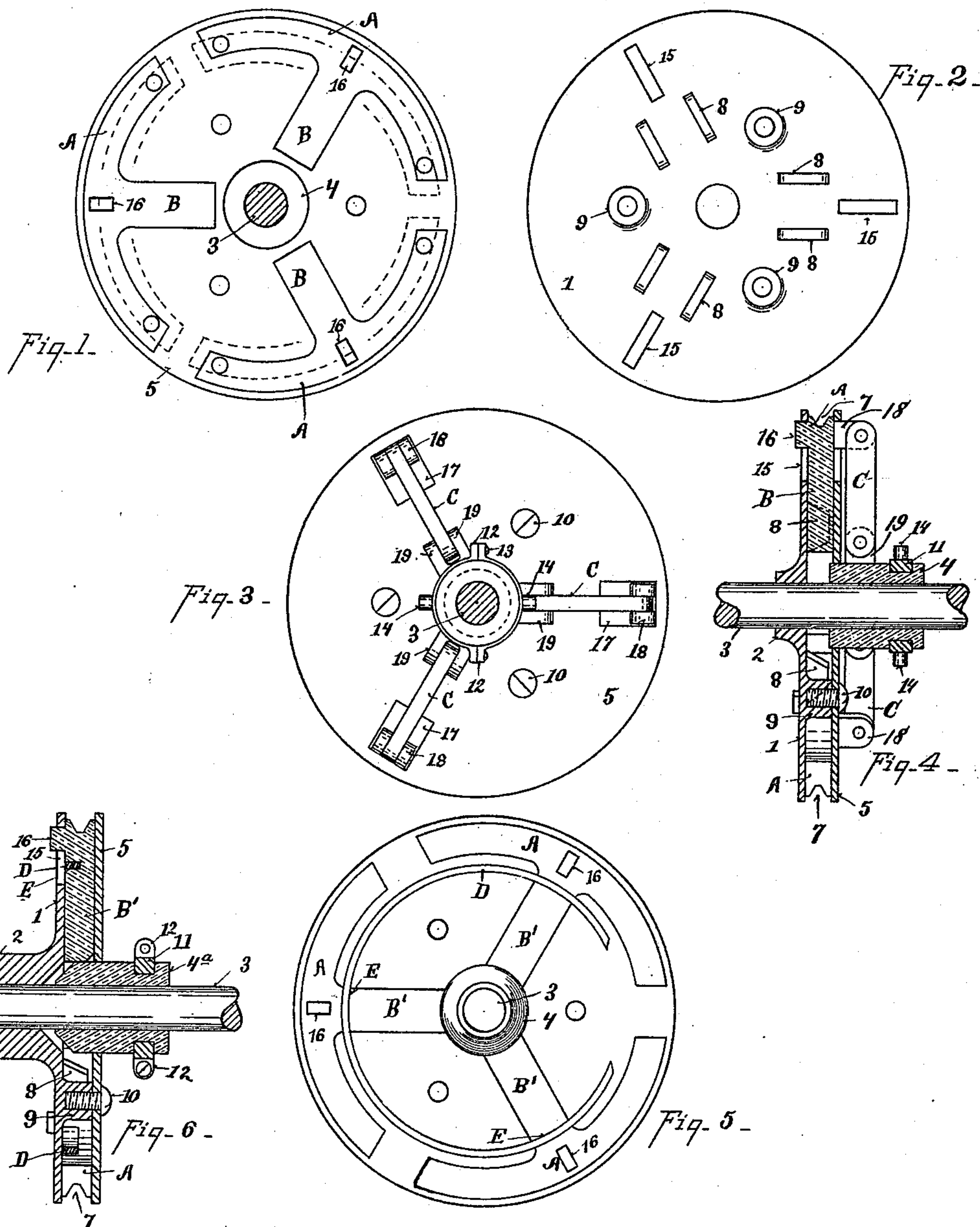


(No Model.)

C. KECK & F. BUOB.
EXPANSION PULLEY.

No. 464.798.

Patented Dec. 8, 1891.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHRISTIAN KECK AND FREDERICK BUOB, OF CINCINNATI, OHIO.

EXPANSION-PULLEY.

SPECIFICATION forming part of Letters Patent No. 464,798, dated December 8, 1891.

Application filed August 8, 1891. Serial No. 402,094. (No model.)

To all whom it may concern:

Be it known that we, CHRISTIAN KECK and FREDERICK BUOB, citizens of the United States, and residents of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Expansion-Pulleys, of which the following is a specification.

The object of our invention is to provide an expansive driving-pulley which can be readily operated to stop or start machinery and to graduate the power of speed of the parts to be driven, its speed depending upon the tautness to which the belt is stretched by the expansion of the driving-pulley. It is specially adapted to be used with that class of machinery that is designed to be started up gradually, such as sewing-machines. It is adapted, also, to be used as a substitute for a tight and loose pulley in ordinary light machinery.

The various features of our invention will be fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of the pulley with the rear disk removed. Fig. 2 is a plan view of the inside face of the disk. Fig. 3 is a plan view of the front disk and the operative mechanism. Fig. 4 is a central vertical section of Fig. 3. Fig. 5 is a modification of Fig. 1. Fig. 6 is a central vertical section of the modification shown in Fig. 5.

1 represents the rear disk of the pulley; 2, the hub thereof; 3, the driving-shaft to which the disk 2 is keyed or secured, so as to revolve the latter with the shaft. Instead of the disk 1 the spider form may be employed.

4 represents an annular hub projecting through the face of the front disk 5, and it journals and slides on the shaft 3. The expansive portion of the pulley is formed of segments A, the outer periphery of which forms the driving-surface of the pulley. In Figs. 4 and 6 we have shown these faces with the groove 7 adapted to receive a round belt; but it is obvious that the faces may be plane and a flat belt employed.

B represents arms projecting in from the segments A. These arms are held laterally in position by means of guides 8, which project inward from the face of the rear disk 1,

which is the preferred form of construction.

In Fig. 1 the dotted lines show the position of the segments in their contracted position. The driving-pulley then being of small diameter allows the belts to set loosely thereon. The full lines show the driving-segments in their expanded position.

In order to prevent the binding upon the segments and arms the disk 1 is provided with a series of bosses 9, upon which face of the front pulley 5 rests, being secured together by screws 10, which pass through the front plate 5 and tap into the bosses 9, allowing free movement of the segments A and the arms B between the two disks 1 and 5. The sliding hub 4 is grooved to receive an annular collar 11, which is made of two sections and secured together by ears 12 and screws 13.

14 represents pivots, on which journals the yoke of the ordinary shifting-lever, whereby the hub 4 is slidden laterally upon the shaft.

15 represents slots or grooves pierced through the rear disk, and 16 represents lugs projecting from the segments A and traveling within these slots or grooves. These lugs serve as limits or stops for the radial movement of the segments A. They serve, also, as guides for said segments. The front disk 5 is provided with a series of openings 17. 18 represents ears formed on the front face of the segments projecting through said openings.

19 represents a corresponding set of ears projecting from the hub 4.

C represents a series of links hinged to ears 18 and 19, respectively, so that as the hub 4 is slid or moved outward on the shaft 3 the links C contract or move the segments A inward, and a reverse motion depresses the link and expands the segments, whereby the said segments are converted from a loose into a driving pulley. These movements being under the control of the operator, any desired degree of tension or tautness of the driving-belt may be secured at the will of the operator, and the motion may be graduated for the stopping or starting proportionate to the amount of movement or throw of the driving-segments A.

In the modification shown in Figs. 5 and 6 we dispense with the links C, recesses 17, and

ears 18 and 19, and operate the segments in the following manner: D represents a retractile spring, which rests in slots E of the arms B', and so adjusted that the retractile force of the springs hold the segments A in their retracted position. The inner ends of said arms project downward and rest against the hub 4^a. The inner ends of said arms B' are tapered or beveled, and a corresponding bevel is formed upon the inner end of the hub 4^a, which hub acts as a wedge to force the arms B' and the segments A outward whenever the said hub 4^a is driven or moved inward by the lever, thereby employing expansive force upon the inner ends of the arms B', instead of through the medium of links and ears, as shown in Fig. 3.

Mode of operation: The pulley of either form of construction is mounted upon the driving-shaft 3. The forked ends of the yoke of the ordinary shifting-lever is hinged upon the journals 14, so as to move the hub 4 outwardly or inwardly. When the hub 4 is moved inward to its farthest point, the segments A are moved outward and are in the position for driving the machinery at the highest speed. As the hub 4 is moved or slid outward longitudinally on the shaft 3 the size of the pulley is contracted and the speed is gradually lessened, and when said hub is moved outward to its farthest limit the driving portion of the pulley, which consists of the segments A, are retracted so much that the band or belt will slip loosely thereon without communicating motion to the machinery to be driven. Hence our invention serves both as a substitute for loose and tight pulley and as a substitute for a clutch-pulley, and serves also the purpose of graduating the speed, depending upon the position of adjustment of the driving parts of the pulley.

It is obvious that instead of the retractile spring D holding the segments inward the said spring could be used expansively, so as to hold the segments in their expanded position and depending upon lever adjustment for contracting the same, and in some cases this is a desirable form of construction.

We have shown the driving portions of the pulley as composed of disks 1 and 5, between which the segments A are suspended and move radially, and in some cases we desire to have the said disks serve as guides to hold the belt in position against the segments.

Having described our invention, what we claim is—

1. An expansive pulley consisting of a pair of disks, the front one of which is provided

with a central orifice, a hub movable in the said orifice, a series of radially-movable segments arranged between the disks so that the latter project beyond the periphery of the segments to form side flanges for the pulley, said segments having arms projecting toward the center of the disks, and means for adjusting the arms and segments radially when the hub is moved laterally in the central orifice of the disk, substantially as described.

2. An expansive pulley consisting of a pair of disks, one of which is provided with slots or grooves 15, the segments A, having inwardly-projecting arms and provided with lugs 16, engaging the slots or grooves, a hub movable through an orifice in one of the disks, and means for adjusting the arms and segments radially when the hub is moved through the orifice in the disk, substantially as described.

3. An expansive pulley consisting of a pair of parallel disks, the front one having a central orifice and the rear one provided with a series of slots or grooves 15, a hub movable through the orifice in the front disk, a series of segments provided with inwardly-projecting arms and having lugs 16 engaging the slots or grooves, and means for adjusting the arms and segments radially when the hub is moved laterally in the central orifice of the front disk, substantially as described.

4. An expansive pulley consisting of a pair of parallel disks, a series of radially-movable segments interposed between the two disks and having arms which project toward the center thereof, a movable hub, and links pivotally connected with the segments and with the hub for adjusting the segments radially between the parallel disks when the hub is moved, substantially as described.

5. An expansive pulley consisting of front and rear disks, the rear one having slots or grooves 15 and the front one having a central opening, a series of segments having inwardly-projecting arms and provided with lugs 16, which engage the slots or grooves in the rear disk, a hub movable through the central opening in the front disk, and links pivotally connected with the segments and with the hub for adjusting the segments radially when the hub is moved laterally, substantially as described.

In testimony whereof we have hereunto set our hands.

CHRISTIAN KECK.
FREDERICK BUOB.

Witnesses:

T. SIMMONS,
C. W. MILES.