

No. 640,596.

Patented Jan. 2, 1900.

F. H. STAHL.
AUTOMATIC ADJUSTABLE DIE.

(Application filed May 12, 1899.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

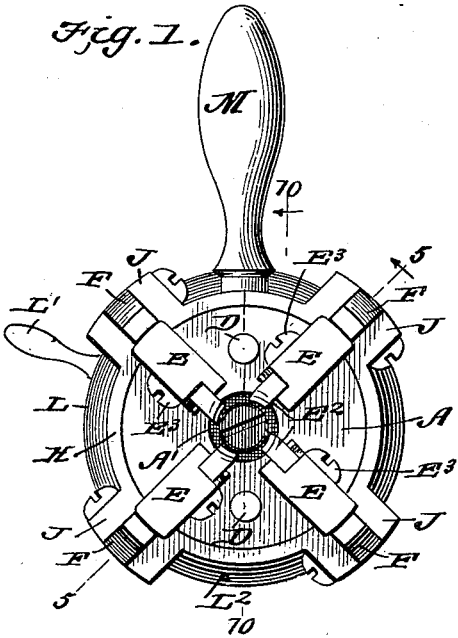


Fig. 2.

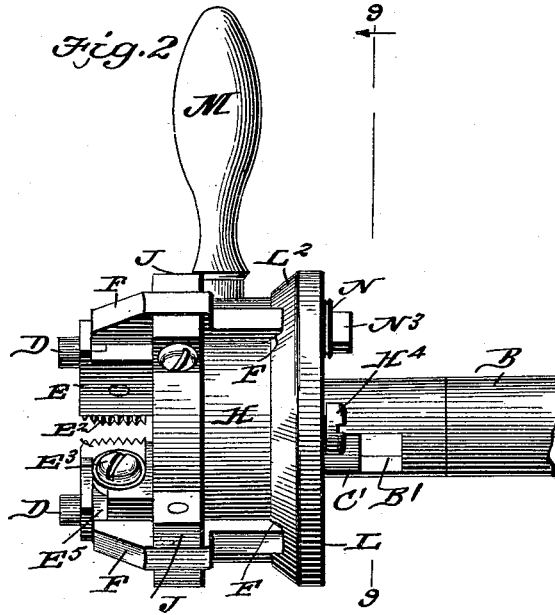


Fig. 3.

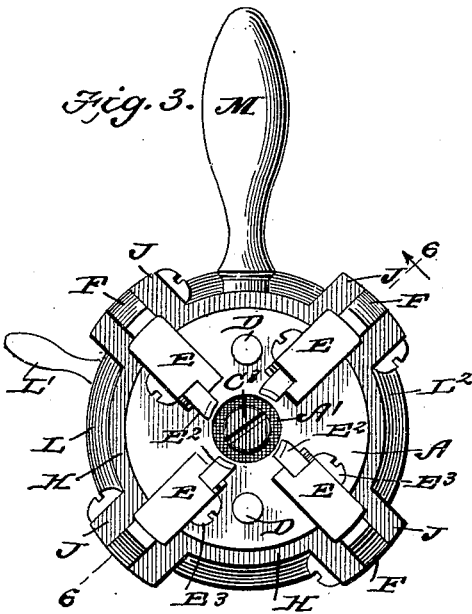
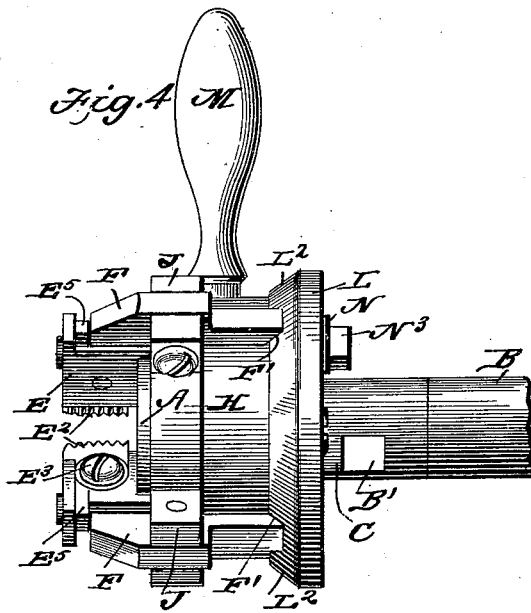


Fig. 4.



WITNESSES:

W. D. Blondel,
Perry B. Swepin

INVENTOR

Frank Henry Stahl.

BY *Munn & Co.*

ATTORNEYS.

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4 Sheets—Sheet 4.

Fig. 13.

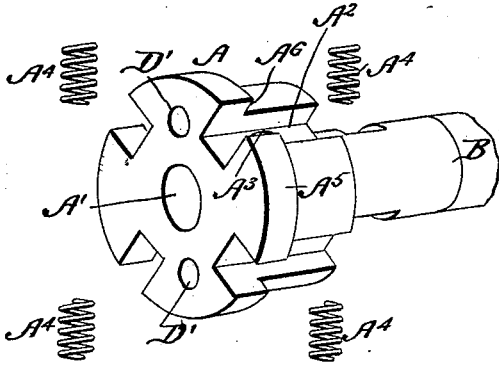


Fig. 14.

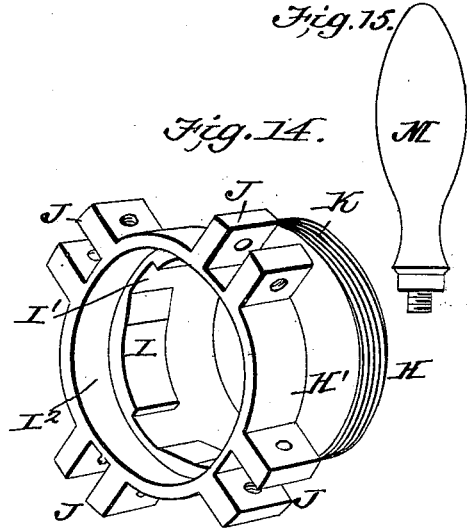


Fig. 15.

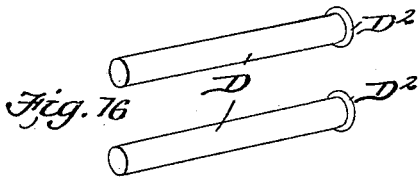


Fig. 21.

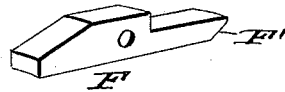


Fig. 17.

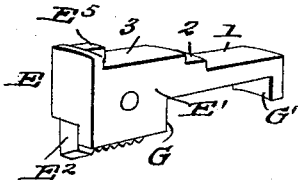


Fig. 19.

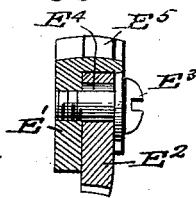


Fig. 18.

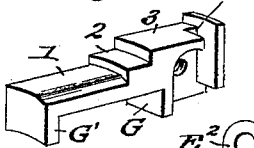


Fig. 20.

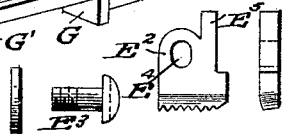
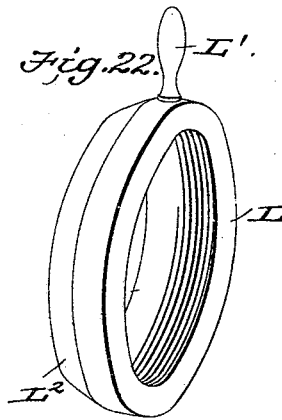


Fig. 22.



WITNESSES:

M. S. Blondel

Perry B. Turpin

INVENTOR

Frank Henry Stahl

BY *Munn & Co.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANK HENRY STAHL, OF CHARLESTOWN, WEST VIRGINIA.

AUTOMATIC ADJUSTABLE DIE.

SPECIFICATION forming part of Letters Patent No. 640,596, dated January 2, 1900.

Application filed May 12, 1899. Serial No. 716,604. (No model.)

To all whom it may concern:

Be it known that I, FRANK HENRY STAHL, residing at Charlestown, in the county of Jefferson and State of West Virginia, have invented certain new and useful Improvements in Automatic Adjustable Dies, of which the following is a specification.

My invention is an improvement in thread-cutting dies for use in cutting threads on pipes or rods and in general brasswork; and it has for an object to provide a die which will be automatic in releasing the blades from the work when it is desired to run the die back to another cut and also to provide means whereby to effect the convenient adjustment of the die to suit different sizes of rods or pipes, as well as to take up wear on the cutting-surfaces of the blades.

The invention has for further objects other improvements; and it consists in certain novel constructions and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is an end view of the die with the blades adjusted into position for use, and Fig. 2 is a side view of the die with the parts in the position shown in Fig. 1. Fig. 3 is an end view of the die with the blades adjusted out to position to permit the sliding of the die off the work, and Fig. 4 is a side view of the die with the parts in the adjustment shown in Fig. 3. Fig. 5 is a vertical longitudinal section on about line 5 5 of Fig. 1. Fig. 6 is a vertical longitudinal section on about line 6 6 of Fig. 3. Fig. 7 is a cross-sectional view on about line 7 7 of Fig. 5. Fig. 8 is an end view similar to Fig. 7, but showing the sleeve adjusted to set the blades inward by means of the cam. Fig. 9 is a cross-section on about line 9 9 of Fig. 2. Fig. 10 is a longitudinal section on about line 10 10 of Fig. 1. Fig. 11 is a detail section on about line 11 11 of Fig. 9. Fig. 12 illustrates the device for locking the adjustment-ring from movement. Fig. 13 is a detail view illustrating the carrier-block and the springs used for throwing out the die-jaws. Fig. 14 is a detail view of the jaw-setting cover. Fig. 15 is a detail view of the handle for said cover. Fig. 16 is a detail view of the throw-off pins. Figs. 17, 18, 19, and 20 illustrate the die-jaws. Fig. 21 is a detail view of one

of the locking-levers, and Fig. 22 is a detail view of the adjusting-ring.

By my invention I provide the several die-blades and support them in such manner that they may be adjusted to proper relation to cut the thread upon the end of a pipe-section and may when such thread has been cut in a lathe or other suitable machine be automatically released and spread apart, so the die can be moved quickly back for another operation. This avoids the objection in the use of the ordinary die which requires when the thread has been cut that the motion of the lathe be reversed in order to remove the die, which follows the thread back to the starting-point. The saving of time by the automatic release is apparent, as one motion will return the die to its former position, the old style of die requiring much more time in following the thread back to the starting-point, also the time necessary for reversing the speed and the wear and tear of the belting and machinery, all of which is saved by the use of my improved die. In the ordinary die different dies are necessary for each gage of thread, while by means of a special adjusting feature my dies can be adjusted readily to various gages, thus combining a number of dies in one and enabling me to take up wear on the cutting-surfaces of the die-blades, thus increasing the usefulness of the die.

Another desirable feature of my improvement is its safety. In the use of the ordinary die if the lathe is not reversed promptly in running a thread up to a shoulder the die will run up too far and jam against the shoulder, spoiling the thread and frequently breaking the die. By the automatic release incident to my die this becomes an impossibility, and the release can be set to secure the automatic spreading of the dies at any desired point.

In carrying out my invention I employ a carrier block or head A, (shown in detail in Fig. 13,) carried upon the shank B, which latter is in operation secured in the turret-head of a monitor-lathe or similar machine. This carrier-block A has a central bore A' leading into the shank B, which is slotted at B' for the passage of the yoke C, which has a cross-bar C', receiving the threaded shank C² of the screw, whose head C³ forms an abutment for engagement by the end of the pipe

or other work being threaded. This yoke C also has the arms or flanges C⁴, which engage the back wall of the jaw-setting cover, as shown in Figs. 5 and 6, and operate to throw off said cover and release the die-jaws, so the latter can spread in the operation of the device. The block A is also provided with longitudinal openings D', in which play the throw-off rods D, which are provided at their inner ends with heads D² to prevent their displacement. In the adjustment of parts shown in Figs. 1 and 10 the pins D bear at their inner ends against the rear wall of the jaw-setting cover and project at their outer ends beyond the outer ends of the die-blades presently described, so they may be engaged by the shoulder or other abutment on the lathe and push the cover-sleeve back to release the die-jaws when the thread has been cut to the desired point.

In its outer side the block A is provided with channels A² for the die-jaws and with sockets A³, leading from such channels for the springs A⁴, which actuate the die-jaws outward in the operation of the die. A flange A⁵ is formed circumferentially at the outer end of the block A and forms at its inner side a shoulder or bearing A⁶ for engagement by the outer edges of the cams in the jaw-setting cover presently described.

The die-jaws E are shown in detail in Figs. 17, 18, 19, and 20, and they are preferably formed with a body portion E' and separate blades E², having at their inner edges the thread-cutting portions and adjustably connected with the body portion E', so the blades can be adjusted in or out on the body E' for the purpose of varying the gage of the thread, as well as for taking up wear upon the thread-cutting surfaces. In securing the blades E² they are provided with slots E⁴ for the passage of the screws E³. The blades E² also have outwardly-projecting shanks E⁵, which extend through slots or passages E⁶, beyond the body E', in position for engagement by the outer ends of the locking and adjusting levers F, of which I provide one for each of the die-jaws, and which, like the die-jaws, are alike, so a description of one will answer for all.

In the adjustment of the several parts of the die for use the outer ends of the levers F rest upon the outer ends of the extensions or shanks E⁵ of the blades. This is important for two reasons, as the levers thereby positively lock the blades from any outward movement and also operate when the levers are operated by the adjusting-ring to set the die-blades uniformly inward to any desired gage.

The die-jaws fit within the channels A² of the block A and are provided with inwardly-extending shoulders G and G', which overlap, respectively, the outer and inner ends of the block, and thus prevent any lateral displacement of the die-jaws and at the same time permit the movements of the die-jaws in and out. It should be understood that these

die-jaws are pressed normally outward by their respective springs A⁴ to spread the die and are forced inward to compress the die to position for use by means of the cams on the jaw-setting cover H, which I will now describe.

The jaw-setting cover H is shown in detail in Fig. 14 and is fitted in operation upon the carrier-block and over the die-jaws, being movable longitudinally and also rotarily within certain limits for the purposes presently described. This cover-sleeve H has a cylindrical portion H' and the back plate H², the latter being arranged for engagement by the throw-off devices C and D, before described. By these throw-off devices the cover-sleeve is moved longitudinally rearward from the position shown in Figs. 2 and 5 to that shown in Figs. 4 and 6 to free the die-jaws and permit the same to be forced outward by their springs A⁴, as before described.

In its inner face the cover-sleeve is provided with the cams I, leading circumferentially from the channels I', as best shown in Fig. 14, and between such cams and the outer ends of the cover-sleeve I provide a circular chamber I² of greater diameter than the circle of the cams, so it will operate in adjusting the die-jaws, as presently described. It will be noticed that the die-jaws are stepped at 1, 2, and 3 on their outer faces, and such steps receive the different portions of the cover in the different positions thereof, as presently described.

On its outer side the cover-sleeve is provided with lugs J, forming bearings for the levers F, with threads K next to its rear end for the adjusting-ring L, and with a handle M, by which the cover-sleeve may be moved rotarily. The ring L also has a handle L' and is provided at its front edge with a cam-surface L², which engages beneath the rear ends of the levers F at F' and may thus operate to adjust the said levers F, as well as to lock the same in any desired adjustment. To lock the ring L, I provide what for convenience of reference I term the "ring-locking" bolt N, which is threaded at N' to engage within the threads of the ring L, as shown at Figs 10 and 12, and is provided with a threaded stud N², eccentric to the threaded surface N' and turning into the rear wall H² of the cover-sleeve, as shown in Fig. 10, and with a head N³, by which the bolt N may be turned to cause its threads N' to move into and out of engagement with the threads of the ring L. By reason of the eccentric pivot N² of the bolt N the same may be turned to engage and lock the ring L, as shown in Fig. 10 and in full lines in Fig. 12, or it may be swung clear of the ring L, as indicated in dotted lines in Fig. 12, to permit the ring L to be moved freely in either direction.

To limit the movements of the cover-sleeve rotarily I, provide its back plate H² with a curved slot H³, which receives a stop-bolt H⁴, as shown in Figs. 9 and 11.

When the parts are in position as shown in Fig. 1, the die-jaws are held inward in position to cut the thread by means of the cover-sleeve, which is adjusted to the position shown in Fig. 5, with the steps 3 of the die-jaws lying in the channel I² of the cover-sleeve and in line with the channels I' between the cams I and the outer ends of the levers F, bearing upon the outer ends of the shanks E⁵ of the blades E². In this position the die-jaws are doubly locked, one locking being effected by the fitting of the steps 3 of the jaws in the outer end I² of the cover-sleeve and the other being effected by the bearing of the levers F upon the outer extensions E⁵ of the blades. If now the die be run upon the pipe to cut the thread, the jaws will be held in the position shown in Figs. 1 and 5 until the throw-off devices are operated. These devices may be the pieces D or the yoke C, either of which when pushed rearwardly will force the cover-sleeve back. These pins and yoke are pushed rearwardly in the manner before described, and the jaws are released by such operation by the pushing of the sleeve back, so the outer end of the sleeve will fit on the steps 2 of the jaws, the outer ends of levers F will slip off the blade-shank E⁵ onto the steps 3, and the steps 1 of the jaws will lie in the way I' between the cams, the die-jaws being forced outward by the springs A⁴. The several parts will now be in the position shown in Figs. 3 and 6, and the die can be slipped freely back off the pipe or rod which has been threaded. To reset the jaws, the sleeve H can be moved rotarily by the handle M from the position shown in Figs. 3 and 4 to that shown in Fig. 8, the movement being limited by the slot H³ and pin H⁴. In this movement the cams I will force the die-jaws inward, and such jaws will be in position, as shown in Fig. 8, to properly thread the work, and to this extent such construction is useful; but to provide for automatically releasing the die-jaws I provide for adjusting the cover-sleeve so it will retain the said jaws contracted and yet can be pushed back to release the jaws. To this end the cover-sleeve after it has been set to the position shown in Fig. 8 is given a motion longitudinally forward and rotarily back from the position shown in Fig. 8 to that shown in Fig. 1. These two motions may be given simultaneously by moving the sleeve rotarily as it is pushed forward, or the sleeve may be moved first forward on the die-jaws to bring the outer end of the sleeve over the steps 3 of the jaws to secure the die-jaws inward, and then the sleeve may be given its backward rotary movement to bring the die-jaws into alinement with the spaces between the cams of the sleeve, so the sleeve when pushed backward will release the jaws, and the latter may be forced outward by their springs.

It will be noticed from the foregoing that the sleeve has cams to operate the die-jaws and also means for securing the die-jaws when compressed and during the readjustment of

the sleeve to position to permit the automatic release of the jaws in the operation before described.

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

1. In a die substantially as described the combination of the carrier-block having radial channels, the die-jaws operating therein and provided with front and rear flanges overlapping and fitting against the front and rear ends of the carrier-block whereby the jaws are held and guided in their radial movements, the springs for opening the jaws, and means for closing the jaws substantially as set forth.

2. The combination of the die-jaws, the support for same, the cover-sleeve arranged to operate the die-jaws and provided with projecting lever-arms arranged to overlie the outer ends of the die-jaws, and means for moving the cover-sleeve to release the die-jaws, substantially as set forth.

3. The combination with the die-jaws having the movable blades, the cover-sleeve arranged to operate said die-jaws, the levers pivoted to said cover-sleeve and arranged to engage the blades of the die-jaws whereby to operate the same, and means for operating said levers substantially as set forth.

4. The combination of the die-jaws stepped and having the separate blades provided with the projecting shanks also forming steps, the cover-sleeves having cams for closing the jaws, and the enlarged channel at its outer end, the levers pivoted to the cover-sleeve and engaging the shank of the die-jaw blades, and means for operating said levers substantially as set forth.

5. The combination of the die-jaws having the movable blades, the blocks supporting the same, the cover-sleeve, the levers thereon and arranged at one end to engage the die-jaw blades, and the ring threaded on the cover-sleeve and engaging the opposite ends of the said levers whereby to operate the same substantially as set forth.

6. The combination with the threaded ring and threaded portion receiving the same, of the bolt having its axis parallel with that of the ring and threaded to mesh with the threads of the ring and pivoted eccentrically to the threaded portion receiving the ring, whereby the bolt may be turned to set it into and out of engagement with the threaded ring substantially as set forth.

7. The combination with the die-jaws, the support for same, the cover-sleeve, and the levers thereon, of the ring for adjusting said levers, such ring being threaded on the cover-sleeve, and the bolt pivoted eccentrically to the cover-sleeve and having the exterior threaded portion movable into and out of mesh with the threads of the threaded ring substantially as set forth.

8. The combination of the carrier-block having the central bore and the longitudinal passages for the throw-off pins, the die-jaws,

the cover-sleeve having a back plate arranged for engagement by the throw-off pins, the throw-off pins operating in such passages and projecting beyond the outer end of the head
5 and the yoke arranged to engage the back plate of the cover-sleeve and having the bolt in the bore of the carrier-block, all substantially as described whereby the cover-sleeve may be released by engagement of the outer
10 ends of the throw-off pins with a shoulder on the work or by the engagement of the end of the pipe or rod being threaded with the bolt on the yoke substantially as set forth.

9. The combination of the carrier-block
15 having channels for the die-jaws, the die-jaws fitted in said channel and having the die-blades, the springs for opening the die-jaws, the cover-sleeve movable longitudinally and rotarily on the die-jaws whereby to close
20 the die-jaws, hold the same closed and re-

lease them, the levers pivoted to the cover-sleeve and arranged at their outer ends to engage the die-jaws, the ring engaging the inner ends of the levers whereby to operate
25 the same, means for locking said ring, and throw-off devices for releasing the cover-sleeve substantially as set forth.

10. The combination of the die-jaws having the movable blades fitted in said jaws and projecting at their outer ends beyond the jaws
30 and the cover-sleeve arranged to operate the jaws and provided with projecting portions arranged to overlie the projecting portions of the movable blades of the die-jaws when the latter are in operative position substan-
35 tially as set forth.

FRANK HENRY STAHL.

Witnesses:

CHAS. H. SMITH,

WM. B. WOODWARD.