OF PHILADELPHIA, PENNSYLVANIA.

## MEANS FOR INCREASING ADHESION OF BELTS AND PULLEYS.

SPECIFICATION forming part of Letters Patent No. 566,638, dated August 25, 1896.

Original application filed December 3, 1895, Serial No. 570,931. Divided and this application filed July 9, 1896. Serial No. 598,594. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD N. WALLIS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Means for Increasing the Adhesion of Belts and Pulleys, (a division of my application, Serial No. 570,931, filed December 3, 1895,) of which the following is a specification.

10 The object of my invention is to cause a driving-belt to adhere more firmly than usual to the surface of the driving or driven pulley with which it is in contact, and this object I attain in the manner hereinafter set forth, reference being had to the accompanying  
15 drawings, in which—

Figure 1 is a longitudinal section of a belt-pulley provided with means in accordance with my invention for increasing adhesion of  
20 the belt. Fig. 2 is a transverse section of the same, and Fig. 3 is a longitudinal section illustrating a modification of the invention.

One primary cause of the slipping of belts on pulleys I conceive to be the formation of a cushion between the belt and pulley by air  
25 carried forward on the inner side of the rapidly-moving belt and trapped between the belt and the rim of the pulley. In carrying out my invention, therefore, I use means for  
30 withdrawing this air, and thus preventing the formation of the objectionable cushion between the pulley and belt.

In the pulley shown in Figs. 1, 2, and 3, A represents the rim of the pulley, which has  
35 formed therein slots or openings *x* of any available character disposed by preference uniformly throughout the rim of the pulley, and so as to weaken the same as little as possible. The pulley shown is closed at one end  
40 and open at the other and is mounted upon a shaft G, surrounding which and projecting into the pulley to the full depth of the same is a sleeve B, having thereon vanes *a*, curved transversely and inclined longitudinally,  
45 these vanes extending close to the inner face of the rim A of the pulley, so that as the latter is rapidly rotated the air within the same will partake of this rotating motion and will be caught by the curved and inclined vanes  
50 *a*, and projected thereby from the open end

of the pulley, thereby causing within the pulley a partial vacuum which will induce a flow of air through the slots or perforations in the rim of the pulley, and will thus prevent the formation of an air-cushion between  
55 said pulley-rim and belt.

The vanes *a* may be so designed as to have such a projecting force upon the air within the pulley as will maintain a partial vacuum therein greater than can be supplied by air  
60 entering through the openings in the exposed portion of the pulley, that is to say, the portion not covered by the belt, so that in all cases there will be a tendency to withdraw  
65 air from the openings in that portion of the pulley which is covered by the belt; but, in order to still further insure the proper draft of air from the latter openings, I prefer to use a curved guard or check plate D, located close  
70 to the inner side of the pulley-rim and extending throughout that portion of said rim which is uncovered by the belt, whereby the flow of air through the openings in the uncovered portion of the pulley will be cut off, and the partial vacuum created in the pulley  
75 will have to be supplied largely, if not wholly, by air drawn through the openings in that portion of the pulley which is covered by the belt.

The guard-plate D, while close to the inner  
80 face of the rim of the pulley, is of course free from contact therewith, and there is the same relation between the sleeve B and the pulley-shaft.

The guard or check plate D is preferably  
85 mounted upon the outer ends of certain of the vanes *a*, whereby it is properly braced and supported in the desired relation to the inner face of the pulley-rim, the sleeve B being supported by connection with any fixed  
90 object adjacent to the pulley, for instance, by means of a right-angled bracket B', projecting from the pulley-shaft bearing, as shown in Fig. 1.

Although I prefer the use of the stationary  
95 sleeve with its inclined vanes as a means of creating a partial vacuum within the pulley, a rotary fan or exhausting device with inclined vanes may, if desired, be used in place of the same in many cases. For instance, in  
100



Fig. 3 I have shown a form of pulley which has at the open end a rotary fan with inclined blades or vanes  $a'$ , the hub of this fan being secured to a projecting portion of the pulley-shaft  $G'$ . When the pulley is rotated, therefore, the exhaust-fan  $H$  is likewise rotated and causes a partial vacuum in the interior of the pulley, so as to cause an inflow of air through the perforations or slots formed in the rim of the pulley.

The guard or check plate  $D'$  in this case may be supported by a bracket  $D^2$  or in any other available way, or it may be dispensed with altogether if the openings or slots in the rim of the pulley are so proportioned that those which are uncovered by the belt will not be sufficient in area to supply the volume of air required by the draft of the fan.

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

1. The combination of a belt-pulley having openings in the rim of the same, with inclined vanes for withdrawing air from the interior of the pulley as the latter is rotated, substantially as specified.

2. The combination of a belt-pulley having openings in the rim of the same, inclined vanes for withdrawing air from the interior of the pulley as the latter is rotated, and a guard or check plate adapted to cover those open-

ings of the pulley-rim which are not covered by the belt, substantially as specified.

3. The combination of a belt-pulley having openings in the rim of the same, with stationary inclined vanes mounted on the inside of the pulley and serving to discharge air therefrom as the pulley is rotated, substantially as specified.

4. The combination of a belt-pulley having openings in the rim of the same, with fixed inclined vanes located on the interior of the pulley and serving to discharge air therefrom as the pulley is rotated, and a guard or check plate carried by said vanes and serving to cover the openings in the pulley-rim not covered by the belt, substantially as specified.

5. The combination of a belt-pulley having openings in the rim of the same, a central sleeve or support carrying inclined vanes located on the interior of the pulley and serving to drive the air therefrom as the pulley is rotated, and means for fixedly mounting said sleeve or support, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD N. WALLIS.

Witnesses:

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F. E. BECHTOLD.