May 31, 1955 R. I. HAYWOOD 2,709,509

CUTTING MACHINE

Filed Sept. 13, 1951 2 Sheets-Sheet 1

Fig-1

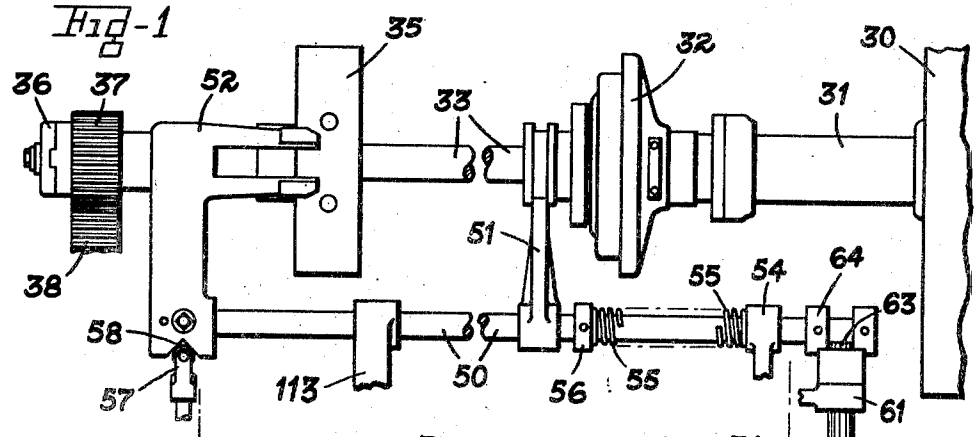


Fig-3

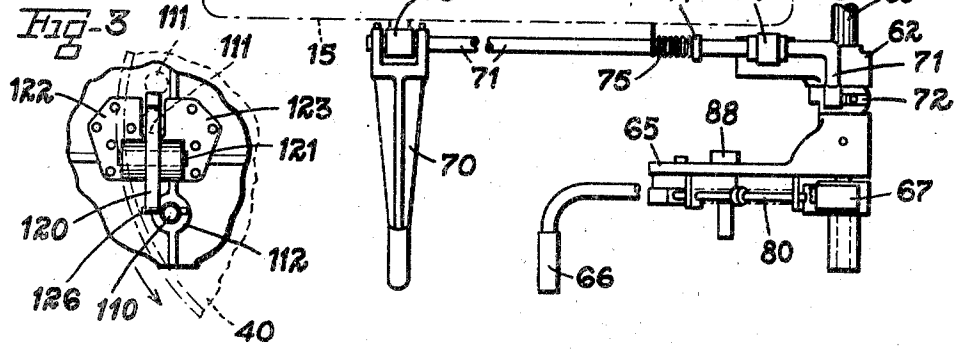
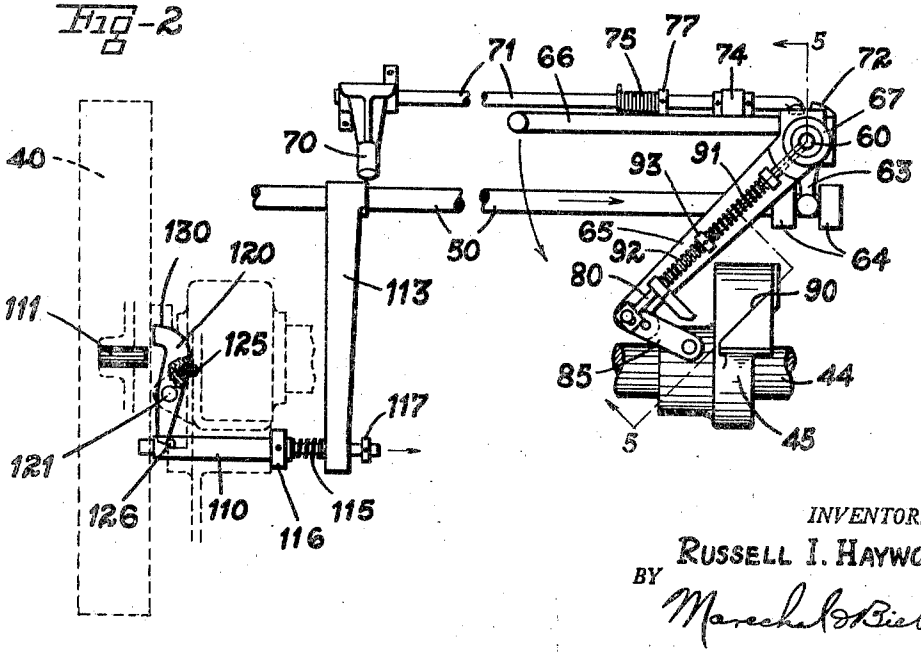


Fig-2



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CUTTING MACHINE

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Fig-8

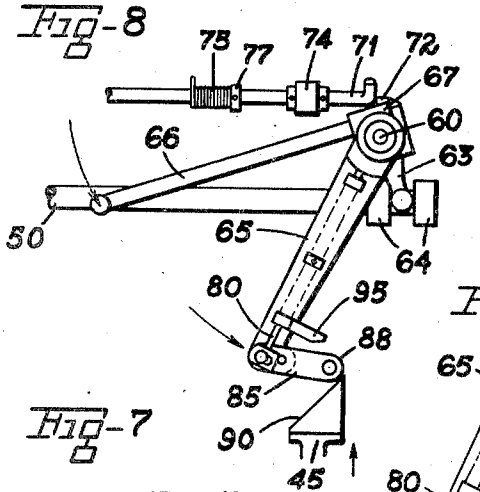


Fig-10

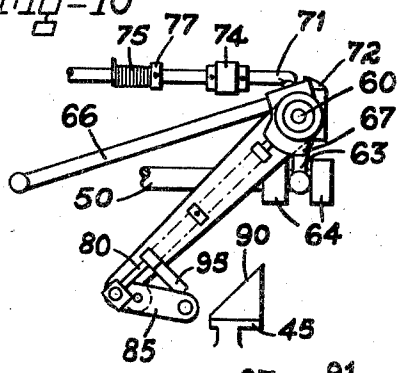


Fig-9

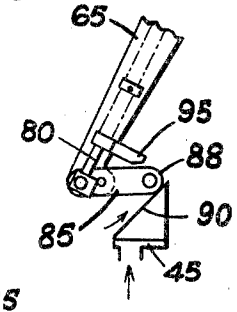


Fig-7

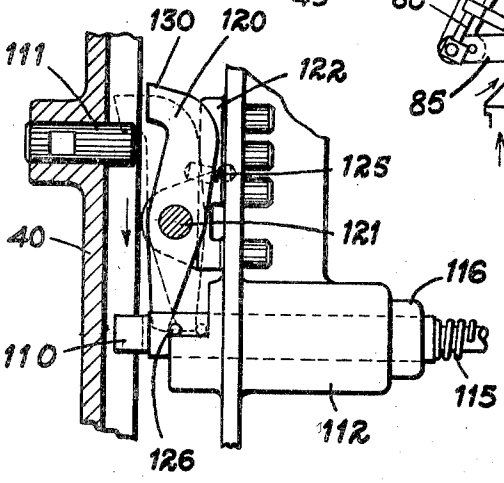


Fig-6

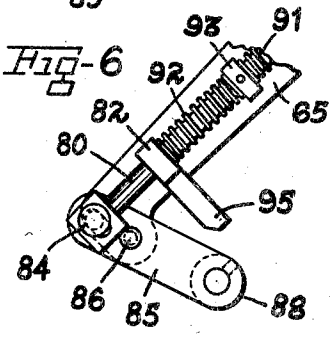


Fig-5

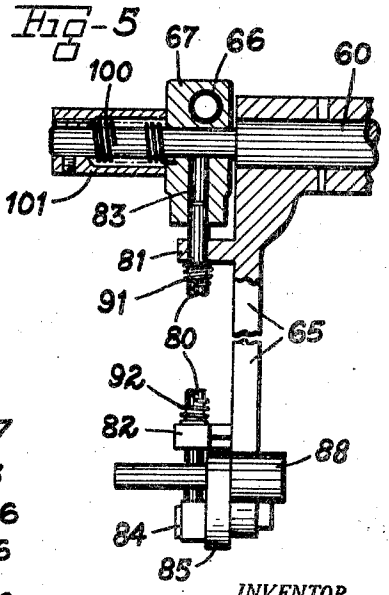
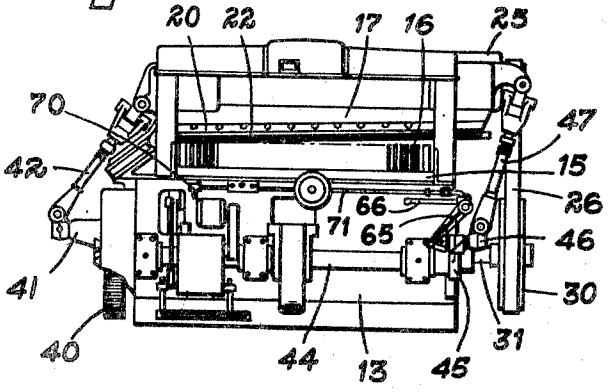


Fig-4



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United States Patent Office

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2,709,509

CUTTING MACHINE

Russell I. Haywood, Dayton, Ohio, assignor to Harris-Seybold Company, Cleveland, Ohio, a corporation of Delaware

Application September 13, 1951, Serial No. 246,393

14 Claims. (Cl. 192—129)

This invention relates to cutting machines for paper and the like wherein a cutting knife has a reciprocating cycle of operation, and the invention has particular relation to a safety mechanism for preventing accidental repetition of the cutting cycle of the knife.

Machines of this character are commonly provided with a starting mechanism requiring simultaneous use of both hands of the operator in order to assure that both hands will be safely out of the path of the cutting movement of the knife. For example, in Spiller et al. application Serial No. 654,157, filed March 13, 1946, now Patent #2,599,591, issued June 10, 1952, assigned to the same assignee as this application, a left hand button is provided which must be pressed at the start of the cutting operation to cause energizing of a solenoid for withdrawing a locking member normally preventing movement of the starting handle operated by the right hand, and thus it is impossible with such an arrangement to start the cutting cycle of the machine unless both hands of the operator simultaneously actuate their separate locking and starting members.

It is a primary object of the present invention to provide a safety starting mechanism for a cutting machine wherein the starting member manually actuated by the operator has a releasable connection with another part of the starting mechanism such that if the manually operated member fails to return to its initial or rest position at the end of the cycle, it is automatically disconnected from the remainder of the starting mechanism, and the latter is returned to its rest or stop position independently of the manually operated member in order to prevent repetition of the cycle even if the manually operated part is held in operated or start position.

It is also an object of the invention to provide a safety mechanism for incorporation in the starting apparatus of a cutting machine wherein a starting lever is moved to starting position by means of a manually operated part and is returned from its starting position to stop position by a part of the drive at the end of the cycle, and wherein the manually operated member is connected with the starting lever through a releasable connection arranged for automatic disconnection in conjunction with the movement of the starting lever from starting to stop position to prevent repetition of the cycle irrespective of the position of the manually operated member at the end of the cycle.

The invention is further concerned with the provision of an additional safety stop arrangement for a cutting machine for the purpose of assuring that the cycle of the machine cannot be repeated unless the entire starting mechanism is first returned to its rest or stop position. A stop member is movably mounted in the machine in such manner as to advance into the path of movement of a part of the drive at the end of the cycle to act as a positive stop for the drive, a similar arrangement being shown, for example, in the above noted copending application and in Spiller et al., Patent No. 2,350,540, issued June 6, 1944, and assigned to the same assignee as this

application. However, in order to operate the machine, this stop member must be retracted at the start of the cycle, which is commonly effected by connecting the stop member with a moving part of the starting mechanism, and therefore if the starting mechanism fails to return to its stop position at the end of the cycle, the stop member may remain retracted and not fulfill its function as a positive stop.

It is accordingly a further object of the present invention to provide a safety stop arrangement for a cutting machine which is so constructed and arranged in the machine that there is at all times in operation a positive stop member located in the path of movement necessarily traversed by a part of the drive at approximately the end of the cycle, and which is also so coupled with the starting mechanism that proper return of the starting mechanism to its rest position at the end of the cycle will reset the safety stop so that the machine can be reoperated to repeat the cycle.

An additional object is to provide a safety mechanism for a cutting machine having a main positive stop which is normally located in advanced or operative position when the machine is at rest and is retracted by the starting mechanism at the start of a cycle, and which in turn upon retraction causes an emergency positive stop to advance into operative position such that if the main stop is not returned to its advanced position at the end of the cycle, the emergency stop will prevent repetition of the cycle.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawings—

Fig. 1 is a schematic top view showing a safety starting mechanism for a cutting machine constructed in accordance with the invention;

Fig. 2 is a schematic front elevational view of the safety starting mechanism of Fig. 1 showing the parts in their respective stop positions;

Fig. 3 is a fragmentary view of the positive stop arrangement of the starting mechanism looking from left to right in Fig. 2;

Fig. 4 is a view in front elevation showing a paper cutting machine provided with the safety starting mechanism of the invention;

Fig. 5 is an enlarged fragmentary section through the throw-out arm of the starting mechanism, the view being taken on the line 5—5 of Fig. 2;

Fig. 6 is a fragmentary view of the lower end of the throw-out arm looking from left to right in Fig. 5;

Fig. 7 is an enlarged fragmentary view of the positive stop arrangement shown in Figs. 2 and 3;

Fig. 8 is a fragmentary view similar to Fig. 2 showing the position of the parts just prior to the end of a cycle; and

Figs. 9 and 10 are views similar to Fig. 8 showing successive positions of the parts following the position shown in Fig. 8.

Referring to the drawings, which illustrate a preferred embodiment of the invention, Fig. 4 shows a cutting machine of the type to which the invention relates which includes a base and side frame indicated generally at 13 for supporting a work table 15 provided with a back gauge 16 for determining the depth of sheet which will be cut by the knife. The knife bar 17 carries the knife blade 20 for vertical reciprocating movement just in front of the usual clamping member 22, and the knife is shown as operated by a main drive motor 25 mounted at the top of the frame and connected through a pulley and drive belts 26 with a fly wheel 30 on shaft 31 (Fig. 1) which is adapted to be connected through clutch 32 with a shaft 33 provided with a brake 35. It will be

understood that any other suitable drive arrangement may be used for the knife, and also for the clamp 22 as desired.

The shaft 33 is connected through a frangible safety washer 36 with a pinion 37 which is in turn connected through the gear train indicated diagrammatically at 38 with the crank gear 40, the washer 36 being arranged to break in the event of an undesired high load on the gear train to prevent damage to the drive. The crank gear 40 is provided with a crank pin 41 connected through pull bar 42 with one end of the knife bar 17, and gear 40 is mounted at one end of the cam shaft 44 carrying a cam 45 and having at its other end a crank 46 connected by pull bar 47 with the other end of the knife bar.

The drive to the knife is controlled by a rod 50 mounted for sliding movement in the frame and carrying a clutch operating lever 51 and brake releasing member 52. A spring 55 mounted on rod 50 between the bracket portion 54 of the frame and the collar 56 on rod 50 normally biases this rod to its rest or stop position in which the clutch is released and the brake is engaged. A detent indicated generally at 57 cooperates alternately with a notch 58 in brake operating member 52 and with the outer end of member 52 to hold rod 50 yieldably in either its stop position shown in Fig. 1 or its starting position respectively.

Movement of rod 50 is controlled by a shaft 60 mounted for rotation in the frame as by bracket portions 61 and 62, and shaft 60 carries a lever 63 engaging between collars 64 on rod 50 to cause push-pull movement of rod 50 as shaft 60 rocks. A throw-out lever or arm 65 is pinned on shaft 60, and the starting handle 66 for manual actuation by the right hand of the operator is also mounted on shaft 60 by means of a lever 67 fixed relative thereto.

A handle 70 for actuation by the left hand of the operator controls an L-shaped locking lever 71 adapted to engage a complementary locking member 72 pinned on shaft 60 to lock the shaft against movement from rest to starting position. The locking lever 71 is mounted for rocking movement in the frame by means of bracket portions 73 and 74, and it is provided with a torsion spring 75 and cooperating collar 77 normally biasing its locking end downwardly and hence into locking engagement with the part 72. Thus, before the shaft 60 can be rotated from rest to starting position, the handle 70 must be raised to release the locking parts 71 and 72.

The throw-out arm 65 and handle 66 are provided with a releasable latch connection comprising a rod 80 slidably mounted in lugs 81 and 82 on arm 65 and adapted to be received in a socket 83 in the lever 67. The opposite end of rod 80 is connected at 84 with a lever 85 pivoted at 86 to the end of the throw-out arm 65 and carrying a roller 88 adapted to be engaged by the beveled cam surface 90 of cam 45 on cam shaft 44. The movement of the rod 80 is controlled by a pair of balanced springs 91 and 92 fitting between lugs 81 and 82 and a collar 93 pinned on rod 80, these springs normally balancing each other to hold rod 80 in latching engagement within socket 83 in such position that lever 85 will be spaced from a projecting stop 95 on throw-out arm 65.

With this construction, so long as latch rod 85 is engaged in socket 83, the starting handle 66 and throw-out arm 65 are connected together for movement with shaft 60. However, if rod 80 is withdrawn from socket 83, the connection between the starting handle and throw-out arm will be released, permitting handle 66 to rotate freely on shaft 60. In order to return the starting handle to its normal rest position when disconnected from the throw-out arm, a torsion spring 100 (Fig. 5) and sleeve 101 are provided on the reduced end portion of shaft 60 as shown in Fig. 5 and are arranged to bias handle 66 towards its rest position whenever it is disconnected from the throw-out arm 65.

The operation of this starting mechanism is illustrated in Figs. 8 to 10. The relative positions of the parts, including the cam 45 and its cam surface 90, when the machine is at rest are shown in Fig. 2. To start the cutting cycle, the left hand handle 70 is raised to release the locking parts 71 and 72, and the right hand starting handle 66 is moved downwardly, carrying with it the throw-out arm 65 and thereby rotating shaft 60 to pull the rod 50 to the right as viewed in Figs. 1 and 2 and thus to release the brake 35 and engage the clutch 32. The full cutting cycle requires one complete revolution of the crank gear 40 and hence of the cam shaft 44 and cam 45, and the starting movement of the throw-out arm carries the lever 85 into such position that the roller 88 thereon will be in the path of the cam surface 90 as cam 45 completes its revolution, as shown in Fig. 8.

As the cutting cycle nears completion, the cam surface 90 engages the roller 88 and through it forces the lever 85 upwardly as shown in Fig. 9. This pivotal movement of lever 85 about pivot 86 is transmitted to the rod 80, causing the latter to be pulled out of its socket 83 in the lever 67, thus disconnecting the starting handle 66 from the throw-out arm 65. The pivoting movement of lever 85 continues only until it strikes the stop 95, and thereafter the continued movement of cam surface 90 will force the throw-out arm upwardly to the left and thus through it rotate the shaft 60 to its stop position, this movement of shaft 60 being effective to push rod 50 to the left as viewed in the drawings and thereby to release clutch 32 and effect engagement of brake 35 to stop the machine. Even though starting handle 66 is held down, it is ineffective and will not prevent shaft 60 from moving to and remaining in its stop position.

It will thus be seen that the starting mechanism will be properly returned to its stop position irrespective of the position of the starting handle 66 and even if the latter should be positively held down in its starting position. Furthermore, it is not possible to restart the machine through the starting handle without first raising it to its normal rest position in order to effect reengagement of rod 80 in socket 83 to reestablish the connection between the starting handle and throw-out arm. When the handle is released, this reconnection of the handle 66 and throw-out arm 65 will be effected automatically by the action of the torsion spring 100, which will swing the handle up on shaft 60 until it is in such position that the rod 80 will reengage in socket 83.

The cutting machine also incorporates a positive stop arrangement which is operated by the starting mechanism in timed relation with the operating cycle of the machine. Referring to Figs. 2, 3 and 7, a stop pin 110 is supported in the frame for movement into and out of the path of a pin 111 forming an abutment on the crank gear 40 and located near the outer rim of this gear as shown in Fig. 3. The pin 110 is supported for axial movement in a bracket portion 112 of the frame, and its movement is effected and controlled by an arm 113 carried by rod 50, the pin 110 having a reduced end portion which extends through the end of arm 113 and is provided with a cushioning spring 115 and a pair of collars 116 and 117.

In operation, when the machine is at rest with its starting mechanism in stop position, the pin 110 is in the advanced position shown in full lines in Figs. 3 and 7 and is therefore in the path of the pin 111 so that if the gear 40 should start to rotate, the pin 111 will engage pin 110 to stop the drive. The starting movement of rod 50 will cause pin 110 to be retracted to the position of its working end shown in dotted lines in Fig. 7 in which it is clear of pin 111 to permit the operating movement of gear 40. Then when rod 50 is moved in the opposite direction by the action of cam 45 and the throw-out arm 65 as described, pin 110 will be returned to its advanced position to prevent further rotation of gear 40, in which connection it may be noted that if the pins 110 and 111 do engage, the resulting overload on the drive will cause the safety washer 36 to break as previously described.

This arrangement of the pin 110 provides a positive stop if the starting mechanism is properly returned to its stop position at the end of the cycle, but if for any reason the starting mechanism should be retarded, pin 110 will not return to its advanced position in time to prevent repetition of the cutting cycle. In order to prevent this undesirable result, a further or emergency stop is provided which comprises a pawl 120 pivoted at 121 in a pair of brackets 122 and 123 bolted to the frame just above the bracket portion 112. A spring 125 is mounted as shown in position to bias pawl 120 in counterclockwise direction as viewed in Figs. 2 and 7 and a pin 126 extends transversely from the stop pin 110 in position to engage the lower end of pawl 120 and thus to move it in clockwise direction as pin 110 moves from its retracted to its advanced position.

The pawl 120 is so proportioned and mounted in the frame that when the parts are at rest as shown in Fig. 7, its working end portion 130 will be retracted from the path of pin 111, but when it has advanced to the full extent permitted by the retracting movement of pin 110, its working end portion will be in the path of pin 111. However, the length of pawl 120 is such that its movement from retracted to advanced position will cause its working end 130 to move behind pin 111 so that it will not interfere with movement of gear 40 until near the end of the full cycle of the gear, the normal rest position of pin 111 being between the pawl portion 130 and the pin 110 as shown in Fig. 7.

Thus when the pin 110 is retracted as described at the start of a working cycle, the pawl 120 will automatically have its working end 130 advanced into the dotted position shown in Fig. 7, so that if the starting mechanism should fail to return to its proper stop position at the end of the cycle, the pawl portion 130 will be in position to act as a positive stop for engagement by pin 111 to stop the machine. On the other hand, if the starting mechanism does function properly, the pin 110 will return to its advanced position in timed relation with the rotation of gear 40 such that the pawl 120 will return to its retracted position just before pin 111 reaches the end portion 130 of the pawl. It will accordingly be seen that with this arrangement as described, there is at all times a positive stop member located in the path of pin 111 so that the cutting cycle of the machine cannot be repeated unless the starting mechanism is properly returned to its stop position at the end of the cycle and then properly reactuated when the next cycle is to be made.

It will accordingly be seen that this invention provides a safety starting mechanism for a cutting machine which is of such character that positive assurance is given at all times against repetition of the cutting cycle of the machine unless both the left hand and right hand control handles are properly manipulated by the operator. Thus if the operator should hold down the starting handle 66 at the end of a cycle, the throw-out arm 65 will nevertheless be shifted back to its stop position, and the additional arrangement of the main and safety stops 110 and 120 assures positive stopping if in any way the throw-out arm should be retarded in its return movement. As to the left hand handle 70, if it is released, then the locking parts 71 and 82 will automatically reengage upon movement of the shaft 60 by the action of the cam and throw-out arm so that the machine cannot be restarted until the operator again raises the handle 70. Thus under all conditions it is necessary for restarting the cutting cycle that the operator positively actuate both the left and right hand handle for each cycle, giving maximum assurance of safety in operation.

While the form of apparatus herein described constitutes preferred embodiments of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made

therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said cycle comprising control means having starting and stop positions for starting and stopping said drive to effect said cycle, a starting member positioned for actuation by the operator from a rest position to an operative position, means forming a releasable connection between said starting member and said control means to provide for movement of said control means to said starting position upon actuation of said starting member to said operative position, yieldable means for retaining said control means in said starting position, mechanical means operated by said drive for positively engaging and shifting said control means from starting to stop position against said yieldable retaining means at the end of said cycle, and means operated by said mechanical means upon engagement therewith by said mechanical means for releasing said releasable connection for movement of said control means to said stop position by said mechanical means independently of said starting member.

2. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said cycle comprising control means having starting and stop positions for starting and stopping said drive to effect said cycle, a starting member positioned for actuation by the operator from a rest position to an operative position, means forming a releasable connection between said starting member and said control means to provide for movement of said control means to said starting position upon actuation of said starting member to said operative position, yieldable means for retaining said control means in said starting position, mechanical means operated by said drive for positively engaging and shifting said control means from starting to stop position against said yieldable retaining means at the end of said cycle, means operated by said mechanical means upon engagement therewith by said mechanical means for releasing said releasable connection for movement of said control means to said stop position by said mechanical means independently of said starting member, and means requiring return of said starting member to its said rest position to restore its said connection with said control means.

3. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said cycle comprising control means having starting and stop positions for starting and stopping said drive to effect said cycle, a member having starting and stop positions for operating said control means, a starting member positioned for actuation by the operator and having operative and rest positions, means forming a releasable connection between said operating member and said starting member providing for movement of said control means to said starting position upon actuation of said starting member to said operative position, yieldable means for retaining said control means in said starting position, a cam connected with said drive for positively engaging and shifting said operating member to said stop position against said yieldable retaining means at the end of said cycle, and means operated by said cam at the end of said cycle for effecting release of said releasable connection between said starting member and said operating member to cause said shifting of said operating member to said stop position thereof by said cam independently of said starting member and thereby to prevent repetition of said cycle if said starting member is held in the operative position thereof.

4. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said

operating cycle comprising a control shaft having means thereon for starting and stopping said drive upon movement of said shaft, an arm on said shaft for moving said shaft between the starting and stop positions thereof, a handle for said arm mounted for movement on said shaft, means forming a releasable connection between said handle and said arm to cause movement of said arm and said shaft between said starting and stop positions upon movement of said handle, yieldable means for retaining said shaft in said starting position thereof, mechanical means operated by said drive for positively engaging and shifting said arm to said stop position against said yieldable retaining means at the end of said cycle, and means operated by said mechanical means at the end of said cycle for releasing said releasable connection for movement of said arm and said shaft to said stop position by said shifting means independently of control by said handle.

5. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said operating cycle comprising a control shaft having means thereon for starting and stopping said drive upon movement of said shaft, an arm on said shaft for moving said shaft between the starting and stop positions thereof, a handle for said arm mounted for movement on said shaft, means forming a releasable connection between said handle and said arm to cause movement of said arm and said shaft between said starting and stop positions upon movement of said handle, yieldable means for retaining said shaft in said starting position thereof, mechanical means operated by said drive for positively engaging and shifting said arm to said stop position against said yieldable retaining means at the end of said cycle, means operated by said mechanical means at the end of said cycle for releasing said releasable connection for movement of said arm and said shaft to said stop position by said shifting means independently of control by said handle, means for returning said handle to the rest position thereof independently of said arm, and means for reconnecting said arm and said handle only when both are in said stop positions.

6. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said operating cycle comprising a control shaft having means thereon for starting and stopping said drive upon movement of said shaft, an arm on said shaft for moving said shaft between the starting and stop positions thereof, a handle for said arm mounted for movement on said shaft, means forming a releasable connection between said handle and said arm to cause movement of said arm and said shaft between said starting and stop positions upon movement of said handle, yieldable means for retaining said shaft in said starting position thereof, a cam connected with said drive for positively engaging and shifting said arm to said stop position against said yieldable retaining means at the end of said cycle, and means on said arm positioned for operation by said cam at the end of said cycle to release said releasable connection for return movement of said arm to said stop position by said cam independently of said handle.

7. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said operating cycle comprising a control shaft having means thereon for starting and stopping said drive upon movement of said shaft, an arm upon said shaft for moving said shaft between the starting and stop positions thereof, a handle for said arm mounted for movement on said shaft, a latching member mounted for movement on said arm for releasable latching engagement with said handle to form a releasable connection between said handle and said arm providing for movement of said shaft to said starting position thereof by said handle, a lever pivoted on said arm to operate said latching member, a cam connected with said drive for shifting said arm to said stop position at the end of said cycle, said lever being located on said arm in position for engagement by said cam prior to the end of said cycle to effect disconnection of said latching member, and a stop on said arm limiting said disconnecting movement of said lever to cause further movement of said arm to shift said arm and said shaft to said stop position at the end of said cycle independently of said handle.

8. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said cycle comprising control means having starting and stop positions for starting and stopping said drive to effect said cycle, a starting member positioned for actuation by the operator, means forming a releasable connection between said starting member and said control means, means operated by said drive for shifting said control means from starting to stop positions at the end of said cycle, means operated by said shifting means for releasing said releasable connection for movement of said control means to said stop position by said shifting means independently of control by said starting member, a stop having advanced and retracted positions, an abutment carried by a moving part of said drive for engagement with said stop in the advanced potsition of said stop, and means operated by said control means in the movement thereof between the starting and stop positions thereof for shifting said stop between said advanced and retracted positions respectively to cause retraction of said stop only upon shifting of said control means to said stop position thereof providing positive stopping of said drive at the end of each said cycle by said stop in the event of failure of said control member to reach said stop position thereof in time to prevent repetition of said cycle.

9. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said operating cycle comprising control means having starting and stop positions for starting and stopping operation of said drive to effect said cycle, an operating member for said control means having starting and stop positions, a starting member positioned for actuation by the operator and having operative and rest positions, means forming a releasable connection between said operating member and said starting member, a cam connected with said drive for shifting said operating member to said stop position at the end of said cycle, means operated by said cam at the end of said cycle for effecting release of said releasable connection between said starting member and said operating member to shift said operating member to said stop position thereof independently of control by said starting member, a stop having advanced and retracted positions, an abutment carried by a moving part of said drive for engagement with said stop in the advanced position of said stop, and means operated by said operating member in the movement thereof between the starting and stop positions thereof for shifting said stop between said advanced and retracted positions respectively to cause retraction of said stop only upon shifting of said operating member to said stop position thereof providing positive stopping of said drive at the end of each said cycle by said stop in the event of failure of said operating member to reach said stop position thereof in time to prevent repetition of said cycle.

10. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said cycle comprising control means having starting and stop positions for starting and stopping said drive to effect said cycle, a starting member positioned for actuation by the operator, means forming a releasable connection between said starting member and said control means, means operated by said drive for shifting said control means from starting to stop position at the end of said

cycle, means operated by said shifting means for releasing said releasable connection for movement of said control means to said stop position by said shifting means independently of said starting member, a main stop having advanced and retracted positions, an abutment carried by a moving part of said drive for engagement with said main stop in the advanced position of said stop, means operated by said control means in the movement thereof between the starting and stop positions thereof for shifting said main stop between said retracted and advanced positions respectively, a safety stop supported for movement into and out of the path of said abutment, and means operated by said main stop for effecting movement of said safety stop into and out of the path of said abutment simultaneously with the movement of said main stop between said retracted and advanced positions thereof respectively to cause retraction of said safety stop only upon shifting of said control means and said main stop to said stop and advanced positions thereof respectively providing positive stopping of said drive by said safety stop in the event of failure of said control means to reach said stop position thereof in time to prevent repetition of said cycle.

11. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said operating cycle comprising control means having starting and stop positions for starting and stopping operation of said drive to effect said cycle, an operating member for said control means having starting and stop positions, a starting member positioned for actuation by the operator and having operative and rest positions, means forming a releasable connection between said operating member and said starting member, a cam connected with said drive for shifting said operating member to said stop position at the end of said cycle, means operated by said cam at the end of said cycle for effecting release of said releasable connection between said starting member and said operating member to shift said operating member to said stop position thereof independently of said starting member, a main stop having advanced and retracted positions, an abutment carried by a moving part of said drive for engagement with said main stop in the advanced position of said main stop, means operated by said operating member in the movement thereof between the starting and stop positions thereof for shifting said main stop between said retracted and advanced positions respectively, a safety stop supported for movement into and out of the path of said abutment, and means operated by said main stop for effecting movement of said safety stop into and out of the path of said abutment simultaneously with the movement of said main stop between said retracted and advanced positions thereof respectively to cause retraction of said safety stop only upon shifting of said control member and said main stop to said stop and advanced positions thereof respectively providing positive stopping of said drive by said safety stop at the end of each said cycle in the event of failure of said control member to reach said stop position thereof in time to prevent repetition of said cycle.

12. In a cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said operating cycle comprising movable control means having start and stop positions for starting and stopping said drive to effect said cycle, a main stop having advanced and retracted positions, an abutment carried by a moving part of said drive for engagement with said main stop in the advanced position of said stop, means responsive to the movement of said control means between the start and stop positions thereof for shifting said main stop between said retracted and advanced positions respectively, a safety stop supported for movement into and out of the path of said abutment, and means operated by said main stop for effecting movement of said safety stop into and out of the path of said abutment simultaneously with the movement of said main stop between said retracted and advanced positions thereof respectively.

13. A cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said operating cycle comprising movable control means having start and stop positions for starting and stopping said drive to effect said cycle, a main stop for said drive having advanced and retracted positions, an abutment carried by a moving part of said drive for engagement with said main stop in the advanced position of said stop, said stop being located beyond the normal position of said abutment at the end of said cycle, means responsive to the movement of said control means between the start and stop positions thereof for shitfing said main stop between said retracted and advanced positions respectively, a safety stop supported for movement into and out of the path of said abutment and including an operating part having an operating position located behind said normal position of said abutment at the end of said cycle, and means operated by said main stop for effecting movement of said safety stop into and out of the path of said abutment simultaneously with the movement of said main stop between said retracted and advanced positions thereof respectively.

14. A cutting machine of the character described having a drive for effecting an operating cycle, a safety mechanism for preventing accidental repetition of said operating cycle comprising movable control means having start and stop positions for starting and stopping said drive having advanced and retracted positions, an abutment carried by a moving part of said drive for engagement with said main stop in the advanced position of said stop, said stop being located beyond the normal position of said abutment at the end of said cycle, means responsive to the movement of said control means between the start and stop positions thereof for shifting said main stop between said retracted and advanced positions respectively, a pawl including an end portion forming a safety stop, means supporting said pawl adjacent said main stop, means biasing said pawl in a direction to locate said end thereof in the path of said abutment at a position located behind said normal position of said abutment at the end of said cycle, and means on said main stop cooperating said biasing means to cause movement of said pawl into and out of the path of said abutment simultaneously with the movement of said main stop between said retracted and advanced positions thereof respectively.

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