

UNITED STATES PATENT OFFICE.

DANIEL E. KRAUSE, OF CHASE, WISCONSIN.

CLUTCHING DEVICE.

No. 844,730.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DANIEL E. KRAUSE, a citizen of the United States, and a resident of Chase, in the county of Oconto and State of Wisconsin, have invented a new and useful Improvement in Clutching Devices, of which the following is a specification.

My invention relates to a clutching device which may be applied to a variety of mechanical purposes, and is particularly well adapted for operating a hand drilling-machine for producing a nearly continuous rotary movement of the drill-shaft, and it is shown as being applied to such a drilling-machine, although it should be understood that the drilling-machine as a mechanical device is no part of this invention, it having been made the subject of another application, Serial No. 317,851, filed May 21, 1906.

Figure 1 is a plan of a drilling-machine having two of my improved clutches applied to it, parts of the machine at its right-hand end for applying it for drilling being omitted. Fig. 2 is an end elevation of the parts shown in Fig. 1, at the left of the line *a a* of Fig. 1. Fig. 3 is an elevation of one of the clutches, showing a modification thereof. Fig. 4 is a vertical section of a modification shown in Fig. 3 and also showing a piece of the drill-shaft having two clutching devices applied to it, its feeding-nut, a journal-box for supporting said nut, and a pinion, some of said parts being in elevation. Fig. 5 is an end view of one of the journal-boxes for supporting the drill-shaft. Fig. 6 is a plan of a dog used in the clutching mechanism. Figs. 3, 4, and 6 are upon an enlarged scale.

Similar numerals and letters indicate like parts in all of the views.

1 indicates the machine-frame; 2, a drill-shaft mounted on the cross-sill 1^a of the frame; 3, a journal-box for supporting the drill-shaft near its forward end, (see Fig. 5,) the same form also supporting its feed-nut intermediate the ends of the shaft; 4, a non-rotating shaft mounted on the upper part of the frame, said shaft being bent downward near its rear end and forming the vertical shaft 5 and again bent at a right angle, upon the end 6 of which the gear-wheel 7 is mounted for revolution, and its engagement with a pinion 8 on the feed-nut 9 of the drill-shaft.

At the forward end of the drill-shaft a drill 10 is provided. From its mid-length to its rear end it is threaded for engaging with the feed-nut 9, and at its rear end a thrust-

bearing 11 is arranged, the feed-nut being mounted upon the threaded part of the drill-shaft and being provided with a brake-band 12, upon which the foot of the operator can press for retarding the revolutions of the drill-shaft and regulating the feed of the drill as required.

The aforementioned parts, while no part of my present invention, show one useful application of my improvement.

13 indicates a round collar which is secured to and revolves with the shaft 2. If only an intermittent movement is wanted, but one spring-band 14 is used upon said collar; but when a nearly continuous rotary movement is desired, as is usually the case in drilling, two are required, each one being connected at each end of each band at the points 15 and 16 with an operating-lever 17. The bands are bent into such form as to engage the collar the larger part of its circumference and leave room for a dog 18, said dog being bent into an angular form, one leg of the angle being cut off square and the other having a sharp point 19 for engaging the surface of the collar and making a positive clutch. The dog upon the outside of its curved bend should have a seat 18^a, in which to receive the point of a set-screw 20, which, passing through the band, can enter said seat and retain the dog in position. Mounted loosely upon the shaft 4 is a collar 21, having an operating-handle 22 and two arms 23 and 24, rigid with each other, each lever of which is connected by means of a link 25 with the lever 17 of one of the clutch-bands. The several arms, links, and levers are connected together with pins 26.

The operator in oscillating the handle 22 back and forth will cause the arms 23 and 24 to act on the arms or levers 17 of the clutch-bands, and thereby tighten the bands around the collar and engage the point of the dog with the surface of the collar, and thereby turn the collar, and consequently the drill-shaft, in the direction of the arrow in Fig. 2. In continuing this movement the dogs are alternately engaged with the collar and a nearly continuous rotary movement of the drill produced.

In Fig. 2 the clutch-band consists of but one thickness or leaf of steel, while in Fig. 3 a modification 14^a in the construction of the band is shown, it being formed of two leaves of thin spring metal bent around at the points 15 and 16 from a strip of suitable length, the

ends lapped and secured together in any convenient manner. In the present case it is by lapping the ends and inserting a set-screw 20, which holds the dog 18 in position. The advantages of the band thus formed over one made of a single leaf are its greater resiliency and cheaper construction.

The collar should have a slight shoulder 27 for the retention thereon of the bands. The bands are to be arranged upon the collar and shaft in different positions circumferentially thereof.

Having described my invention and the manner of its application, what I claim, and desire to secure by Letters Patent, is—

1. A clutching device consisting of a collar adapted to be secured upon a shaft, a band of spring metal encircling said collar, a lever connected with each end of said band by which the band may be tightened around the collar and loosened therefrom by the oscillation of said lever, a two-legged angular-shaped dog arranged between said band and collar, one leg of the angle being blunt and smooth and the other pointed and sharp, the latter being adapted to engage the circumference of said collar and turn the same by the action of the band thereon when said lever is oscillated, and means for retaining the dog in position upon the collar relative to its inclosing band.

2. A clutching device consisting of a collar adapted to be secured upon a shaft, a band of spring metal encircling said collar, a lever connected with each end of said band by which the band may be tightened around the collar and loosened therefrom by the oscillation of said lever, pins passing through said lever for the connection therewith of each end of said band, said band being formed by bending a strip around each of said pins and forming two leaves entirely around the collar and connecting the ends of the strip together, a two-legged angular-shaped dog arranged between said band and collar, one leg of the angle being blunt and smooth and the other pointed and sharp, the latter being adapted to engage the circumference of said collar and turn the same by the action of the band thereon when said lever is oscillated, and means for retaining the dog in position upon the collar relative to its inclosing band.

3. A clutching device consisting of a collar adapted to be secured upon a shaft, a band of spring metal encircling said collar, a lever connected with each end of said band by which the band may be tightened around the collar and loosened therefrom by the oscillation of said lever, pins passing through said lever for the connection therewith of each end of said band, said band being formed by bending a strip around each of said pins and forming two leaves entirely around the collar and connecting the ends of the strip together, a two-legged angular-shaped dog arranged between said band and collar, one leg of the angle being blunt and smooth and the other pointed and sharp, the latter being adapted to engage the circumference of said collar and turn the same by the action of the band thereon when said lever is oscillated, and means for retaining the dog in position upon the collar relative to its inclosing band.

tion of said lever, pins passing through said lever for the connection therewith of each end of said band, said band being formed by bending a strip around each of said pins and forming two leaves entirely around the collar and connecting the ends of the strip together by lapping said ends, a bolt inserted through said ends, a two-legged angular-shaped dog arranged between said band and collar, one leg being adapted to engage the circumference of said collar and turn the same as said lever is oscillated, and means cooperating with said bolt for retaining the dog in position upon the collar relative to its inclosing band.

4. A clutching device for producing a nearly continuous rotary movement, consisting of a collar adapted to be secured upon a shaft, two bands of spring metal arranged side by side and encircling said collar, a lever connected with each end of each band by which the bands may be tightened around the collar and loosened therefrom by the oscillation of said levers, a two-legged angular-shaped dog arranged between each band and the collar, one leg of the angle being blunt and smooth and the other pointed and sharp, the latter ends being adapted to engage the circumference of said collar and turn the same when said levers are oscillated, and means for retaining the dogs in position upon the collar relative to its inclosing band.

5. A clutching device adapted for producing a nearly continuous rotary motion for a hand drilling-machine, or similar tool, to be operated by the oscillation of its operating-handle, comprising a round smooth-faced collar secured upon a shaft, two bands of spring metal arranged side by side around the collar, a lever connecting with both ends of each band, arranged to be operated for alternately closing the band around a portion and releasing from the circumference of the collar, an angular-shaped two-legged dog having the foot of one leg sharpened to a point, secured in position between each band and the collar for engaging the outer circumference of the collar, as the operating-handle is oscillated, suitable connecting arms and links between the operating-handle and band-connecting levers, said bands and their connected levers being arranged around the collar in different circumferential positions.

DANIEL E. KRAUSE.

Witnesses:

OTTO R. KRAUSE,
E. J. FOLEY.