

No. 806,133.

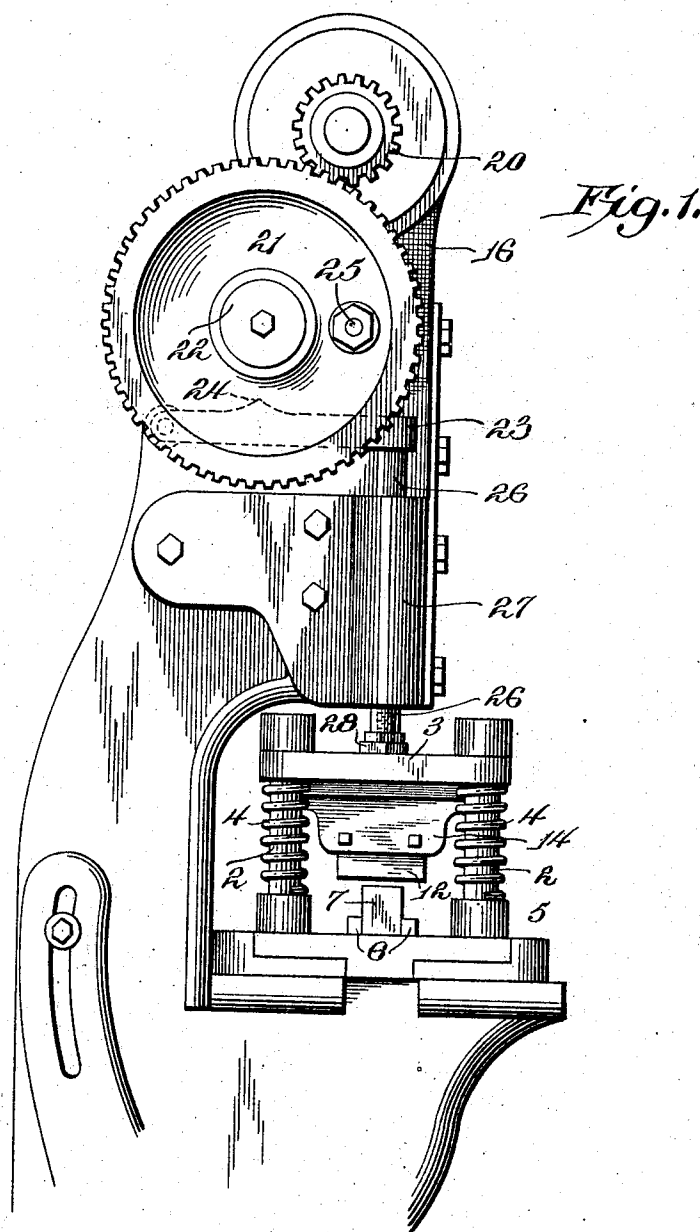
PATENTED DEC. 5, 1905.

D. T. GRAHAM.

CUT-OFF ATTACHMENT FOR METAL FORMING PRESSES.

APPLICATION FILED MAR. 11, 1905.

2 SHEETS—SHEET 1.



Witnesses

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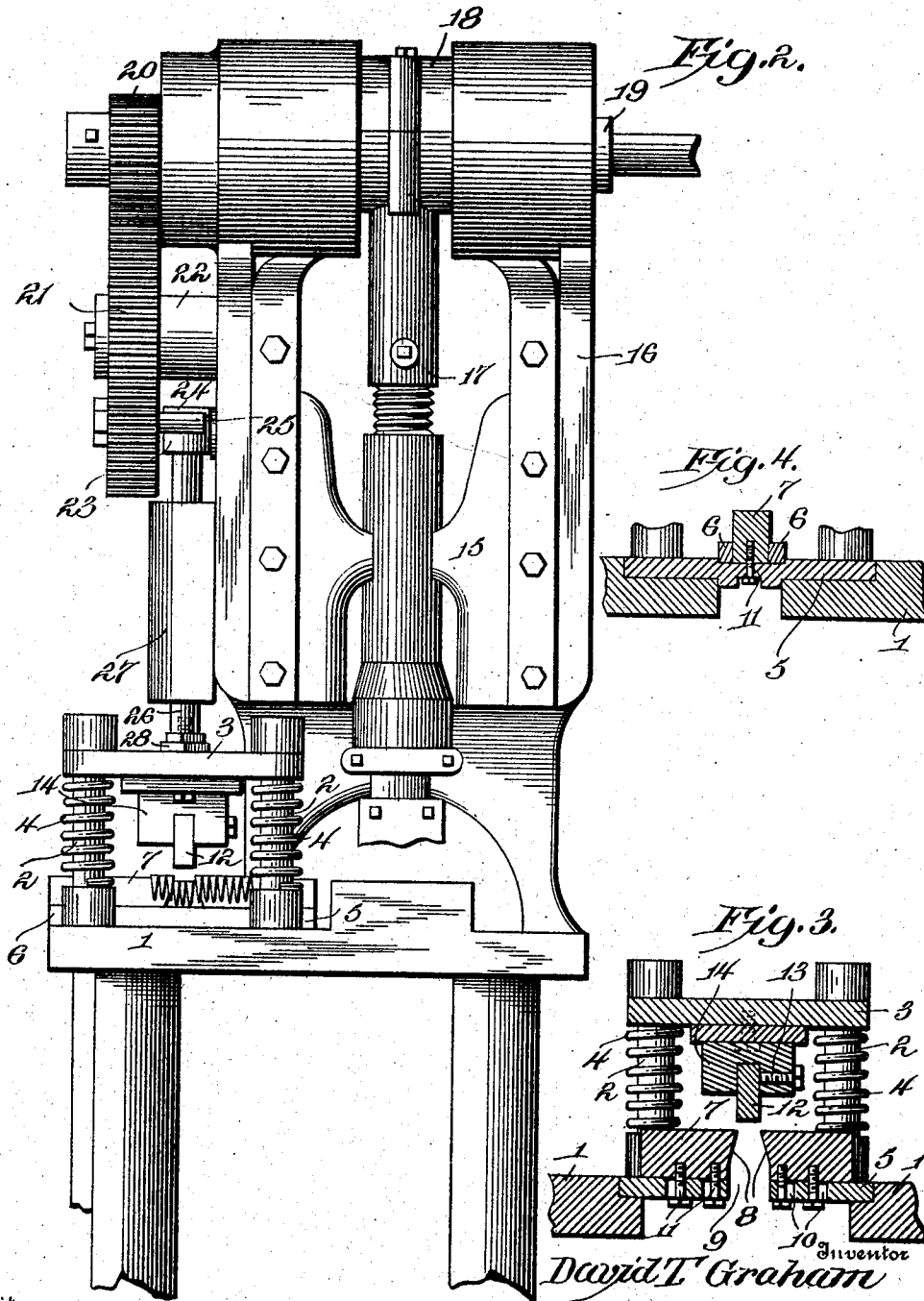
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UNITED STATES PATENT OFFICE.

DAVID T. GRAHAM, OF ST. LOUIS, MISSOURI.

CUT-OFF ATTACHMENT FOR METAL-FORMING PRESSES.

No. 806,133.

Specification of Letters Patent.

Patented Dec. 5, 1905.

Application filed March 11, 1905. Serial No. 249,644.

To all whom it may concern:

Be it known that I, DAVID T. GRAHAM, a citizen of the United States, residing at St. Louis; State of Missouri, have invented certain new and useful Improvements in Cut-Off Attachments for Metal-Forming Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to cut-off attachments for metal-forming presses; and it is more particularly adapted for use upon machines having means for performing a series of operations on a continuous strip of metal which must subsequently be cut into equal lengths to produce similar articles of manufacture.

Heretofore when machines have been employed to shape strips of metal it has been necessary to provide a separate machine for cutting the strips into proper lengths, especially where the finished articles each represents a fraction of the result of one or more operations of the shaping or forming mechanism.

The object of the invention is to provide an attachment which can be mounted upon an ordinary style of forming-press and having cut-off devices in alinement with the forming-dies and adapted to receive the strip of metal after it has been operated upon by the forming-dies.

Another object is to provide novel mechanism whereby the strip of metal can be severed after any predetermined number of forming operations, thereby producing a finished article.

A still further object is to provide cut-off mechanism whereby a multiplicity of finished articles may be cut from the formed strip at one operation.

With the above and other objects in view the invention consists of oppositely-extending alining dies which are spaced apart at their adjoining edges and serve to support the strip after it has left the forming-dies of the machine upon which the attachment is mounted. A plunger is disposed above the space formed between the two dies of the cut-off attachment and is so connected to the forming-dies as to be operated after any preferred number of operations of said forming-dies.

The invention also consists of further novel constructions, which will be hereinafter more clearly set forth, and pointed out in the claims.

In the accompanying drawings I have shown the preferred form of my invention.

In said drawings, Figure 1 is an end elevation of a portion of a press having my improved cut-off attachment connected thereto. Fig. 2 is a front elevation thereof, the forming-dies and the bed of the press being removed. Fig. 3 is an enlarged longitudinal section through the cut-off dies, and Fig. 4 is an enlarged transverse section through one of the lower cut-off dies.

Referring to the figures by numerals of reference, 1 is the bed of a press, and the same is provided with posts 2, preferably arranged at substantially equal distances apart and extending through the corners of a head 3, which is slidably mounted upon the posts and is supported by springs 4, mounted upon the posts. A holding-plate 5 is adjustably mounted in any preferred manner upon the bed and has parallel flanges 6 extending upward therefrom, between which are arranged alining cut-off dies 7, the inner ends of which are spaced apart and are undercut, as at 8, forming a passage which communicates with an aperture 9 in the holding-plate 5. This aperture is located above a large opening 10 within the bed 1. Screws 11 extend upward in the dies 7 from the holding-plate 5 and serve to secure them in position. The inner walls of the cut-off dies 7 are adapted to receive therebetween a die member 12, which is detachably secured by means of a screw 13 or other suitable device in a recess formed within a block 14, secured to and depending from the central portion of the head 3. It will be understood that when this head is depressed the member 12 will move downward between the die members 7, thereby compressing the springs 4, and when released these springs will expand and return the member 14 and the head 3 to normal positions.

A suitable forming-die (not shown) is adapted to be mounted above the bed and at one side of the mechanism above described, and this forming-die is adapted to be connected to and operated by a cross-head 15, which reciprocates upon the body 16 of the press and is connected by a rod 17 with an eccentric 18 on the main or driving shaft of the press. A gear 20 is secured to the shaft 19 and rotates therewith, and this gear meshes with a gear 21, mounted upon a stud-shaft 22, extending laterally from the body 16 of the press. An arm 23 is pivoted at one end to the body of the press and has an angular extension 24 upon its upper face which normally rests in

the path of the trip-pin 25, extending inwardly from the gear 21. The arm 23 is supported at its free end by a sliding rod 26, mounted in a guide 27, secured to the side of the body 16 and resting on the head 3.

It will be understood that by properly proportioning the gears 20 and 21 any preferred number of rotations of gear 21 may be produced during a predetermined number of reciprocations of cross-head 15. A strip of metal is adapted to be fed by any suitable mechanism to the forming-dies, (not shown,) and it will of course be understood that these dies can be adapted to produce any desired operation upon the strip. If, for example, the die is constructed to cut two teeth at a time upon the strip, it will be understood that after each forming operation the strip will be fed forward the width of two teeth and again cut to produce two more teeth, and this operation will be continued as long as desired. The portion of the strip which has been cut in this manner is fed forward by the same feeding mechanism to the dies 7, and at every third operation of the forming-dies the movable die 12 comes down between the dies 7 and cuts off that portion of the strip lying between the dies. If the die 12 and the space between the dies 7 is equal to a portion of the strip having three teeth upon it, it will be understood that each portion of the strip cut off by the dies 7 and 12 will contain three teeth. After this cutting operation the toothed strip will continue to feed forward on die 7 two teeth at a time, and after it has been moved forward six teeth at the completion of the forming operation it will be noticed that three of the teeth rest on the outer die 7 and three between the dies 7. As soon as the teeth assume this position the die 12 will be again depressed and two sections of the strip will be cut off, each of said sections having three teeth. The end section will remain upon the die 7, while the second section will drop through the passage 9. This operation is repeated indefinitely.

It will of course be understood that by changing the relation of the gears 20 and 21 sections can be cut from the strip containing any desired number of teeth, it being only necessary to adjust the dies 7 toward or away from each other, so that that portion of the strip resting therebetween will be of proper length.

Although I have described this attachment in connection with machines for producing toothed articles, it will of course be understood that the strip may be shaped in any desired manner by the forming-dies. The primary object of my invention is to employ an attachment which can be used upon a shaping or forming press and which will cut off predetermined lengths from a strip before said strip entirely leaves the forming-dies and while it is being fed forward between said forming-dies. The dies 7 and 12 are detach-

able and adjustable, so that larger and smaller ones may be used and the dies 7 can be moved from or toward each other.

As shown in the drawings, the rod 26 has a screw 28 in its lower end, the head of which bears on the head 3. By adjusting this screw the depression of said head 3 may be regulated.

In the foregoing description I have shown the preferred form of my invention; but I do not wish to limit myself to the precise construction and combination of parts shown, as I am aware that modifications can be made therein without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

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

1. A metal forming or shaping machine comprising an operating-shaft, means connected thereto for operating a forming-die at each revolution of the shaft, stationary dies spaced apart and forming an outlet-opening therebetween, a movable die adapted to project between the stationary dies and to simultaneously sever a plurality of similar articles from a strip fed to the movable and stationary dies from the forming-die, and means connecting the movable die to the operating-shaft for depressing said die after a predetermined number of revolutions of the operating-shaft.

2. In a metal forming or shaping machine the combination with an operating-shaft and means connected thereto for actuating a forming-die at each revolution of the shaft; of a cut-off attachment comprising alining stationary dies spaced apart and forming an outlet-opening therebetween, a movable die adapted to project between the stationary dies, and means connecting the movable die to the operating-shaft for depressing said die after a predetermined number of operations of the forming-die, said movable die adapted to simultaneously sever a plurality of similar articles from a strip fed thereto during each downward movement of said movable die.

3. In a metal forming or shaping machine the combination with an operating-shaft and means connected thereto for actuating a forming-die at each revolution of the shaft; of a cut-off attachment comprising alining stationary dies spaced apart and forming an outlet-opening therebetween, means for adjusting said dies from or toward each other, a spring-supported movable die adapted to project between the stationary dies to sever a strip fed to said dies from the forming-die, said movable die simultaneously severing a plurality of similar articles from the strip during each downward movement, one of said articles being discharged into the opening between the stationary dies, and means connecting the

movable die to the movable shaft for depressing said die after a predetermined number of revolutions of the operating-shaft.

4. In a metal forming or shaping machine
5 the combination with an operating-shaft and means connected thereto for operating a forming-die at each revolution of the shaft; of a cut-off attachment comprising a lining stationary dies spaced apart and forming an outlet-
10 opening therebetween, a movable die, one face of which is adapted to project between the stationary dies, said face being equal in length to the length of an article to be severed by the movable die, and means connecting the
15 movable die to the operating-shaft for de-

pressing said die when a strip fed thereto passes beyond the opening between the stationary dies a distance equal to the distance between said dies whereby, when the movable die is depressed, a plurality of similar articles 20 is simultaneously produced, one of said articles being discharged through the opening between the stationary dies.

In testimony whereof I have signed my name to this specification in the presence of two sub- 25 scribing witnesses.

DAVID T. GRAHAM.

Witnesses:

LOUIS T. VITT,
W. WOLTENING.