No. 742,497. PATENTED OCT. 27, 1903.

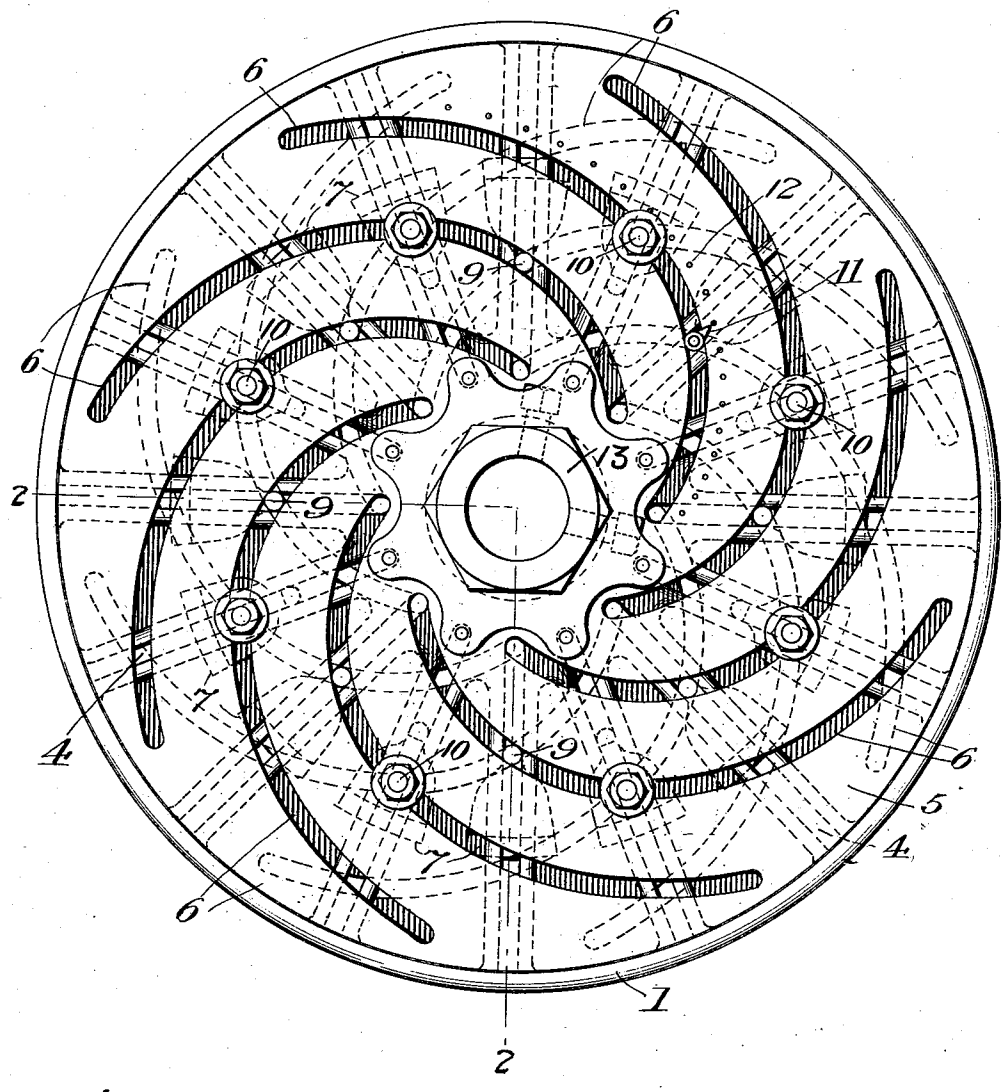
L. G. ROWAND.

EXPANSIBLE PULLEY.

APPLICATION FILED MAR. 11, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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J. E. Hutchinson Jr.

Inventor:
L. G. Rowand
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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EXPANSIBLE PULLEY.

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NO MODEL. 2 SHEETS—SHEET 2.

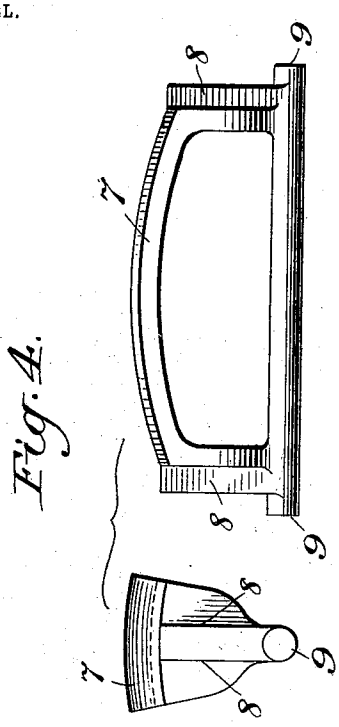


Fig. 4.

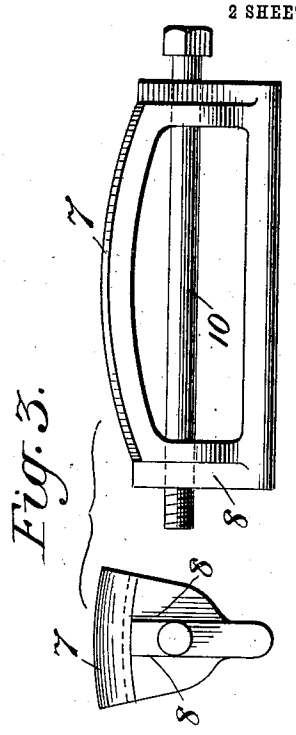


Fig. 3.

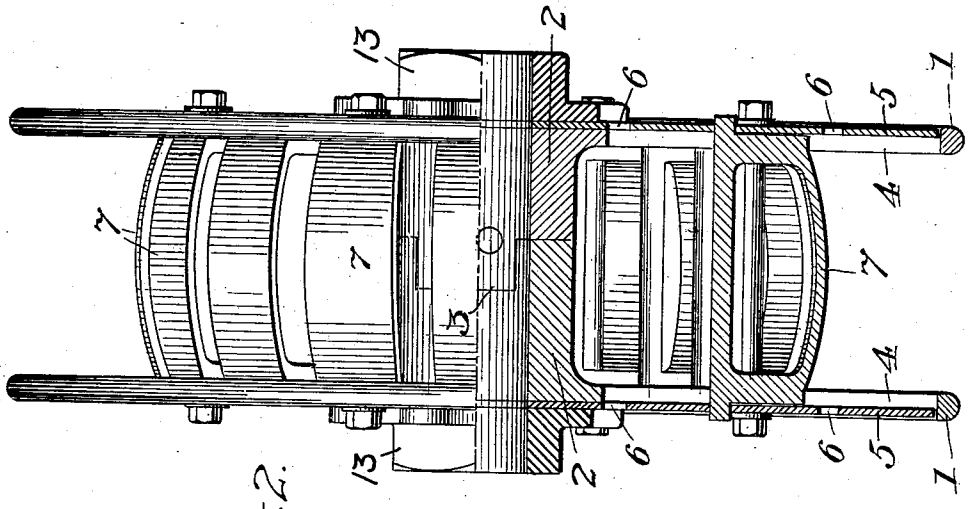


Fig. 2.

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No. 742,497. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

LEWIS G. ROWAND, OF EAST ORANGE, NEW JERSEY.

EXPANSIBLE PULLEY.

SPECIFICATION forming part of Letters Patent No. 742,497, dated October 27, 1903.

Application filed March 11, 1903. Serial No. 147,267. (No model.)

To all whom it may concern:

Be it known that I, LEWIS G. ROWAND, a citizen of the United States, residing at East Orange, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Expansible Pulleys; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in expansible pulleys—that is to say, pulleys in which the rim portions are composed of a series of sections adapted to be adjusted in a radial direction simultaneously, so as to increase or decrease the diameter of the pulley.

It has for its object to produce a simplified, durable, cheap, and efficient pulley of compact construction that can be applied to any driving or driven shaft without the necessity of mechanism other than that contained in the pulley itself.

The invention has reference more especially to that type of expansible pulley in which the rim-sections are radially adjustable by means of circular plates loosely mounted upon the shaft and provided with cam-slots in which the sections are supported.

Before my invention in all pulleys of this particular type the arrangement of the cam-slots in the adjusting-plates has been such that when the plates are operated to radially adjust the rim-sections for increasing or decreasing the diameter of the pulley they tend to rotate the shaft, and as this tendency is in one direction only the shaft requires some suitable means to hold it at rest.

In the present invention the adjusting-plates are provided with reversely-arranged cam-slots, whereby in order to actuate the rim-sections the plates are necessarily operated in opposite directions, thus giving to the shaft a like pull in both directions, which perfectly balances it and holds the shaft at rest during the adjusting operation.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of my improved pulley. Fig. 2 is a view of the pulley, partly in end elevation and partly in section, the section taken on line 2 2 of Fig. 1. Figs. 3 and 4 are detail views of the rim-sections.

Referring to the drawings, the expansion-pulley is illustrated as consisting, preferably, of two section-guiding circular frame members 1 1, each having a hub portion 2 integrally formed therewith, the inner faces of said hub portions interlocking by tongue and groove, as clearly shown at 3, for the purpose of connecting the guiding frame members and holding the same in proper relation one with the other, and each frame member having a plurality of rectilinear radial guiding-slots 4 preferably formed therein, as shown; the two section-adjusting plates 5 5, disposed in cooperative relation with the two guiding frame members and each having a plurality of radiating spirally-disposed section-adjusting cam-slots 6 formed therein and in coöperative relation with the rectilinear radial slots 4 of the two guiding frame members, each radial guiding-slot being disposed longitudinally in a plane intersecting the spiral plane of one cam-slot, the cam-slots of one plate being reversely arranged with respect to the cam-slots of the other plate, and a plurality of rim sections or segments 7, supported for radial adjustment between the inner faces of the two guiding-frame members and having projections at opposite ends thereof extending through the radial guiding-slots into the spiral cam-slots of the adjusting-plates 5 5, respectively, that portion of the end projections lying within the guiding-slots having plane or straight faces, as indicated at 8 8, fitting between the side walls of the said guiding-slots and preventing rotative movements of the rim-sections about the axes of their respective end projections during radial adjustments thereof, while that portion of the projections lying within the cam-slots is cylindrical in cross-section and will be more fully described hereinafter.

It is important in the construction of pulleys of the expansible type to so arrange the rim-sections within the pulley that they present as nearly as possible a continuous periphery. This may be accomplished by making the sections small in cross-section, thus allowing for a greater number of them being used in assembling the pulley, it being obvious that the greater the number of rim-sections the less space there is required between them.

I have shown in the present pulley sixteen rim-sections and have mounted two in each cam-slot, thus allowing one cam-slot to operate and adjust two of the rim-sections. This arrangement of sections obviates the necessity of increasing the number of cam-slots in the adjusting-plates to correspond to the large number of sections that are employed. It will be understood, however, that while I show only two of the sections carried by each cam-slot a greater number could be mounted therein, thus making the number of cam-slots much less in proportion to the number of sections.

The spiral cam-slots are so disposed within the adjusting-plates that to properly mount two or more rim-sections within each cam-slot it is necessary for the end projections extending therein to be so positioned that the exterior faces of all the rim-sections in their different radial adjustments will constitute the periphery of the pulley. The rim-section mounted in that part of each cam-slot nearest the center of the pulley is constructed substantially as shown in Fig. 4, the same having the plane-faced projections 8 8, as heretofore mentioned, fitting within the guiding-slots, and thus preventing the rotation of the sections during the radial adjustments thereof, and also provided with studs or pins, as shown at 9, which project into the cam-slots and support the sections therein. The other rim-section for each cam-slot is somewhat differently constructed, as will be seen by reference to Fig. 3, it, however, having the plane-faced projections 8 8, as in the first-mentioned one; but instead of having studs or pins for supporting the sections within the cam-slot a bolt 10 is provided, which runs lengthwise through the section and projects beyond the ends thereof a sufficient distance to rest within the cam-slots, and thus provide a support for the sections. This manner of mounting the sections also provides for the locking together of the different parts of the pulley after the sections have been adjusted to the desired diameter, one end of the bolt being screw-threaded, as shown, to receive a nut which may be tightened with a suitable wrench, thus making the pulley as rigid as if it were made in one piece.

Mounted upon one of the studs 9 is an arm or index-pointer 11, adapted to operate in connection with a scale 12 of divisions indicated upon the outer face of one of the adjusting-plates, which represent different diameters of circles to which the rim-sections may be expanded, so that the adjustment of the sections may be made with little or no difficulty. The index-pointer, however, may be mounted on the rim of the guiding frame member 1 or on the outer face of the adjusting-plate 5, near the periphery thereof, and the division-scale 12 placed either upon the guiding-frame-member rim or the outer face of the adjusting-plate, according to the location of the pointer, thus enabling one to readily read the scale and adjust the pulley to its proper diameter.

To expand or contract the diameter of the pulley, it is only necessary to loosen the bolts 10, apply a wrench to each of the nuts 13 13, which are rigidly fixed to the outer faces of the adjusting-plates, and then turn the nuts in opposite directions, thus dispensing with separate means for holding the shaft at rest during such adjusting operation. It is apparent that in carrying out my invention various modifications in the construction herein shown and described may be made, and I would therefore have it understood that I do not limit myself to the precise details herein illustrated, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

Having thus described my invention, what I claim is—

1. An expansible pulley, comprising a frame fixed to a shaft and having radial guiding-slots therein, two adjusting-plates loosely mounted upon said shaft and provided with cam-slots, and a plurality of rim-sections mounted within the guiding-slots and cam-slots, the cam-slots of one plate being arranged reversely to the cam-slots of the other, whereby the rim-sections are adjusted radially by rotating the said plates in opposite directions.

2. An expansible pulley, comprising a frame fixed to a shaft and having radial guiding-slots therein, an adjusting-plate loosely mounted upon said shaft and provided with cam-slots, a plurality of rim-sections having straight-faced projections extending into the guiding-slots of the frame, bolts extending from said rim-sections through the frame and into the cam-slots of the plate and serving to support the sections in the slots, and means on said bolts for holding the different parts together.

3. An expansible pulley, comprising a frame fixed to a shaft and having radial guiding-slots therein, an adjusting-plate loosely mounted upon said shaft and provided with cam-slots, and a plurality of rim-sections having projections extending into the guiding-slots and cam-slots, the end projections of the rim-sections being located so that a plurality of sections may be adjusted by each of the cam-slots in the plate.

4. An expansible pulley, comprising two frame members fixed to a shaft and having radial guiding-slots therein, two adjusting-plates loosely mounted upon said shaft and provided with cam-slots, and a plurality of rim-sections having projections at opposite ends extending through both the guiding-slots and cam-slots, the cam-slots of one plate being arranged reversely to the cam-slots of the other, whereby the rim-sections are adjusted radially by rotating the said plates in opposite directions.

5. An expansible pulley, comprising two frame members fixed to a shaft and having

radial guiding-slots therein, two adjusting-plates loosely mounted upon said shaft outside of said frame members and provided with cam-slots, a plurality of rim-sections having straight-faced projections at opposite ends thereof extending into the guiding-slots of the frame members, bolts extending from said rim-sections through the frame members and into the cam-slots of the plates and serving to support the sections in the slots, and means on said bolts for holding the different parts together.

6. An expansible pulley, comprising two frame members fixed to a shaft and having radial guiding-slots therein, two adjusting-plates loosely mounted upon said shaft and provided with cam-slots, and a plurality of rim-sections having projections at opposite ends thereof extending through both the guiding-slots and cam-slots, the end projections of the rim-sections being located so that a plurality of sections may be adjusted by each of the cam-slots in the plates.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS G. ROWAND.

Witnesses:
FRANZ MEYER,
GUSTAV HARTMANN.