

June 9, 1925.

1,541,760

W. CAMERON

AUTOMATIC DIE PRESS

Original Filed Oct. 13, 1919

2 Sheets-Sheet 1

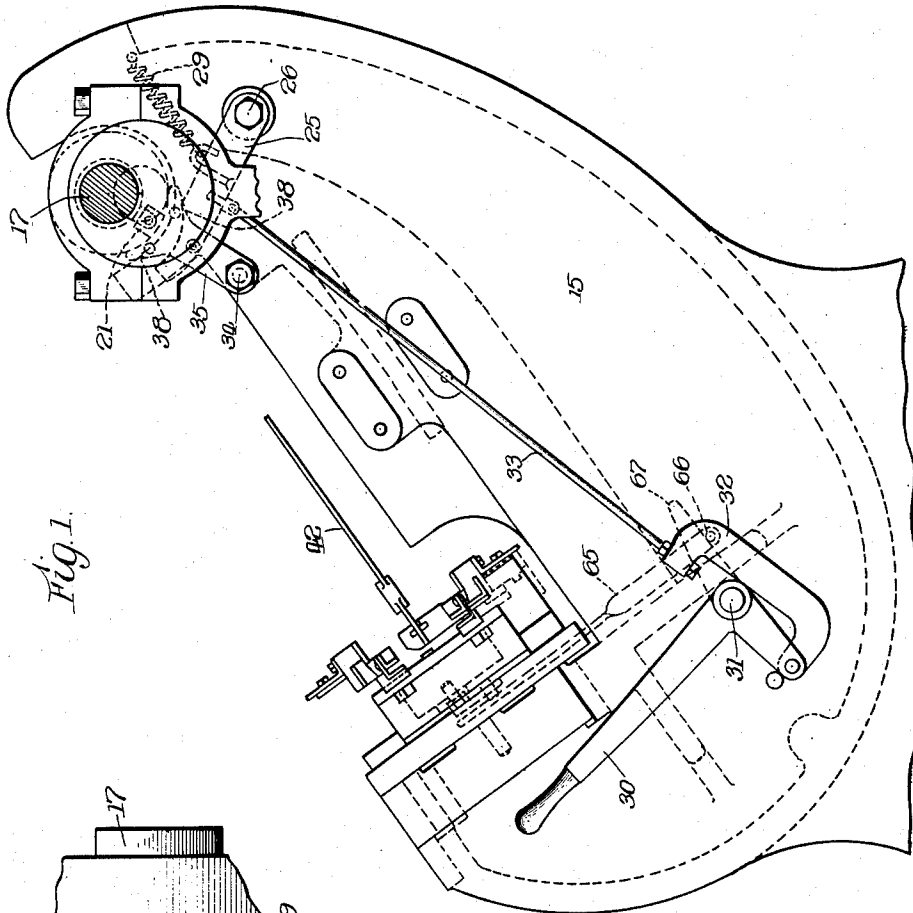


Fig. 1.

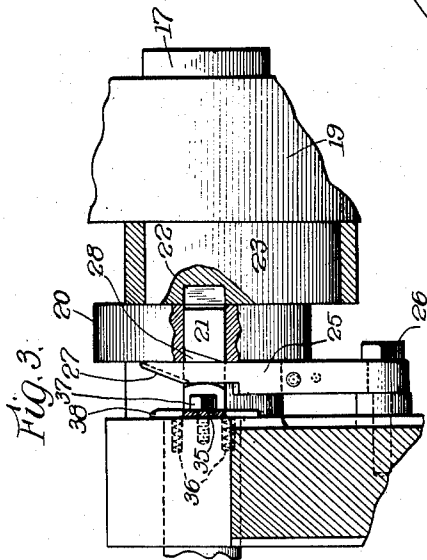


Fig. 3.

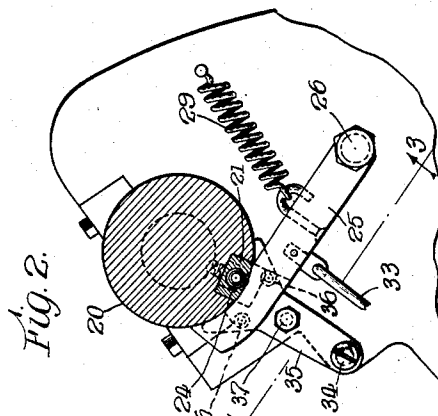


Fig. 2.

Witness:
A. J. Sauer.

Inventor:
William Cameron
By Pondell Wilson attys.

June 9, 1925.

1,541,760

W. CAMERON

AUTOMATIC DIE PRESS

Original Filed Oct. 13, 1919

2 Sheets-Sheet 2

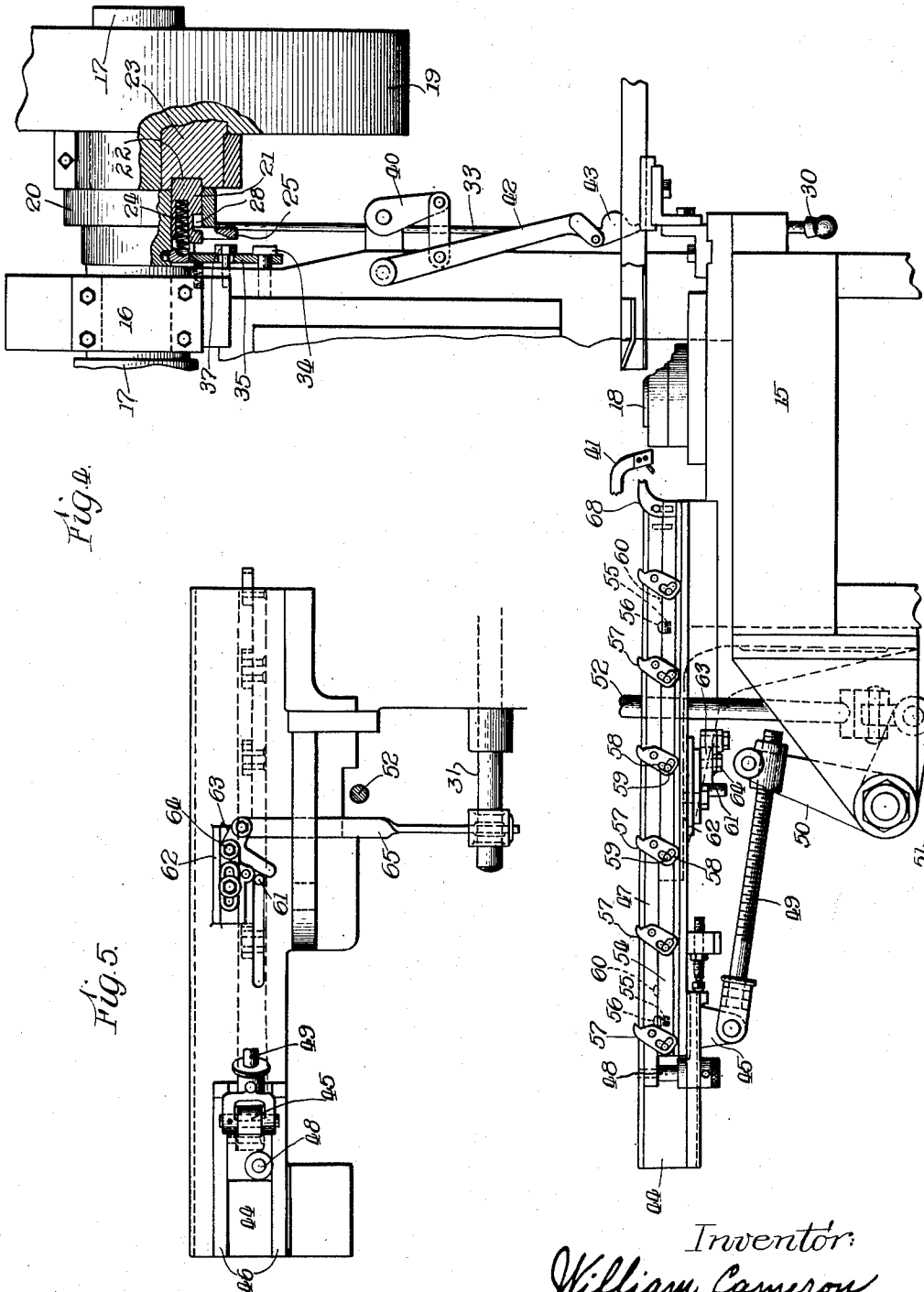


Fig. 4.

Fig. 5.

Witness:
A. J. Sauer,

Inventor:
William Cameron
By Fonder Wilson
Attys

Patented June 9, 1925.

1,541,760

UNITED STATES PATENT OFFICE.

WILLIAM CAMERON, OF CHICAGO, ILLINOIS, ASSIGNOR TO CAMERON CAN MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC DIE PRESS.

Original application filed October 13, 1919, Serial No. 330,284. Divided and this application filed March 18, 1920. Serial No. 366,898.

To all whom it may concern:

Be it known that I, WILLIAM CAMERON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Die Presses, of which the following is a specification.

This invention relates in general to metal working machines and has more particular reference to die presses for stamping out various articles such, for instance, as the tops and bottoms of tin can bodies, this application being a division of my prior application, Serial No. 330,284, filed October 13, 1919.

One of the primary objects of this invention is to eliminate the brake which is customarily employed to bring the machine to rest, upon disengagement of the clutch. These brakes have been customarily hand-operated and if improperly adjusted, or if inaccurately disposed with relation to the brake drum by reason of wear or otherwise, the machine is not stopped at the proper time. My present invention is designed to eliminate entirely the hand-controlled brake and to provide means brought into operation by the disengagement of the clutch for positively and automatically bringing the machine to rest in a predetermined position.

Another object of my invention is to provide novel feed mechanism for feeding the blanks along the feed channel toward the die, which mechanism is so constructed that it will cause the press to be automatically stopped in case of a jam or other accident which imposes an excessive strain upon the feed mechanism.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following description, when considered in connection with the accompanying drawings.

Referring to the drawings—

Fig. 1 is an end elevation of a press embodying my invention, such parts as are not comprehended in this application being omitted;

Fig. 2 is a sectional view showing the clutch and automatic brake;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary view showing the

clutch and brake in section, and with the blank magazine and the mechanism for removing the blanks therefrom removed, so as to show the reciprocatory feeding mechanism and the automatic stop mechanism associated therewith; and

Fig. 5 is a bottom view of the feed bar and press-stopping mechanism.

By reference to the drawings, it will be observed that the machine comprises generally a frame 15, provided near its top with suitable bearings 16, in which the main power shaft 17 is journaled. The shaft is provided with a crank by which the cross head to which the upper die is attached is reciprocated to cooperate in its reciprocatory movements with the stationary die 18 mounted on the bed of the machine.

It is essential in machines of this character that when they are stopped for any reason, the upper die should be in its uppermost position, thus permitting access to the dies and to the work between them. The driving mechanism for the press consists of a belt pulley 19, rotatably mounted upon the shaft 17 and adapted to be connected with the shaft by a clutch. The shaft is equipped adjacent to the hub of the wheel with a collar 20 in which there is slidably disposed, a clutch pin 21, normally urged outwardly into engagement in a socket 22 formed in the inner face of the hub 23 of the wheel, by means of an expansion spring 24. A clutch shoe 25 pivoted to the machine frame at 26 is formed at its upper extremity to provide a cam face 27 which, when disposed in the path of travel of the clutch pin 21, engages in a notch or transverse groove 28, formed in the outer face of the clutch pin 21 and withdraws the clutch pin from the socket 22 in the drive wheel hub, thus unclutching the wheel from the shaft. A tractile spring 29 normally urges the clutch shoe 25 into operative position, from which it is withdrawn into the position shown in Fig. 1 by a hand lever 30 pivoted to the machine frame at 31 and connected by means of a yoke 32 and a link 33 with the clutch shoe.

In order to overcome the momentum of the machine and bring the same to rest without injury to the machine upon the release of the clutch, I have provided a stopping mechanism which accomplishes this pur-

pose automatically and entirely eliminates from the press construction the usual hand brake which has heretofore been employed to accomplish this purpose.

5 Referring now more particularly to Figs. 1 to 4 inclusive, it will be observed that I have loosely mounted upon a bolt 34, a stop member 35, having a curved end disposed in close proximity to the clutch collar 20, its upper end being urged outwardly away from the machine frame by a plurality of heavy coil springs 36 disposed in sockets formed in the machine frame. The outward movement of the stop member is adjustably limited by a lag bolt 37 extending through an aperture formed midway in the stop member 35 and threaded into a tapped opening into the machine frame. By threading this bolt inwardly or outwardly, the position of the upper end of the stop member may be regulated as the springs 36 will always force the member outwardly away from the machine frame as far as is permitted by the adjusting bolt 37. The inner-end of the clutch pin 21 inwardly of the transverse groove 28 is so proportioned that when the clutch pin is withdrawn by the cam face 27 of the clutch shoe, this portion of the pin will be wedged between the clutch shoe and the stop member 35, thus quickly but yieldingly bringing the shaft 17 to rest. In order to ensure against the clutch pin striking the upper edge of the stop member, this edge is chamfered off as indicated at 38.

It will be manifest that when the clutch shoe is moved by the hand lever from the inoperative position shown in Fig. 1 to the operative position shown in Fig. 2, wherein it is disposed in the path of travel of the clutch pin, the clutch pin as the shaft revolves will be withdrawn from the socket in the fly wheel by the cam face 27, thus effecting the clutch release and simultaneously, this clutch pin will be wedged between the clutch shoe and the yielding stop member 35 so that movement of the pin and consequently, of the whole press, will be yieldingly resisted by a gradually increasing force until the press is brought positively but gently to rest. Since the clutch pin is always withdrawn by the clutch shoe at the same point in the revolution of the shaft 17, it will be manifest that the machine will always be stopped at a predetermined position.

The blanks are fed longitudinally forward by a step by step movement between the dies so that an article is stamped out at each reciprocation of the upper die in the usual manner. During its approach to the die, the blank is guided and held by a guiding device 41, and after the blank has been completely used up, the scrap is thrown out by a throw-out lever 42 equipped with

a finger 43, said lever being actuated from an arm 40, all in the usual manner.

The mechanism for feeding the blanks along the feed channel to the dies consists primarily of a reciprocatory feed bar the two parts of which are indicated by reference numerals 47 and 54 respectively equipped with a plurality of feed dogs which advance the blanks by a step by step movement.

Referring to Figs. 4 and 5, reference character 44 indicates the channel or groove in which the feed bar reciprocates. A cross head 45 adapted to reciprocate in suitable guideways 46 beneath the feed bar channel is connected to the upper member 47 of the feed bar by means of a pin 48 which, when removed to disengage the feed bar from the cross head enables the feed bar to be withdrawn bodily from its guide channel. The cross head is reciprocated by means of a link 49 connected to an arm 50 of a bell crank lever, the other arm 51 of which is connected by a link 52 with a crank pin (not shown) carried by the main shaft 17 so that upon each revolution of this shaft, a complete reciprocatory stroke of the feed bar will be performed.

Instead of employing a solid feed bar as has heretofore been customary, I have devised a feed bar consisting of two members, namely, an upper member 47 and a lower member 54. These members are yieldingly locked together in the position shown in Fig. 4 by a plurality of spring pressed latch members 55 carried by the lower member and adapted to seat in correspondingly shaped depressions 56 formed in the opposed face of the member 47. Upon one side of the member 47, I have pivoted a plurality of feed dogs 57, which project above the feed bar in position to engage the rear edge of a blank to be fed so that upon each reciprocation of the feed bar, the blank will be fed forward the distance between two adjacent dogs. Each dog is provided beneath the member 47 with a somewhat arcuately shaped opening 58, in which is disposed a pin 59 fixed to and projecting laterally from the feed bar member 54. So long as no abnormal resistance is offered to the step by step feeding movements of the blanks toward the dies, the feed bar will operate with its parts relatively disposed as shown in Fig. 4. Should an abnormal resistance to the feeding movement of the blank be encountered, however, the strain or backward pressure exerted upon the particular dog which is performing the feeding operation, will cause this dog to swing in a counterclockwise direction upon its pivot, thus causing a relative longitudinal movement between the feed bar members 47 and 54 sufficient to cause the latch members 55 to be disengaged from their

depressions 56 and engaged in depressions 60. This relative movement between the members 47 and 54 of the feed bar is utilized to bring the machine to a stop, by means of mechanism which will now be described.

Projecting downwardly from the member 54 is a pin 61 and in the path of this pin, mounted upon an adjustable bracket 62 attached to the machine frame, is a bell crank lever 63, pivoted to the bracket 62 at 64. The short arm of this bell crank lever is connected with a link 65. This link carries at its lower end a pin 66 which upon upward movement of the link, is adapted to swing in a counter clockwise direction viewing Fig. 1 an arm 67 fixed upon the rock shaft 31 upon the other end of which is mounted the hand lever 30. It will be obvious that upon rocking movement of the rock shaft 31 in a counterclockwise direction, the clutch shoe will be moved upwardly into the path of the clutch pin, thereby stopping the press.

When the feed bar is operating normally, the pin 61 upon the feeding stroke of the feed bar does not travel far enough to contact with the bell crank lever 63 but when the member 54 carrying the pin 61 is slid forwardly relatively to the member 47 as the result of excessive resistance offered to the movement of one of the feed dogs as previously explained, the pin 61 engages the bell crank lever as the feed bar moves forwardly and rocks this lever, thereby rocking the shaft 31 and stopping the press in the manner explained. Upon return movement of the feed bar, the parts 47 and 54 will be restored to normal position.

The last feed dog 68 on the feed bar is longer than the others, as will be apparent from Fig. 4 and its purpose is to move the blank farther on its last feeding stroke so that it will be out of the way of the next blank inserted into the feed channel by the transferring devices.

In the operation of my machine, the metal sheets or blanks are removed singly from a magazine and delivered in position to be advanced by the feed dogs 57. Upon the reciprocation of the feed bar, the blank is fed forwardly by the feed dogs over the die 18 and if the sheet should stick so as to offer excessive resistance to its feeding movement, the particular feed dog which is at that moment feeding the sheet forward, will be rocked on its pivot so as to slide the member 54 carrying the pin 61 forwardly so that this pin will engage the bell crank lever 63, and through the link 65 rock the shaft 31 so as to dispose the clutch shoe 25 in the path of the clutch pin 21. As the shaft 17 revolves, the tapered surface 27 of the shoe 25 will engage the notch 28 in the clutch pin and withdraw the pin from the fly wheel, thus disconnecting the fly wheel and at the

same time, the head of the pin will be wedged between the clutch shoe and the member 35 to bring the shaft 17 to rest in a predetermined position.

It is believed that my invention, its mode of operation and many of its inherent advantages will be readily appreciated and understood from the foregoing without further description, and while I have shown and described a preferred embodiment of the invention, it should be manifest that various changes in the size, shape, proportion and arrangement of the parts disclosed may be resorted to without departing from the essence of the invention as set forth in the appended claims.

I claim:

1. In a machine of the class described, the combination of a shaft, a driving wheel rotatably mounted thereon, a clutch, including a pin, for connecting said wheel and shaft, and yielding means positioned to engage the end of said pin upon withdrawal of the same for automatically stopping said shaft in predetermined position.

2. In a machine of the class described, the combination of a frame, a shaft mounted therein, a wheel rotatable on said shaft, a clutch for connecting said wheel and shaft, and means mounted on said frame in position to engage the end of the connecting element of said clutch when the same is disengaged for yieldingly causing said shaft to stop in predetermined position.

3. In a machine of the class described, the combination of a frame, a shaft mounted therein, a drive wheel on said shaft, a clutch including a sliding pin for connecting said wheel to said shaft, and means yieldingly mounted on said frame in position to be engaged by an end of said clutch pin upon disengagement of the clutch, whereby said shaft is stopped in predetermined position.

4. In a machine of the class described, the combination of a frame, a shaft, a wheel on said shaft, a clutch including a clutch pin for connecting said wheel to said shaft, a clutch shoe for withdrawing said clutch pin, and a stop member yieldingly mounted on said frame in position to clamp the pin between said member and shoe whereby to stop the rotation of said shaft upon disengagement of the clutch.

5. In a machine of the class described, the combination of a driving member, a driven member, a clutch including a sliding pin for connecting said members, means for withdrawing said pin from operative position and means for stopping said driven member, said means including a stop device pivotally mounted at one end and spring-pressed at its other end into cooperative relation with said clutch pin when withdrawn.

6. In a machine of the class described, the combination of a shaft, driving means

therefor, a clutch including a connecting pin, means for disconnecting said pin, a stop member pivoted at one end and spring-pressed at its other into the path of travel
5 of the pin when disconnected, and means for adjusting the position of said stop member.
7. In a machine of the class described, the combination of a driving member, a driven member, means including a clutch
10 pin for connecting said members, a stop member mounted adjacent to said driven member, springs for urging said stop member into operative position, means for adjusting the position of said stop member, and a shoe for withdrawing said pin from
15 the driving member and causing the same to be clamped between the shoe and said stop member whereby to stop said driven member.

WILLIAM CAMERON.