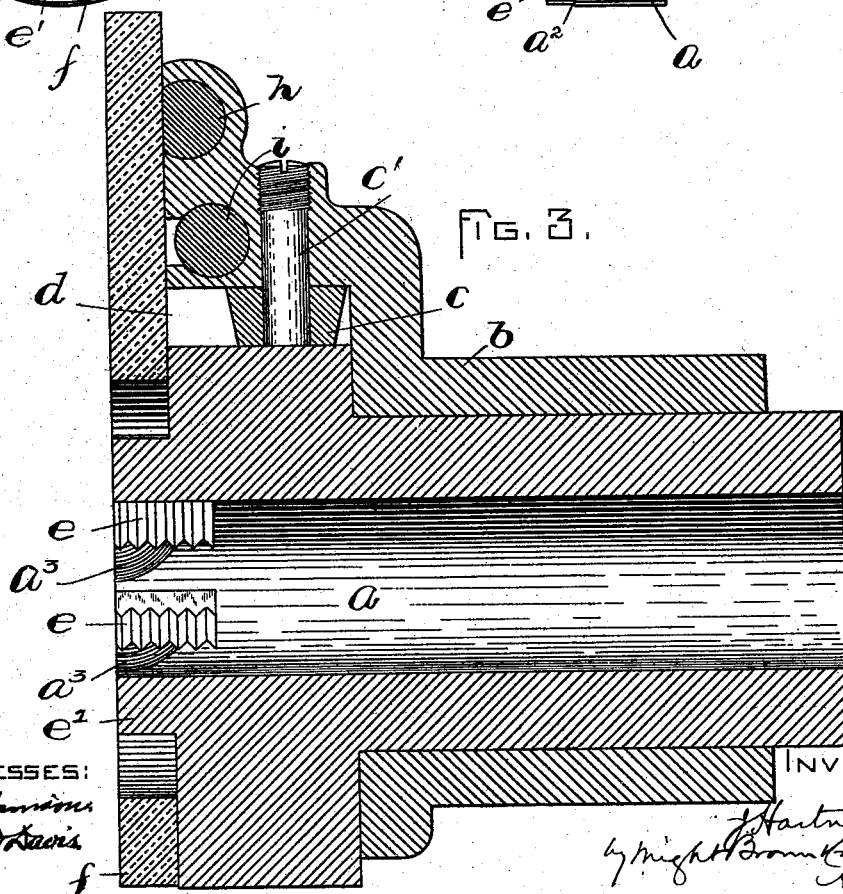
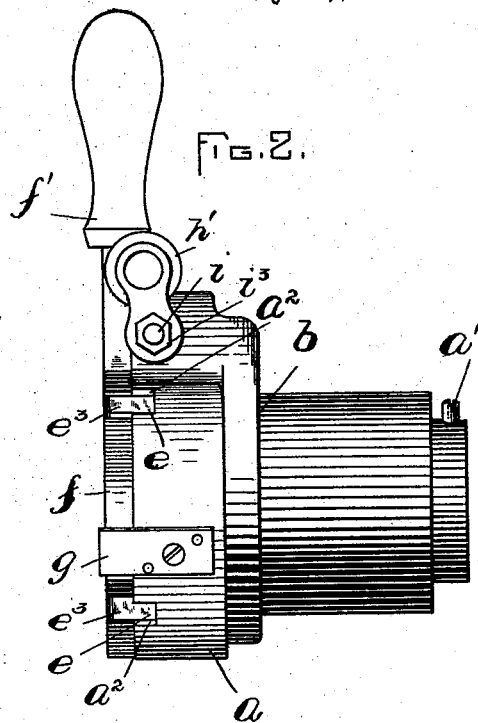
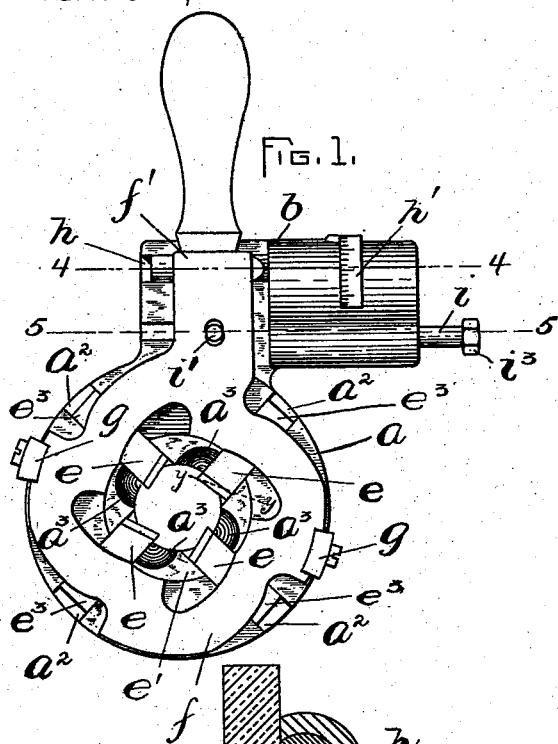


J. HARTNESS.

AUTOMATICALLY OPENING DIE FOR CUTTING SCREW THREADS.

No. 522,413.

Patented July 3, 1894.



WITNESSES:

A. D. Harrison
E. D. Davis

INVENTOR:

J. Hartness
by night from family
Atty.

(No Model.)

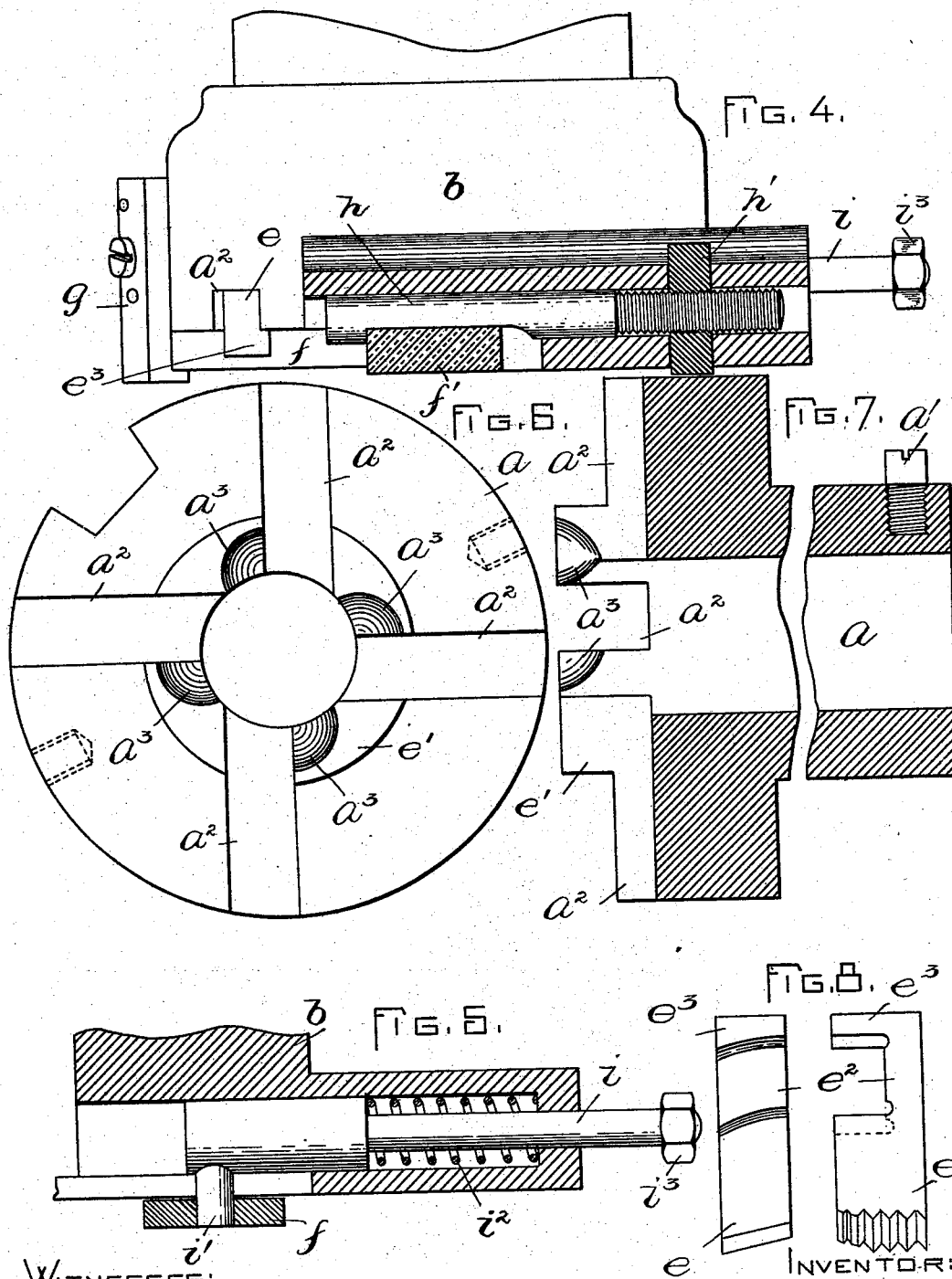
2 Sheets—Sheet 2.

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AUTOMATICALLY OPENING DIE FOR CUTTING SCREW THREADS.

No. 522,413.

Patented July 3, 1894.



WITNESSES:

A. D. Hamlin.
Parker Davis.

INVENTOR:

J. Hartness
by Wright & Son, Attys.

UNITED STATES PATENT OFFICE.

JAMES HARTNESS, OF SPRINGFIELD, VERMONT.

AUTOMATICALLY-OPENING DIE FOR CUTTING SCREW-THREADS.

SPECIFICATION forming part of Letters Patent No. 522,413, dated July 3, 1894.

Application filed June 12, 1893. Serial No. 477,297. (No model.)

To all whom it may concern:

Be it known that I, JAMES HARTNESS, of Springfield, in the county of Windsor and State of Vermont, have invented certain new and useful Improvements in Automatically-Opening Dies for Cutting Screw-Threads, of which the following is a specification.

The object of this invention is to provide an improved automatically-opening die for cutting parallel standard threads, which will be more compact than dies of this character heretofore in vogue and adapted for use in a turret machine, and to provide improvements in the construction of the die which render its manipulation handier, its action more effective and its adjustment easier.

The accompanying drawings illustrate the invention.

Figure 1 shows a front view of the die. Fig. 2 shows a side view. Fig. 3 shows a longitudinal section. Fig. 4 shows a section on line 4—4 of Fig. 1. Fig. 5 shows a section on line 5—5 of Fig. 1. Figs. 6 and 7 show details of the holder for the cutters or chasers. Fig. 8 shows details of the cutter or chaser.

The same letters of reference indicate the same parts in all the figures.

In the drawings: The letter *a* designates the body of the die, which is supported in a holder *b* designed to be rigidly affixed to a turret or other carriage, and is capable of a limited longitudinal movement in said holder but cannot turn therein, the connection being effected by means of a roll *c*, mounted on a stud *c'* fixed in the holder *b*, and a groove *d* in the body *a* and engaged by said roll. The longitudinal movement of the body is limited by a pin *a'*, fastened in it and arranged to abut the inner end of the holder *b*.

The face of the body *a* is formed with a plurality of radial slots *a²*, which receive the cutters or chasers *e*, and said body is also formed with a projecting annulus *e'* around its bore. Adjacent to each slot *a²*, a flaring concavity *a³* is formed in the face of the annulus *e'*, and this concavity in shape is a segment of a sphere, the purpose of which construction will hereinafter appear. This concavity cuts off the corner where the side of the slot and the wall of the central opening of the die would meet, and thus the cavity extends along the chaser back from the cen-

tral opening of the die, merging into the chaser-slot. Each cutter or chaser comprises a main portion, which occupies the slot, with its outer face flush with the face of the annulus *e'*, and one corner projecting into the bore of the body *a*; a slender neck *e²*; and a thickened rear portion *e³*.

A cam *f* fits against the face of the body *a*, and engages each of the cutters or chasers, the cam fitting over the reduced necks of the latter, and its cam-edges engaging the shoulders at the ends of the necks. The said cam has portions which fit the annulus *e'*, and it is designed to have a rotary motion sufficient to open and close the cutters or chasers, the cam being guided in such movement by its engagement with the annulus. The cam is held against the face of the body *a* by pieces *g*, secured to the sides of said body and having flanges which extend over the cam.

The operative adjustment of the die, that is, the adjustment when the chasers are closed, is shown in Fig. 1, and in this adjustment the handle *f'* of the cam extends vertically, and is so held by a latch *h*, fastened in a projection of the holder *b*. The latch has a threaded shank, which is engaged by a nut *h'*, suitably supported in the holder *b*, and having its periphery marked with graduations adapted to register with a fixed mark or projection on the holder. By means of this graduated nut, the position of the latch can be adjusted to a nicety, and the consequent position of the cam and thereby the diameter of the work can be accurately gaged.

The cam is spring-pressed to an open position through the following agencies: A sliding rod *i* is fitted in the holder *b*, and has a laterally-projecting pin *i'*, which engages an opening in the cam. A spring *i²* acts against the rod *i* in a direction to move the cam to the open position, and a nut *i³* on the end of the rod limits the movement of the cam. By removing this nut, the cam may be turned far enough to disengage it from the pieces *g*, and permit its removal, for the purpose of taking out the cutters.

The method of operating the die is as follows: To put the die in condition to operate on the work, the cam-handle *f'* is pulled back to the position shown in Fig. 1, whereby the cam is caused to revolve to the right and close

the cutters. Sufficient pressure is exerted to bring the handle over the latch, and it is locked thereby. The die is crowded onto the end of the revolving piece of work, and is allowed to cut a thread thereon as far as the travel of the holder *b* will permit. As soon as the motion of the said holder toward the work is arrested, the die will continue to screw forward on the work until the body *a* is drawn out of the holder *b* a sufficient distance to disengage the cam *f* from the latch *h*, whereupon the spring-pressed rod *i* forces the cam to the left, and the die is opened.

It will be observed that, in this die, the chaser-cutters are so seated that the strains of cutting are directly backed up by the controlling surfaces of the body and cam, and no intermediate parts are used to obtain connection between the cutters and the cam. Thus the cutters are under no bending strain.

It will be observed that the entire rear side of each cutter,—*i. e.*, that side opposite where the cutting begins,—is wholly back from the central opening of the die, and is backed up by the wall of the groove. In Fig. 1, the dotted line designated *y-y* shows the direction of the cutting strain, so it will be seen that it is received by the wall of the groove.

The chips strike the flaring walls of the concavities *a*³, and are thereby caused to travel forward and out of the die. It will be observed that, by reason of these concavities receding from the central opening of the die along the chasers and merging into the chaser-slots, work of a diameter to completely fill the said central openings can be cut, the chips curling directly into the cavities.

Dies for doing the work which this die is intended have heretofore been objectionable on account of their weight and size, which make them inconvenient to handle and operate and ill-adapted to the work.

It will be observed that, in the construction of the die herein described, regard has been had for compactness, and the construction and arrangement of the various parts is productive of a die much more compact than any heretofore devised for accomplishing the same work. It can be readily applied and operated in a turret-machine.

Many changes which would naturally suggest themselves to a skilled mechanic might be made in the construction of the die, without departing from the spirit and scope of the invention, and hence the invention is not confined to the embodiment here shown.

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

1. An automatically-opening die, comprising in its construction a holder for attachment to a turret or other carriage, a body in said holder and capable of limited longitudinal movement therein, said body having radiating slots in its outer face, chaser-cutters fitting said slots, a rotatable cam engaging said cutters and adapted to open and close

the same, a latch for holding the cam in closed adjustment, and whose disengagement which releases the cam is effected by the longitudinal movement of the body, and means for throwing the cam to its open adjustment when released from the latch.

2. An automatically-opening die, comprising in its construction a holder for attachment to a turret or other carriage, a body in said holder and capable of limited longitudinal movement therein, said body having radiating slots in its outer face, chaser-cutters fitting said slots, a rotatable cam engaging said cutters and adapted to open and close the same, a latch for holding the cam in closed adjustment and whose disengagement which releases the cam is effected by the longitudinal movement of the body, and a spring tending to move the cam to open adjustment.

3. An automatically-opening die, comprising in its construction a holder for attachment to a turret or other carriage, a body in said holder and capable of limited longitudinal movement therein, said body having radial slots in its face, chaser-cutters fitting said slots, a rotatable cam engaging said cutters and adapted by its rotation to move the same to open and closed adjustments, means tending to move said cam to open adjustment, a latch adapted to hold the cam in its closed adjustment and whose disengagement which releases the cam is effected by the longitudinal movement of the body, and means for adjusting the latch and thereby the cutters, substantially as described.

4. An automatically-opening die, comprising in its construction a holder for attachment to a turret or other carriage, a body in said holder and capable of limited longitudinal movement therein, said body having radiating slots in its outer face, chaser-cutters fitting said slots, a rotatable cam engaging said cutters and adapted to open and close the same, a latch for holding the cam in closed adjustment, said cam adapted to be released from the latch by its longitudinal movement in the holder, and said latch having a threaded shank, a nut engaging said shank and suitably supported in the holder, said nut having graduation marks, and means for throwing the cam to its open adjustment when released from the latch.

5. An automatically-opening die, comprising in its construction a holder for attachment to a turret or other carriage, a body in said holder and capable of limited longitudinal movement therein, said body having radiating slots in its outer face, chaser-cutters fitting said slots, a rotatable cam engaging said cutters and adapted to open and close the same, a latch for holding the cam in closed adjustment, said cam adapted to be released from the latch by its longitudinal movement in the holder, and a spring-pressed rod connected with the cam and tending to move it to open adjustment.

6. An automatically-opening die, compris-

ing in its construction a holder for attachment to a turret or other carriage, a body in said holder and capable of limited longitudinal movement therein, said body having radial slots in its face, chaser-cutters fitting said slots, a rotatable cam engaging said cutters and adapted by its rotation to move the same to open and closed adjustments, a spring-pressed rod connected with the cam and tending to move it to open adjustment, a latch adapted to hold the cam in closed adjustment and to be disengaged from the cam by longitudinal

movement of the body, and means for adjusting the latch and thereby the cutters, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 26th day of May, A. D. 1893.

JAMES HARTNESS.

Witnesses:

W. D. WOODSON,
L. B. HURD.