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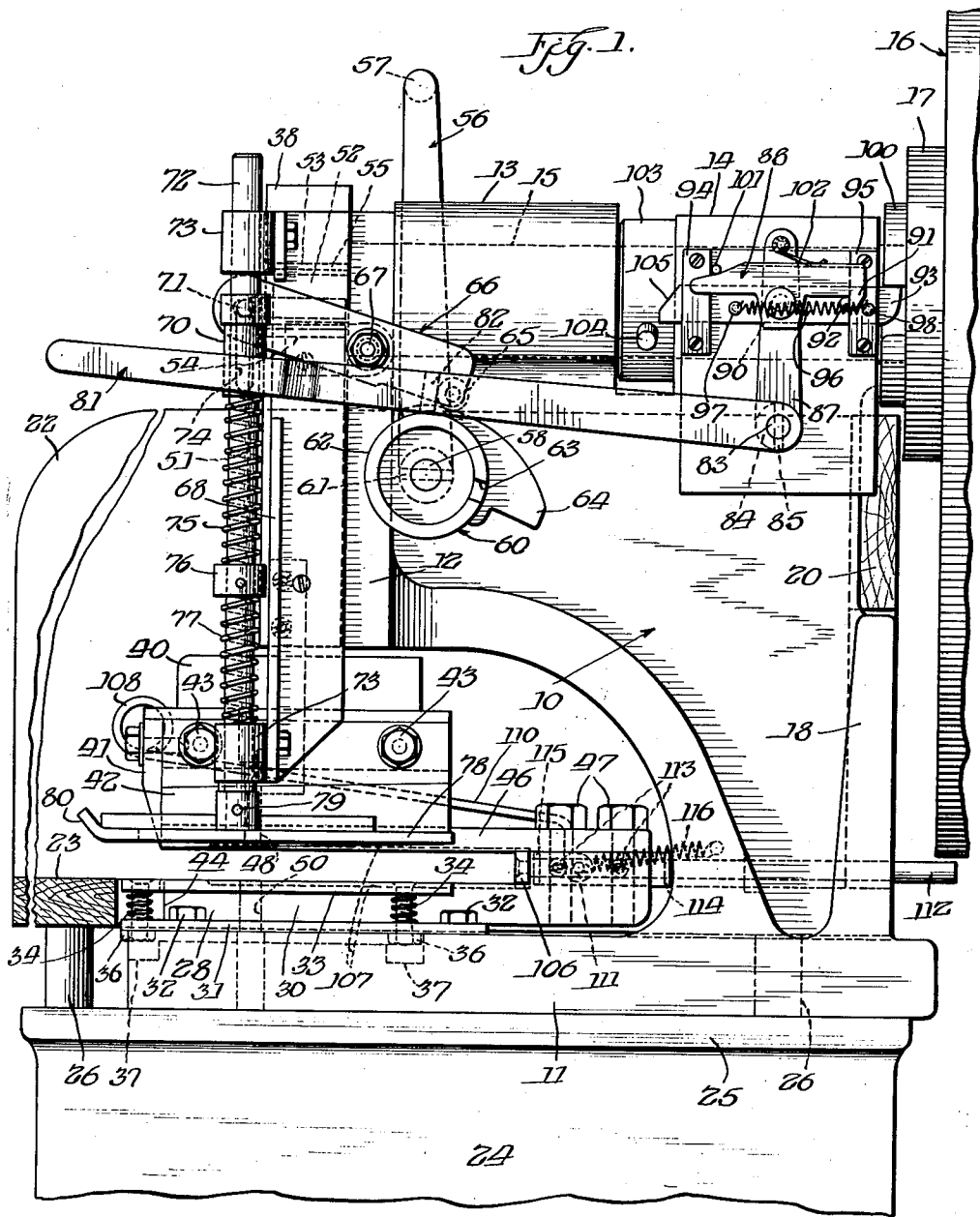
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2,289,076

COUPON CUTTER

Filed Oct. 14, 1940

3 Sheets-Sheet 1



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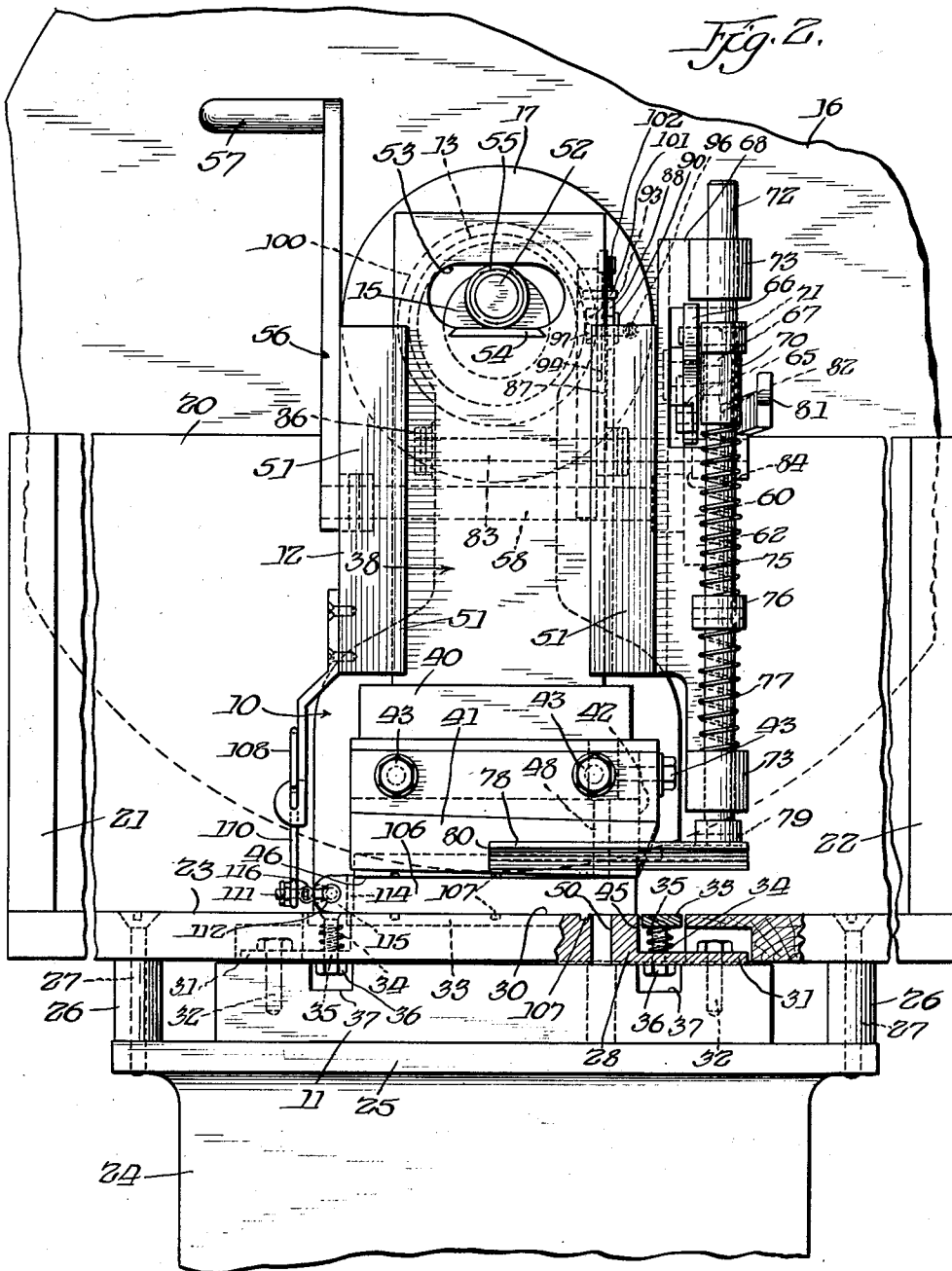
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3 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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COUPON CUTTER

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8 Claims. (Cl. 164—57)

The invention relates generally to cutting mechanism and has more particular reference to a coupon cutter for cutting coupons or interest bearing certificates from bonds and the like.

The apparatus of the invention has been designed for use in banks and other financial houses where a large number of bonds are handled and which are generally in lots of fifty or a hundred and serially numbered. It is possible with the invention to cut similar coupons from an entire lot or package of bonds with one operation of the apparatus and with absolute safety to the operator. The invention also makes possible the handling of these coupons in a manner to retain them in proper order according to serial number.

A more specific object of the invention is to provide a coupon cutter such as described with improved safety means preventing operation of the machine until the bonds are securely held on the die block in proper registered position for cutting the coupons.

A further object is to provide an improved pressure plate for yieldingly holding the bonds on the die block and which must be first moved into operative position in order to free the tripping lever for actuation to initiate a cutting operation.

Another object is to provide a die block having a rigid supporting portion for the coupons to be severed and having in combination therewith a yieldingly mounted peripheral plate for facilitating the cutting operation.

A further object resides in the provision of improved tripping means for the clutch which will operate in a manner to permit only one operation of the machine for each actuation of the trip lever.

Another object is to provide a coupon cutter having means for partially ejecting the cut coupons from the machine in stacked relation whereby they may be easily removed by the operator and also maintained in proper order according to serial number.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings which illustrate an embodiment of the device and wherein like reference characters are used to designate like parts—

Figure 1 is a side elevational view of a coupon cutter embodying the features of the invention;

Figure 2 is a front elevational view of the cou-

pon cutter of Figure 1 showing the reciprocating knives in retracted position and illustrating a preferred manner of supporting the device for the most efficient operation; and

5 Figure 3 is a top plan view of the coupon cutter of the invention.

The frame 10 of the machine is of conventional design comprising an integral base 11, a vertically disposed guiding portion 12 located to the front of the machine and spaced with respect to the base 11 to accommodate the head 40 of the reciprocating plunger, the cutting knives 41 and 42 and die block 28. The top portion of the frame provides the journal bearings 13 and 14 for the main operating shaft 15 which is accordingly mounted by the frame for rotation, the said shaft extending from the rear to the guiding portion 12 and being driven from the fly wheel 16 provided with the hub portion 17 which in turn has operative connection with a source of power not shown.

The vertically extending back portion 18, integral with the base 11, provides a suitable support for the rear board 20 which, as shown in Figure 2, extends laterally a substantial distance on either side of the machine. Said rear board 20 in combination with side members 21 and 22, located on the respective sides of the machine, provide an enclosure within which the machine is located so as to substantially eliminate air currents such as would have a tendency to disturb the stacked relation of the bonds or coupons which, as previously explained, are required to be maintained in numerical order. The rear board 20 on both sides of the back portion 18 is suitably secured to the base board 23 and the said side frames 21 and 22 are also secured to said base board. Any suitable post or column 24 may be used to support the device in its entirety. As shown, the column is topped with an outwardly directed flange 25 on which is mounted the base 11 of the machine. The base board 23, which is independent of the base 11 of the machine and also independent of the die block 28, is suitably supported from flange 25 by the tubular spacing means 26 which receive the securing screws 27 for securely and firmly holding the said base board to said flange and thus the post.

The die block 28 has a central supporting surface 30 substantially rectangular in area and horizontally positioned for supporting the coupons to be severed. On both sides of its flat supporting surface and along the front periphery thereof the said die block is provided with

a ledge 31 materially reduced in thickness as compared to the block, by means of which the block is secured to the base 11, the said ledge being bolted to the base by screws 32. This cut away portion on the three sides of flat supporting surface 30 of the die block makes possible the positioning of the peripheral plate 33 relatively close to the edges of the die block. The plate extends along both sides of the die block and along the front, the same being U-shaped in plan and having resilient supports in the form of coil springs 34. The coil springs in combination with studs 35 permit limited movement of the peripheral plate in a vertical direction substantially parallel with the edges of the die block. The studs depend through the plate at spaced intervals and through openings in the ledge 31 of the die block to receive the nuts which are accordingly located in a recess 37. The length of the studs 35 determines the upper level of the peripheral plate, which, in accordance with the invention, is in alignment with the top surface 30 of the die block. Pressure on the plate 33 will compress the coil springs 34, forcing the nuts 36 deeper into their respective recess, the limit of this downward movement of the plate being reached when the coil springs are completely compressed. The said peripheral plate may be considered as a continuation of the top surface of the die block since the same is horizontally aligned therewith and is relatively close to, although spaced from, said die block. Also the base board 23 in a similar manner provides a continuation of the top surface of the peripheral plate.

A reciprocating plunger 38 is located directly over the substantially rectangular surface 30 of the die block, said plunger providing an enlarged portion 40 at its lower end to which is suitably secured the cutting knives 41 and 42, each knife being releasably held to portion 40 by bolts 43 and having a sharp cutting edge which may taper slightly in order to facilitate the cutting operation. Knife 41 is located along the front surface of block 40 and accordingly the knife edge thereof is adapted to cooperate with the front edge 44, Figure 1, of the die block. The knife 42 extends along the right side of member 40 when the machine is viewed from the front and the cutting edge thereof effects a cutting operation with the edge 45 of the die block, Figure 2. The cutting of the coupons therefore takes place along two edges at right angles to each other.

In retracted position the cutting knives 41 and 42 are elevated until their cutting edge is substantially horizontal with the lower surface of a stripping plate 46 secured by screws 47 to a support provided by the frame 11, and extending forwardly to the space within the two cutting knives. In combination with the die block the said stripping plate forms the throat of the machine and the space between the die block and said plate, or, in other words, the height of the throat determines the number of bonds that can be placed within the machine at a time. The present machine has been designed to accommodate as a maximum a package of one hundred bonds.

The stripping plate is provided with an opening near its forward end for accommodating the punch 48 depending from portion 40 of the plunger. In retracted position of the plunger the lower end of the punch is flush with the lower surface of the stripping plate 46. An open-

ing 50 is also formed in the die block which continues through base 11. The said opening receives the punch at the completion of the cutting operation effected by reciprocation of plunger 38, to be more particularly described, and the portions punched out from the coupons by the punch 48 are in this manner directed through opening 50 which conducts the same to any suitable container. The round opening thus punched in the coupons makes possible the stacking of the coupons on a spindle and thus they can be easily maintained in proper numerical order.

The plunger 38 is mounted for vertical reciprocating movement within the guide portion 12, being retained within said portion by the overlapping guides 51. The main operating shaft 15 has an eccentric 52 extending forwardly into the guiding portion 12 and for reciprocating the plunger the same is provided with an elongated horizontally disposed opening 53 within which the eccentric 52 projects. A wear plate 54 reinforces the base of the elongated opening and for relieving the wear on the eccentric the same is provided with hardened steel sleeves 55. Each revolution of the main operating shaft 15 will move the plunger 38 in a downward direction toward the die block and then in an upward direction to initial position, thus completing a cutting operation, providing, of course, the knives 41 and 42 are in place on the portion 40. However, before a cutting operation can be effected the invention provides a safety lever 56 fixed to the left projecting end, Figure 2, of shaft 58, which is journaled by the frame 10 of the machine and likewise projects a distance from the right hand side thereof. A cam 60, Figure 1, is secured to said right hand end of shaft 58 by means of the pin 61, the same consisting of a cylindrical portion 62, Figure 1, having a slot 63 in its periphery and a cam portion 64 having its highest point in substantially aligned relation with the slot 63. It will be observed that when the handle 57 of lever 56 is drawn toward the operator the shaft 58 will be rotated to in turn rotate the cylindrical portion 62 and the cam portion 64. Said cam portion is positioned for engagement with the roller 65 carried by the arm 66 which is pivotally secured substantially centrally thereof to the frame of the machine by the securing nut 67. The end of arm 66 opposite roller 65 extends forwardly of the machine between bracket 68 and the sleeve 70. The pin 71, fixed to said forwardly extending end of arm 66 and to the sleeve, passes through said sleeve and through the vertical rod 72 on which the sleeve is mounted. Bearing portions 73 provided by bracket 68 support the rod for vertical movement. As best shown in Figure 1 the said rod 72 is formed with an elongated slot 74 within which the pin 71 is located and accordingly the sleeve may be moved axially of said rod independently of any movement of the rod. A coil spring 75 encircles the rod 72, being located between sleeve 70 and a fixed collar 76. The rod carries another coil spring 77 located below the fixed collar and between the same and the lower bearing portion 73.

Rocking of cam portion 64 to bring the high point of the cam in contact with roller 65 will oscillate the arm 66, causing movement of the sleeve 70 in a downward direction against the tension of coil spring 75. The tension of said coil spring is imparted to rod 72 through the

fixed collar 76 and when the same overcomes the opposing tension of spring 77 the rod will be caused to move in a downward direction. This downward movement of the rod causes similar movement of the pressure plate 78 since said plate is suitably fixed by means of pin 79 to the lower projecting end of said rod. Said plate is located adjacent to but in spaced relation with respect to the cutting knives 41 and 42, the same extending for the length of the knife 42 and along the front of the machine for a portion of the length of knife 41. The lower surface of the plate is substantially flat except for the upwardly flared front end 80. The function of said plate is to securely hold the bonds in desired position on the base board 23, in which position of the bonds the coupons to be severed will be located directly over the surface 30 of the die block and in alignment with the edges of said block. Since the pressure plate is yieldingly urged in a downward direction pressure will be applied to the bonds sufficiently to firmly hold them against inadvertent movement irrespective of the number of bonds. In other words, a pack of one hundred will be yieldingly held with the same efficiency as a smaller pack or one or two bonds.

In accordance with the invention lever 56 functions as a safety lever in addition to causing downward movement of pressure plate 78 by the instrumentalities above described. The tripping lever 81 can not be actuated to trip the clutch by mechanism to be presently described until the groove or slot 63 is aligned with projection 82 formed on said lever. Normally the said projection is in contact with the periphery of the cylindrical portion 62 which accordingly prevents movement of the tripping lever in a downward direction. However, by reason of actuation of the pressure plate the said cylindrical portion 62 will have been rotated a part of a revolution to align the opening 63 with the projection. When this operation has taken place it is then possible to move lever 81 downwardly, causing rotation of shaft 83. The hub 84 of said tripping lever is fixed to the shaft by pin 85 and said shaft is suitably journaled by the frame 10, being held against axial movement by the collar 86 and the vertical arm 87, located on the respective sides of the frame.

The arm 87 is fixed to shaft 83 and normally has a vertical position since the tripping lever 81 is normally supported on the periphery of the cylindrical portion 82. When said lever is actuated as permitted by alignment of projection 82 with slot 63 it will be observed that arm 87 will be oscillated in a direction toward the left, Figure 1. The arm will carry with it a pawl 88 pivotally secured to the arm by the pin 90. Pawl 88 has a right angle relationship with arm 87 in that the pawl is substantially horizontal, as shown in Figure 1, but this position is not maintained throughout the entire range of movement of arm 87. The right hand end of said pawl is provided with a latch 91 which engages pin 92 fixed to a clutch tripping member 93, the member being supported for movement in a longitudinal direction by the plates 94 and 95, located at the respective ends of the bearing portions 14. The clutch tripping member is yieldingly urged in a direction toward the right by means of the coil spring 96 fixed at one end to pin 97 extending outwardly from the member 93 and at its other end to pin 98 anchored to the plate 95. It will be observed that the member is thus urged into operative relation with the over-running clutch

100 located within the hub 17 of the fly wheel 16 which is mounted for free rotation on the projecting portion of the main operating shaft 15 extending from this rear end of the machine. The over-running clutch is similar in all respects to that shown and described in Patent No. 2,183,361 granted to Hjalmar A. Swanson on December 12, 1939, for Perforating machine. When the clutch is held by the member 93 having location within a slot in the periphery of the clutch, as shown in Figure 1, the fly wheel 16 is maintained in disconnected relation with the main operating shaft 15, the fly wheel having free rotation on the shaft, but said shaft remaining at rest in a predetermined position with the eccentric 52 being located at the top of its movement.

When the tripping lever 81 is actuated to impart oscillating movement toward the left to arm 87 the pawl 88 will also be moved toward the left. This movement of the pawl is imparted to member 93 and accordingly the member is moved against the tension of coil spring 96 in a direction to release the clutch 100. The pin 101 extending from the bearing portion 14 is in contact with the sloping surface on the left end of pawl 81. As the pawl is moved toward the left this end in contact with pin 101 is cammed downwardly to effect release of latch 91 with pin 92. Any releasing action, however, of the pawl must take place against the tension of spring 102. Full actuation of the tripping lever 81 will move arm 87 and pawl 88 a distance toward the left to completely withdraw member 93 from clutch 100 and thereby trip the clutch, effecting a clutching connection between the fly wheel 16 and the main operating shaft 15. As the shaft is caused to rotate plunger 38 is moved downwardly to effect a cutting operation and is then withdrawn as the eccentric 52 moves in an upward direction. The action of pin 101 in camming the left end of pawl 88 is to free the pawl from latching engagement with pin 92 following complete withdrawal of the member 93 from its recess in clutch 100. Therefore, the operation of the clutch tripping mechanism is such that the clutch is first of all tripped and immediately following this action the member 93 is released by pawl 88. As a result of the tension of spring 96 the member will drop back into the slot in clutch 100 when a complete revolution has taken place.

The invention also provides a safety feature having action on the clutch tripping member 93 to further insure one cutting operation for each actuation of the clutch. This mechanism consists of a ring 103 suitably fixed to the main operating shaft 15 and located between bearing portions 13 and 14. Said ring accordingly rotates with the shaft and the periphery of the same carries a pin 104 which is located a short distance below member 93 when the shaft is at rest. Rotation of said shaft will rotate the pin and the position of the same on the ring is such as to have camming action against the sloping surface 105 formed on the extreme left end of member 93. If for any reason member 93 does not enter the slot in the clutch when aligned therewith pin 104 will automatically operate to cam the member toward the right, forcing the same into the aligned slot, thereby holding the clutch and preventing further rotation of the main operating shaft.

After the coupons have been severed it is necessary to remove them from the throat of the

machine provided by the die block and stripping plate. Since removal of the coupons by the fingers of the operator would be difficult owing to the restricted size of the throat, the invention provides a manually actuated ejector 106, Figure 2, in the form of a bar disposed transversely across the throat and normally positioned to the rear of the throat adjacent the support for the stripping plate 46. The ejector is adapted to have movement forwardly and this movement is guided by means of grooves 107 located in the top surface of the die block and in the lower surface of the stripping plate, respectively. The grooves extend from the rear of the throat in a forward direction, terminating just short of the front edge of surface 30 of the die block and stripping plate, respectively. Movement is imparted to said ejector by the action of the operator in gripping the ring 108 formed on the end of the wire member 110, having indirect connection with the ejector. Member 110 is suitably fastened to pin 111 extending laterally of and fixed to a guide rod 112. A U-shaped bracket secured to the frame by screws 113 provides spaced portions 114 and 115 within which the rod 112 is guided. The opening in portion 115 extends outwardly to the edge thereof in order to permit passage of pin 111, which movement of the pin is imparted to the guiding rod 112 and to ejector 106 secured to the guide rod, as shown in Figure 3. The said parts are yieldingly maintained in a rearward position by coil spring 116. After the operator has moved the ejector forwardly to partially eject the severed coupons from the throat it is only necessary that he release the ring 108 and the ejector will move rearwardly to initial position under the tension of spring 116.

Since it is necessary to maintain the coupons in numerical order it is best to eject the coupons only partially since otherwise their numerical order would be disturbed. In accordance with the invention the severed coupons which will project from the throat of the machine following actuation of the ejector may be removed by the operator and placed on a spindle using the round opening punched in the coupons for this purpose.

In operation of the coupon cutter of the invention the cutting knives 41 and 42, which have a right angled relation with each other, are reciprocated toward and from the die block 30 by movement of the plunger as a result of rotation of the main operating shaft 15. Said shaft is normally disconnected from the operating means therefor comprising the fly wheel 16 and the source of power for driving the fly wheel. However, tripping of the clutch 100 will result in rotation of the main operating shaft and reciprocation of the cutting knives to effect one cutting operation. In accordance with the invention handle 55 provides safety means which must be first actuated, causing downward movement of the pressure plate to hold the bonds or the like on the supporting surface before lever 81 can be moved to trip the clutch. The pressure plate is moved downwardly under resilient tension from spring 75 and therefore said plate functions to hold the bonds firmly in place on the supporting surface provided therefor including the base board 23.

The flat supporting surface 30 of the die block is substantially rectangular in contour, having substantially vertical edges along at least three sides thereof, with two of said edges, namely, 44 and 45, being disposed in alignment with the knife

edge of the knives 41 and 42. The U-shaped peripheral plate 33 is located within the space between the die block and the base board 23 which surrounds the said die block. Said peripheral plate may have limited movement in a vertical direction substantially parallel to the edges 44 and 45 and which is also parallel to movement of the knives 41 and 42. This permissible yielding movement of the peripheral plate in a downward direction facilitates the cutting operation by making possible a shearing action since the flat surface 30 of the die block is rigid.

The ejector 106 having the projections which ride within the grooves located in the top surface of the die block and the lower surface of the stripping plate respectively constitute an important element of the present device. While these projections do guide the ejector their principal function is to prevent a coupon from becoming wedged or lodged in the die opening. Without these projections no matter how closely the ejector may fit within the die opening trouble will be caused by a coupon becoming wedged in the die opening. The front face of the ejector can also be used as a rear guide for the coupons to be cut from the bonds. By providing a sliding side guide which could also be attached to the ejector the present machine could be arranged to automatically locate the position of the coupons to be cut. This is a major advantage when operations are being conducted on a large number of bonds of the same type.

The safety feature of the present machine is based on the fact that two levers are provided which must be actuated in succession before the clutch is released to effect a cutting operation. Since both hands of the operator are required to actuate and hold these levers it is impossible for the fingers of the operator to be under the cutting knives at the start of a cutting operation. It may also be mentioned that when the right hand lever is depressed following actuation of the left hand lever, which makes actuation of the right hand lever possible, the clutch will be operated and the main shaft will be operatively connected with the source of power. However, the clutch release or tripping means is automatically returned to its normal idle position even though said right hand lever is held depressed and it is necessary to return said right hand lever to its initial position again before the clutch can be rendered operative for a second cutting operation.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings, as various other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In a coupon cutter of the character described, a supporting surface for bonds and the like having coupons to be cut, a reciprocating knife member for cutting said coupons, operating means for the reciprocating knife member including a clutch normally maintaining the said means disconnected from its source of power, means for releasing the clutch to cause reciprocation of the knife member, and a safety lever permitting actuation of the clutch release means only after said lever has been moved to a predetermined position.

2. In a coupon cutter of the character described, a supporting surface for bonds and the like having coupons to be cut, a reciprocating

knife member for cutting said coupons, operating means for the reciprocating knife member including a clutch normally maintaining the said means disconnected from its source of power, means for releasing the clutch to cause reciprocation of the knife member, a safety lever permitting actuation of the clutch release means only after the said lever has been moved to a predetermined position, and a pressure plate operatively connected to said safety lever, said plate having operation to resiliently hold the bonds on said supporting surface upon actuation of said lever.

3. In a coupon cutter of the character described, a supporting surface for bonds and the like having coupons to be cut, a reciprocating knife member for cutting said coupons, operating means for the reciprocating knife member including a clutch normally maintaining the said means disconnected from its source of power, means for releasing the clutch to cause reciprocation of the knife member, a pressure plate for holding the bonds in proper position on the supporting surface, a safety lever having operative connection with said pressure plate through resilient means, whereby actuation of the lever will yieldingly position the plate in contact with said bonds, and means providing a lock between said safety lever and clutch release means preventing the release of said clutch until said safety lever has been actuated.

4. In a coupon cutter of the character described, a supporting surface for bonds and the like having coupons to be cut, a reciprocating knife member for cutting said coupons, operating means for the reciprocating knife member including a clutch normally maintaining the said means disconnected from its source of power, means for releasing the clutch to cause reciprocation of the knife member, a vertically movable pressure plate resiliently maintained in elevated position, means for camming the pressure plate in a downward direction for holding the bonds in proper position on the supporting surface including a cam member and a safety lever for rotating said cam member, said cam member providing locking means preventing actuation of the clutch release means until said safety lever has been moved to a predetermined position.

5. In a coupon cutter of the character described, a supporting surface for bonds and the like having coupons to be cut, a reciprocating knife member for cutting said coupons, operating means for the reciprocating knife member including a clutch normally maintaining the said means disconnected from its source of power, means for releasing the clutch to cause reciprocation of the knife member, a vertically movable pressure plate resiliently maintained in elevated position, means for camming the pressure plate in a downward direction for holding the bonds in proper position on the supporting surface including a cam member and a safety lever for rotating said cam member, a clutch release lever having connection with said clutch release means

and normally maintained in inoperative position by said cam member, and means on said cam member operating to free said clutch lever for actuation following rotation of the cam member in a direction to cause camming of the pressure plate downwardly, whereby said bonds must be held in proper position on the supporting surface before the clutch can be released to initiate a cutting operation.

6. In a coupon cutter of the character described, a supporting surface for bonds and the like having coupons to be cut, including a stationary die block of substantially rectangular shape, a flange projecting laterally from the bottom surface along certain edges of the die block, a peripheral plate in superposed relation on said flange extending the length of said edges and being positioned relatively adjacent the edges, resilient means yieldingly supporting said plate for limited movement in a direction substantially parallel to the edges, a base board in surrounding spaced relation with said peripheral plate, said base board and said peripheral plate when in normal position forming a continuation of the top surface of the die block, a reciprocating cutting knife having movement toward and from the die block in alignment with said edges, and a vertically movable pressure plate member for resiliently holding the bonds in proper position on said base board with the coupons located over the die block.

7. In a coupon cutter of the character described, a supporting surface for bonds and the like having coupons to be cut including a stationary die block having a flat top surface, a stripping member located above said die block in spaced relation thereto, reciprocating cutting knives associated with said stripping member, a plunger supporting said knives and adapted to have reciprocating movement with respect to the die block, and an ejector mounted for movement within the die opening provided by the die block and said stripping member for ejecting the coupons remaining in the die opening following a cutting operation.

8. In a coupon cutter of the character described, a supporting surface for bonds and the like having coupons to be cut including a stationary die block having a flat top surface, a stripping member located above said die block in spaced relation thereto, reciprocating cutting knives associated with said stripping member, a plunger supporting said knives and adapted to have reciprocating movement with respect to the die block, an ejector mounted for movement within the die opening provided by the die block and said stripping member for ejecting the coupons remaining in the die opening following a cutting operation, and means guiding said ejector in its movement including projections on the top and bottom surface thereof adapted to fit within grooves in said die block and stripping plate respectively.

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