

No. 742,171.

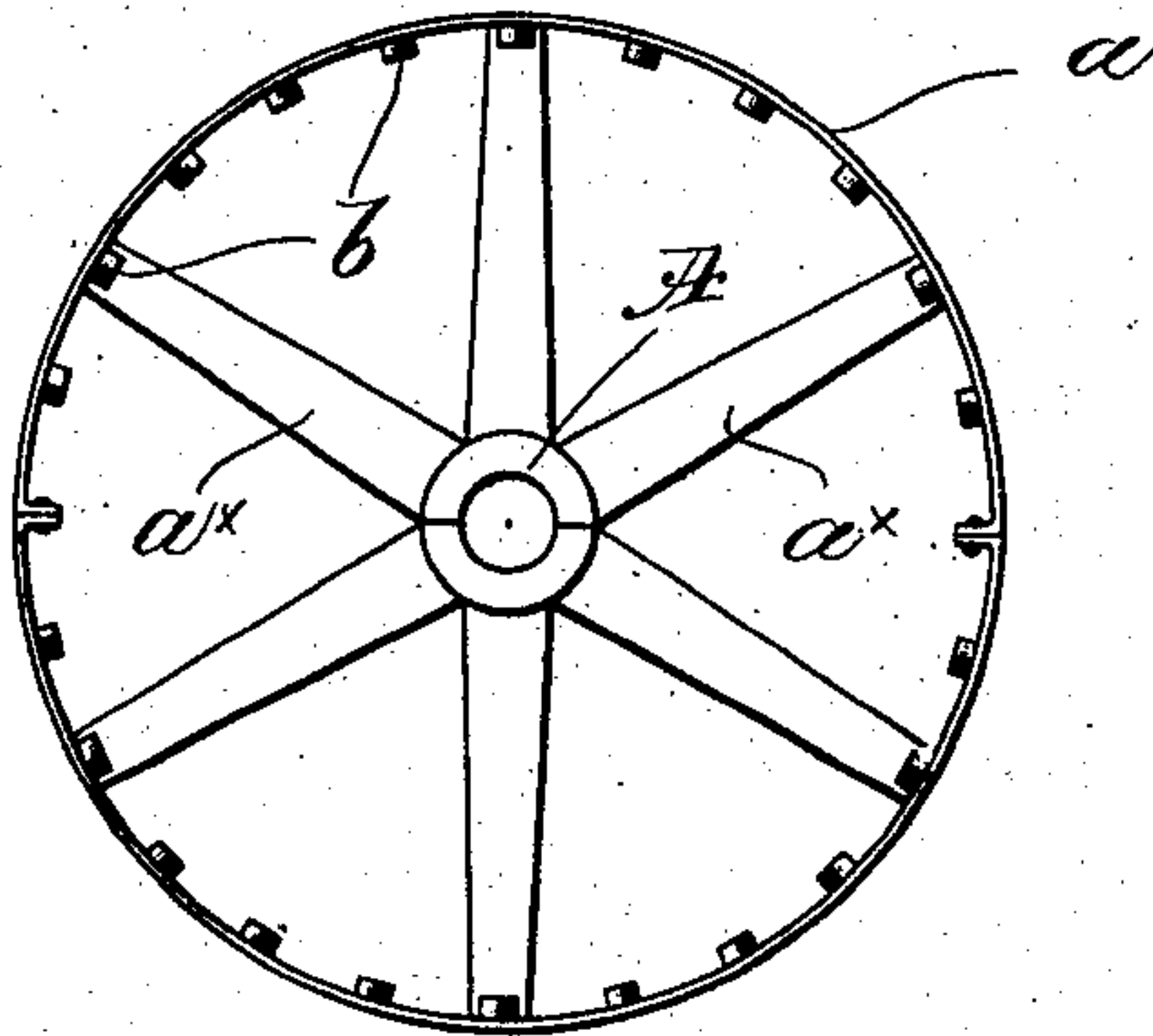
PATENTED OCT. 27, 1903.

F. L. DAVIS.  
PULLEY.

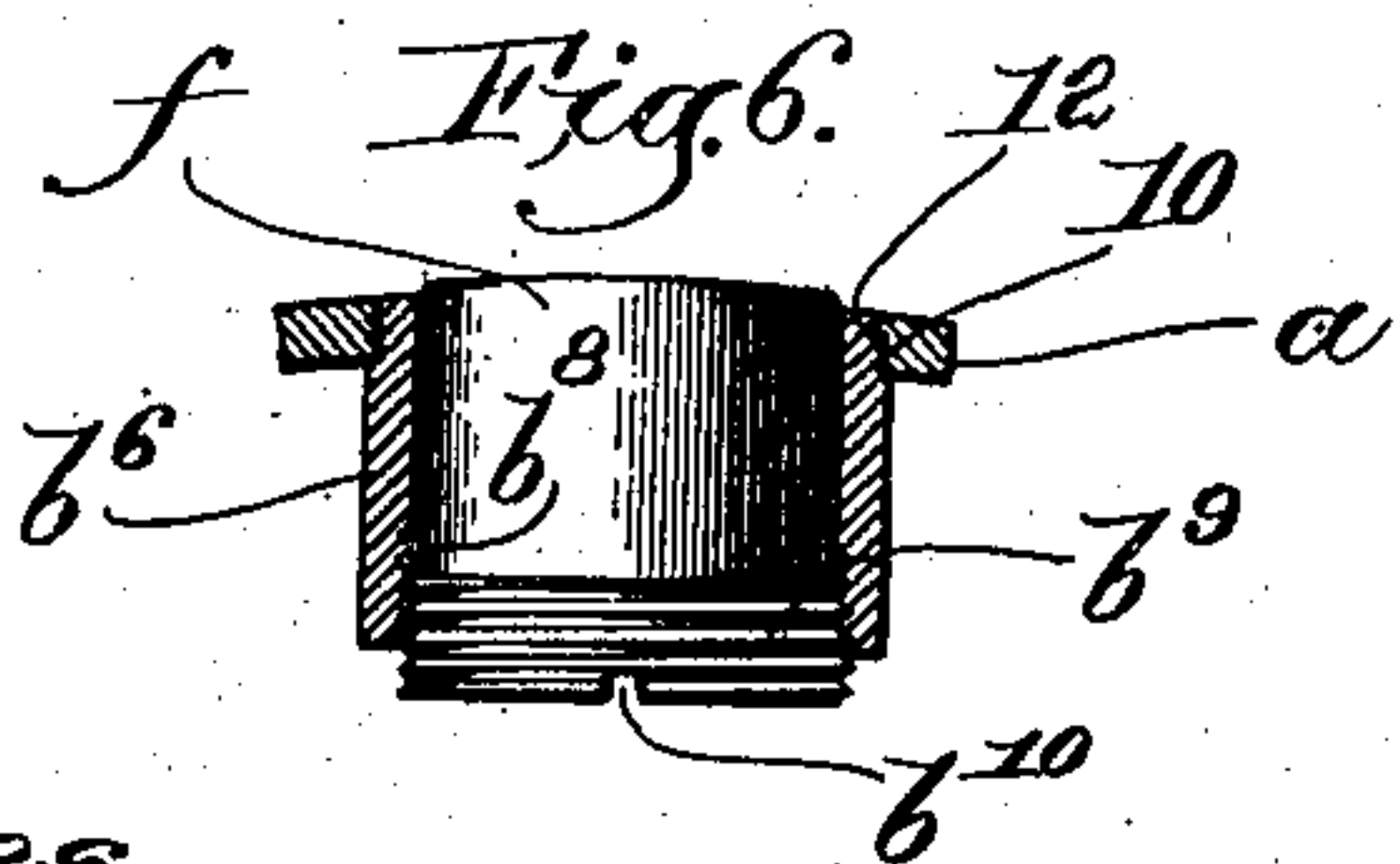
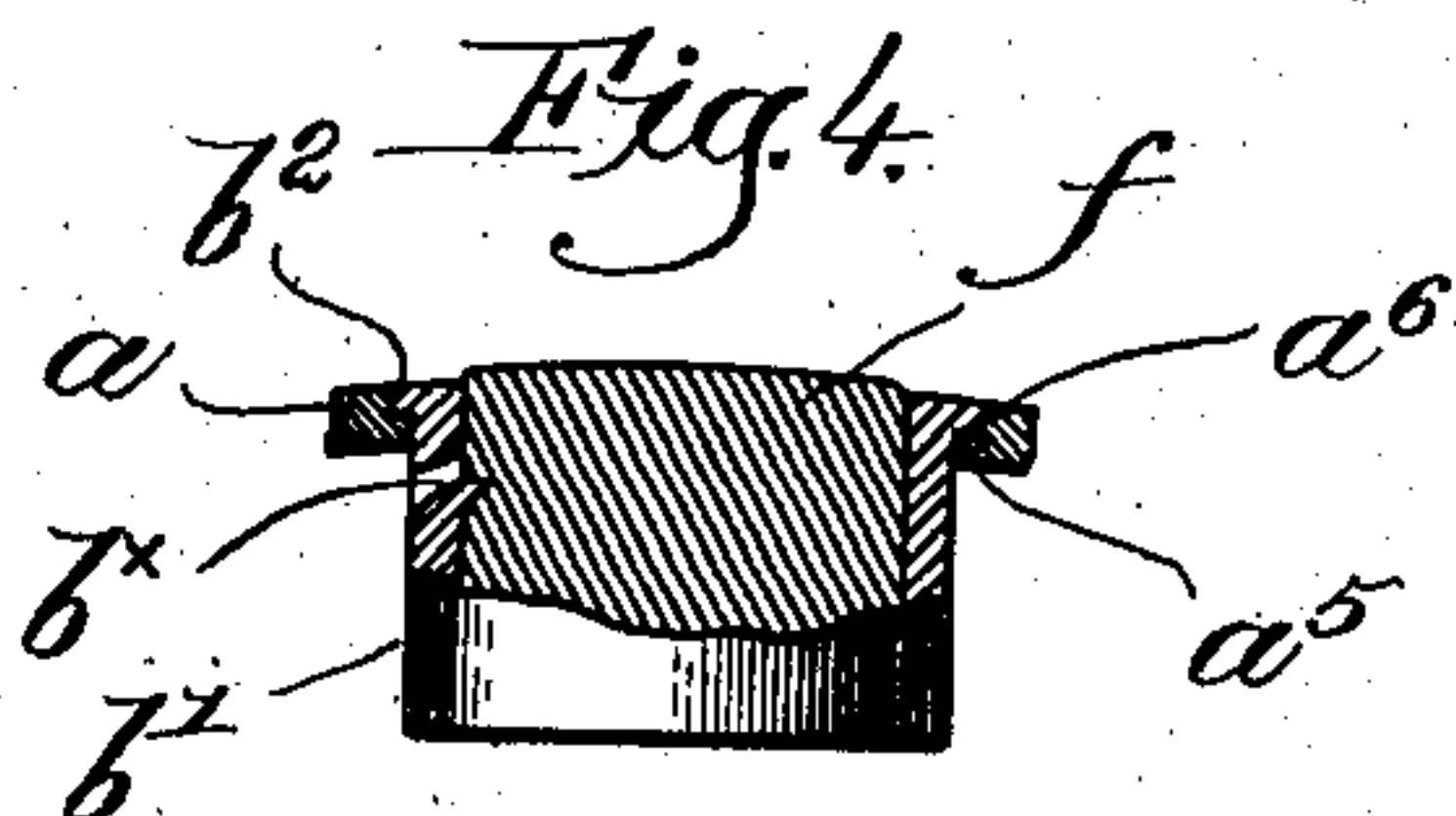
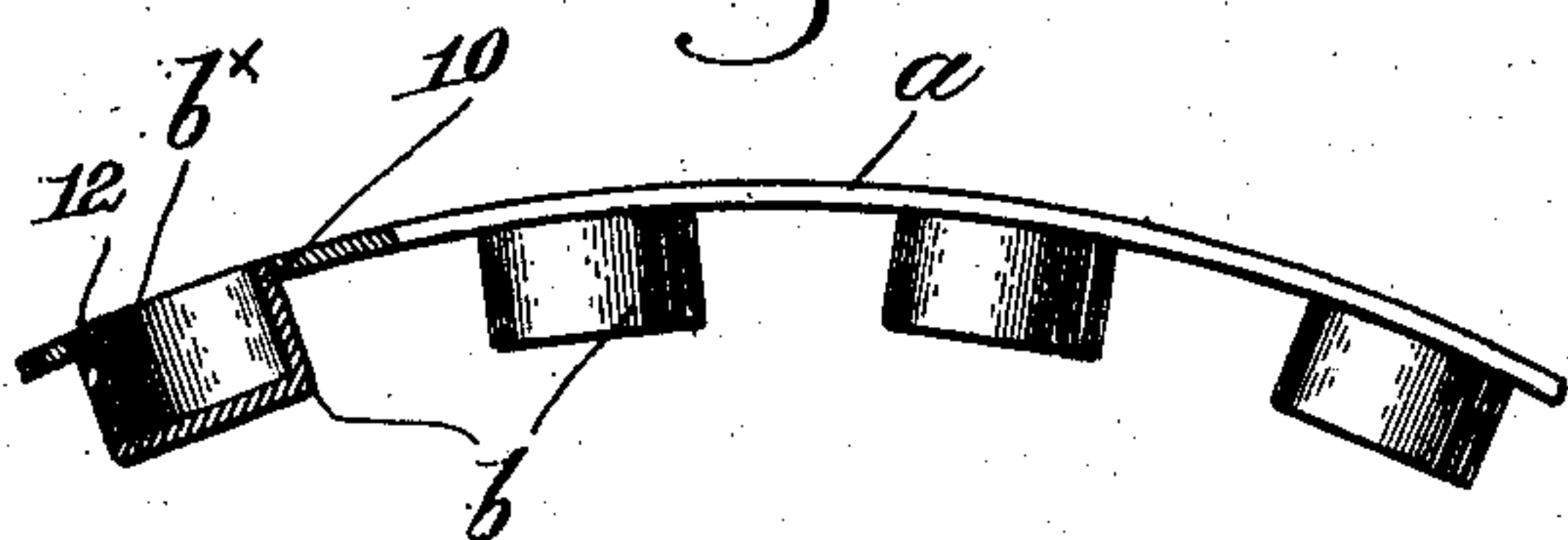
APPLICATION FILED JUNE 15, 1903.

NO MODEL.

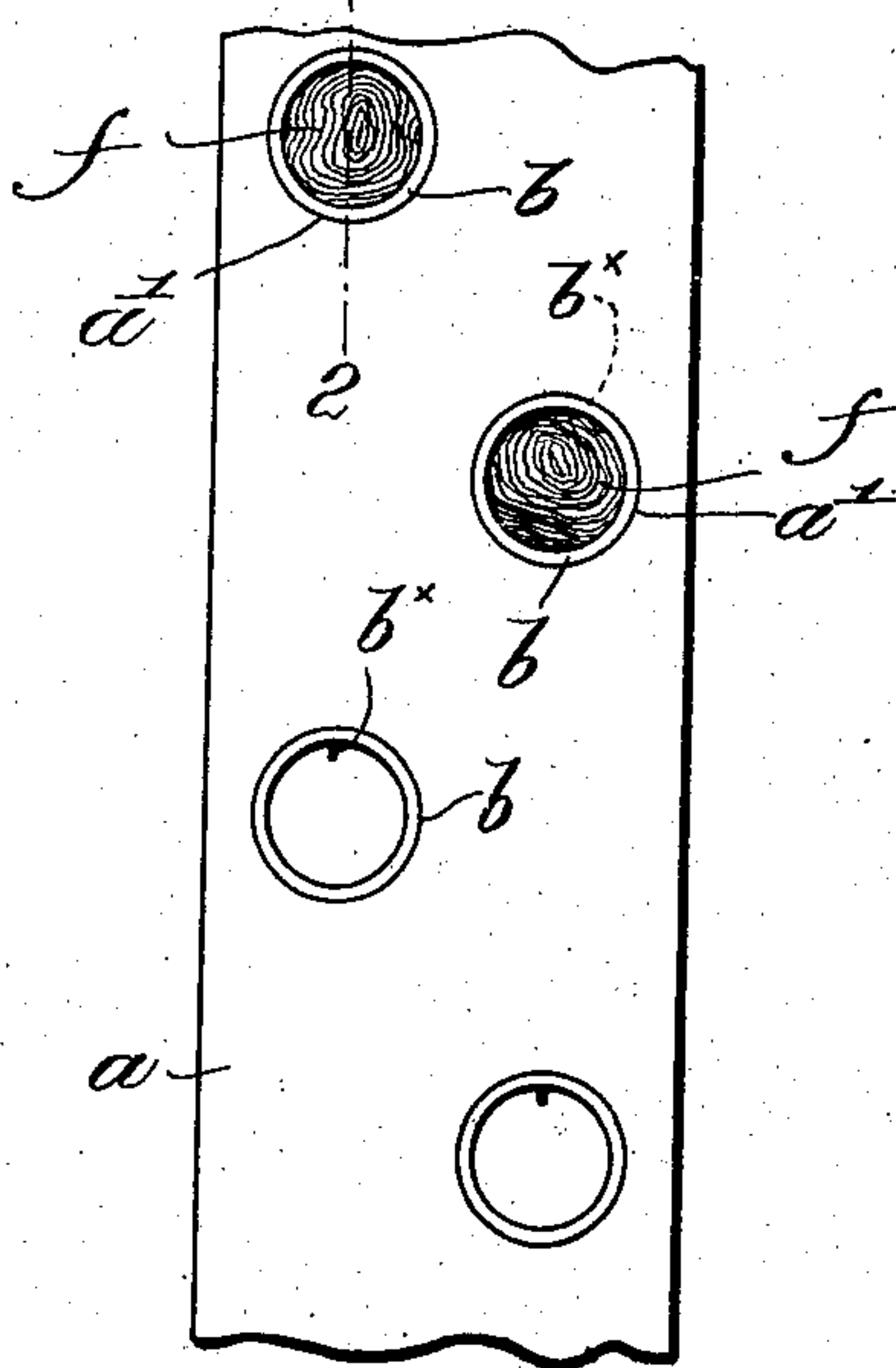
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## PULLEY.

SPECIFICATION forming part of Letters Patent No. 742,171, dated October 27, 1903.

Application filed June 15, 1903. Serial No. 161,451. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK L. DAVIS, a citizen of the United States, and a resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Pulleys, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

10 This invention relates to wheels or pulleys for transmitting power by belts; and it has for its object the production of simple and effective means for preventing slipping of the belt over the pulley when running and to prevent the belt from running off the pulley when in operation.

Cast-metal pulleys have been made with integral pockets or thimbles communicating with holes in the rim or face, the pockets being filled with plugs or masses of wood or other elastic or fibrous material, the exposed portions of which engage and hold the inner surface of the belt and prevent it from slipping on or running off from the pulley when in operation. So, too, wooden-rim pulleys have been bored at intervals to receive such holding-plugs, and pulleys having a thin cast or rolled metallic rim or face have been provided with a wooden backing, the latter and the rim being bored to form pockets for elastic or fibrous plugs. In practice it has been found that these various forms of pulleys are open to certain objections which to a material extent offset the undoubtedly valuable results which accrue from the use of the plugs, blocks, or masses of wood or other holding material and restrict the use of the pulleys. Thus a cast-metal pulley having the pockets integral therewith is very expensive to manufacture, while a pulley having a thin rim or face, either cast or rolled, has to be backed with wood to afford sufficient thickness in which to place the plugs, and the backing becomes loose after comparatively short service. The rolled-steel-rim pulley and that form of cast-metal pulley having a thin rim are in widely-extended use, and my present invention is particularly adapted thereto.

50 In accordance with my invention the pulley rim or face is provided with a suitable number of holes, round or otherwise, as may

be desired, and separately-formed pockets or thimbles of corresponding shape are secured to the rim, opening into the holes and extending radially from the rim toward the center of the pulley. The plugs of wood, rubber, or other suitable fibrous or elastic material are inserted in the pockets and are exposed at the outer surface of the pulley-rim to engage and hold the belt in the desired manner. The holes in the rim are made in any suitable manner, as by drilling, punching, or dieing out during the rolling of the rim, if the latter be so made, and the pockets or thimbles can be struck up, spun, pressed, or otherwise formed and secured to the rim in various ways, some of which will be referred to hereinafter.

The various novel features of my invention will be described in the subjoined specification, and particularly pointed out in the following claims.

Figure 1 is a side elevation of a pulley embodying one form of my invention. Fig. 2 is an enlarged segmental portion thereof, partly shown in section to more clearly illustrate the pocket and the mode of attaching it to the rim, taken on the line 2 2, Fig. 3. Fig. 3 is a face view of a portion of the rim of a so-called "steel-rim" pulley with my invention applied thereto. Figs. 4 and 5 are views similar to Fig. 2, but showing different modes of securing the pockets to the pulley-rim; and Fig. 6 is yet another modification, showing means for adjusting the plug when its acting or exposed end becomes worn down.

The pulley illustrated in Fig. 1 is what is known as a "steel-rim" pulley, the thin rim or face  $a$  being made of rolled steel and secured to the hub  $A$  by radial arms  $a^x$ , such a pulley *per se* forming no part of my present invention, and I desire it to be understood that my invention is equally applicable to cast-metal pulleys having relatively thin rims. In accordance with my invention the rim of the pulley is provided with a series of apertures  $a'$ , Fig. 3, preferably arranged in rows around the periphery of the rim, the apertures in one row being shown in Fig. 3 as staggered relatively to those of the next row. The number of rows and the number of apertures per row will be determined by the diameter of the pulley and the width of its rim.



or face. In Figs. 2 and 3 I have shown the apertures as circular, and they are screw-threaded at 10 by a suitable tool, I having found three threads to be amply sufficient.

5 Pockets or thimbles  $b$  are arranged upon the interior of the rim corresponding in number and cross-section to the apertures and communicating therewith, the pockets being struck up, stamped, or otherwise formed from  
10 sheet metal and externally threaded at their open ends at 12, Fig. 2. Each pocket is screwed into its appropriate aperture until its end is flush with the outer surface of the rim or slightly below it, the fit of the threads  
15 being close enough to firmly secure the pocket to the rim and projecting inward radially therefrom. A plug, block, or mass  $f$  of wood, cork, fiber, rubber, or other elastic or fibrous material is forced into each pocket, the outer  
20 end of such plug projecting slightly beyond the outer surface of the rim of the pulley to present a friction or holding surface for the belt. A lug  $b^x$  is shown in Figs. 2, 3, and 4 as projecting inwardly from the side wall of  
25 the pocket to engage and hold the plug  $f$  in place. I have found the screw-threaded connection between the rim and the pockets to be very satisfactory in holding the pockets securely in position; but other modes of se-  
30 curing them in place may be used.

Referring to Fig. 4, the aperture  $a^5$  in the pulley-rim is countersunk at its outer end at  $a^6$ , and the pocket  $b^1$  is provided at its open end with an external annular lip or flange  $b^2$   
35 to enter the countersink. By inserting a tube-expander or similar tool the open end of the pocket can be expanded sufficiently to make an absolutely-rigid connection between the pocket and rim. The closed bottom of the  
40 pocket supports the plug  $f$  of friction material, so that the latter can be forced into the pocket under pressure, if desired.

In Fig. 5 the aperture in the rim is reamed out to present a socket, as  $a^7$ , around the edge  
45 of the aperture, and when the end of the pocket is inserted therein an external head  $b^3$  is formed thereon by an expander to fit in the socket  $a^7$  and hold the pocket in place.

In the structure shown in Fig. 2 the apertures are circular and the pockets are tubular, and with the screw-thread connection this must be, manifestly; but with the structures shown in Figs. 4 and 5 the apertures may be round, oval, or elliptical, as desired.

55 Sometimes it may be desirable to adjust the plugs by moving them outward in order to compensate for wear of their exposed ends at the outer surface of the rim, and I have shown a construction in Fig. 6 whereby such  
60 adjustment can be effected.

The pocket  $b^6$ , tubular in form, is externally threaded at one end, as at 12, to screw into the thread 10 of the aperture in the rim, as in Fig. 2, and the opposite open end of the  
65 pocket is internally threaded at  $b^8$  to engage the thread of an adjustable bottom  $b^9$ , having a nick  $b^{10}$  in its outer face. By means of a

screw-driver this bottom can be screwed into the pocket when desired, to thereby force the plug  $f$  of friction material outward the re- 70 quired distance.

The pockets or thimbles can be made very cheaply and easily, and their added weight is not objectionable, and they can be used in connection with pulleys having very light 75 rims, the function of the pockets being to retain the frictional material in place, obviating wooden backing for the rim or a rim so thick and heavy that its use would be prohibitive. 80

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

1. A pulley having an apertured rim or face, and a series of pockets detachably se- 85 cured to the rim and communicating with the apertures therein.

2. A pulley having a thin metallic rim provided with a series of apertures, metallic pockets arranged upon the rim at its interior 90 face and communicating with said apertures, means to detachably secure the pockets directly to the rim, and friction-plugs of elastic or fibrous material held in the pockets and extending slightly beyond the outer surface 95 of the rim.

3. A pulley having a thin metallic rim provided with a series of apertures, pockets corresponding in cross-section to the shape of the apertures inserted therein and extending 100 radially from the inner surface of the rim, and means to rigidly secure the pockets to the rim.

4. A pulley having an apertured metallic rim or face, a plurality of separately-formed 105 pockets corresponding in cross-section to the shape of the apertures, the pockets being arranged at the interior of the rim and having their outer ends inserted in the apertures, and means to detachably connect the pockets with 110 the rim.

5. A pulley having a metallic rim provided with a series of threaded apertures, and a corresponding number of metal pockets externally threaded at one end and closed at the 115 other end, the threaded ends being screwed into the apertures so that the pockets project from the inner surface of the rim.

6. A pulley having a metallic rim provided with a series of apertures, metallic pockets 120 arranged upon the interior of the rim and detachably secured thereto, communicating at their outer ends with the apertures, an adjustable bottom for each pocket, and plugs of fibrous or elastic friction material inserted 125 in the pockets and projecting slightly beyond the outer surface of the rim.

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

FREDERICK L. DAVIS.

Witnesses:

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