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No. 838,162. PATENTED DEC. 11, 1906.

C. W. BATES.

PROTECTOR MECHANISM FOR LOOMS.

APPLICATION FILED JULY 7, 1905.

3 SHEETS—SHEET 1.

FIG. 2.

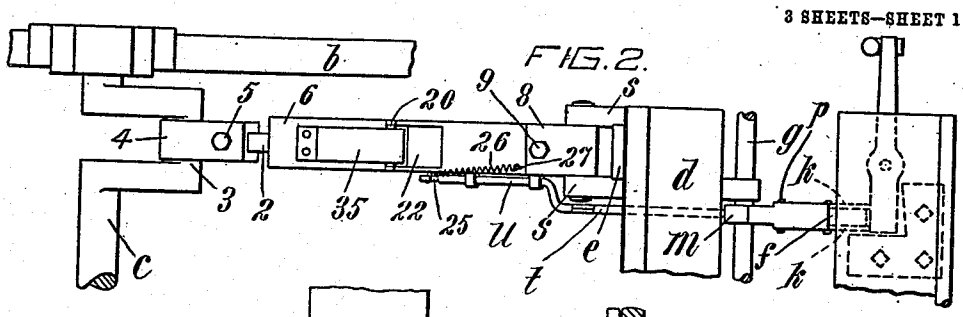
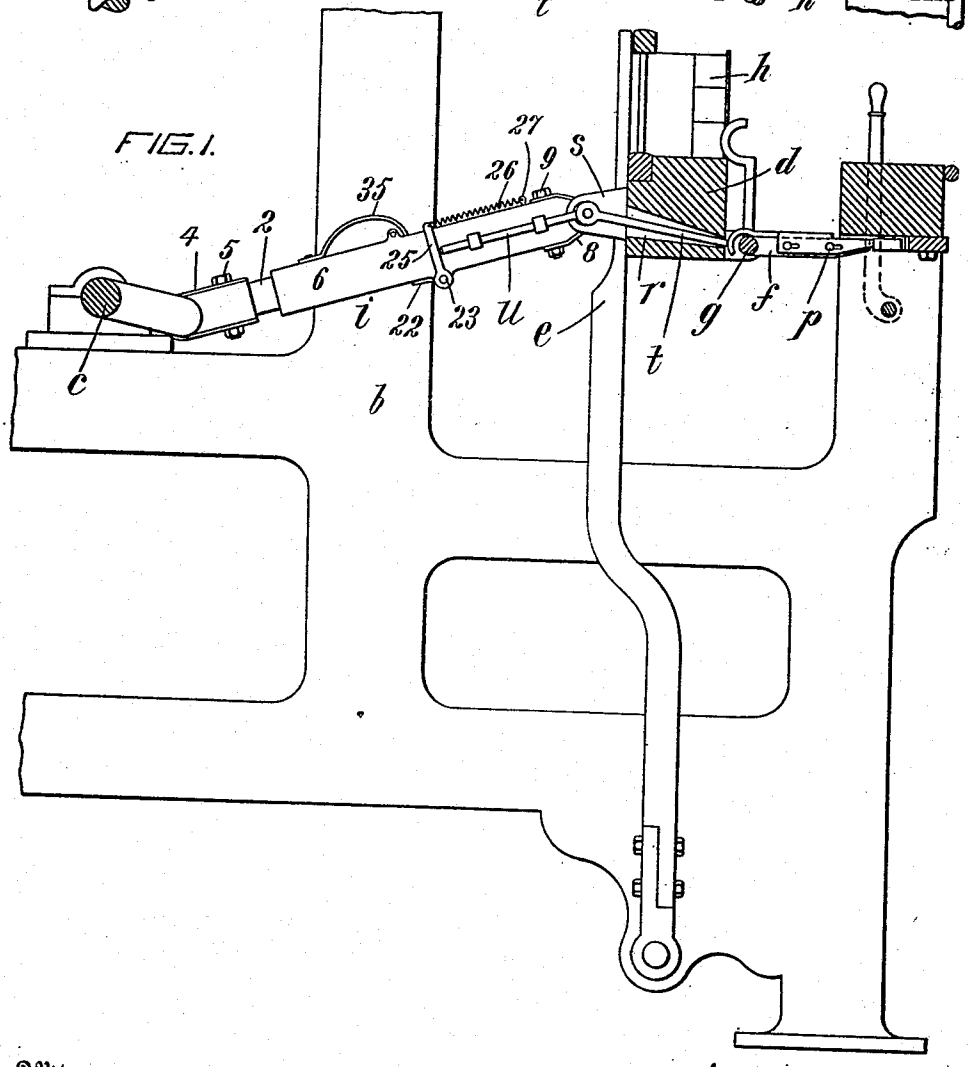


FIG. 1.



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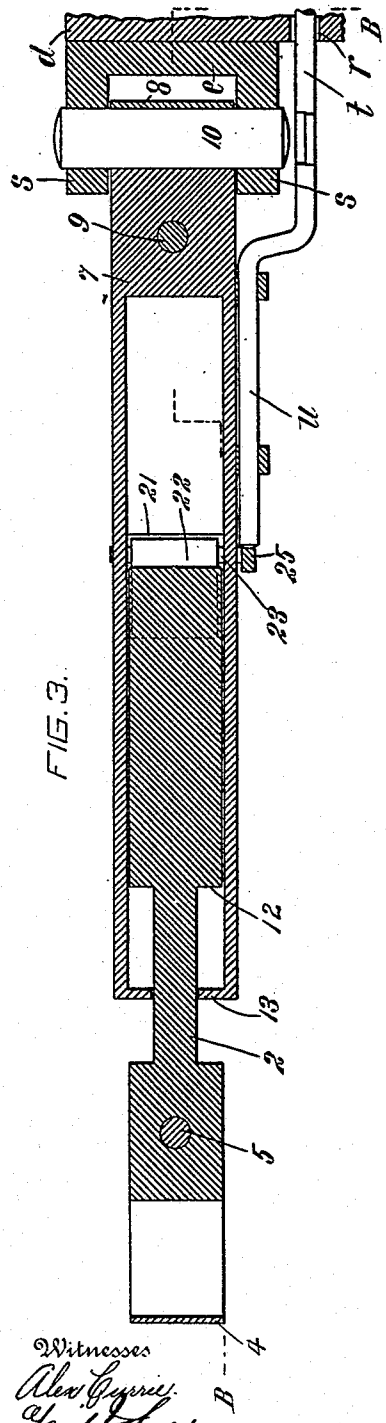


FIG. 3.

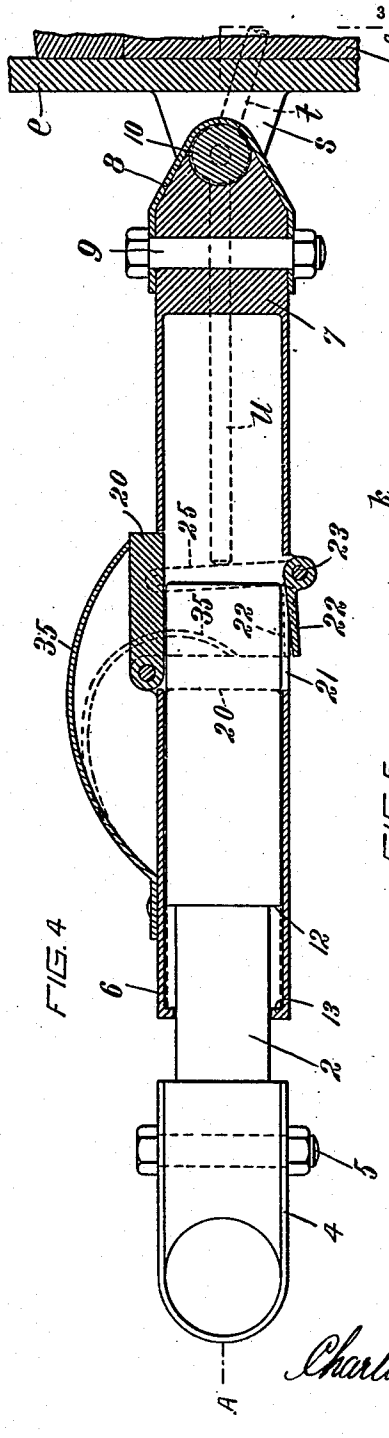


FIG. 4.

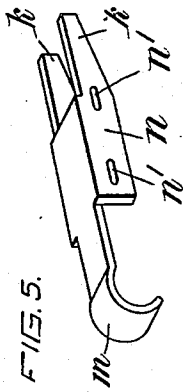


FIG. 5.

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No. 838,162. PATENTED DEC. 11, 1906.

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PROTECTOR MECHANISM FOR LOOMS.

APPLICATION FILED JULY 7, 1905.

3 SHEETS—SHEET 3.

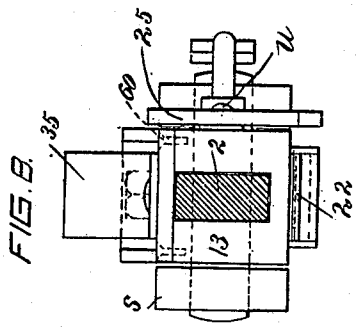


FIG. 8.

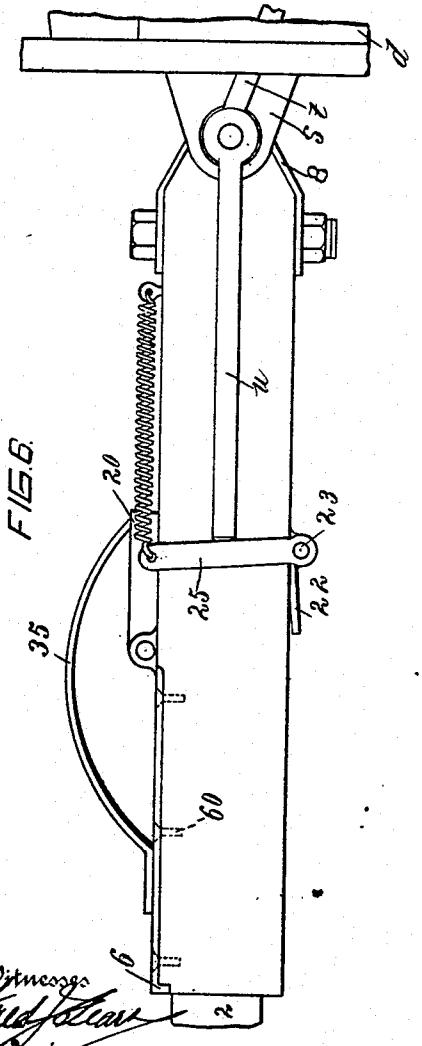


FIG. 6.

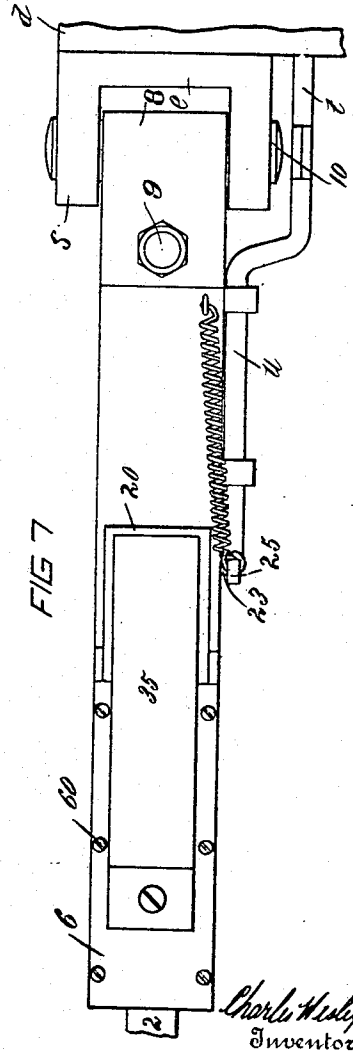


FIG. 7.

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CHARLES WESLEY BATES, OF ST. HYACINTHE, QUEBEC, CANADA.

PROTECTOR MECHANISM FOR LOOMS.

No. 838,162. Specification of Letters Patent. Patented Dec. 11, 1906.

Application filed July 7, 1905. Serial No. 268,631.

To all whom it may concern:

Be it known that I, CHARLES WESLEY BATES, of St. Hyacinthe, Province of Quebec, Canada, have invented certain new and useful Improvements in Protector Mechanism for Looms; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has for its object to enable the forward beat of the lay to be shortened through the medium of the dagger when the shuttle fails to enter its box, thus making such shortening action more prompt than heretofore; and a further object of the invention is to simplify and reduce the weight of this high-speed mechanism, and thereby obviate or reduce the breakage heretofore frequently experienced.

The invention may be said, briefly, to consist of a displaceable device connecting the initial operating means of the lay to the lay and a member coacting with the dagger for displacing such device and shortening the forward beat of the lay when the shuttle fails to enter its box.

For full comprehension, however, of my invention reference must be had to the accompanying drawings, forming a part of this specification, in which similar reference characters indicate the same parts, and wherein—

Figure 1 is a side elevation of a loom provided with my invention, partly in section. Fig. 2 is a plan view thereof. Fig. 3 is a detail horizontal sectional view of my improved means for automatically shortening the forward beat of the lay, the section being taken on line A A, Fig. 4. Fig. 4 is a part side elevation and part vertical sectional view, the sectional view being taken on line B B, Fig. 3. Fig. 5 is a perspective view of the sheath carried by the dagger and constituting the initial operative part of my improved mechanism. Fig. 6 is a side elevation of my improved collapsible pitman. Fig. 7 is a plan view thereof, and Fig. 8 an end view.

The frame *b* of the loom, the crank-shaft *c*, the lay *d*, the lay-sword *e*, the protector-dagger *f*, the protector-shaft *g*, and the shuttle-boxes *h* may be of any preferred type and constructed and arranged as usual.

My invention relates to the protector mechanism, and it has particular reference to the pitman *i*, which connects the crank to the lay-sword, and means carried by and acting in conjunction with the dagger for causing the forward beat of the lay to be shortened.

According to my invention the protector-dagger *f* is collapsible in that it carries slidably a sheath consisting of a metallic plate formed to present a pair of straight fingers *k*, one at each side of and adapted to project slightly beyond the forward end of the dagger, and a curved finger *m*, adapted to partially encircle the protector-shaft *g*, with its end projecting between such shaft and the lay *d*, while the sides *n* of the plate are slotted, as at *n'*, and bent down to overlap the sides of the dagger. The sheath thus constructed is secured slidably to the dagger by a pair of headed studs *p*, thus providing a collapsible protector-dagger of telescopic construction. The lay *d* has a tapered hole *r* cut therethrough, with its smaller end adjacent to the protector-shaft and its larger end in close proximity to the lugs *s* upon the sword and through which the pitman *i* is connected to the sword. An oscillatory slide-rod *t* lies in the tapered hole *r* in position to have its lower end project through the hole and rest normally in contact with curved finger *m*, and its upper end is pivotally connected to a slide-rod *u*, which is caused to actuate a latching-plate and allow the pitman to collapse, and thus shorten the forward beat of the lay.

My improved pitman consists of a preferably wooden bar 2, preferably rectangular in cross-section and pivotally connected to the wrist 3 of the crank-shaft *c* by a metallic band 4, secured to one end of the bar by a bolt 5. This wooden bar is inserted into one end of a metallic sleeve 6, conforming in cross-section to it, the opposite end 7 whereof is cast solid and tapered and formed with a concavity, by means of which and a metallic band 8, a bolt 9 for securing such band in place, and a pin 10 such end is pivotally connected to the lugs *s* upon the lay-sword. The bar is free to slide to and fro in the sleeve; but the extent of its movement is limited in one direction by the solid end 7 and in the opposite direction by a shoulder 12 and an inwardly-projecting flange 13, diminishing the open end of the sleeve, such shoulder being formed by a diminishment of the cross-section of the portion of the bar adjacent to the crank, this diminished portion also accommodating the movement of the sleeve and bar relatively to one another while the pitman is collapsing or being drawn out. A portion of the top of the sleeve 6 is removable and held in place by screws 60, and the object thereof is to enable

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the enlarged end of the bar to be set in place or removed.

The means for retaining the members of the pitman in their extended condition consists of a stopping-plate 20, hinged at one end to one end of a longitudinal opening in preferably the top side of the sleeve, such plate being arranged to extend transversely to the sleeve and in close proximity to the end of the bar 2 when the pitman is extended and with its free end projecting into an opening 21 in the under side of the sleeve. The stopping-plate is displaceably held in this position by a latching-plate 22, before mentioned, secured rigidly at one end to a rod 23, pivotally mounted in a pair of lugs upon the under side of the sleeve, such latching-plate when raised fitting into the opening 21 in position to engage the lower end of and retain the stopping-plate. A lever-arm 25 is mounted rigidly upon the rod 23 and projects upwardly alongside of the sleeve, and it is yieldingly held in position with the latching-plate in the opening 21 by a retractile helical spring 26, connected between its upper end and a rigid eye 27 upon the sleeve. The lever-arm 25 and with it the latching-plate 22 are displaced to remove the latter from its engaging position, and thereby releasing the stopping-plate and allowing the pitman to collapse or telescope, by means of the before-mentioned slide-rod *u*, which bears upon the lever-arm 25 and the means for actuating the same. The stopping-plate 20 is yieldingly retained transversely to the sleeve 6 by a bow-spring 35, secured at one end to the top of the sleeve and curved around the fulcrum-point of such plate 20 with its free end bearing upon the said plate.

Operation: The operation of my improved protector mechanism is as follows: When the shuttle enters its box properly, the pitman will remain extended and will perform the usual function of actuating the lay, and the protector-daggers are displaced from alinement with the buffers carried by the breast-beam, also as usual. It is when the shuttle fails to enter its box properly and remains on the raceway and the forward beat of the lay if not shortened would cause damage to the warp in the loom that my improved mechanism comes into play. When this condition obtains, the protector-dagger (as usual) strikes the protector-lever upon the breast-beam and causes the belt to be thrown off, thereby stopping the loom. The fingers *k* strike just before the dagger, thus causing the sheath to slide upon the dagger and the curved finger *m* to force the slide-rod *t* upwardly in the hole *r*, which slides the rod *u* and moves the lever-arm 25, and consequently depresses the latching-plate 22, with the result that the stopping-plate 20 is freed and the bar 2 is released. The pitman then telescopes, and the forward beat of the lay is shortened. After the shuttle has been replaced and the loom started the pitman will be again extended, the stopping-plate being forced by the bow-spring into position to be engaged by the latching-plate, which will meanwhile have been raised by the coiled spring, and such spring simultaneously will have caused the rods *t* and *u* and the sheath to be returned to their normal positions.

It is obvious that the dagger and sheath together constitute a telescopic or collapsible protector device, upon the telescoping or collapsing of which the pitman is collapsed and the forward beat of the lay shortened, which action takes place slightly in advance of the action of the dagger proper.

What I claim is as follows:

1. In a loom the combination with the means for beating the "weft" into the "shed," of collapsible means for operating the beating means including a dagger, and means including a part capable of movement without affecting the movement of the dagger for causing the said collapsible means to collapse upon an abnormal condition occurring in the loom for the purpose of limiting the extent of operation of the beating means.

2. In a loom the combination with the means for beating the "weft" into the "shed," of telescopic collapsible means for operating the beating means, and means for causing the said last-mentioned means to telescope upon an abnormal condition occurring in the loom for the purpose of limiting the extent of operation of the beating means.

3. In a loom the combination with the lay, means for operating the same, and collapsible means for restricting the extent of such operation, of a displaceable device retaining the collapsible means against collapsing, and protective mechanism adapted to move the said displaceable device when the shuttle fails to box.

4. In a loom the combination with the lay, means for operating the same, and collapsible means for restricting the extent of such operation, of means retaining the collapsible means against collapsing, and protective mechanism adapted to move the said displaceble device when the shuttle fails to box.

5. In a loom, the combination with the lay and means for operating the same, of telescopic collapsible means for restricting the extent of such operation.

6. In a loom the combination with the protector-dagger, the lay, and the means for operating the lay, of a displaceable device connecting the operating means to the lay, and means carried by and coacting with the dagger and constructed to displace the displaceable device when the shuttle fails to box, for the purpose of shortening the forward beat of the lay.

7. In a loom the combination with the

protector-dagger, the lay, and the means for operating the lay, of a displaceable device connecting the operating means to the lay, and means including a part capable of movement without affecting the movement of the dagger coacting with the dagger and constructed to displace the displaceable device when the shuttle fails to box, for the purpose of shortening the forward beat of the lay.

8. In a loom the combination with the protector mechanism and means for operating the lay, of a collapsible device connecting the lay to the means for operating the same, and means movable independently of the protector mechanism and coacting therewith for causing the collapse of the connecting device, for the purpose of shortening the forward beat of the lay.

9. In a loom the combination with the protector mechanism and means for operating the lay, of a telescopic collapsible device connecting the lay to the means for operating the same, and means controlled by the protector mechanism for causing the collapse of the connecting device, for the purpose of shortening the forward beat of the lay.

10. In a loom the combination with the lay, and means for operating the same, of a collapsible protector-dagger, and means controlled by such collapsible dagger whereby, upon the collapsing thereof, the forward beat of the lay is shortened.

11. In a loom, the combination with the lay, and means for operating the same, of a telescopic collapsible protector-dagger, and means controlled by such collapsible dagger whereby, upon the collapsing thereof, the forward beat of the lay is shortened.

12. In a loom the combination with the lay, and means for operating the same, of a collapsible protector-dagger, and collapsible means controlled by such collapsible dagger whereby, upon the collapsing of the dagger, the forward beat of the lay is shortened.

13. In a loom, the combination with the lay, and means for operating the same, of a collapsible protector-dagger, and telescopic collapsible means controlled by such collapsible dagger whereby, upon the collapsing of the dagger the forward beat of the lay is shortened.

14. In a loom the combination with the lay, a crank-shaft, and protector mechanism, of a collapsible pitman connecting the crank to the lay, a movable device retaining the pitman against collapsing, and means under the control of the protector mechanism for moving the said device and causing the pitman to collapse when the shuttle fails to enter its box, for the purpose of shortening the beat of the lay.

15. In a loom the combination with the lay, a crank-shaft, and protector mechanism, of a telescopic collapsible pitman connecting the crank to the lay, a movable device retaining the pitman against collapsing, and means under the control of the protector mechanism for moving the said device and causing the pitman to collapse when the shuttle fails to enter its box, for the purpose of shortening the beat of the lay.

16. In a loom the combination with the lay, the crank-shaft, and the protector-dagger, of a collapsible pitman connecting the crank to the lay, a movable device retaining the pitman against collapsing, and means under the control of the protector-dagger for moving the said device and causing the pitman to collapse when the shuttle fails to enter its box, for the purpose of shortening the beat of the lay.

17. In a loom the combination with the lay, the crank-shaft, and the protector-dagger, of a telescopic collapsible pitman connecting the crank to the lay, a movable device retaining the pitman against collapsing, and means under the control of the protector-dagger for moving the said device and causing the pitman to collapse when the shuttle fails to enter its box, for the purpose of shortening the beat of the lay.

18. In a loom the combination with the lay, and the crank-shaft for operating the same, of a collapsible pitman connecting the lay to the crank-shaft, a movable device retaining the pitman against collapsing, a collapsible dagger, and means operated synchronously with the collapsing of the dagger and operatively connected to the said device for the purpose of causing the pitman to collapse when the shuttle fails to enter its box.

19. In a loom the combination with the lay, and the crank-shaft for operating the same, of a telescopic collapsible pitman connecting the lay to the crank-shaft, a movable device retaining the pitman against collapsing, a collapsible dagger, and means operated synchronously with the collapsing of the dagger and operatively connected to the said device for the purpose of causing the pitman to collapse when the shuttle fails to enter its box.

20. In a loom the combination with the lay, and the crank-shaft for operating the same, of a collapsible pitman connecting the lay to the crank-shaft, a movable device retaining the pitman against collapsing, a telescopic collapsible dagger, and means operated synchronously with the collapsing of the dagger and operatively connected to the said device for the purpose of causing the pitman to collapse when the shuttle fails to enter its box.

21. In a loom the combination with the lay, and the crank-shaft for operating the same, of a telescopic collapsible pitman connecting the lay to the crank-shaft, a movable device retaining the pitman against collapsing, a telescopic collapsible dagger, and means operated synchronously with the col-

lapsing of the dagger and operatively connected to the said device for the purpose of causing the pitman to collapse when the shuttle fails to enter its box.

22. In a loom the combination with the lay, the protector mechanism and the crank-shaft, of a telescopic pitman connecting the crank to the lay and consisting of a member of bar form pivotally connected at one end to the wrist of the crank, and a hollow member constructed to slidably contain the free end of such bar and having one end pivotally connected to the lay, means limiting the movement of the bar out of the hollow member, means controlled by the protector mechanism for causing the pitman to collapse when the shuttle fails to enter its box for the purpose of shortening the forward beat of the lay.

23. In a loom the combination with the lay, the protector mechanism and the crank-shaft, of a telescopic pitman connecting the crank to the lay and consisting of a member of bar form pivotally connected at one end to the wrist of the crank, and a hollow member constructed to slidably contain the free end of such bar and having one end pivotally connected to the lay, means limiting the movement of the bar out of the hollow member, the hollow member having openings in diametrically opposite sides, a stopping-plate pivoted at one end in one of such openings and adapted to extend transversely across the interior of the hollow member, a latching-plate pivoted in the opposite opening, a lever-arm rigidly connected to the latching-plate, means acting upon the lever-arm and yieldingly retaining the latching-plate in position to engage the stopping-plate, and means controlled by the protector mechanism for moving the lever-arm and displacing the latching-plate for the purpose of allowing the pitman to telescope.

24. In a loom the combination with the lay, the protector mechanism and the crank-shaft, of a telescopic pitman connecting the crank to the lay and consisting of a member of bar form pivotally connected at one end to the wrist of the crank, and a hollow member constructed to slidably contain the free end of such bar and having one end pivotally connected to the lay, means limiting the movement of the bar out of the hollow member, the hollow member having openings in diametrically opposite sides, a stopping-plate pivoted at one end in one of such openings and adapted to extend transversely across the interior of the hollow member, means yieldingly retaining the stopping-plate in the said position, a latching-plate pivoted in the opposite opening, a lever-arm rigidly connected to the latching-plate, means acting upon the lever-arm and yieldingly retaining the latching-plate in position to engage the stopping-plate, and means controlled by the protector mechanism for moving the lever-arm and displacing the latching-plate for the purpose of allowing the pitman to telescope.

25. In a loom the combination with the lay, and the crank-shaft for operating the same, of a collapsible pitman connecting the lay to the crank-shaft, and consisting of a member of bar form pivotally connected at one end to the wrist of the crank, and a hollow member constructed to slidably contain the free end of such bar and having one end pivotally connected to the lay, a movable device retaining the pitman against collapsing, a collapsible dagger, and means operated synchronously with the collapsing of the dagger and operatively connected to the said device for the purpose of causing the pitman to collapse when the shuttle fails to enter its box.

26. In a loom the combination with the lay, and the crank-shaft for operating the same, of a collapsible pitman connecting the lay to the crank-shaft, and consisting of a member of bar form formed with a shoulder pivotally connected at one end to the wrist of the crank, and a hollow member constructed to slidably contain the free end of such bar and having one end pivotally connected to the lay and its opposite end formed with an inwardly-turned flange coacting with the shoulder, a movable device retaining the pitman against collapsing, a collapsible dagger, and means operated synchronously with the collapsing of the dagger and operatively connected to the said device for the purpose of causing the pitman to collapse when the shuttle fails to enter its box.

27. In a loom the combination with the lay, the protector-dagger and the crank-shaft, of a telescopic pitman connecting the crank to the lay and consisting of a member of bar form pivotally connected at one end to the wrist of the crank, and a hollow member constructed to slidably contain the free end of such bar and having one end pivotally connected to the lay, means limiting the movement of the bar out of the hollow member, a sheath carried slidably by the protector-dagger, means controlled by the sheath for causing the pitman to collapse when the shuttle fails to enter its box for the purpose of shortening the forward beat of the lay.

28. In a loom the combination with the lay, the protector-dagger and the crank-shaft, of a telescopic pitman connecting the crank to the lay and consisting of a member of bar form pivotally connected at one end to the wrist of the crank, and a hollow member constructed to slidably contain the free end of such bar and having one end pivotally connected to the lay, means limiting the movement of the bar out of the hollow member, the hollow member having openings in diametrically opposite sides, a stopping-plate pivoted at one end in one of such open-

ings and adapted to extend transversely across the interior of the hollow member, means yieldingly retaining the stopping-plate in the said position, a latching-plate pivoted in the opposite opening, a lever-arm rigidly connected to the latching-plate, means acting upon the lever-arm and yieldingly retaining the latching-plate in position to engage the stopping-plate, and means controlled by the protector mechanism for moving the lever-arm and displacing the latching-plate for the purpose of allowing the pitman to telescope, a sheath carried slidably by the protector-dagger, means controlled by the sheath for causing the pitman to collapse when the shuttle fails to enter its box for the purpose of shortening the forward beat of the lay.

29. In a loom the combination with the lay, the breast-beam, the protector-dagger, and the crank-shaft, of a telescopic pitman connecting the crank to the lay and consisting of a member of bar form pivotally connected at one end to the wrist of the crank, and a hollow member constructed to slidably contain the free end of such bar and having one end pivotally connected to the lay, means limiting the movement of the bar out of the hollow member, the hollow member having openings in diametrically opposite sides, a stopping-plate pivoted at one end in one of such openings and adapted to extend transversely across the interior of the hollow member, a latching-plate pivoted in the opposite opening, a lever-arm rigidly connected to the latching-plate, means acting upon the lever-arm and yieldingly retaining the latching-plate in position to engage the stopping-plate, and means controlled by the protector-dagger for moving the lever-arm and displacing the latching-plate for the purpose of allowing the pitman to telescope, a sheath carried slidably by the protector-dagger, and projecting beyond the free end thereof and having a curved finger encircling the butt of the protector-dagger, a bar located slidably in a hole obliquely through the breast-beam, a bar mounted slidably upon the side of the pitman adjacent to the lever-arm, and pivoted to the oblique bar, and a retractile helical spring retaining the lever-arm against the slide-bar, for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES WESLEY BATES.

Witnesses:
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