A. B. LANDIS.

CUTTER HEAD.

APPLICATION FILED APR. 1, 1907.

948,891.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

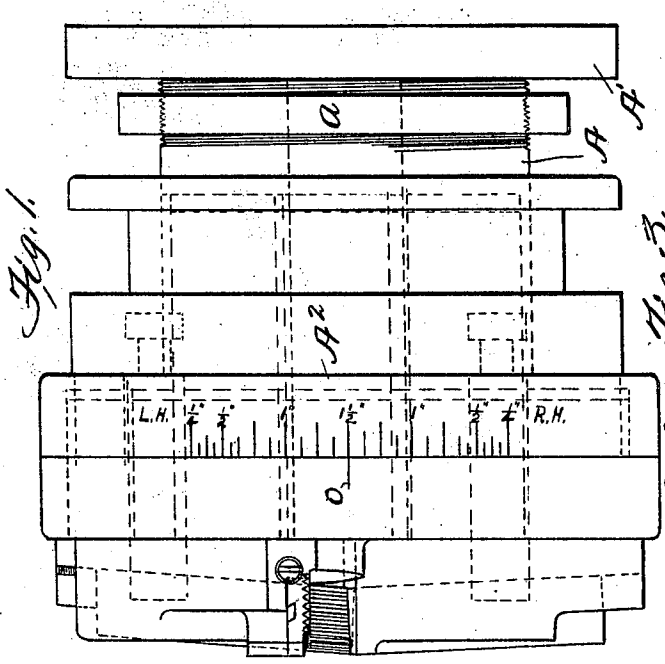


Fig. 3.

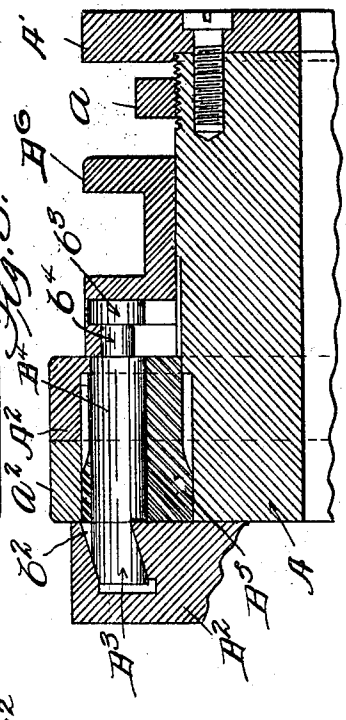


Fig. 2.

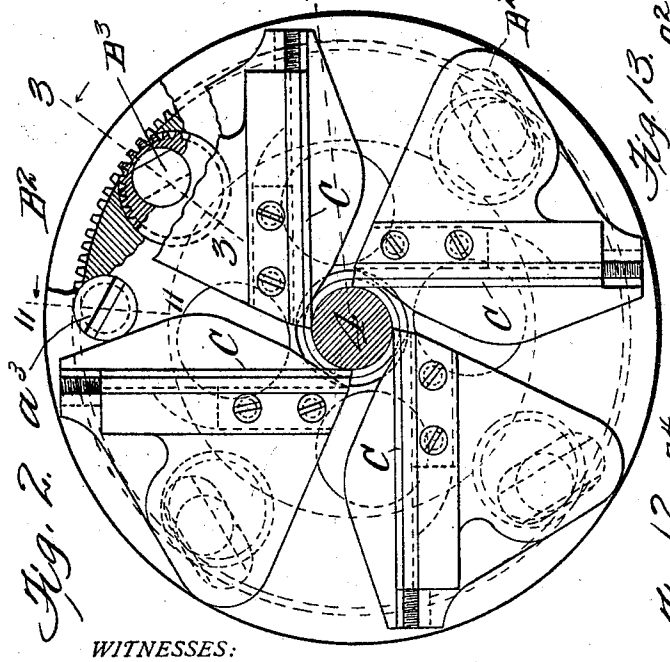


Fig. 13.

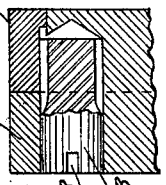
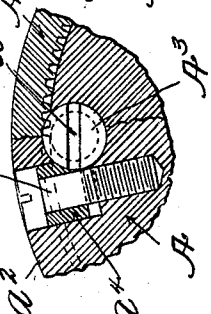


Fig. 12.



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2 SHEETS—SHEET 2.

Fig. 6.

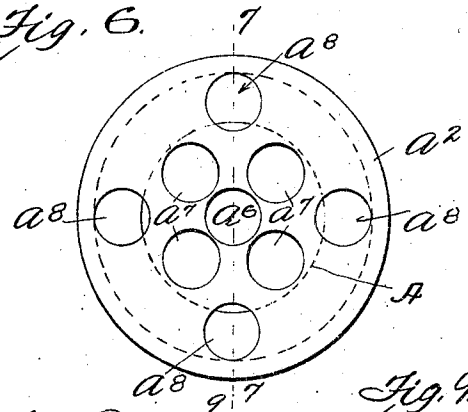


Fig. 7.

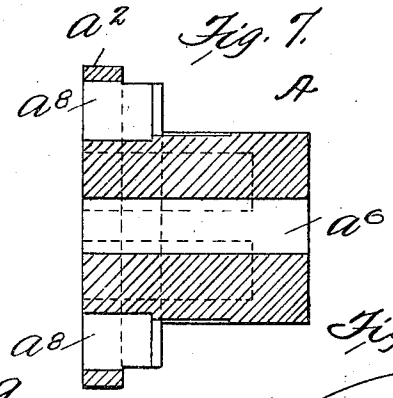


Fig. 8.

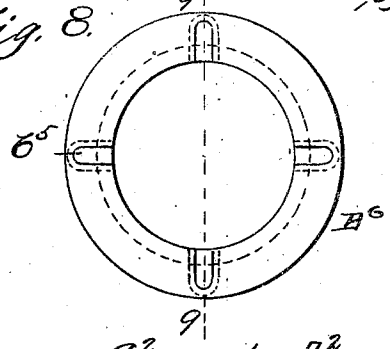


Fig. 9.

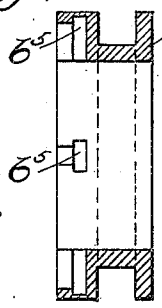


Fig. 5.

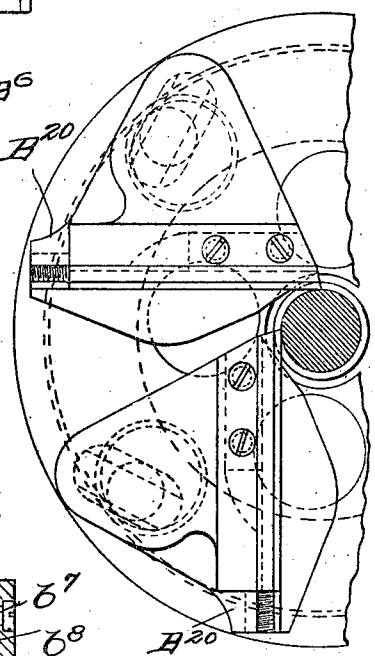


Fig. 4.

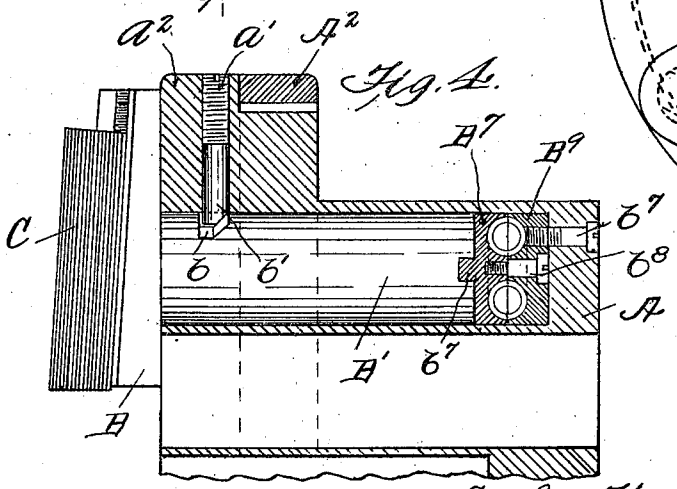


Fig. 10.

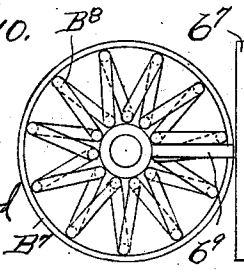
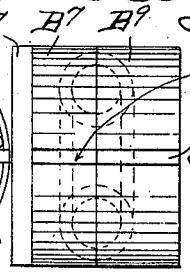


Fig. 11



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ABRAHAM B. LANDIS, OF WAYNESBORO, PENNSYLVANIA.

CUTTER-HEAD.

948,891. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed April 1, 1907. Serial No. 365,777.

To all whom it may concern:

Be it known that I, ABRAHAM B. LANDIS, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Cutter-Heads, of which the following is a specification.

My said invention consists in various improvements in the details of construction and arrangement of parts of cutter-heads for cutting threads on screws, bolts, etc., whereby such a tool is provided which will be very efficient in operation and comparatively inexpensive in construction, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts: Figure 1 is a side elevation of one of my improved cutter-heads, Fig. 2 a front elevation thereof, Fig. 3 a detail longitudinal section on the dotted line 3—3 in Fig. 2, Fig. 4 a similar view on the dotted line 4—4 in Fig. 2, Fig. 5 a view similar to a portion of Fig. 2, showing left-hand cutter-holders substituted for the right-hand cutter-holders shown in the principal views, and Figs. 6 to 13 inclusive, detailed views illustrating different parts of the device separately, as will be hereinafter pointed out.

In said drawings the portions marked A represent the main casting constituting the body or frame of the cutter-head, B the cutter-holders, and C the cutters.

The body A is a casting of suitable form to support the other parts, provided with a central perforation a^6 to clear the work as it passes through the cutter-die and has a flange A' on its rear end by which it may be bolted to the face-plate of the spindle of the machine, in the usual manner. It is formed screw-threaded on its outside adjacent to said flange A' and has a screw-threaded collar a mounted thereon, for a purpose to be presently described.

The cutter-holders B are each of suitable form on their faces to receive the cutters C and are mounted on, or formed in piece with, a trunnion B' which is mounted in a suitable seat or bearing a^7 in the body A. Each of said trunnions is formed with a segmental groove b in its outside near its front end the rear side of which is tapered and a sliding detent b' mounted in a radial perforation in the body A is adapted to engage therewith. A screw-threaded plug a' in the outer end of said perforation serves as a means to force said detent into said groove, its tapered face bearing upon the tapered face of said groove, and thus serving to draw the cutter-holders B back tightly against the face of the part A. Each of said cutter-holders B is formed with a transverse wing B^2 projecting to one side thereof and adapted to rest against the face of the part A. A groove b^2 with tapered edges (see especially Fig. 3) is formed therein with which a cam B^3 is adapted to engage. Said slot b^2 is formed of sufficient length to permit the swinging of the cutter-holder on its trunnion required by the work. Said cam B^3 is formed on the forward end of a pin B^4 the main body of which is eccentrically mounted in a cylinder B^5, which is mounted in a suitable seat or bearing a^8 in the body A. The rear end of said pin B^4 is formed with a head b^3 between which and the main body of said pin is a neck b^4. Said head b^3 of each of said pins B^4 engages with a slot b^5 in the face of a sliding collar B^6 (see Figs. 8 and 9) which is mounted upon the main portion of the part B. Said collar B^6 is formed with a circumferential groove, as shown, with which a shifting-fork (not shown) may engage for sliding it back and forth. Each cylinder B^5 is formed with gear teeth on its exterior at its rear end with which internal gear teeth on a ring A^2 are adapted to engage. Said cylinders B^5 are thus geared together by means of said internal tooth-ring A^2, which is mounted on the body A on a seat formed therefor adjacent to the flange a^2 at the front end of said body. Between two of said cylinders B^5 is mounted a cylinder A^3 in a suitable bearing in the part A having teeth on its inner end which are also adapted to engage with the internal teeth of said ring A^2 (see Figs. 12 and 13). The outer end of said cylinder A^3 is provided with a slot a^3 to receive a screw-driver, or other tool, for turning said cylinder and adjusting said ring A^2 and through said ring the cylinders B^5. Adjacent to one side of said cylinder A^3 is formed a radial perforation extending through the flange a^2 into the part A in which is mounted a sleeve a^4 having a tapered or wedge-shaped side adapted to impinge against the side of said cylinder. A screw A^4 extends through said sleeve into a

screw-threaded portion in the bottom of said radial perforation and is thus adapted to force said sleeve down upon the side of said cylinder and lock it firmly against rotation.

The rear end of each of the trunnions B′ is formed with a transverse groove adapted to engage with a transverse tongue b^7 on the front side of the casing B^7 which is mounted in the rear end of the bearing for said trunnion in part A and forms half a casing for the coiled-spring B^8. The other part of said casing B^9 is secured rigidly in the rear end of said bearing by means of a screw b^7 and the part B^7 is connected therewith and secured thereto by a central screw b^8 which also serves as a pivot to permit the part B^7 to rotate with said trunnion. Each of said parts B^7 and B^9 have inwardly extending wings b^9 and b^{10} respectively, against the opposite sides of which the opposite ends of spring B^8 are adapted to bear. As said trunnion B′ turns in operation it turns the part B^7 of said casing and also the wing b^9 which serves to compress said spring between the advancing side of said wing b^9 and the stationary wing b^{10} of the part B^9, so that when the operating parts are released said spring expands and thus normally operates to return the cutter-holders to open position.

The apparatus as shown in the principal views is constructed for cutting right-hand threads. When it is desired to cut left-hand threads the cutter-holders B are removed and left-hand cutter-holders B^{20} substituted. In Fig. 5 I have indicated cutter-holders of this character. Except that the form and position of the parts is reversed the construction and operation is identical with the corresponding parts as above described for the right-hand construction.

The cutters C are moved in the cutter-holders B in the same manner as shown in some of my former applications, as for instance application No. 353,852, filed Jan. 24, 1907, or may be secured in any approved manner.

The operation is as follows: The size of the die composed of the cutters C in the holders B is adjusted by releasing the toothed cylinder A^3 from the clamping sleeve a^4, which is done by backing the screw A^4, when by means of the screw-driver said cylinder A^3 is turned to turn the ring A^2 and through it the cylinders B^5. As said cylinders B^5 turn they operate to move the pins B^4 having the cams B^3 on their outer ends in or out in relation to the axis of the head, according to the direction of the rotation, by reason of said pins being located in said cylinders to one side of their centers. I have provided a series of graduation marks on the surface of said ring A^2, as shown in Fig. 1, which are adapted to register with an indicator point 0 on the flange a^2 adjacent to it and by which the operator is enabled to set the die for any size of work desired. When the size desired has been secured the screw A^4 is again tightened to clamp the cylinder A^3 and lock it securely against further movement. This serves to set and hold the die for the size of work desired. The die is then opened and closed by means of the sliding collar B^6 and the connection between said collar and said pins B^4 having the cams B^3 which engage the grooves b^2 with tapered sides in the inner faces of the wings B^2 of the cutter-holders B. As said ring B^6 is slid back from the position shown in Fig. 3 until it abuts the collar a the wings B^2 will be thrown inwardly and the die closed as shown in Fig. 1. When it is desired to open the die the collar B^6 is slid forward to the position shown in Fig. 3 when the tapered rear side of said cam contacting with the tapered outside wall of the groove b^2 will serve to draw said wing outwardly and swing the cutter-holders to open the die. The spring B^8 will also serve to throw said cutter-holders open, each being adjusted so that when the cutter-die is closed the spring is compressed and as soon as the parts are moved to open said die said springs will operate to throw them open and prevent any lost motion between the parts. It will be seen that by reason of the elongated form of the slots b^2 the sliding in and out of the cams B^3 will operate to swing said cutter-holders as said slots will slide over said pins as the holders turn in making this movement. The collar a is adjusted on the part A in position to serve as an abutment for the sliding collar B^6 so that the parts will be limited in their closing movement to the size of die as fixed by the adjustment of the ring A^2, or any slight variation of said adjustment that may be found necessary or desirable.

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

1. In a cutter-head, the combination, of the body, the cutter-holders movably mounted on said body around the axis thereof, the cutters mounted on said cutter-holders, and means for adjusting said cutter-holders and opening and closing the die comprising a cam for each cutter-holder mounted in an eccentric bearing in said body and having a tapered end engaging with a tapered edge on said cutter-holder, said eccentric bearings, means for sliding said cams longitudinally, and means for rotating said eccentric bearings, substantially set forth.

2. In a cutter-head, the combination, of the body, the cutter-holders movably mounted around the axis of said body, a cam mounted in an eccentric bearing and formed with a tapered outer end engaging with a tapered edge of each cutter-holder, means

for sliding said cams longitudinally, said eccentric bearings, means for rotating the eccentric bearings, and means for securing them in adjusted position, substantially set forth.

3. In a cutter-head, the combination, of the body, the cutter-holders mounted on the face of said body, means for adjusting said cutter-holders and opening and closing the die comprising eccentrically mounted sliding cams engaging with said cutter-holders, eccentric bearings mounted to rotate and carrying said sliding cams, means for sliding said cams, means for rotating the bearings containing them, and means for locking said bearings in adjusted position, substantially set forth.

4. In a cutter-head, the combination, of the body, the cutter-holders adjustably mounted on said body around its axis, and means for adjusting said cutter-holders comprising a sliding cam engaging with each of said cutter-holders, each of said cams being mounted in an eccentric bearing, said eccentric bearings provided with teeth, and a ring surrounding the body and formed with internal teeth engaging with the teeth of said several bearings, means for turning said ring, and means for sliding said cams, substantially set forth.

5. In a cutter-head, the combination, of the body, a series of cutter-holders adjustably mounted on the face of said body around its axis, a series of cams mounted to slide in eccentric bearings adjacent to said cutter-holders and formed to engage therewith, a gear connecting said several eccentric bearings, means for operating said gear, and a sliding ring connected with said several sliding cams, substantially set forth.

6. In a cutter-head, the combination of the body, the cutter-holders adjustably mounted on the face of said body around its axis, sliding cams mounted eccentrically in a rotary bearing, means connecting said bearings for rotating them, a sliding collar connected to said cams for operating them longitudinally, and an adjustable collar for limiting the movement of said sliding ring, substantially set forth.

7. A cutter-head comprising a body, cutter-holders mounted on trunnions journaled in bearings in said body, cams engaging slots with tapered edges to one side of the axis of said cutter-holders for swinging them on their trunnions, each of said cams being mounted eccentrically in a cylinder journaled in said body, said cylinders, means for turning them to change the position of the cams, and means for sliding said cams independent of the movement of said cylinders, substantially as set forth.

8. A cutter-head comprising a body, cutter-holders mounted on trunnions journaled in bearings in said body, each cutter-holder formed with a transversely extending wing having cam-engaging faces, a cam mounted eccentrically in a cylinder journaled in said body with its cam-face engaging with the cam-faces of said wing, said cylinders each being formed with gear teeth, an internally toothed ring surrounding said body and engaging with the teeth of said several cylinders, means for operating said ring, and means for operating said several cams independent of the movement of the cylinders, substantially as set forth.

9. In a cutter-head, the combination, of the body, the cutter-holders movable in bearings around the axis of said body, cams mounted eccentrically in toothed cylinders at intervals around said body, each cam engaging with one of said cutter-holders, a toothed ring mounted on said body engaging with each of said toothed cylinders, means for turning said toothed ring whereby said cylinders may be moved simultaneously, means for locking said toothed ring whereby said several cylinders are locked in position, and means for moving said cams longitudinally independent of the movement of said cylinders, substantially as set forth.

10. In a cutter-head, the combination, of the body, the movable cutter-holders, the movable cams for operating said cutter-holders, each of said cams being eccentrically mounted in a toothed cylinder, said toothed cylinders journaled between said cutter-holders, a toothed ring mounted on said body engaging with each of said cylinders, said toothed ring being formed with a graduated scale or indicator on its surface, and means for operating said toothed ring to adjust the die for different sizes of work, substantially as set forth.

11. In a cutter-die, the combination, of the body, the cutter-holders mounted on pivots around the axis of said body and formed with side wings, cams for operating said cutter-holders mounted eccentrically in toothed cylinders and adapted to slide longitudinally in said cylinders with their cam ends engaging slots in said wings, said cylinders, means for rotating them, means for locking them in fixed position, and means for sliding said cams in said cylinders independent of the rotary movement thereof, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Washington D. C. this 20th day of March, A. D. nineteen hundred and seven.

ABRAHAM B. LANDIS. [L. S.]

Witnesses:

E. H. PARKINS,

E. W. BRADFORD.