Sept. 4, 1928.

A. F. BREITENSTEIN

1,683,126

SELF OPENING DIE HEAD

Filed Nov. 23, 1925

2 Sheets-Sheet 1

Fig. 1.

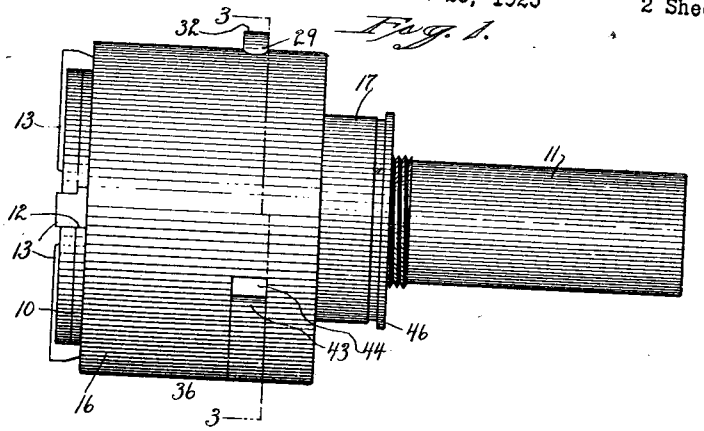


Fig. 2.

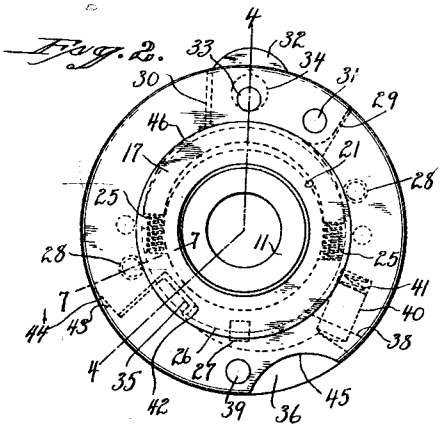


Fig. 3.

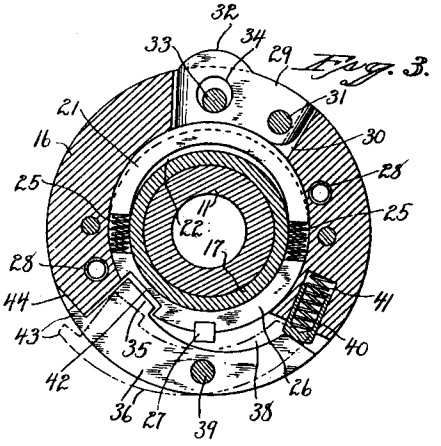
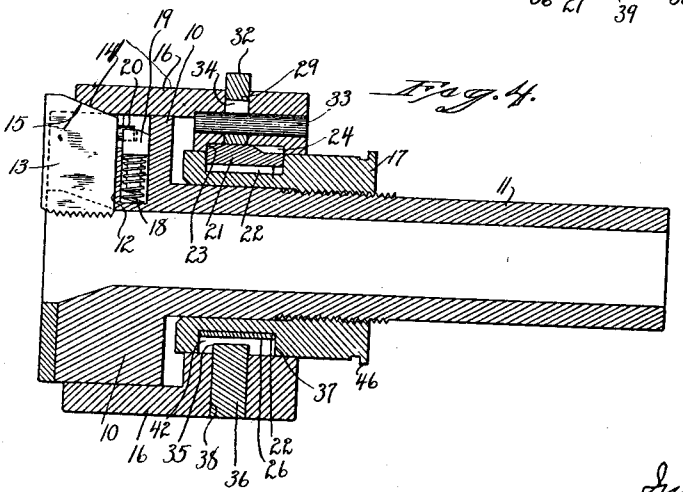


Fig. 4.



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2 Sheets-Sheet 2

Fig. 5.

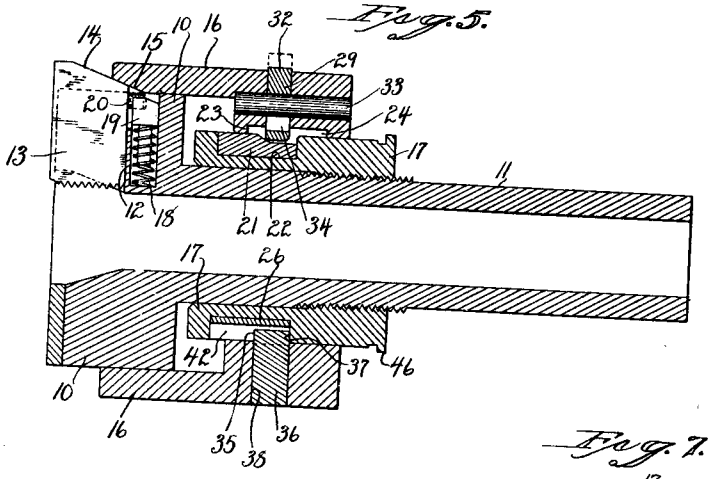


Fig. 7.

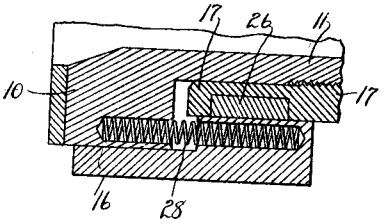
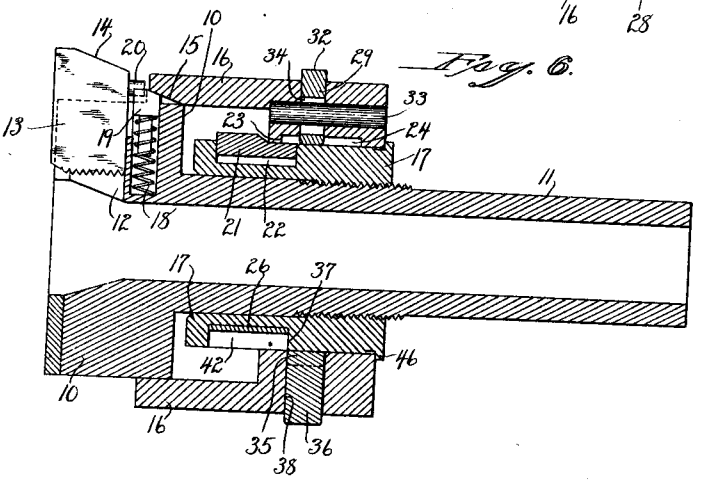


Fig. 6.



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Patented Sept. 4, 1928. 1,683,126

UNITED STATES PATENT OFFICE.

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SELF-OPENING DIE HEAD.

Application filed November 23, 1925. Serial No. 70,949.

Fig. 1 is a view in side elevation of one form which my improved self-opening die-head may assume, the tool being shown in its closed or cutting position.

Fig. 2 is a view thereof in rear elevation.

Fig. 3 is a view thereof in transverse section on the line 3—3 of Fig. 1.

Fig. 4 is a view thereof in longitudinal section on the line 4—4 of Fig. 2.

Fig. 5 is a view corresponding to Fig. 4, save for showing the tool in its open position.

Fig. 6 is a corresponding view, showing the tool in its chaser-clearance or extreme open position.

Fig. 7 is a broken, longitudinal, sectional view on the line 7—7 of Fig. 4.

My invention relates to an improvement in self-opening die-heads, the object being to produce a tool constructed with particular reference to saving time in the removal and replacement of its chasers as occasion requires, as well as to superior durability in use.

With these objects in view, my invention consists in a self-opening die-head characterized by its provision with a pivotal stop-member for normally stopping the operating-member of the tool in the open position of the chasers and manually operable for permitting their removal and replacement.

My invention further consists in a self-opening die-head having a spring-actuated, manually-operable, pivotal, latch-like stop mounted in its operating-sleeve for limiting the outward movement of the chasers and manually operable for permitting their removal and replacement.

My invention further consists in a self-opening die-head having certain details of construction and combinations of parts as will be hereinafter described and particularly pointed out in the claims.

For the purpose of illustrating my invention, I have shown it as applied to a self-opening die-head having a body 10 provided with an integral, hollow shank 11, and formed in its front face with a plurality of radial, spaced slots 12, each receiving a radially-movable chaser 13, the outer end of which is beveled as at 14, to co-operate with a cam-surface 15 formed within the forward end of an operating-sleeve 16 having axial sliding movement upon an adjusting-ring 17 threaded upon the hollow shank 11 aforesaid, whereby the chasers are positively forced into their closed or cutting positions. Each chaser is moved outward into its open position as the said sleeve is moved from front to rear into its open position, by a chaser-spring 18 co-acting with a plunger 19 impinging against a pin 20 projecting inward from the outer end of its inner face.

For holding the said sleeve in its closed position, and hence the chasers in their cutting positions, as shown in Figs. 1 to 4 inclusive, the tool is provided with a radially-movable locking-segment 21, located in an annular groove 22 in the adjusting-ring 17, the forward edge of the said segment co-acting with the forward wall 23 of an eccentric groove 24 in the inner periphery of the operating-sleeve 16, as shown in Fig. 4. The said segment 21 is normally held in its outward or locking position by means of springs 25 interposed between its ends and the respective ends of a filler-segment 26, located in the said annular groove 22 in opposition to the locking-segment 21, the said filler-segment being held against movement relative to the operating-sleeve 16 by a key 27 (Fig. 3). For moving the locking-segment 21 inwardly from its locking into its unlocking position, in which latter it releases the sleeve 16 to the action of the springs 28, by which the sleeve is moved rearward from its closed position (shown in Figs. 1 to 4 inclusive) into its open position (shown in Fig. 5), the tool is provided with a pivotal tripping-lever 29 located in a segmental slot 30 in the sleeve 16 and rocking upon a pin 31 in the said slot. The outer end of the lever 29 is formed with a cam-surface 32, normally projecting beyond the periphery of the sleeve 16 and designed to be engaged with a stop on the machine in which the tool is being used in the ordinary manner. A pin 33, located in the slot 30, passes through a hole 34 formed in the lever and limiting its rocking movement.

The concave inner edge of the said lever co-acts with the convex outer face of the locking-segment 21 for crowding the same inward into its unlocking position, whereby the forward edge of the segment is cleared from the forward wall 23 of the eccentric slot 24 in the sleeve, permitting the same to be moved rearward by the springs 28 until the nose 35 of my improved latch-like, pivotal stop 36 (by means of which my pres-

ent invention is characterized) is impinged against the rear wall 37 of the annular groove 22 in the adjusting-ring 17, as clearly shown in Fig. 5.

The said stop 36, which in the present embodiment of my invention has the form of a pivotal latch, is located in a segmental slot 38 in the operating-sleeve 16 and pivotally mounted on a pin 39 therein. A hollow plunger 40, operated by a spring 41, is installed in the sleeve 16 in position to engage with the tail-end of the stop 36, as shown in Fig. 3, for normally maintaining the nose 35 at the opposite end thereof in the annular groove 22, for which purpose the filler-segment 26 is formed with a clearance cut 42 (Fig. 3).

For limiting the inward movement of the nose 35 of the stop 36, under the action of the spring 41, the outer end of the stop is formed with a stop-finger 43 resting on a seat 44 in the sleeve 16.

For access to the tail-end of the stop 36 for its manual operation, the sleeve 16 is furnished with a clearance-notch 45 (Fig. 2).

In the use of my improved self-opening die-head, if it is desired to remove the chasers for grinding them or for changing them or for any other reason, the user has only to manually operate the stop 36 against the tension of the spring 41, whereby its nose 35 is withdrawn from engagement with the rear wall 37 of the concentric groove 22 in the adjusting-ring 17, thus permitting the springs 28 to further assert themselves and move the sleeve 16 into its fully-retired or chaser-clearance position, as shown in Fig. 6, in which its rear face engages with a stop-flange 46 upon the rear end of the adjusting-ring 17, at which time the forward end of the sleeve 16 is entirely cleared from the outer ends of the chasers, which may now be removed and replaced as required. In its normal position, my improved stop conforms to the external contour of the body of the die-head and in no wise obstructs the use of the same. At the same time, it permits the sleeve 16 to be moved into its chaser-clearance position without loss of time or the use of tools, and is so simple and rugged in its construction that it increases the durability of the tool. At the same time, it provides a stop for the chaser-opening movement of the sleeve, of superior ruggedness and durability.

It will be understood that the use of my improved pivotal stop-member is not limited to a self-opening die-head like that shown and described, as it may also be applied to other forms of die-heads and kindred tools.

I claim:

1. A self-opening die-head having a body, radially-movable chasers, a chaser-operating member having chaser-closing, chaser-retracted and chaser-clearance positions, a stop member pivoted between its ends in the said chaser-operating member, one of its ends acting as a stop for normally stopping the chaser-operating member in its chaser-retracted position and its other end providing means for operating it by an inward thrust to permit the said chaser-operating member to move into its chaser-clearance position, and spring means for rocking the said stop-member into its stopping position.

2. A self-opening die-head having a body, radially-movable chasers, a chaser-operating member having chaser-closing, chaser-retracted and chaser-clearance positions, a latch-like stop-member pivoted between its ends in the said chaser-operating member, one end of the said stop-member acting to stop the said chaser-operating member in its chaser-retracted position and its other end providing means for operating it by an inward thrust to permit the chaser-operating member to move into its chaser-clearance position, and spring means for rocking the said stop-member into its stopping position.

3. A self-opening die-head having a body, radially-movable chasers, a chaser-operating member having chaser-closing, chaser-retracted and chaser-clearance positions, an adjusting-ring mounted upon the said body, and a spring-actuated stop-member pivoted between its ends in the said chaser-operating member, one of its ends co-acting with the said adjusting-ring for stopping the operating-member in its chaser-retracted position and its opposite end being adapted to be pushed inward, whereby its first mentioned end is moved outward to disengage it from the said adjusting-ring to permit the chaser-operating member to move into its chaser-clearance position.

4. A self-opening die-head having a body, radially-movable chasers, a chaser-operating member having chaser-closing, chaser-retracted and chaser-clearance positions, an adjusting-ring mounted upon the said body, a bowed latch-like stop-member pivoted between its ends in the operating-member in position for one of its ends to coact with the said ring for stopping the operating-member in its chaser-retracted position and its other end being positioned for being pushed inwardly, whereby its first mentioned end is moved outwardly for disengagement from the said ring to permit the said chaser-operating member to move into its chaser-clearance position, and a spring for normally holding the said stop-member in position for co-acting with the said ring.

5. A self-opening die-head having a body, radially-movable chasers installed therein, an axially-movable operating-sleeve having chaser-closing, chaser-retracted and chaser-clearance positions and co-acting directly at its forward end with the chasers for forcing them inwardly into their cutting positions,

springs for moving the sleeve from front to rear into its chaser retracted position and into its chaser-clearance position, an adjusting-ring mounted upon the said body, a transversely-arranged latch-like stop-member pivoted between its locking and tail ends in the said sleeve in position for the co-action of its locking-end with the said ring for stopping the said sleeve in the chaser-retracted position thereof, and its tail-end being exposed for being manually pushed inward, whereby its locking end is disengaged from the said ring, and a spring co-acting with the tail-end of the said stop-member for holding its locking-end in engagement with the said ring.

6. A self-opening die-head having a body, radially-movable chasers installed therein, an axially-movable operating-sleeve having chaser-closing, chaser-retracted and chaser-clearance positions and co-acting directly at its forward end with the chasers for forcing them inwardly into their cutting positions, springs for moving the sleeve from front to rear into its chaser-retracted position and into its chaser-clearance position, an adjusting-ring mounted upon the said body, a transversely-arranged bowed latch-like stop-member pivoted between its ends in the said sleeve and provided at its locking-end with a nose for engagement with the said ring and at its opposite end with a tail for its manual operation by a direct inward thrust, and a spring co-acting with the tail-end of the stop, whereby its said nose is normally kept in engagement with the said ring.

In testimony whereof I have signed this specification.

ALBERT F. BREITENSTEIN.