C. A. WILLIAMS.

SELF FEEDING MECHANISM FOR PUNCH AND DIE PRESSES.

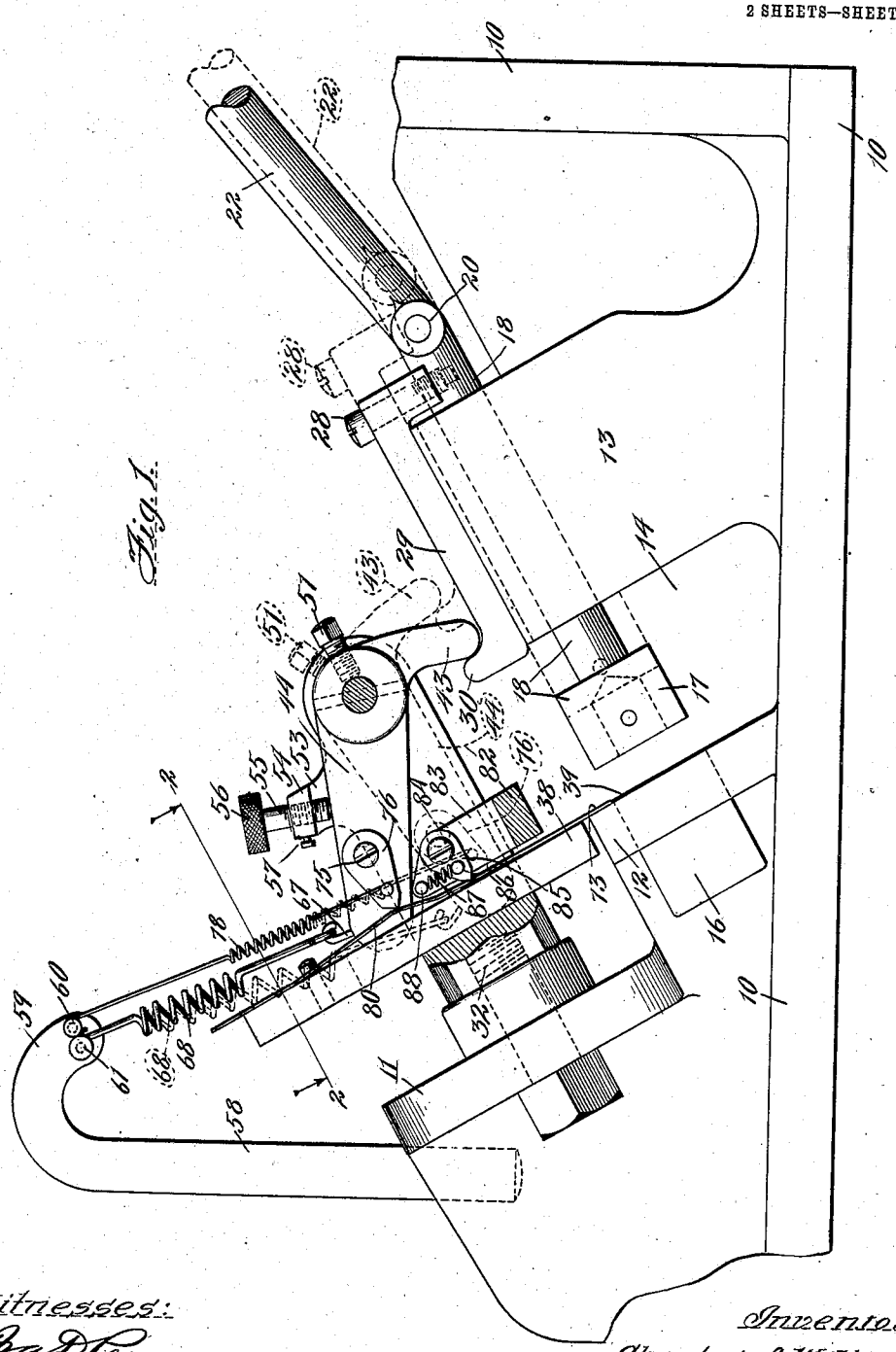
APPLICATION FILED MAY 24, 1907.

900,335.

Patented Oct. 6, 1908.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Jno. A. Nelson Jr.

Inventor:

Charles A. Williams

By Cheever Cox

Attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

C. A. WILLIAMS.

SELF FEEDING MECHANISM FOR PUNCH AND DIE PRESSES.

APPLICATION FILED MAY 24, 1907

900,335.

Patented Oct. 6, 1908.

2 SHEETS—SHEET 2.

Fig. 2.

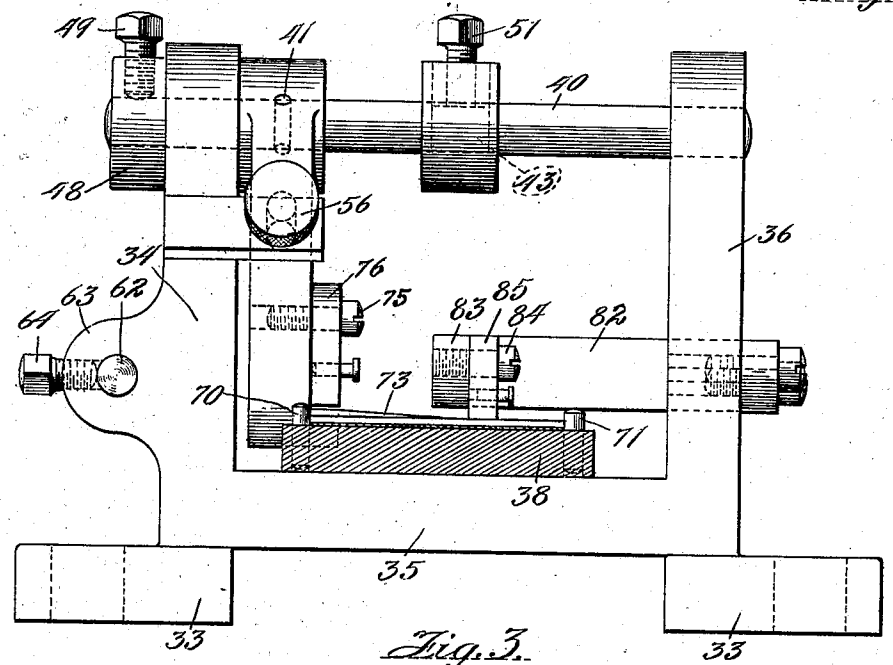
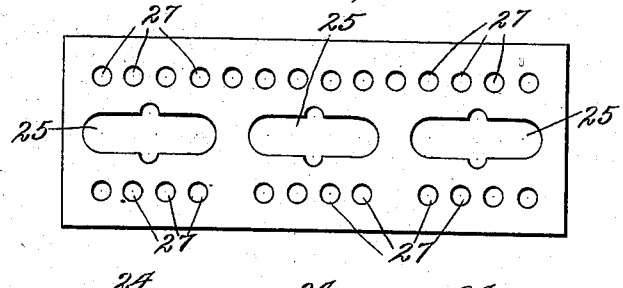


Fig. 3.



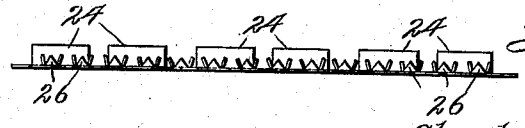


Fig. 4.

Witnesses:

Geo. D. Perry

Jno. H. Nelson Jr.

Inventor:

Charles A. Williams

By Cheever & Cox

Attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES A. WILLIAMS, OF DETROIT, MICHIGAN, ASSIGNOR TO BRISCOE MANUFACTURING COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

SELF-FEEDING MECHANISM FOR PUNCH AND DIE PRESSES.

No. 900,335. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed May 24, 1907. Serial No. 375,548.

To all whom it may concern:

Be it known that I, CHARLES A. WILLIAMS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a certain new and useful Improvement in Self-Feeding Mechanism for Punch and Die Presses, of which the following is a specification.

The invention relates to mechanism for automatically feeding a supply of material, usually in the form of thin sheet metal, to the working tools of a punch and die press.

The object of the invention is to provide such a mechanism for positively feeding material which is to be operated upon by the punch or die into the machine exactly the proper distance, and to allow the operating tools of the machine to work fully and completely upon the last fed portion of the material before the next portion is fed into the machine.

Stated differently, the object of the invention is to provide automatic means by which the feed is perfectly positive and there is no back slip to the material.

The invention consists in a device capable of accomplishing the foregoing objects, which can be very conveniently made, and attached to a machine of the general class described, said device being efficient in operation and not readily liable to get out of order.

The invention also consists in features or details of construction which will be hereafter more fully described and claimed as the specification proceeds.

In the drawings, Figure 1 is a side elevation of a punch and die press having mechanism illustrating the preferred form of the invention attached thereto. Fig. 2 is a plan view, taken on line 2—2 of Fig. 1. Fig. 3 is a plan, and Fig. 4 an edge, view of a gas engine radiator fin, such as is more fully described in United States Patent Number 858,258 to Briscoe and Anguish, issued June 25th, 1907, which fin presents some difficulties in automatic construction by means of a punch and die, which renders the invention especially desirable in connection therewith. It is, however, to be clearly understood that the invention may be applied to a punch and die operating machine making any sort of a product.

As the actual form of the particular punch and die, and the particular punch press for operating the same, are not features of the invention, the drawings show them in a diagrammatic form and only so much of them as is necessary to a clear understanding of the invention.

In the drawings, numerals 10, 11, 12 and 13 indicate various parts of the frame of the machine, the parts 12 and 13 being spaced apart so as to form a jawed opening 14, through whose bottom (not shown) pieces of finished product made by the machine may fall into suitable receptacles (not shown) in the ordinary way. Within the portion 12 of the frame is one die member 16, while the opposite die member 17 is mounted upon a cross head or rod 18 slidable backward and forward within the frame portion 13. Pivotally attached to this cross-head or rod 18, by the pin or bolt 20, is a connecting rod 22, having its end which is beyond the figure connected to any suitable punch press operating mechanism, many examples of which are well known, adapted to reciprocate it and the cross-head 18 backward and forward between the dotted line position shown in Fig. 1, and the lowest position which the die member 17 assumes when in working engagement with the die member 16, in the case of dies making the fin illustrated in Figs. 3 and 4, until the proper portion of the die member 17 has moved into member 16 a sufficient distance to turn up and properly form the flanges 24 about the hole 25, and the teeth 26 about the holes 27.

Rigidly but preferably removably secured to the cross-head 18, by suitable means, such as the screw 28, is a bar 29, having at its lower end the hook or horn portion 30. Rigidly but preferably detachably secured to the base portion 11 by any suitable means, such as screws or bolts 32, entering the lugs 33, is a suitable, preferably U-shaped, casting 34—35—36, integral with said lugs. This casting is secured in such a position that the front face of the rectangular plate 38, carried by the portion 35 of the casting, is in substantially the same plane as the front face 39 of the die member 16, and it is also so located adjacent to said die member that metal 73 which is to be punched by the machine will pass over the face of plate 38 before it reaches the face 39 of the die. Near the outer ends of portions 34 and 35 of the casting is a shaft 40 having rigidly secured to it by any suitable means a bell crank having two arms, the shorter one 43, secured to the

shaft by the set screw 51, engaging the hook or horn 30 heretofore described, and the longer one 44, secured to the shaft by the key 41, extending toward and slightly past the plate 38 into the corner between the edge of said plate 38, and the casting portions 34 and 35. The shaft 40 is secured against improper endwise motion by means of the collar 48 and set screw 49.

Rising from the member 34 is an upright 53 terminating in a horizontal member 54, angular thereto, extending over the lever arm 44. Through this horizontal member 54 is screw threaded a set screw 55 having a milled head 56 by means of which said set screw may be rotated to adjust the possible upward motion of the lever 44, in the ordinary manner. This screw 55 may be locked in any position by the screw 57 or any other suitable means.

In the particular machine here illustrated, there is, rising from the frame proper of the machine, an upright rod 58 having a hooked upper end 59 on whose ends are two screws or pins 60 and 61. This upright 58 may, if desired, be detachably secured in a hole 62 in lug 63, and be secured in position therein by the set screw 64, without departing from the invention.

On the end of the lever 44 is a hook 67 connected with the pin or screw 61 by means of a retractile spring 68, so that the lever 44 is normally spring-pressed against the bottom of the set screw 55.

In the rectangular plate 38 above the mechanism heretofore described, are two guide pins 70 and 71, so located that the distance between them is approximately the width of the material 73 which is to be fed over the plate 38 between the die members 16 and 17. In other words, the path of the copper, brass or other material 73 to be operated upon by the punch is fed vertically downward between those members.

On the inside face of the lever 44 adjacent to the edge of the material 73 is a screw 75 on which is pivotally mounted a driving or feeding dog 76 having a sharp tooth, as shown, adapted to engage the material 73 for the purpose of feeding it downward, as will be hereafter described. This driving dog 76 is spring-pressed upward by means of the spring 78 connected to the pin 60 on the curved head 59 of the arm 58. This dog is held against upward movement beyond its proper limit by means of the lug 80, on the face of lever 44. Extending from the lower side of the casting member 36 is an arm or bar 82 having rising from its end at approximately the center of the machine an upright 83 on which is a screw 84 on which is pivotally mounted locking dog 85 having, as best shown in Fig. 1, a sharp edge adapted to engage the material 73, as it passes over a raised portion 86 mounted upon the face of the plate 38 adjacent to said dog. This locking dog 85 is normally spring-pressed against the material 73 by means of a short spring 87 secured to a pin 88 on the upright 83. This dog is so located that, as shown in Fig. 1, it normally extends slightly downward, or in locking position, and is prevented from swinging any further upward or out of locking position by its engagement with the raised portion 86 heretofore described.

In the operation of the device, assume that material 73 has been fed downward, as shown in Fig. 1, until its lower edge is just at the upper edge of die 16, or that a previously cut off portion has been operated upon and the dies have separated to the full line position of Fig. 1, and that the power operating the cross head 18 is moving it toward the dotted line position of that figure. As this movement takes place, the horn 30 engages the lever 43, and tends to move it toward dotted line position, thereby moving the lever 44 and with it the driving dog 76, downward toward dotted line position. As this movement takes place, the point of the driving dog 76 engages the material 73 upon the plate 38 and forcibly drives it downward exactly as the driving dog of an ordinary ratchet drives the wheel forward. During this forward movement of the material it slips freely under locking dog 85. The parts are so adjusted that when they have reached the dotted line position of Fig. 1, the material has moved a distance equal to the width of the dies 16 and 17, or until just a sufficient quantity of material has been placed between said dies. When now the power controlling the cross head 18 starts it on its reverse stroke, the spring 68 causes the lever 44 to follow the horn 30 from dotted line to full line position, during which movement driving dog 76 slips over the previously fed material without moving the said material, being locked in its previously fed position by locking dog 85. When the cross head 18 has thus returned to full line position, the lever 44 engages the bottom of screw 55, and the entire feeding mechanism comes to rest where it remains until the punch member 17 has been forced to and into the punch member 16, and has returned back to the full line position of Fig. 1, in which position the horn 30, which has been, during the punching operation, entirely clear of lever 43, again engages said lever arm 43, and the feeding operation is resumed.

The amount or length of material fed down by each movement of the feeding mechanism, as described, may be accurately adjusted by adjusting the screw 55, so as to control the length of travel of the lever arm 44, and consequently movement of the feed dog 76.

It will be noticed that both the dogs 76 and 85 are so spring controlled that the thickness of the material 73 worked upon may be varied considerably without requiring any adjust-

ment of the machine. It will be also noticed that by loosening the screw 28, and the screw connections 32, and removing the member 58, all the parts of the feeding mechanism may be removed from the remainder of the machine; and that what remains is simply an ordinary punch press and may be used in that way.

The invention is not, except as particularly specified in the claims, limited to exact details of construction which may be varied within reasonable limits without departing from the spirit of the invention.

What I claim:

1. In mechanism of the class described in combination with a suitable supporting frame, one punch or die member, another punch or die member, and means for moving one of said punch members into and out of engagement with the other punch member, means for supporting a continuous strip of workable material in such a position that it may pass between said punch members, a member movable by the mechanism which drives the movable punch member, carrying a driving dog adapted to engage said material and forcibly move it in between said punch members, a locking dog mounted upon a stationary support adapted to permit said forward movement of the material and to prevent its moving backward as said first dog returns to normal position, and a connection between said movable member and the moving parts of the punch press proper so constructed that feeding takes place only while the punch members are not in working position and is wholly inoperative when said punch members are carried into said operative position.

2. In mechanism of the class described in combination with a suitable supporting frame, two punch or die members, means for moving one of them with reference to the other, a detachable support for working material adapted to be secured to the machine adjacent to the stationary punch member, a lever pivoted to said detachable support carrying a feeding dog adapted to engage workable material passing over said support between said punch members to force it in between said punch members, a locking dog carried by said support so mounted that it does not obstruct the forward movement of the workable material but does prevent any backward movement after said material has once been fed forward, spring mechanism for causing said dogs to engage the workable material, and a detachable member secured to a portion of the machine moving with the movable punch member adapted to operate said movable lever at such times in the operation of the machine that the workable material is fed forward a predetermined distance between the die members during the period of time in the operation of the machine when they are out of engagement with each other and that it does not in any way engage said feeding mechanism during the time that said dies are in working engagement with each other.

3. In mechanism of the class described in combination with a suitable supporting frame carrying a punch or die member, another punch or die member movable with reference thereto, a casting detachably secured to the frame adjacent to the stationary die member, said casting carrying a plate or table approximately in line with the face of the stationary die member so that workable material may pass over said plate and between said die members, a lever arm pivoted to said casting carrying a feed dog adapted to engage working material upon said plate and force it between the die members, another dog pivotally mounted upon the casting adapted to engage working material upon said plate to hold it against movement tending to withdraw it from between said die members; spring mechanism adapted to hold said dogs in working positions and a detachable member adapted to be secured to a part moving in unison with the movable die member adapted to temporarily engage and move said lever and the first mentioned dog, all of the parts being so arranged and proportioned that material is fed between the die members a predetermined distance during the time said members are out of engagement with each other and said material is then locked in position and is not fed again while said members are in engagement with each other, substantially as described, for the purposes set forth.

4. In a machine of the class described, in combination with two punch or die members, and means for operating one of them with reference to the other, a support for workable material adjacent to said die members, a feeding dog adjacent to said support, a locking dog adjacent to said support engaging working material thereon and a power supplying means connecting the movable die member with the feed dog so arranged and proportioned that the feed dog moves the workable material in between the dies while they are out of engagement with each other and that said strip of workable material remains at rest at all other times.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

CHARLES A. WILLIAMS.

Witnesses:
EMIL D. MOESSNER,
JOHN A. BOYLE.