

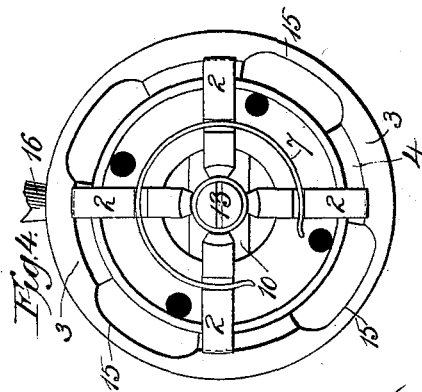
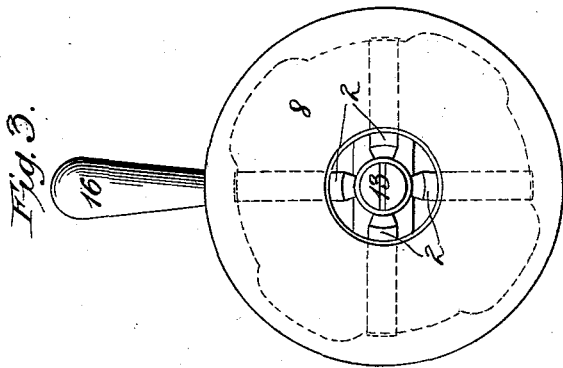
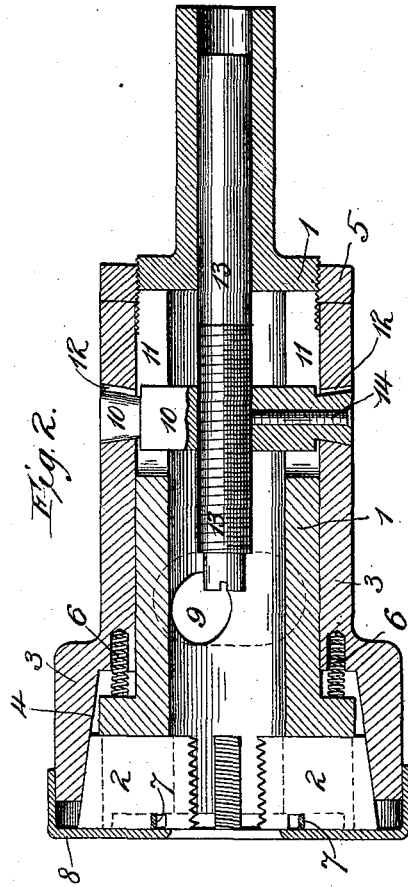
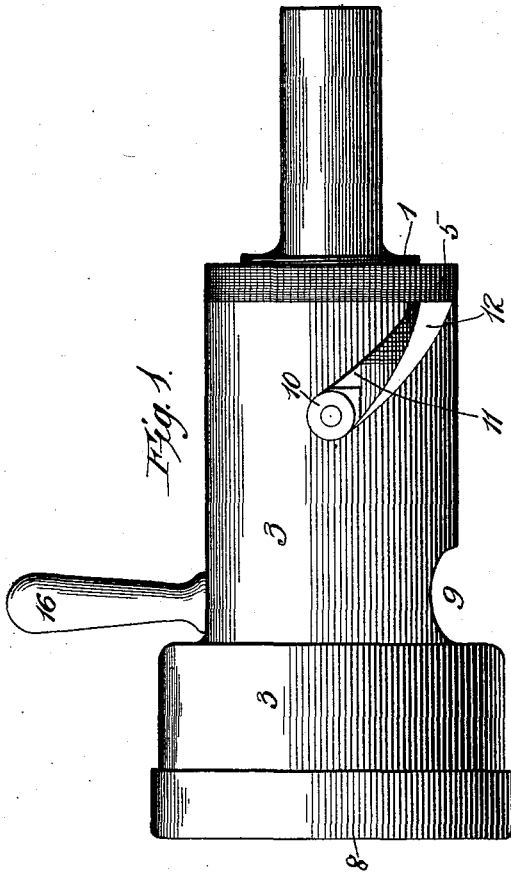
(No Model.)

2 Sheets—Sheet 1.

L. KIRCHENBAUER. BOLT THREADER.

No. 509,039..

Patented Nov. 21, 1893.



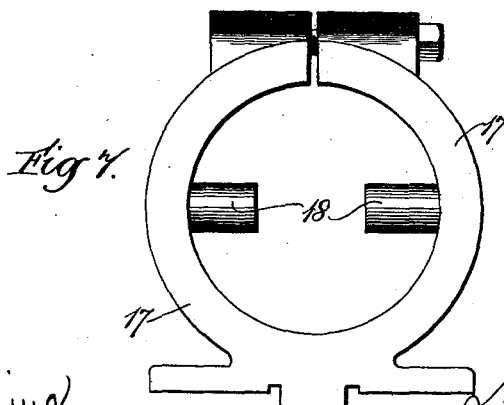
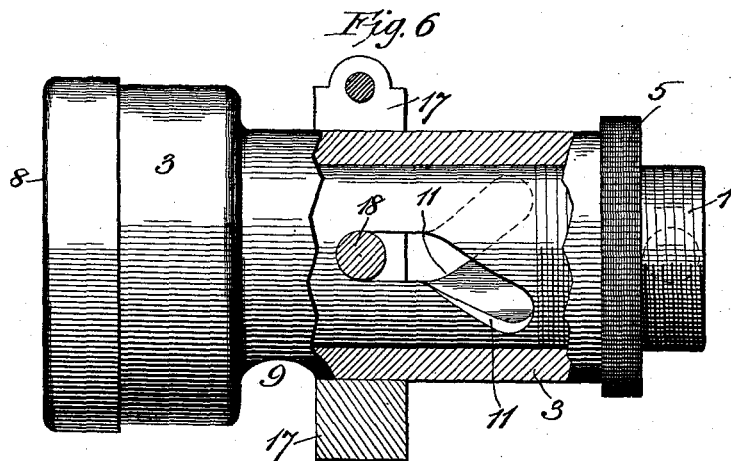
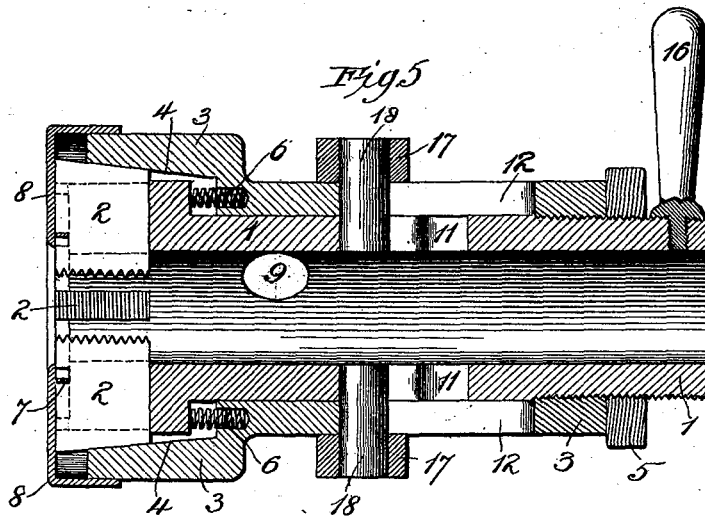
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BOLT THREADER.

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UNITED STATES PATENT OFFICE.

LOUIS KIRCHENBAUER, OF CHICAGO, ILLINOIS.

BOLT-THREADER.

SPECIFICATION forming part of Letters Patent No. 509,039, dated November 21, 1893.

Application filed April 26, 1893. Serial No. 471,925. (No model.)

To all whom it may concern:

Be it known that I, LOUIS KIRCHENBAUER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bolt-Threaders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to appliances for cutting screw-threads upon bolts, and for performing similar and analogous operations, and my invention relates more particularly to such appliances as are designed for use upon turret-lathes, in which the dies or cutters are maintained in stationary condition while the object to be threaded is rotated.

Among the primary objects of my invention is included that of producing thread-cutting appliances which shall automatically cut screw-threads of any desired length and depth, and which at the completion of the thread-cutting action, shall automatically release the object which has been operated upon; furthermore, to produce a thread-cutter which shall be simple, strong and durable in its construction, and accurate and reliable in its operation, and the parts of which shall be capable of ready adjustment to accord with different sizes and lengths of screw-threads, and the parts of which shall also be free from all liability of derangement.

To the above purposes, my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

The more precise nature of my invention will be better understood when described with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a bolt-threading appliance embodying my invention. Fig. 2 is a central longitudinal section of the same; the structure being turned axially ninety degrees from the position shown in Fig. 1. Fig. 3 is an end elevation of the appliance with its die-retaining cap in position; the direction of view being toward the cutting end of the appliance. Fig. 4 is an end elevation of the appliance with its die-retaining cap removed; the direction of view being toward the cutting

end of the appliance. Fig. 5 is a central longitudinal section of a modified form of bolt-threading appliance embodying my invention. Fig. 6 is a central longitudinal section of the modified structure; the appliance being turned axially ninety degrees from the position shown in Fig. 5. Fig. 7 is a detached view, in side elevation, of a tail-stock for holding the appliance shown in Figs. 5 and 6.

Referring first to the structure shown in Figs. 1 to 4, both inclusive, 1 designates the stock of the bolt-threader, this stock being of elongated tubular form, as to its body-portion, and having at its rear end a reduced tubular extension 1^a which is designed to be connected to the tail-stock of a turret-lathe. The stock 1 of the appliance is designed to extend horizontally from the tail-stock of the lathe, and the sides of its body-portion are formed with two oppositely disposed slots 11 each of which is of straight form and extends longitudinally of the body-portion of the stock. The rear end of the stock 1, or that end which is proximate to the extension 1^a, is externally screw-threaded to receive an adjusting-nut 5, the purpose of which will be presently fully explained, and the opposite or front end of the stock is diametrically enlarged so as to form an external annular shoulder 1^b; said enlarged end-portion being also radially recessed to form guides for the cutting-dies 2. Spiral springs 6 are interposed between the rear side of the shoulder 1^b and the front end of the body-portion of a sleeve 3 which surrounds the stock 1, so as to move both longitudinally and axially thereon; the springs 6 serving to keep the sleeve 3 pressed rearward so that its rear end shall be in contact with the adjusting-nut 5 just referred to. At its front end, the sleeve 3 is formed with a forward extension 3^a the inner surface of which is formed with inclined surfaces 4 and radial recesses or cavities 15; said inclined surfaces and recesses or cavities being alternated with each other, as is most clearly shown in Fig. 4. Within the stock 1 is located a cross-head or carrier 10 which extends transversely of the stock, and which is of such length as to extend at its ends through the slots 11 and also through two oppositely disposed spiral-like slots 12 formed in the corresponding sides of the

sleeve 3. Midway of its length, the cross-head or carrier 10 is formed with an internally screw-threaded opening 10^a through which is inserted a regulating-screw 13; said screw being externally screw-threaded and extending longitudinally of the stock 1, within the same. A retaining-screw 14 is shown as threaded longitudinally through one arm of the cross-head or carrier 10; the inner end of said retaining-screw impinging against the regulating-screw 13 and serving to fix it in any position to which it may have been set in the cross-head or carrier 10. There may either be four cutting-dies 2, as shown, or any other suitable number, arranged radially within the front end of the stock 1 so that their outer ends shall come into contact with the inclined surfaces 4 of the sleeve 3. The outer sides of these cutting-dies 2 are notched, as at 2^a, to receive a circular spring 7 the pressure of which serves to force the dies outward against the inclined surfaces 4, and the dies and their springs are retained in proper position by a cap 8 which fits closely over the front end of the sleeve 3.

In using the appliance above described, the regulating-screw 13 is first turned axially in one direction or the other, so as to bring its front end a distance from the cutting-dies 2 equal to the length of the screw-thread which is to be cut, and the adjusting-nut 5 is turned in one direction or the other, so as to bring the inner ends of the cutting-dies to such a distance from the axial center of the stock 1 as will accord with the thickness of the bolt minus the depth of the thread to be cut. The extension 1^a is now fixed in the tail-stock of a turret-lathe, and the bolt is fixed in the head-stock of said lathe so that the unheaded end of the bolt shall protrude inward between the cutting-dies 2. Power being now applied to the lathe, the bolt revolves axially while the appliance remains stationary, so far as any bodily axial movement is concerned. As the bolt revolves, it draws the thread-cutting appliance along bodily in a direction longitudinal of the bolt; the bolt entering the stock 1 and having the screw-thread cut thereon until the entering end of the bolt strikes the front end of the regulating-screw 13. At this moment the stock 1 and the sleeve 3 are drawn along over the cross-head or carrier 10, and the stock 1 being prevented from turning axially by its straight longitudinal grooves 11, while the sleeve 13 is turned axially by the engagement of its spiral grooves 12 with the ends of the cross-head. This rotation of the sleeve 3 carries the inclined surfaces 4 off of the outer ends of the cutting-dies 2 and brings the intermediate recesses 15 into alignment with said outer ends of the dies; the spring 7 thereupon instantly throwing the dies 2 outward so that their outer ends shall enter the recesses 15, and automatically release the bolt from the dies without necessitating any immediate

stoppage of the lathe. I have also shown the sleeve 3 as provided with a handle 16 which extends radially outward from the sleeve and by means of which an attendant can readily partially rotate the sleeve sufficiently to release the bolt whenever desired.

In Figs. 5 and 6 I have shown a modified form of thread-cutting appliance which also embodies the essential principles of my invention, but which differs from the structure shown in the preceding figures in that the appliance is connected to the tail-stock of the lathe by means of the sleeve of the appliance instead of by means of the stock of the appliance, as before, and also in that no regulating-screw 13 is used. In this instance, a tail-stock, such as is shown at 17 in Fig. 7, is used; said stock having two inwardly extending trunnions 18 which enter two oppositely disposed and straight longitudinal slots 12^a formed in the sleeve 3; two oppositely disposed spiral-like slots 11^a being in this instance formed in the stock 1. As previously stated, no regulating-screw 13 is here used, suitable attachments of the usual or any preferred kind being used for arresting the motion of the lathe, and the handle 16^a corresponding to the handle 16 being provided for the stock 3. In this instance, however, the operation of the appliance is essentially the same as that previously described; the stock 1 and sleeve 3 rotating with relation to each other at the proper moment and the appliance continuing to act under the drawing action of the bolt until the desired length of thread has been cut, as before.

Obviously many other minor modifications in construction and arrangement may be adopted without departing from the essential principles of my invention.

In both of the structures above described, provision is made for discharging the cuttings from the appliance; apertures 9 being formed through the side of the stock 1 and sleeve 3 for such purpose.

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

1. A bolt-threading appliance, comprising a stock or cutter-head and spring-pressed cutters therefor, a spring-pressed sleeve provided with inclines bearing against the cutters, and a nut movable upon the stock for moving the spring-pressed sleeve, substantially as set forth.

2. A bolt-threading appliance, comprising a stock or cutter-head and spring-pressed cutters therefor, a spring-pressed sleeve provided with inclines bearing against the cutters, and also with recesses alternating with said inclines and designed to receive the cutters, and a nut movable upon the stock and serving to move the spring-pressed sleeve, substantially as set forth.

3. A bolt-threading appliance, comprising a stock, spring-pressed cutters carried thereby, a spring-pressed sleeve provided with alter-

nated longitudinal inclines and radial recesses for the cutters, and a nut movable upon the stock and serving to move the spring-pressed sleeve, substantially as set forth.

5 4. A bolt-threading appliance, comprising the cutter-head and its cutters, the sleeve provided with the inclines bearing against the backs of the cutters, a spring or springs for pressing the cutters against said inclines, 10 a nut traveling on the head for moving the sleeve, and a spring or springs for holding the sleeve against said nut, substantially as set forth.

15 5. A bolt-threading appliance, comprising a stock carrying a plurality of radial cutting-dies, a sleeve embracing said stock and provided with alternated longitudinal inclines and radial recesses to act upon and to receive said dies respectively, straight and curved 20 slots for said stock and sleeve, a cross-head within the stock and working through said slots, and a regulating-screw threaded through said cross-head and located within the stock, substantially as set forth.

25 6. A bolt-threading appliance, comprising a stock, movable cutter-dies carried thereby, a sleeve both longitudinally and axially mov-

able directly upon said stock, and means actuated by the bolt and automatically producing the axial movements of such sleeve, substantially as set forth. 30

7. A bolt-threading appliance, comprising a stock, movable cutter-dies carried thereby, a sleeve longitudinally and axially movable upon the stock, a cross-head movable longitudinally within the stock and operating upon 35 the stock and also operating upon the sleeve so as to move the latter axially, and a regulating-screw movable in the cross-head and designed to be engaged by the bolt, substantially as set forth. 40

8. A bolt-threading appliance, comprising a stock, movable cutting-dies carried thereby, a sleeve longitudinally and axially movable upon the stock, a cross-head movable longitudinally within the stock and engaging 45 straight and curved slots in the stock and sleeve respectively, and a regulating-screw movable in the cross-head and designed to be engaged by the bolt, substantially as set forth. 50

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