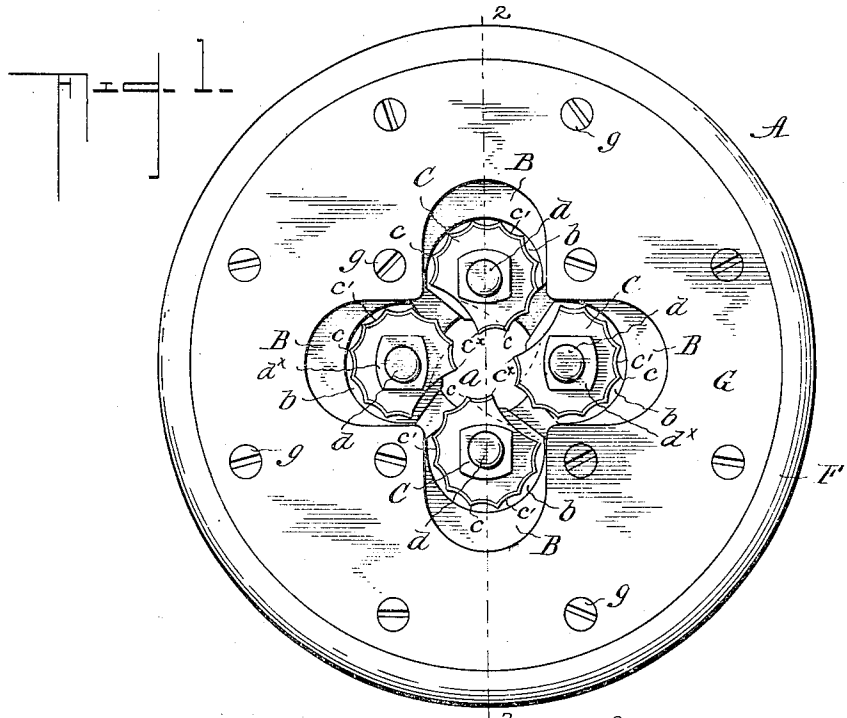
No. 863,515. PATENTED AUG. 13, 1907.

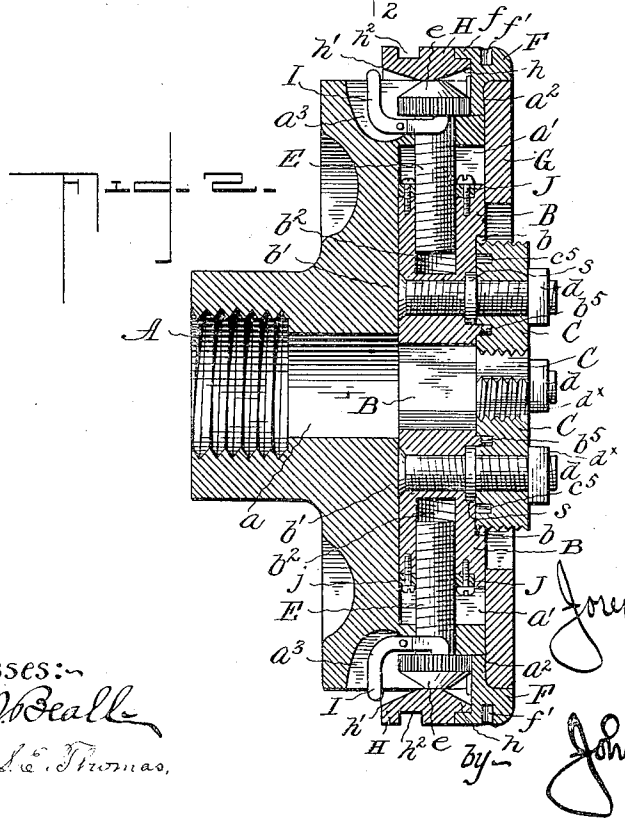
J. O. DIXON.

SCREW THREADING MACHINE.

APPLICATION FILED NOV. 16, 1905.

3 SHEETS—SHEET 1.





Witnesses:-
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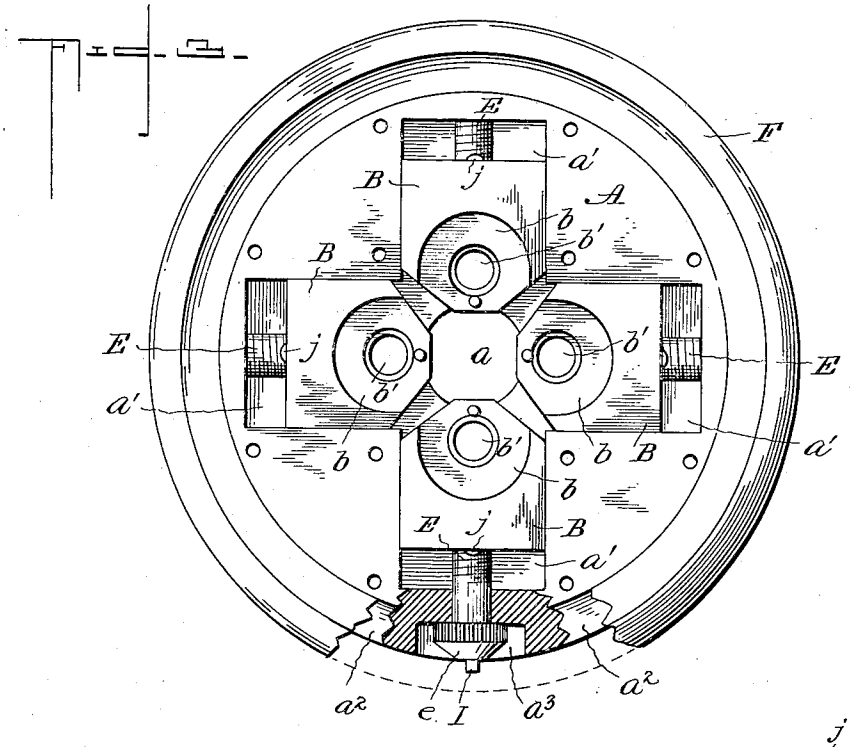
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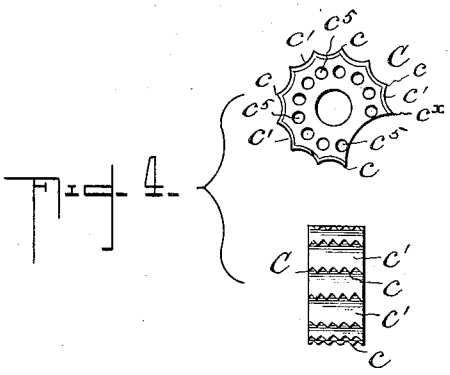
J. O. DIXON.

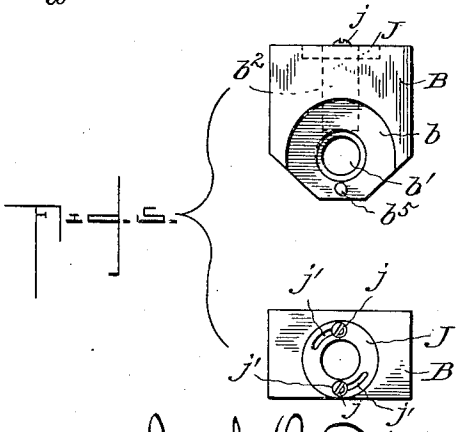
SCREW THREADING MACHINE.

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3 SHEETS—SHEET 2.







Witnesses:—

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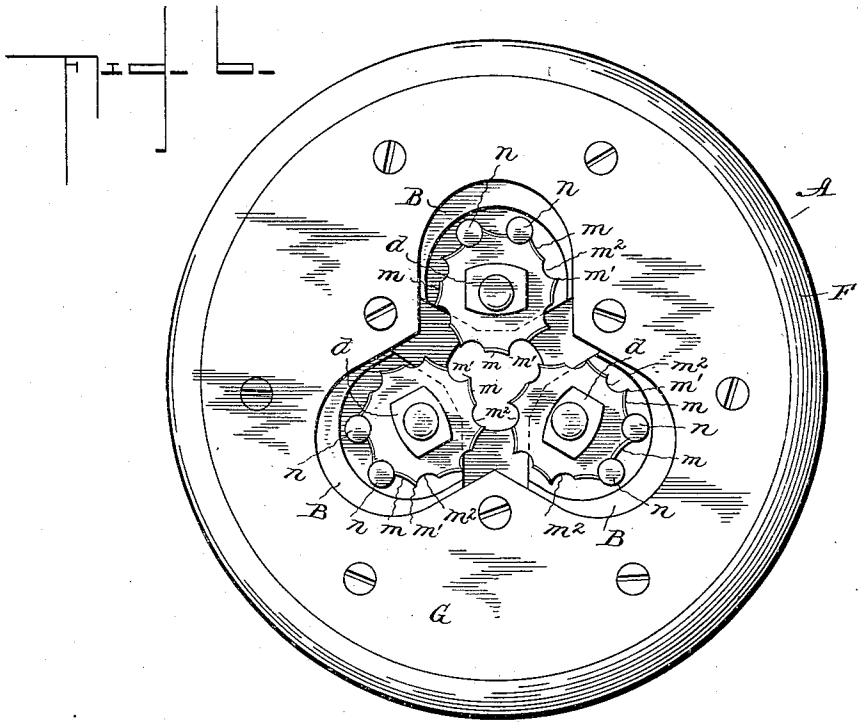
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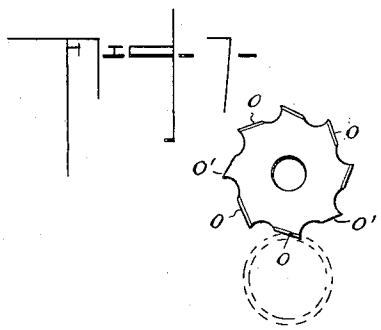
J. O. DIXON.

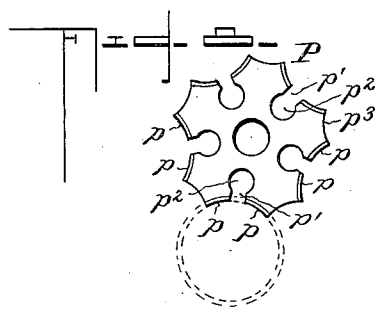
SCREW THREADING MACHINE.

APPLICATION FILED NOV. 16, 1905.

3 SHEETS—SHEET 3.







Witnesses:—

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UNITED STATES PATENT OFFICE.

JOSEPH O. DIXON, OF HANOVER, PENNSYLVANIA.

SCREW-THREADING MACHINE.

No. 863,515. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed November 16, 1905. Serial No. 287,736.

To all whom it may concern:

Be it known that I, JOSEPH O. DIXON, a citizen of the United States, residing at Hanover, in the county of York and State of Pennsylvania, have invented certain Improvements in Screw-Threading Machines, of which the following is a specification.

This invention relates to machines for cutting threads on bolts, rods, etc., and has particular reference to that class of such machines which comprise a rotatable head having radially disposed dies or cutters between which the rod or bolt is fed for the action of said dies in cutting the thread thereon.

The objects of the invention are to provide a peculiar construction of die-head which will permit of a quick and accurate adjustment of the cutters or dies with respect to the bolt or rod, and also permit of a separation of the cutters or dies for the purpose of releasing the bolt or rod after it has been threaded; in conjunction with a peculiar form of die presenting a plurality of cutting edges of particular shape, with means for adjusting such die in the holder for positioning any one of said cutting edges in proper operative relation.

Other though minor objects of the invention will hereinafter appear, and what I claim as novel in the art, and desire to protect by Letters-Patent, will be hereinafter fully described and more specifically set forth in the appended claims.

In the accompanying drawings, which form a part of this specification: Figure 1 is a front elevation of a die-head for screw-threading machines constructed in accordance with my invention, and including one form of die used in connection therewith. Fig. 2 is a vertical sectional view through the die-head and dies, on the line 2—2 of Fig. 1. Fig. 3 is a front elevation of the die-head, with the face-plate and dies removed to show the arrangement of the die-holders or slides. Fig. 4 shows detail views of the die. Fig. 5 shows detail views of one of the die-holders or slides which carry the dies. Fig. 6 is a front elevation of the die-head, illustrating an arrangement for three dies, and including a modified form of die. Fig. 7 is a slight modification of the die shown in Fig. 6. Fig. 8 is another modification of the die.

Like letters and numerals of reference indicate like parts in all the figures of the drawings.

Referring to the drawings, A designates the die-head, which is provided with the usual central opening a, for the passage of the bolt or rod operated upon, and with a series of radially disposed recesses or slide-ways a' in the face thereof, said recesses or slide-ways being preferably rectangular in cross-section, as shown, though such shape is not essential. The die-head is also provided with a marginal recess a^2 in its face, and in its periphery with recesses a^3, the latter communicating with the aforesaid marginal recess for the purpose that will be hereinafter apparent.

Slidably mounted in each recess or slide-way a' is a die-holder or slide B, which is recessed in front, as at b, to receive the die C, hereinafter specifically described, and is provided with a threaded opening b' to receive the bolt, as d, by which said die is secured in place.

Threaded in an opening b^2 in the upper end of the die-holder, and at right-angles to the axis of the die-head, is an adjusting screw or bolt E, which extends through the outer portion of the die-head so that the head e of such adjusting-bolt will be located in the before-mentioned recess a^3, said head e being provided with peripheral teeth, as shown, which are in mesh with a gear-ring F, the latter being seated in the marginal recess a^2 of the die-head, and is held in place by means of a face-plate G, for which purpose the outer lower edge of said gear-ring is formed with an angular recess to receive the edge of the face-plate. The face-plate G also serves to hold in place the die-holders or slides B, and the central portion thereof is provided with an opening which is extended on a line with each die-holder so that the dies may project beyond the die-head to receive the rod or bolt to be threaded. The face-plate is secured to the die-head by means of screws g.

The adjusting bolts E, and consequently the die-holders, are held in adjusted relation to the die-head by means of a ring or band H, against the inner side of which the heads of said adjusting-bolts are adapted to bear, and to provide for an outward movement of the bolts and their slides, for the purpose of releasing the rod or bolt which has been threaded, this holding ring or band H is shiftable laterally on the die-head so as to release said parts, for which purpose the ring or band is beveled at one side its center, as at h. When the holding-ring is moved to force the adjusting-bolts and their die-holders inward towards the center of the die-head the outer edge of said ring passes under an inwardly-projecting flange f on the gear-ring F, whereby to reinforce the holding capacity of the former. To automatically separate the dies when the holding-ring H is shifted rearward a yoked-lever I is pivoted in each recess a^3 of the die-head and the outer end thereof projects into the path of the holding-ring, so that said lever may be operated thereby, the yoked end of such lever embracing the body of the adjusting-bolt so as to engage the underside of the head thereof, whereby a rocking movement of the lever will impart an outward movement to the bolt and its die-holder. The underside of the holding-ring is beveled, as at h', and upon this beveled or inclined surface the end of the lever rides as the said ring is shifted back and forth. It will be noted that the oppositely inclined surfaces h and h' of the holding-ring provide that the surface h' operates the yoked-lever I to separate the dies when

the ring is shifted rearward, and that the surface *h* acts to return said dies to their operative position when said ring is moved forward or returned to its normal position, in which latter instance the heads of the adjusting-bolts ride upon the surfaces *h* and by their inward movement shift the yoked levers so as to project the outer ends thereof in the path of the holding-ring.

The holding-ring H is provided with a peripheral groove h^2, with which engages its operating means, such for instance as an ordinary yoke, not shown, and also the rotatable gear-ring F is provided peripherally with holes *f'* to receive a tool or spanner for turning said gear-ring.

Seated in a recess therefor in the outer end of each die-holder or slide B is a small ring J, which is threaded to receive the adjusting-bolt E, and is held upon the die-holder or slide by means of screws *j*, which latter pass through segmental slots *j'* in said ring on into the die-holder. This threaded ring is employed to reinforce the threads in the bolt-receiving opening b^2, and may be easily replaced by a perfect one when the threads become worn from use.

Referring now to the construction of the die C, the same is provided with a plurality of cutting edges *c*, to form the usual V-shaped thread, as indicated in the drawings, or an ordinary square thread, and the periphery of said die is formed with slightly concave surfaces *c'* in the rear of each cutting edge, as shown. In practice these dies are set in the die-holders so that the operative cutting edge will be slightly in advance of a line drawn through the axes of the die and head (for instance the line 2—2 in Fig. 1), so that the curved portion *c'* will follow the thread and serve to properly feed the bolt or rod. For the purpose of properly setting the dies in the die-holders the latter are each provided with a pin b^5, and the inner side of the die with corresponding holes, as c^5, said holes being each properly located with respect to its cutting edge.

Obviously in using a series of dies of this character they must be set so as to successively act upon the bolt or rod; in other words, the second die must be so disposed with relation to the first as to engage the bolt or rod a quarter of a turn of the thread after such first die, the third die a half turn after the first, and so on. As shown the bolts *d* are headed in countersinks at the inner side of the die-holders B, and are provided with opposed collars *s* which are seated in recesses therefor in the front side of said die-holders, whereby said bolts are rigidly secured to the latter. The nut $d^{\times}$ on the securing bolt *d* is preferably cut away at its inner edge close to the body of the bolt, as shown, so as to permit of the threading of a bolt with a large head close up to such head by allowing the latter to be fed up against the dies.

In Fig. 6 of the drawings I have shown a modification of the die, and in this instance, as in the former, a slightly concave surface, as *m*, is formed in the rear of each cutting edge *m'*, and in addition there is provided between such concave surface and the adjoining cutting edge a segmental recess m^2. These recesses form complete cutting edges on the die without the necessity of grinding as required in the die illustrated in Figs. 1, 2 and 4. With this form of die two centering pins, as *n*, are employed on the die-holder, such pins being located to engage two of the segmental recesses m^2 which are located opposite the operative cutting edge. This construction of die provides a plurality of cutting edges which may be readily and conveniently brought successively into operative position as they become worn. In this modification, Fig. 6, there is also shown an arrangement by which the die-head is provided with three die-holders instead of four, the construction and operation of such die-holders being the same as hereinbefore described.

In Fig. 7 there is illustrated a slight modification of the die shown in Fig. 6, the only difference in this instance being that the surfaces or portions, as *o*, are straight instead of curved.

Fig. 8 illustrates a further modification, consisting of a die, as P, having a plurality of cutting surfaces, each comprising two companion thread-cutting surfaces *p p*, with a recess, as *p'*, between them, such latter recesses communicating with segmental recesses p^2 adapted to receive a centering pin for setting the die in the die-holder. Between each set of thread cutting surfaces *p* there is a concave surface, as p^3, which at its juncture with said thread cutting surfaces forms a cutting edge, as shown, the recess *p'* also forming opposite cutting edges.

In the operation of the device the several dies C are inserted in the die-holders B and properly set through the medium of the pins b^5 to position the cutting edges *c* in proper position, after which said dies are adjusted up to the rod or bolt by turning the gear-ring F, in which latter operation, as will be obvious, all the adjusting-bolts E will be simultaneously turned and feed the die-holders either toward or away from the axis of the die-head, according to the direction the aforesaid gear-ring is turned. During such operation the holding-ring H is in its position over the adjusting-bolts, as shown in Fig. 2, so as to confine the head *e* of said bolts between said ring and the die-head. The parts being thus adjusted the die-head will when revolved cut a thread upon a rod or bolt that is fed between the dies. After the thread has been cut upon the rod or bolt the shifting-ring H is moved rearward and engaging the rear end of the yoke-levers I will rock the same and cause them to separate the dies C, thus permitting the threaded rod or bolt to be readily withdrawn, without having to reverse the direction of the rotation of the die-head and unthread the rod or bolt from between the dies, as is usual. The shifting-ring may be now returned to its initial position, so as to move the dies into operative position for threading another rod or bolt. Should the next rod or bolt be of different diameter than the one previously threaded the dies may be quickly adjusted to accommodate such rod or bolt by simply turning the gear-ring F.

In the use of the dies shown in Figs. 1, 2 and 4 of the drawings, when the cutting edge, as $c^{\times}$, has been worn the die is removed and ground to the next cutting edge, as *c*, (indicated in dotted lines Fig. 1). It will be seen that by the peculiar construction of the die such new cutting edge so ground will be provided with the concave rear surface *c'*. In using the other dies, that is those illustrated in Figs. 6, 7 and 8 of the drawings, it is not necessary to grind them, inasmuch as they are each provided with complete cutting edges, and therefore it is required only to bring a new edge into operative position. This is done by simply loosening the nut $d^{\times}$,

moving the die beyond the pins b^5, and after turning it to bring the next cutting edge into operative position securing the die by tightening the nut $d^\times$ thereagainst.

It will be readily seen that by the particular construction and arrangement of parts, as herein shown and described, I provide an improved die-head and die for screw-threading machines that will greatly facilitate the operation of threading bolts, rods and other articles; inasmuch as the dies are readily adjusted to accommodate the work and are movable radially or separable to provide for quickly removing the article after it has been threaded; this latter operation being accomplished while the die-head is in motion.

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

1. In a die head for screw-threading machines, the combination with the die-holders or slides carrying the dies and radially movable in the die-head to and from an operative position, of adjusting-bolts threaded in the slides and having cone-shaped heads, a ring movable laterally over the bolt-heads and at all times in engagement therewith, said ring having an intermediate flat surface and oppositely inclined surfaces h and h' at the sides of said flat surface upon one of which inclined surfaces the cone-shaped bolt-heads rides to and from the flat surface, and bent levers I each bifurcated at one end to engage the underside of the bolt-heads and having its other end in the path of the inclined surface of the ring opposite that one upon which the bolt-heads ride, as herein shown and described.

2. In a die-head for screw-threading machines, the combination with the die-holders and threaded adjusting bolts, the former having threaded openings therein to receive the latter, of internally threaded rings disposed at the outer ends of said openings and adapted to receive the bolts, and means for rotatably adjusting said rings, substantially as shown and described.

3. In a die-head for screw threading machines, the combination with the die-holders and threaded adjusting bolts, the former having threaded openings therein to receive the latter, of internally threaded rings disposed at the outer ends of said openings and having concentric slots, and screws passed through said slots into the die-holders for removably securing the rings thereto, substantially as shown and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH Q. DIXON.

Witnesses:

J. B. MILLER,

L. T. BARGELT.