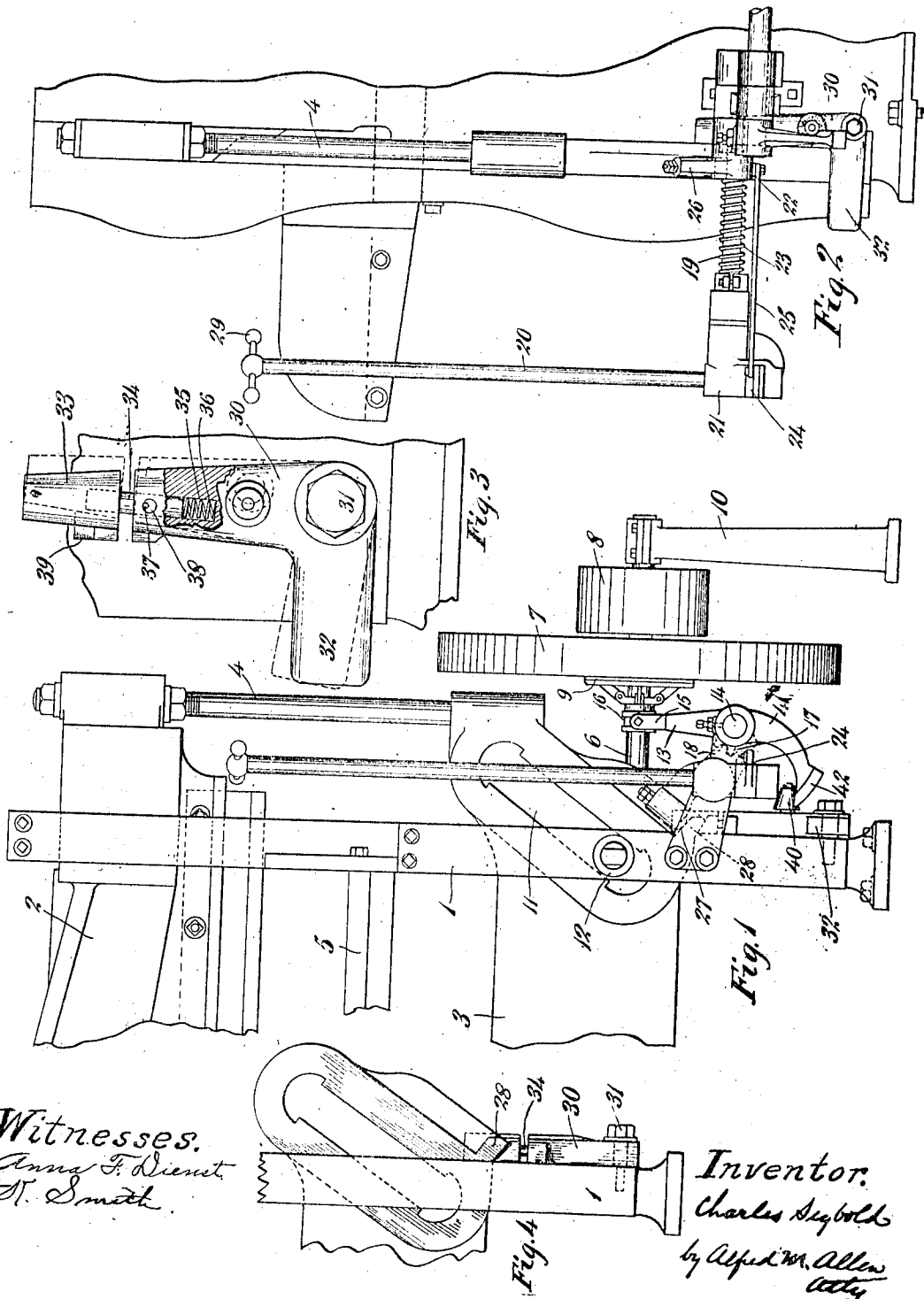


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SAFETY LOCK FOR PAPER CUTTING MACHINES.
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SAFETY-LOCK FOR PAPER-CUTTING MACHINES.

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To all whom it may concern:

Be it known that I, CHARLES SEYBOLD, a citizen of the United States, and a resident of the city of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Safety - Locks for Paper - Cutting Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to provide a positive and automatic lock for paper cutting machines, such as are driven by power, in which, should the ordinary and usual power disconnecting devices fail to operate for any reason and under which the movement of the knife and clamp is arrested at the end of each operation, the overthrow or return movement of the clamp and knife shall be stopped and positively locked, and at the same time when thus locked, it shall be impossible to throw in the driving power by the starting lever, or otherwise, until the safety lock has been released.

Heretofore it has been proposed to provide a locking bar or hook to engage the knife mechanism in the event that the disconnecting devices fail to operate; but with such constructions, the rebound or reaction between the locking lever and knife mechanism in many instances is sufficient to permit the starting lever to be actuated without the operator becoming aware that the mechanism has failed to operate properly; and in other instances, the full driving power of the machine can be thrown on by the operator with the parts still in locked engagement, with the frequent danger of breaking and destroying some part of the mechanism.

It is the purpose of my invention to provide an automatic lock, which shall not only lock the operating parts, should the flywheel or driving pulleys fail to disconnect, or the friction brake fail to operate, but which lock shall be so constructed and arranged that it shall be impossible to throw in the driving power with the starting lever, in the event that the safety lock has been brought into operation.

The invention consists of that certain novel construction and arrangement of parts to be hereinafter particularly pointed out and claimed, whereby the safety lock lever and the starting lever are directly connected,

so that when the locking device is in engagement with the operating mechanism it shall be impossible to operate the starting lever.

In the drawings, Figure 1 is a front elevation of one side of a power driven paper cutting machine embodying my improvements. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged front elevation of the safety lock lever, partly in section. Fig. 4 is a rear elevation of a portion of one of the supporting standards of the machine showing the lock lever in engagement with the end of the driving plate.

My invention is applicable to any of the well known types of power driven paper cutting machines, and I have selected for illustration such parts of the paper cutting machine as may be necessary to show the application of my invention in the type of paper cutting machine illustrated in my Patent No. 511,972, of January 2, 1894.

1 is one of the side standards of such paper cutting machine; 2, a portion of one end of the reciprocating knife bar; 3, a portion of one end of the cam plate for actuating the knife bar; 4, one of the bars connecting the cam plate with the knife bar at one end, and 5, the cutting table.

6 is the driving shaft provided with flywheel 7 and driving pulley 8, which parts are loosely mounted on the driving shaft and arranged to be coupled thereto in the starting of the machine by a suitable friction clutch construction indicated at 9. The driving shaft is suitably journaled in the side standards of the machine and carries the gear mechanism for actuating the driving plate 3. The driving shaft 6 is supported for its outer end in a supplemental standard 10, outside the driving pulley. The driving plate is reciprocated vertically in a diagonal direction by suitable gear mechanism not shown, and 11 is one of the diagonal slots in the cam plate 3, which is engaged by a roller 12 on the standard to guide the plate in its diagonal movement, the plate being suitably guided in a vertical direction in a vertical slot in the side standards.

The friction clutch 9, for throwing the driving power into and out of operation, is actuated by the arm 13, mounted on the shaft 14, suitably journaled in side supports from the main frame, the arm 13 being provided with a bifurcated end 15 engaging in the sliding grooved collar 16, mounted on

the driving shaft 6, and by means of which the clutch is thrown into and out of operation. The shaft 14 carries the segment gear 17, which is engaged by the segment gear 18 secured to the shaft 19, which is likewise journaled in suitable side supports, projecting from the main frame and parallel with the shaft 14. The shaft 19 carries on its outer end the operating or starting lever 20, provided with a head 21, secured on the end of the shaft 19, so that the shaft 19 can be rocked on its longitudinal axis.

22 is a sleeve splined on the shaft 19 so as to turn therewith, but adapted to slide lengthwise on the shaft, and normally held in contact with the inner bearing of the shaft 19 by the coiled spring 23. The lower end of the starting lever 20 carries an arm 24, coupled by a link 25 with a stud on the sleeve 22, and the sleeve 22 carries an upwardly and inwardly extending arm 26, provided with an adjustable stud 27, which is engaged by a projection or nose 28 on the bar 3, when the cam bar and the knife bar are at the top of their throw, so that in this way the arm 26 is actuated to rock the shaft 19, and throw the intermeshing gear or shaft 14 to shift the arm 13 to throw out the clutch mechanism of the driving shaft, and as long as the parts are in this position, it will be evident that the operating lever cannot be operated to shift the clutch mechanism to throw in the power. In order, therefore, to start the machine, it is necessary for the operator to first rotate the starting lever 20 by the handle 29 on its longitudinal axis, and this movement by reason of the arm 24 and link connection 25 draws the sleeve 22 toward the starting lever, compressing the coiled spring 23 and withdrawing the arm 26 from contact with the cam bar, so that as the sleeve 22 is held in this position, the operator can rock the shaft 19 to actuate the friction clutch and couple the driving pulley with the driving shaft. As soon as the machine is started, and the starting lever 20 is released, the sleeve 22 returns to its normal position, and upon the completion of the upstroke of the cam bar, contact is made with the stud 27 on the arm 26, and the shafts 19 and 14 are rocked to throw out the clutch mechanism and disconnect the driving power.

In order to insure against the momentum of the machine continuing the operation after the driving power is disconnected, it is usual to provide a band brake on the driving shaft to prevent any overthrow. It sometimes happens that these brakes may not operate successfully either when freshly oiled or for other reasons, or the flywheel and driving pulley may not disconnect from the driving shaft; and it is in order to insure an absolute and positive lock for the operating mechanism in the event of such

failure of the parts to operate properly, that my invention is directed. To accomplish this result, I provide as follows: 30 is the lock lever pivoted on a stud or plate 31, near the bottom of the side standard on its side face. This lever is provided with a horizontal arm 32, which serves as a weight to hold the lever in vertical position. The upper end of the lock lever 30 is provided with a contact block 33, which is provided with a depending stud 34 seated in a socket 35 formed in the body of the lever lengthwise thereof. The stud 34 rests upon a coiled spring 36 which is located in the base of the socket, and the block 33 is held in position under the tension of this spring by the transverse pin 37, on the stud which projects into the circular opening 38 in the upper end of the lever. The diameter of this opening is sufficient to allow some play of the block under the tension of the coiled spring. The block 33 is provided with a beveled striking face 39 to conform to the under surface of the nose 28 on the cam plate 3, and the lock lever is so located that when in normal position, this striking face of the block will lie in the pathway of the travel of the nose 28 on the cam plate. Projecting from the front face of the lock lever, near its pivoted end, is a cone-shaped roller 40, suitably mounted on a stud projecting from the face of the lever. Secured to the rock shaft 14 is a depending arm 41, provided with a contact shoe 42 at its lower end, the toe of which shoe normally stands in contact with this cone-shaped roller 40. When the rock shaft 14 is actuated, the shoe 42 bears against the roller 40 and rocks the lock lever on its pivot 31, so as to withdraw the striking face 39 from its position under the nose 28 of the cam bar 3, and thus the machine may be operated in its normal way. In the event, however, that, for any reason, the driving bar may not be disconnected, or the band brake fail to operate, and the knife fail to stop at the conclusion of its upthrow, the cam plate will be caught by the lock lever 30, the coiled spring 36 acting as a buffer to prevent too great a jar. In the event that there should be any rebound between the lock lever and the nose on the cam plate, the coiled spring 36 will cause the contact block 33 to follow and keep its bearing on the nose of the cam plate, so that in the event that the machine has not disconnected properly, and the knife has been caught by the lock lever, the lock lever will continue in engagement with the nose on the cam plate, and inasmuch as the arm 41 will continue to bear upon the projecting cone-shaped roller on the lock lever, it will be impossible to actuate the starting lever, and due and sufficient warning will be given the operator, that there is some defect in the operating mechanism.

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

1. In a paper cutting machine, a driving shaft, operating mechanism for the knife, with clutch mechanism for connecting the same with the driving power, and a starting lever to operate said clutch, a separate lock lever normally lying in the pathway of the operating mechanism to lock said mechanism positively, with direct connection intermediate the starting lever and the separate lock lever to withdraw the lock lever under normal conditions upon the actuation of the starting lever, and means to prevent normal disengagement of the lock lever when the mechanism has been locked thereby.
2. In a paper cutting machine, a driving shaft, operating mechanism for the knife, with clutch mechanism for connecting the same with the driving power, and a starting lever to operate said clutch, a separate lock lever normally lying in the pathway of the operating mechanism to lock said mechanism positively, with direct connection intermediate the starting lever and the separate lock lever to withdraw the lock lever when not in engagement upon the actuation of the starting lever, and to prevent operation of the starting lever when the lock lever is in engagement with the operating mechanism, the lock lever being provided with a spring buffer contact block, to prevent jars when in operation, and to take up any rebound of the parts.
3. In a paper cutting machine, a driving shaft, operating mechanism for the knife, with clutch mechanism for connecting the same with the driving power, and a starting lever to operate said clutch, a separate lock lever lying normally in the pathway of the operating mechanism to lock said mechanism positively, with an arm on the starting lever in contact with the separate lock lever to withdraw the lock lever under normal conditions upon the actuation of the starting lever, and means to prevent normal dis-

engagement of the lock lever when the mechanism has been locked thereby.

4. In a paper cutting machine, a driving shaft, operating mechanism for the knife, with clutch mechanism for connecting the same with the driving power, and a starting lever to operate said clutch, a separate lock lever normally lying in the pathway of the operating mechanism to lock said mechanism positively, with an arm on the starting lever in direct engagement with the separate lock lever to withdraw the lock lever when not in engagement upon the actuation of the starting lever, and to prevent operation of the starting lever when the lock lever is in engagement with the operating mechanism, the lock lever being provided with a spring buffer contact block, to prevent jars when in operation, and to take up any rebound of the parts.

5. In a paper cutting machine, a driving shaft, operating mechanism for the knife, with clutch mechanism for connecting the same with the driving power, and a starting lever to operate said clutch, a separate lock lever normally lying in the pathway of the operating mechanism to lock said mechanism positively, with direct connection intermediate the starting lever and the separate lock lever to withdraw the lock lever when not in engagement upon the actuation of the starting lever, and to prevent operation of the starting lever when the lock lever is in engagement with the operating mechanism, the lock lever being normally disposed in vertical position with a longitudinal socket in the outer end thereof, and a coiled spring seated in said socket, and a contact block with a depending stud bearing in said coiled spring, and a transverse pin on the stud engaging a recess in the lock lever to prevent displacement of the contact block while permitting movement thereof under spring tension.

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Attest:

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