C. E. TANNEWITZ.

VARIABLE SPEED BELT GEARING.

APPLICATION FILED JAN. 12, 1914.

1,151,837. Patented Aug. 31, 1915.

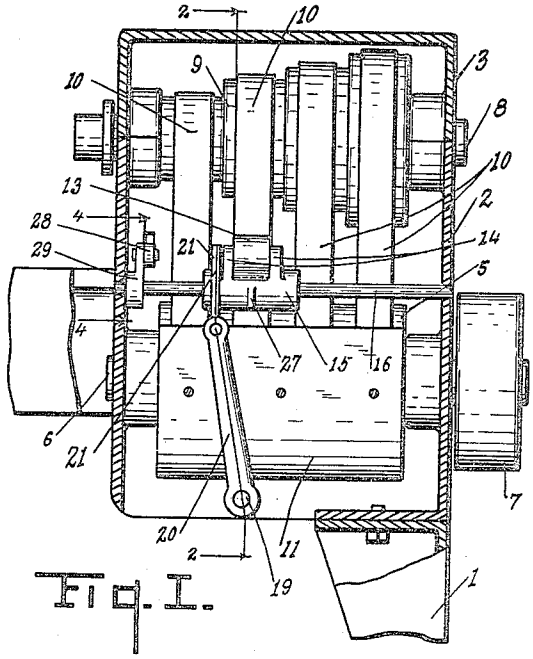


Fig. I.

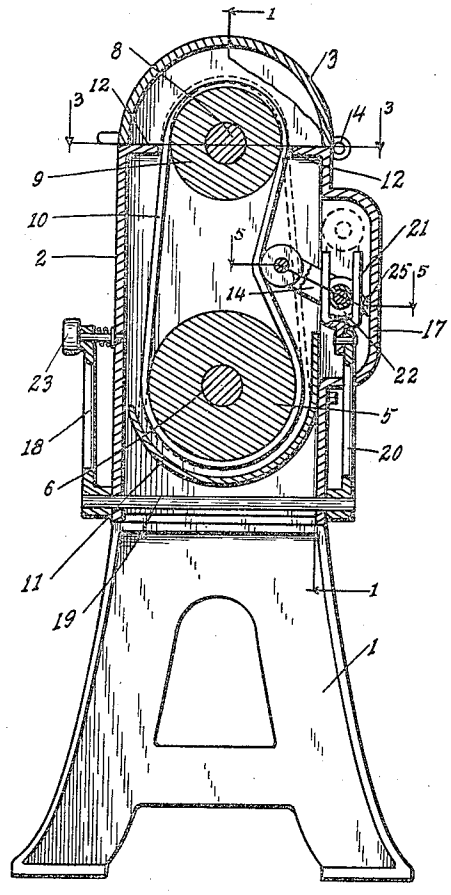


Fig. II.

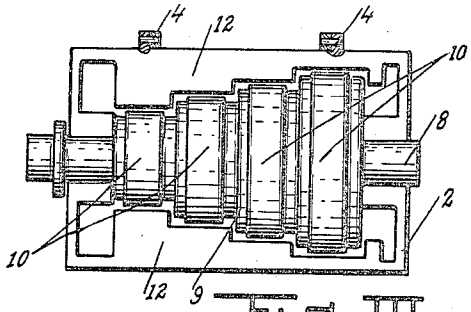


Fig. III.

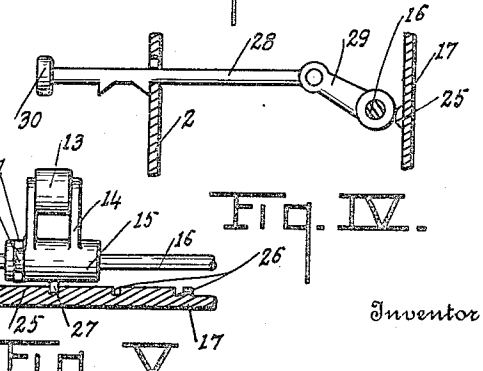


Fig. IV.

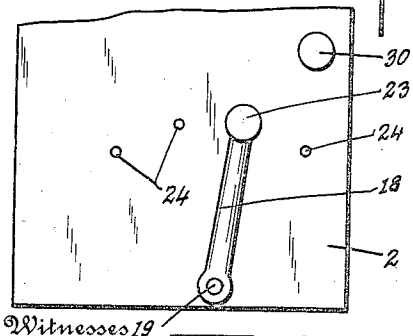


Fig. VI.

Fig. V.

Witnesses
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VARIABLE-SPEED BELT-GEARING.

1,151,837. Specification of Letters Patent. Patented Aug. 31, 1915.

Application filed January 12, 1914. Serial No. 811,611.

To all whom it may concern:

Be it known that I, CARL EDWARD TANNEWITZ, a citizen of the United States, residing at Grand Rapids, Michigan, have invented certain new and useful Improvements in Variable-Speed Belt-Gearing, of which the following is a specification.

This invention relates to improvements in variable speed belt gearing.

My improved variable speed belt gearing is especially designed by me and I have shown and described the same embodied in a lathe head stock. My improvements may, however, be readily adapted and embodied for use in various other relations.

The main objects of this invention are: First, to provide an improved variable speed belt gearing. Second, to provide an improved variable speed belt gearing in which all of the belts are idle and out of contact with the driving and driven members when inoperative. Third, to provide an improved variable speed belt gearing in which wear on the belts is minimized. Fourth, to provide an improved variable speed belt gearing which is simple and economical in structure and very easy to operate.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing forming a part of this specification, in which:

Figure I is a detail view of a lathe head stock structure embodying the features of my invention, parts being shown in section, on a line corresponding to the broken line 1—1 of Fig. II. Fig. II is a vertical transverse section on a line corresponding to the broken line 2—2 of Fig. I. Fig. III is a detail view partially in horizontal section, on a line corresponding to line 3—3 of Fig. II. Fig. IV is a detail vertical section on a line corresponding to line 4—4 of Fig. I, showing details of the control mechanism. Fig. V is a detail section on a line corresponding to the broken line 5—5 of Fig. II, showing further details of the control mechanism. Fig. VI is a detail front view looking from the left of Fig. II, showing the arrangement of the belt tightener adjusting lever.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

In the accompanying drawing, I have, as stated, shown my improvements embodied in the head stock of a lathe in which 1 represents the frame and 2, the head stock gearing casing. The casing 2 is provided with a cover 3 hinged at 4. The driving drum 5 is mounted on the driving shaft 6 in the lower part of the casing. The shaft 6 is provided with a driving pulley 7. In motor driven machines, the motor may be geared directly to the driving shaft. As such an arrangement will be readily understood I do not illustrate the same herein. The driven or head stock shaft 8 is arranged above the driving drum and provided with a stepped cone or driven member 9, there being four steps or pulleys in the structure illustrated. Below the driving drum 5 is a curved pan-like support 11 for the belts 10 when they are released by the belt tightener hereinafter described. At each side of the stepped driven member 9 is a stepped belt support 12. In practice, the steps of the support 12 correspond to the steps of the cone.

The belt tightener comprises a pulley 13 carried by the arms 14 of the slide 15 splined upon the rock shaft 16 at the rear of the casing which is provided with an extension 17 to receive the same, as shown in Fig. II. The tightener is adjusted by means of the lever 18 on the rock shaft 19 which has an arm 20 on its rear end provided with a fork 21 engaging the groove 22 in the slide.

The hand lever 18 has a catch 23 adapted to engage holes 24 in the front wall of the casing when the tightener is in proper position to engage the desired belt. The rib 25 having notches 26 therein, prevents the shifting of the tightener into engagement with a belt until the lug 27 on the slide is brought opposite one of the notches. The tightener is actuated by the control rod 28 which is connected to the arm 29 on the rock shaft 16 and arranged through the front of the casing and provided with a suitable finger piece 30 on its front end. This pro-

vides a simple and effective control means for shifting the gearing. The belts 10 when released by the belt tightener tend to assume a circular or hoop shape and are of such length that they drop away from the driving member or drum 5 and rest on the curved pan-like support 11 below it and also spring laterally away from the driving and driven members against the side supports 12 and finally, on account of these bottom and side supports limiting their downward and lateral movement, rise above the driven member as far as the remaining slack will permit. A sufficient amount of slack is provided for each belt so that when the tightener is released the belt will, as stated, because of its stiffness and weight and its tendency to assume the circular form, drop down and spring out into engagement with the supports provided therefor and lift itself out of engagement with the upper pulley or driven member, as that is the only direction in which the belt can force itself after coming into contact with its supports. When the tightener is brought against a belt the slack is taken up and the belt drawn into contact with the driving and driven members. When the belts are released by the tightener, they are supported by the belt supports, as described, out of driving engagement or contact with the driving and driven members so that the wear on the belts is minimized and it is not necessary to shift the belt from one pulley to another.

My improved belt gearing is quite simple and economical in structure, is very durable and not likely to get out of repair, and is very easily adjusted or manipulated.

I have illustrated and described my improvements in a simple and practical embodiment. I have not attempted to illustrate or describe the various modifications which I contemplate, as I believe the disclosure made will enable those skilled in the art to which my invention relates to embody or adapt the same as may be desired. I desire, however, to be understood as claiming my improvements specifically in the form illustrated as well as broadly within the scope of the appended claims.

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

1. In a belt gearing, the combination of a casing, a driving drum, a stepped driven cone disposed above said drum, connecting belts for said drum and cone, a tightener adapted to tighten any one of the belts independently of the others, a curved pan like belt support below said drum, and stepped belt supports at the sides of said cone, said supports being disposed to support said belts out of contact with the drum and cone when released by said tightener, all coacting for the purpose specified.

2. In a belt gearing, the combination of a casing, a driving drum, a stepped driven cone disposed above said drum, connecting belts for said drum and cone, a tightener adapted to tighten any one of the belts independently of the others, a belt support below said drum, and belt supports at the sides of said cone, said supports being disposed to support said belts out of contact with the drum and cone when released by said tightener, all coacting for the purpose specified.

3. In a belt gearing, the combination of a drum, a stepped cone, connecting belts for said drum and cone, a tightener for said belts, a curved pan-like belt support below said drum, and stepped belt supports at the sides of said cone, said belts being supported by said supports out of contact with the drum and cone when released by said tightener, all coacting for the purpose specified.

4. In a belt gearing, the combination of a drum, a stepped cone, connecting belts for said drum and cone, a tightener for said belts, a belt support below said drum, and belt supports at the sides of said cone, said belts being supported by said supports out of contact with the drum and cone when released by said tightener, all coacting for the purpose specified.

5. In a belt gearing, the combination of a drum, a stepped cone, connecting belts for said drum and cone, a tightener for said belts, and belt supports disposed to support said belts out of contact with the drum and cone when released by said tightener, all coacting for the purpose specified.

6. In a belt gearing, the combination of driving and driven members, one of said members being stepped, connecting belts for said driving and driven members, a tightener for said belts, and belt supports disposed to support the belts out of engagement with said driving and driven members when released by said tightener, including stepped belt supports at the side of said stepped member, all coacting for the purpose specified.

7. In a belt gearing, the combination of driving and driven members, one of said members being stepped, connecting belts for said driving and driven members, a tightener for said belts, and belt supports disposed to support the belts out of engagement with said driving and driven members when released by said tightener, all coacting for the purpose specified.

8. In a belt gearing, the combination of driving and driven members, connecting belts for said driving and driven members, a tightener for said belts, and belt supports disposed to support the belts out of engagement with said driving and driven members when released by said tightener, all coacting for the purpose specified.

9. In a belt gearing, the combination of

driving and driven members, a connecting belt therefor, a tightener for said belt, and belt supports disposed to support the belt out of contact with said driving and driven members when released by said tightener, all coacting for the purpose specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

CARL EDW. TANNEWITZ. [L. S.]

Witnesses:
THERESA CRYDERMAN,
T. W. TANNEWITZ.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."