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AUXILIARY BRAKE FOR LOOMS

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2 Sheets-Sheet 1

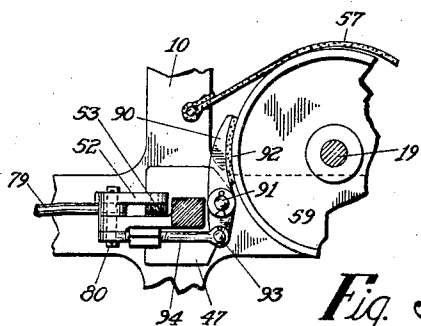
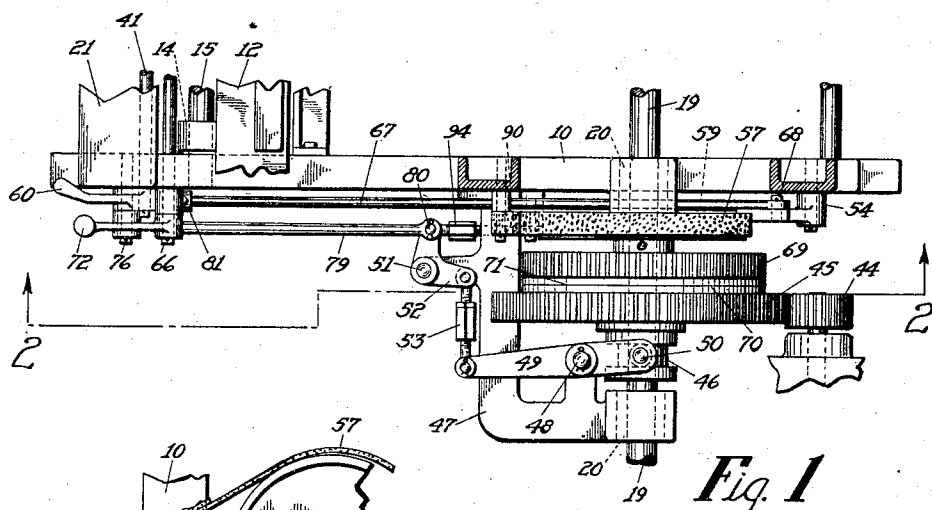
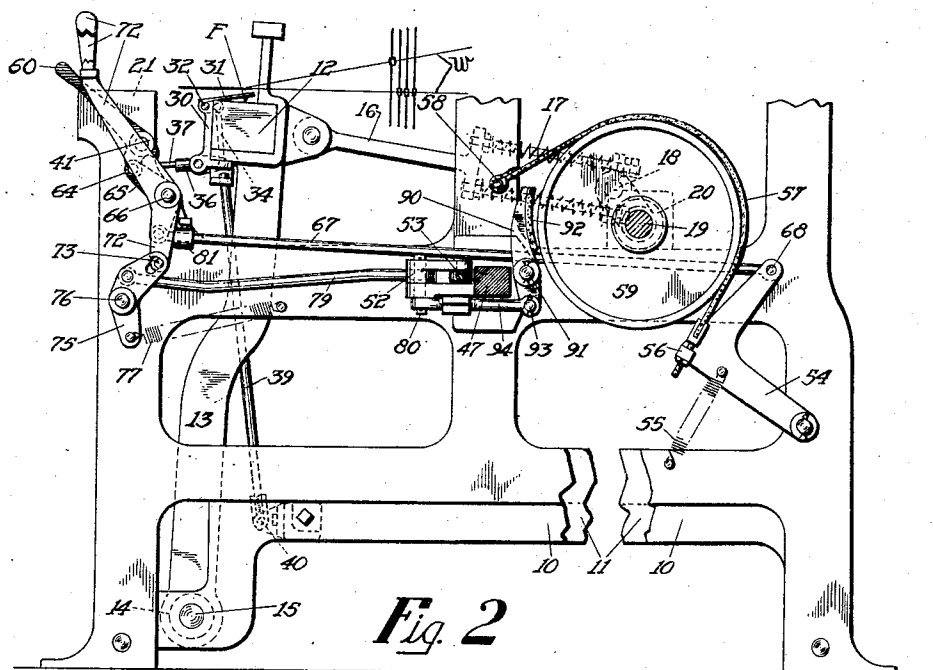


Fig. 3

Fig. 1

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2 Sheets-Sheet 2

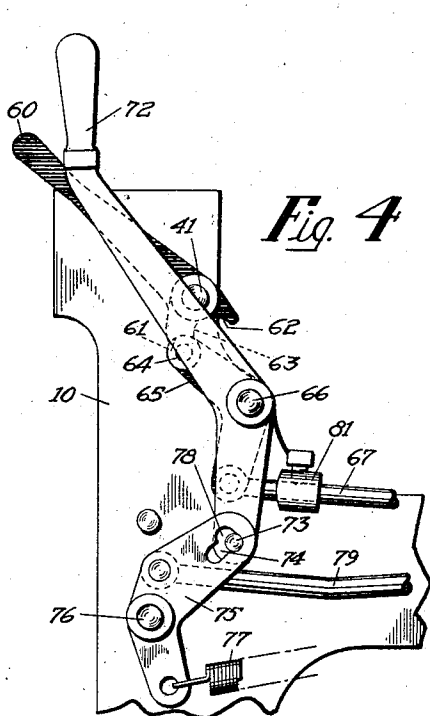


Fig. 4

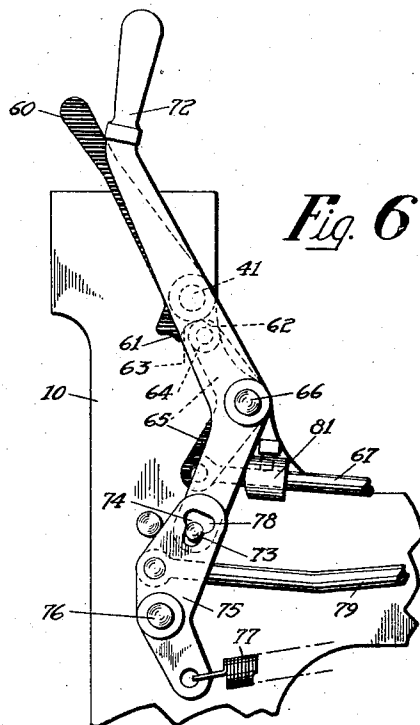


Fig. 6

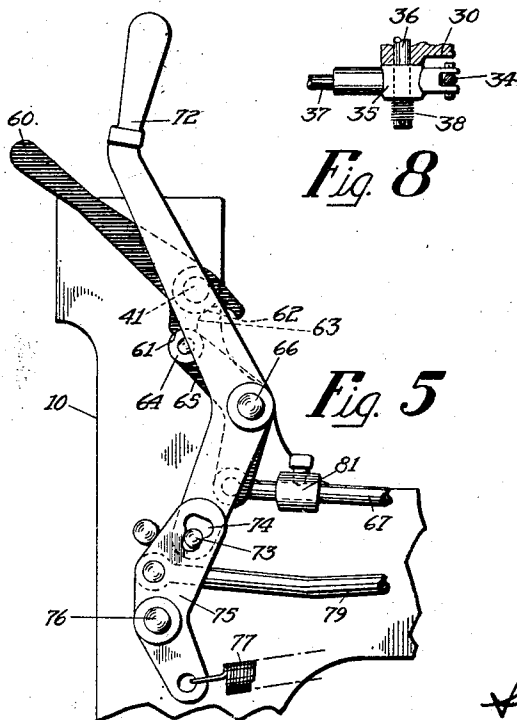


Fig. 5

Fig. 8

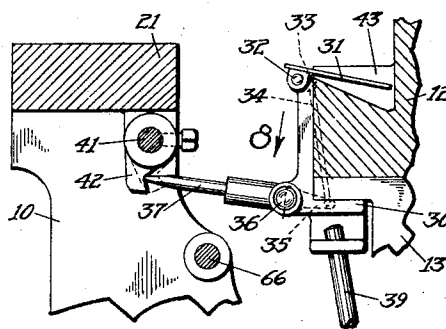


Fig. 7

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UNITED STATES PATENT OFFICE.

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AUXILIARY BRAKE FOR LOOMS.

Application filed December 4, 1925. Serial No. 73,246.

This invention relates to means for applying a light braking force to a loom to stop the same gradually and hold the lay in forward position when a fault in the warp is to be mended. It is the general object of the invention to provide an auxiliary brake operable from the shipper handle and effective to apply light friction to stop the loom sooner than would be possible were no brake used but without the harsh action usually attending the use of the ordinary brake.

Recent improvements in the construction of silk looms have included the use of roller bearings to improve the running of the lay at high speeds. When a break in the warp occurs it is desirable to stop the lay near the extreme forward limit of its movement so as to afford convenient access to the harnesses for the tying together of the broken ends. It is found that looms equipped with roller bearings turn over so easily that the lay tends to move backwardly to an inconvenient position. Looms of the type mentioned are usually provided with a brake which is effective to stop the loom quickly at the time of protection or when a fault in the filling occurs but the brake is independent of the shipper handle and after the loom has been stopped it must be taken off before the shipper handle can be moved to running position. This extra operation is objectionable and it is a further object of my invention to provide an auxiliary brake additional to the usual brake to hold the lay in forward position and be under control of the shipper handle, thus permitting the operator to start up the loom by a single operation after the warp fault has been corrected.

When rayon is used as filling it is found that if the lay moves backwardly after being stopped approximately at front center the filling fork of the filling stop motion is lifted to slacken the tension on the rayon filling. This character of filling is made of a number of very fine strands held together loosely because of the fact that they are not provided with fine serrations or saw tooth edges as is the case with natural fibres and because of this fact any slackening of the tension is likely to result in a slight separation of the strands so that the thread is somewhat wider in some places than in others. Consequently when the lay is moved

forward to beat in the filling after a reverse movement sufficient to slacken the tension on the rayon filling, certain portions of the latter produce broad places in the cloth which are known technically as "shiners" and it is a further object of my invention to prevent these objectionable shiners by preventing retrograde movement of the lay sufficient to slacken the tension on the filling.

In certain looms such as those employing a dobby it is not infrequent that more harnesses are being lifted than are being depressed and as the harnesses in this type of loom are raised against spring action as the loom approaches front center, the tendency of these springs is to move the lay backwardly and it is a still further object of my invention to overcome the action of the springs on the lay by means of the aforesaid auxiliary brake.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawings wherein a convenient embodiment of the invention is shown,

Fig. 1 is a top plan view of one end of a loom showing my invention applied to the driving mechanism therefor.

Fig. 2 is a vertical section on line 2-2 of Fig. 1,

Fig. 3 is a fragmentary side elevation of a portion of Fig. 2 showing the auxiliary brake in braking position and the main brake spaced from the brake drum,

Figs. 4, 5, and 6 present the shipping and braking control mechanism on an enlarged scale in different positions,

Fig. 7 is a vertical section through a portion of the lay and breast beam of the loom showing the manner of operation of the filling stop motion when the lay is on front center and filling is absent, and

Fig. 8 is a detail top plan taken in the direction of arrow 8, Fig. 7.

Referring particularly to Figs. 1 and 2 it will be seen that I have provided loom sides 10 and 11 and a lay 12 having swords 13 the lower ends of which are provided with roller bearings 14 mounted on a rocker shaft 15. The lay is provided with connectors 16 the rear ends of which are pro-

vided with yielding bearings 17 mounted on a wrist pin 18 on the top shaft 19. Said shaft 19 rotates in roller bearings 20 mounted on the loom frame and moves the lay toward and from breast beam 21.

The filling stop motion comprises a bracket 30 secured to the lay 12 substantially at the central portion thereof. A filling fork 31 is secured to and moves with a stub shaft 32 pivoted on the bracket and having an arm 33 attached to the upper end of connector 34 the lower end of which rests on the rear end of a lever 35, see Fig. 7. Said lever 35 moves about a stud 36 secured on the bracket and is provided with a dagger 37 normally held yieldingly in raised position by spring 38 as shown in Fig. 8. The bracket 30 guides the upper end of rod 39 under the rearwardly extending arm of lever 35. As shown in Fig. 2 the lower end of rod 39 is connected as at 40 to a fixed pivot spaced from the rocker shaft 15. I provide a rolling rod 41 having secured thereto a knock-off arm 42 positioned for engagement with the dagger 37 when the latter is in raised position as the lay moves forwardly.

As the lay moves rearwardly the dagger 37 is lowered and as the lay moves forwardly the fork 31 will be held up if yarn is present to hold the dagger down, but if yarn is absent the fork moves down in slot 43 in the lay with an accompanying up motion of the dagger to engage the arm 42 and roll rod 41 to stop the loom by mechanism to be described. The filling fork and its operation are very well understood in the art and a further description of the same is considered unnecessary. It is necessary, however, to keep in mind that as the lay moves backwardly the filling fork 31 is moved out of the slot 43 so as to relieve the tension of any weft which may lie under the fork.

In order to move the lay backwardly and forwardly I provide a constantly driven pinion 44 meshing with a gear 45 rotatable freely on the top shaft 19 and having secured thereto a grooved collar 46. A stand 47 projects laterally from the loom frame and has pivoted as at 48 a shipper lever 49 having a pin 50 which cooperates with collar 46 to move the gear 45 longitudinally of shaft 19 when shipper lever 49 is oscillated. Pivoted on said frame 47 as at 51 is a bell crank lever 52 between which and the lever 49 extends an adjustable connector 53.

As shown in Fig. 2 a brake lever 54 pivoted on the loom frame tends to move down under action of springs 55. Adjustably connected to said brake lever as at 56 is the free end of a friction strap 57 the other end of which is fixed to the loom frame as at 58. In order to hold the strap 57 spaced from a friction drum 59 which is secured to the shaft 19 and thus permit free rotation

of the latter I secure to one end of rod 41 a brake handle 60. As shown in Fig. 6 said lever 60 is provided with a notch 61 farther from rod 41 than a second notch 62 shown more clearly in Fig. 4. These notches are connected by an inclined cam face 63 over which moves a roll 64 pivoted to the upper end of a lever 65 loosely mounted on a shipper shaft 66 which extends across the loom. The lower end of said lever 65 is connected to the forward end of a rod 67 the rear end of which as shown in Fig. 2 is connected as at 68 to the brake lever 54. When said brake handle 60 is moved to the forward position shown in Figs. 2 and 5 the notch 61 will hold the lever 65 to space the friction band 57 from the drum 59, thus permitting free movement of shaft 19.

As shown in Fig. 1 there is secured to the top shaft 19 a gear 69 having a friction face 70 to engage a corresponding friction face 71 moving with gear 45. In order to move said gear 45 into driving relationship with gear 69 and shaft 19 I secure to each end of shipper shaft 66 a shipper handle 72 the lower end of which carries a pin 73 to be received in a slot 74 formed in the upper end of the lock lever 75 pivoted as at 76 on a fixed stud. Spring 77 interposed between the lower end of the locking lever and a fixed part of the loom structure tends normally to move the lock lever to the left but such movement is resisted when the loom is running by reason of the fact that pin 73 is seated in one of the notches 78 in the slot 74 as shown in Fig. 4. A rod 79 is connected at its forward end to the lock lever 75 and at the rear end is connected to stud 80 on bell crank lever 52 (see Figs. 1 and 2). The connections are such that when the shipper handle 72 is in the forward position shown in Figs. 2 and 4 the friction faces 70 and 71 will be held together tightly to cause the loom to operate. A collar 81 adjustably secured to rod 67 is positioned to engage the lower end of the shipper handle 72 when said rod 67 moves forwardly under the action of spring 55. This latter movement will occur when brake handle 60 moves from the position shown in Fig. 4 to that shown in Fig. 6. The driving mechanism is of the common form and it will be noted that the shipper handle will move to the stopping position as shown in Fig. 5 without setting the main brake, the band 57 being held away from the drum 59 so long as brake lever 60 is in forward position irrespective of the position of the shipper handle.

As previously stated looms constructed substantially as described with the roller bearings are found to run so easily that it is difficult to keep the lay in forward position at the time a fault in the warp W is being mended. In order to hold the lay in

forward position and prevent backward movement thereof which would result in raising of filling fork 31 with resultant loss of tension on the filling F, I provide an auxiliary brake lever 90 pivoted as at 91 preferably, though not necessarily, on the bracket 47, and I provide said lever with a braking face 92 to engage the drum 59. The lower end of the auxiliary brake lever 90 is connected as at 93 to an adjustable rod 94 pivotally connected to the stud 80 on the bell crank lever 52.

The connection of the auxiliary brake lever 90 with the shipper handle 72 is such that when the latter is in driving position as shown in Figs. 2 and 4 the braking face 92 will be spaced from the drum 59 but when the shipper handle moves to the position shown in Figs. 5 or 6 the rod 79 will move forwardly to rock the auxiliary brake to the position shown in Fig. 3. This applies a very light friction on the drum 59 sufficient to stop the loom in slightly less than half a pick so that if the weaver throws the shipper handle when the lay is in its rearward position said lay will be brought to rest a short distance before it reaches the forward limit of its movement. The auxiliary brake will serve also to hold the lay in its forward position and prevent undesirable raising of the filling fork 31.

It will be noted that the auxiliary brake is applied to the drum whenever the shipper handle is moved to "off" position. The auxiliary brake is also under control of the brake lever 60 by reason of the fact that when the latter is moved from the position shown in Fig. 4 to that shown in Fig. 6 the collar 81 advances to unseat the pin 73 from its adjacent notch 78 and move the shipper handle backwardly to the position shown in Fig. 6. Obviously therefore, when it is desired to stop the loom quickly, as in the case of a misplaced shuttle or a filling break both the main brake and the auxiliary brake will be applied to drum 59.

When the loom has been stopped by the application of both brakes it is necessary first to take off the main or service brake 57 after which the shipper handle is thrown on, but during the interval of time lapsing between the manipulation of the handles the lay would move back unless the auxiliary brake were still on after the main brake had moved to non-braking position. Furthermore, the auxiliary brake is made light enough in its braking action to permit the weaver to turn the loom over by hand, an operation which would be difficult if the main brake were relied upon to prevent retrograde movement of the lay.

From the foregoing it will be seen that I have provided an auxiliary brake to apply a light braking action whenever the shipper handle is moved to stop the loom and that

this auxiliary brake, which can be controlled by the shipper at either end of the loom, is under the joint control of the shipper and brake handles and always operates when the main brake acts to stop the loom. Furthermore, the provision of the auxiliary brake which permits a gradual stopping of the loom instead of the abrupt stopping attending the operation of the main brake will prevent backward movement of the lay and undesirable raising of the filling fork, thus obviating the previously described shiners and at the same time holding the lay in a position where the weaver can conveniently repair a brake in the warp.

Having thus described my invention it will be apparent that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention, and I do not wish to be limited to the details herein disclosed but what I claim is:

1. In a loom, a driving shaft, a lay connected thereto, means to drive the shaft, a pair of brakes both effective to resist motion of the shaft and lay, one of said brakes being relatively light and effective to offer slight resistance to movement of the lay and shaft whenever the shaft and means to drive are disconnected, and the other brake capable of remaining in non-braking position when the shaft and driving means therefor are disconnected, and operative connections between the brakes to cause the light brake to become operative to brake the shaft when the main brake is effective.

2. In a loom, a lay, a driving shaft connected thereto, a main brake to effect relatively quick stopping of the driving shaft, a brake handle to control said main brake, a shipper handle to control the running and stopping of the loom, and a relatively light auxiliary brake effective to prevent retrograde movement of the shaft and lay, said auxiliary brake being under the joint control of the brake lever and the shipper handle.

3. In a loom, a lay, a driving shaft connected thereto, a main brake to effect relatively quick stopping of the driving shaft, a brake handle to control said main brake, a shipper handle to control the running and stopping of the loom, and a relatively light auxiliary brake effective to prevent retrograde movement of the shaft and lay, said auxiliary brake being under joint control of the brake lever and the shipper handle but being controlled by the shipper handle independently of the brake lever.

4. In a loom, a shaft, a main brake for the shaft, an auxiliary brake for the shaft, a control member for the main brake, a second control member for the auxiliary brake, the auxiliary brake being under joint control of both the members and also being

under the single control of the second named member when the main brake is in non-braking position.

5 5. In a loom, a lay, a filling stop motion thereon to stop the loom when a fault occurs in the filling and having a fork to tension the filling as the lay moves forwardly and to release the tension on the filling upon retrograde movement of the lay, a main
10 brake normally in non-braking position when the loom is running but controlled by the filling stop motion to be effective to brake the loom when said filling stop motion operates, an auxiliary brake to be effective
15 whenever the loom is at rest irrespective of the position of the main brake and effective to exert a light braking action on the lay to prevent retrograde movement thereof, and connections between the brakes to render
20 both brakes operative when the filling stop motion operates.

6. In a loom, a lay, a filling stop motion

having a filling fork to tension the filling when the lay moves forwardly and operating to reduce the tension on the filling upon
25 retrograde movement of the lay, a main brake normally in non-braking position when the loom is running and operable by the filling stop motion to move to braking position when the filling stop motion operates,
30 a shipper mechanism operable independently of the main brake to stop the loom, an auxiliary brake operative whenever the shipper mechanism is moved to stop the loom to exert a light braking action on the lay
35 irrespective of the position of the main brake, and connections between the main brake and the auxiliary brake to render the latter operative whenever the main brake
40 is operative.

In testimony whereof I have hereunto affixed my signature.

BENJAMIN F. McGUINNESS.