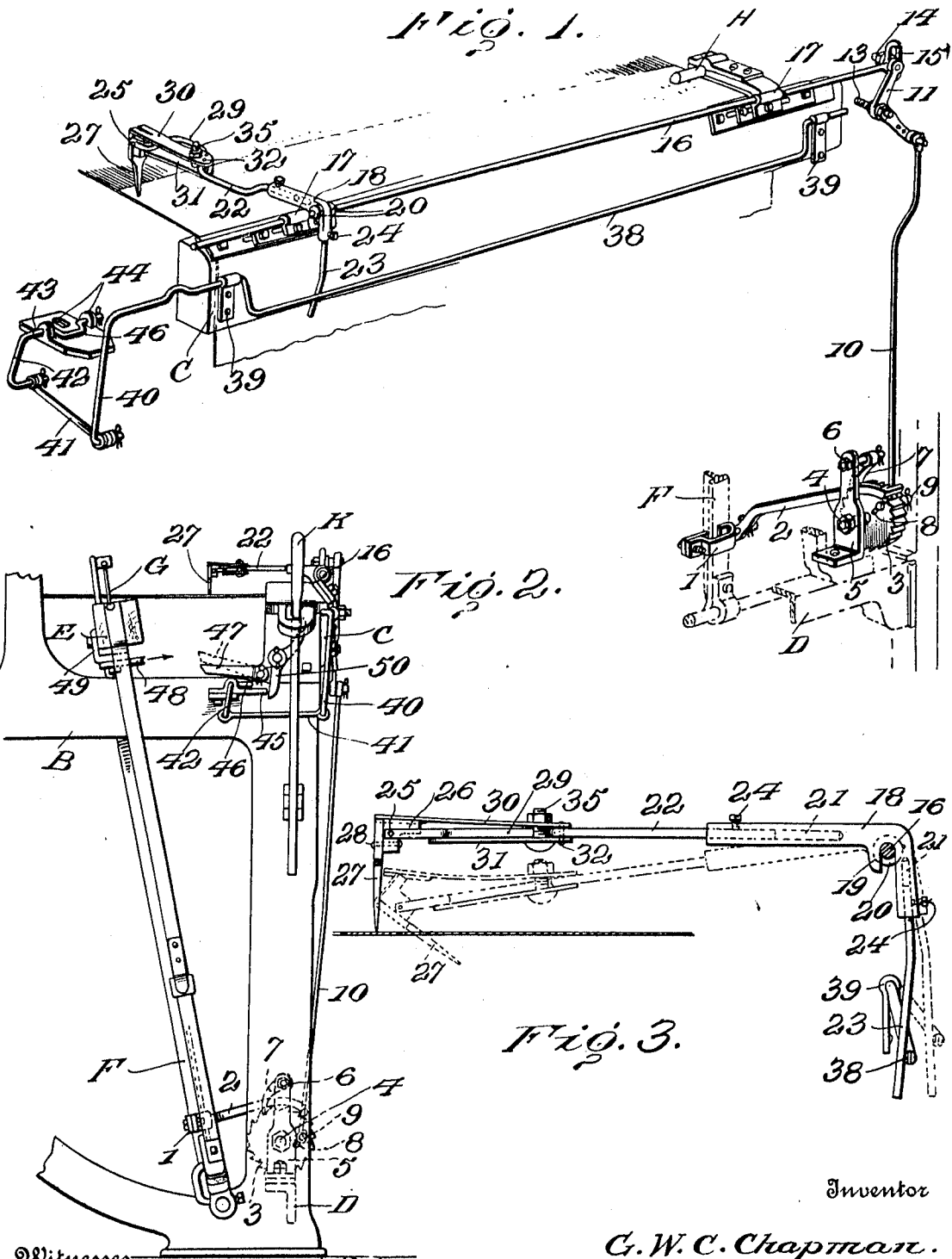


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STOP MOTION FOR LOOMS.
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Patented May 14, 1912.

2 SHEETS--SHEET 1.



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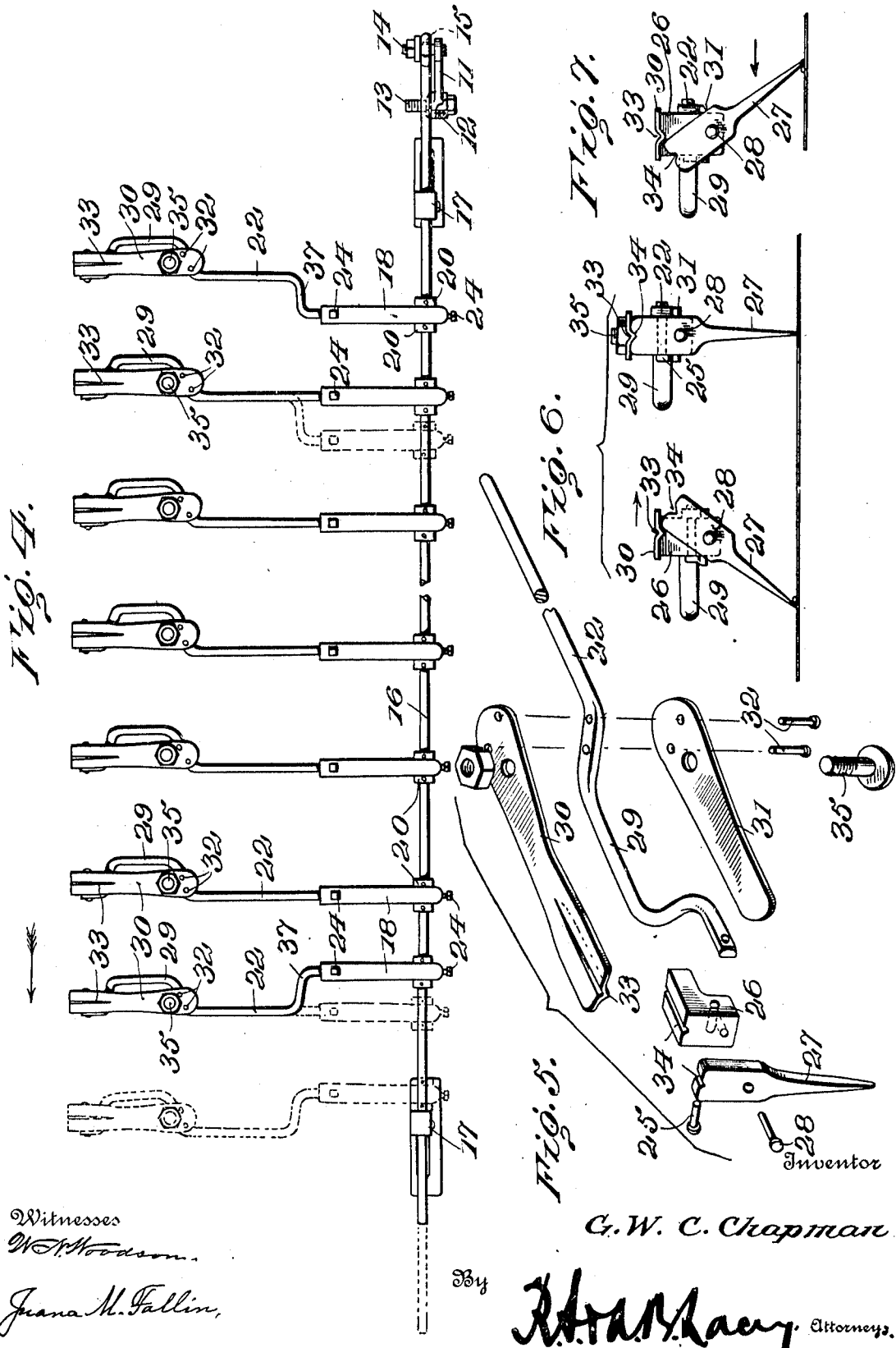
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2 SHEETS-SHEET 2.



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STOP-MOTION FOR LOOMS.

1,026,342.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE W. C. CHAPMAN, citizen of the United States, residing at Huntsville, in the county of Madison and State of Alabama, have invented certain new and useful Improvements in Stop-Motions for Looms, of which the following is a specification.

The present invention comprehends certain new and useful improvements in looms, and the invention has for its object an improved stop-motion which is applied to looms weaving a smooth surface cloth and which includes means for effectually detecting imperfections in the cloth due to any cause such as, for example, one or more warp threads becoming broken or tangled. The loom is automatically stopped upon the detection of a defect in the cloth, so as to permit the defect to be conveniently repaired.

Another object of the invention is a stop mechanism including a series of detectors which are reciprocated across the cloth in order to test the same from selvage to selvage and thus insure against the possibility of any defect being undiscovered.

A further object of the invention is a stop mechanism in which the series of detectors reciprocate with a carrier rod and have an independent turning movement thereon to enable any one of the detectors to actuate the stop mechanism, the detectors being provided with fingers or feeler points that rest upon the cloth and normally support the detectors against turning movement.

A further object of the invention is a device of this character in which the feeler point of each detector is adapted to drop through thin places in the cloth and also arranged during its reciprocatory movement to catch in any tangles or other inequalities in the surface of the cloth, the feeler point being mounted for swinging movement in both longitudinal and lateral planes so as to be prevented from injuring the cloth. The feeler point is yieldingly held against swinging movement in each plane, and is arranged to be swung laterally when caught in an inequality in the surface of the cloth, for

the purpose of permitting the detector to turn on the carrier rod.

A still further object of the invention is a stop mechanism which is positive and reliable in action, which is quite simple and durable and which may be easily and quickly applied to the loom.

With these and other objects in view that will more fully appear as the description proceeds, the invention consists in certain constructions and arrangements of the parts that I shall hereinafter fully describe and then point out the novel features of in the appended claims.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a fragmentary perspective view illustrating the application of the invention; Fig. 2 is a side elevation of a loom equipped with my improved stop mechanism; Fig. 3 is a detail longitudinal sectional view illustrating one of the detectors; Fig. 4 is a top plan view of the series of detectors; Fig. 5 is an enlarged perspective view showing one of the detector arms and the parts carried thereby, in juxtaposition; and, Figs. 6 and 7 are end views of the detectors illustrating the operation thereof.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The invention is applied to a loom which is of well known construction and is of that type weaving a smooth surface cloth. The loom has a suitable supporting frame B, said frame including the breast-beam C and a front lower cross girth D. E designates the lay-beam; F the oscillatory lay-swords; G the reed; H the temples; and K the shipper-lever. These parts are of ordinary construction and need no special description.

Secured around one of the lay-swords F is a two-part clip 1 to which an actuating pawl 2 is pivotally connected at one end. The pawl projects forwardly from the sword

and has its free extremity bent laterally to engage the teeth of a ratchet wheel 3 which is rotatably mounted on a stud 4 projecting horizontally from a stand 5 that is bolted or otherwise suitably secured to the front lower cross girth D. The pawl rides over the teeth in one direction and engages with the teeth in the other direction, so as to rotate the ratchet wheel intermittently in the last-named direction during the oscillation of the lay. The stand 5 is extended upwardly above the ratchet wheel and is provided with a laterally disposed stud 6 on which a detent 7 is rotatably mounted. This detent swings downwardly by gravity and engages the ratchet wheel to prevent any retrograde movement thereof.

The ratchet wheel is formed with a substantially radially disposed slot 8 in which a pin 9 operates. A connecting rod 10 is fitted at its lower end on the pin and projects upwardly therefrom with its upper end pivoted to one arm of an elbow lever 11. The elbow lever is apertured at its vertex to receive a bushing 12. A bolt 13 or like fastening passes through the bushing to fulcrum the elbow lever on the breast-beam C at a point in proximity to one side of the loom. The other arm of the elbow lever is provided with a stud 14 that operates in a slot 15 formed at one end of a carrier rod 16 which extends in the direction of the length of the breast-beam and is mounted in bearings 17 fastened, respectively, on the slides of the temples H. The connecting rod and the elbow lever transmit motion from the ratchet wheel to the carrier rod so as to reciprocate the latter across the loom.

A series of detectors are mounted on the carrier rod. The detectors are all substantial duplicates, and hence only one of the same will be specifically described. The body portion 18 of the detector has a substantially right angular formation and is provided at its vertex with a saddle 19 which straddles the carrier rod 16 between a pair of collars 20 fixed on said rod. The body portion is thus supported in a vertical plane which is perpendicular to the carrier rod and is disposed longitudinally with respect to the loom. Attention is particularly directed to the fact that the saddle 19 fits loosely on the shaft so as to afford the body portion an independent rotary movement thereon. The collars 20 abut against opposite sides of the detector, whereby to positively hold the same against longitudinal movement on the carrier rod and to cause the detector to reciprocate with said rod. The body portion is formed with sockets 21 opening outwardly at its opposite ends and receiving, respectively, an arm 22 and a tail 23. The arm and the tail are adjustably held in the sockets through the instrumen-

ality of set screws 24, this being a manifest desideratum in order to render the detector capable of being extended as occasion requires.

The arm 22 projects longitudinally rearwardly toward the lay-beam E and is provided at its extremity with a laterally projecting pin 25 on which is rotatably mounted the base block 26 of a finger or feeler point 27. The base block is preferably of angular formation, as shown, but not necessarily so. The feeler point is disposed at the rear face of its base block and is pivoted at an intermediate point thereto by suitable fastenings 28 so as to turn about an axis which extends approximately in the direction of the length of the detector arm. It will, therefore, be observed that the feeler point is adapted to swing with the base block in a longitudinal plane, that is, in the plane of the detector, and is capable of turning relative to the block in a lateral plane which is substantially parallel to the carrier rod 16. The upper end of the feeler point normally lies flush with the upper surface of the block, while the lower end portion thereof projects downwardly below the block and is sharpened to rest upon the surface of the cloth between the lay-beam and the breast-beam. The arm is formed intermediate of its ends with a substantially U-shaped bend or crimp 29 that projects laterally on the same side of the rod as the block and feeler point. Two longitudinally disposed flat springs 30 and 31 are placed, respectively, above and below this bend and are rigidly secured thereto at their forward ends, that is, their ends remote from the feeler point. In the present instance a plurality of rivets 32 are inserted through the front ends of the springs and the interposed bent portion of the rod in order to permanently secure these parts together. The upper spring 30 is extended rearwardly beyond the bend and bears upon the upper face of the block 26 and the upper end of the feeler point so as to yieldingly maintain both of these parts against turning movement about their pivots. This spring 30 is preferably formed with a longitudinal bead or rib 33 which is received in grooves 34 in the block and feeler point, such an interlocking connection serving to hold the feeler point more firmly against accidental lateral swinging movement and to guide the block in its pivotal movement. A bolt 35 is passed through both springs 30 and 31 and is housed within the bend 29. This bolt permits the tension of the upper spring 30 to be readily regulated. The lower spring 31 merely serves to strengthen the upper spring.

There may be any suitable number of detectors in the series, according to the width of the cloth. The detectors are spaced apart

at regular intervals, each of said intervals being substantially equal to the length of the throw of the carrier rod 16, so as to insure of the cloth being tested from selvage to selvage during the reciprocation of the carrier rod. However, the arms of the extreme detectors of the series are preferably offset, as indicated at 37, so as to permit the body portions of said extreme detectors to be mounted on the carrier rod at a less distance from the adjacent detectors than the intervals between the remaining detectors. The object of this is to prevent the extreme detectors from coming into contact with the bearings 17 during the reciprocation of the carrier rod. The regular intervals between the feeler points of the detectors are maintained throughout the series.

The tails 23 of the detectors rest against the rear side of the intermediate crank portion of a shipper-rod 38 which is arranged below the carrier rod and is rotatably mounted in journal bearings 39 provided on the breast-beam. The crank of this rod is of sufficient length so that the tails of all of the detectors are in operative relation thereto at all times during the reciprocation of the carrier rod. The shipper rod is substantially parallel to the carrier rod and is formed at its end remote from the elbow lever 11 with an angularly disposed arm 40 that is connected by a link rod 41 with the angularly disposed arm 42 of the dagger-lifter. The dagger-lifter is in the form of a rod 43 which is journaled in bearing ears 44 upstanding from the side edges of the plate 45. The plate is suitably secured to the supporting frame B of the loom. The rod 43 is formed between the bearing ears with a crank 46 normally lying flat against the plate 45. A dagger 47 rests on the crank 46 and is normally supported thereby out of the path of movement of a bunter 48 which is secured by means of an angle bracket 49, to the lay-beam E. The dagger is pivotally connected at one end to one arm of a knock-off lever 50, fulcrumed at an intermediate point on the frame B. The other arm of the knock-off lever bears against the shipper lever K during the operation of the loom.

In the practical operation of the invention, motion is transmitted from the lay-sword F to the carrier rod 16 to effect the automatic reciprocation of the latter during the operation of the loom. The feeler points 27 of the series of detectors are thus moved back and forth over the surface of the cloth. If one of the feeler points encounters an inequality of the surface of the cloth during its lateral movement, it is caught therein so that the subsequent movement of the detector causes said point to swing laterally about its pivot and against

the force of the flat spring 30. The support is removed from the arm and the arm swings downwardly by gravity inasmuch as it is considerably heavier than the tail. This results in the independent rotary movement of the detector on the carrier rod 16 whereby to swing the tail forwardly and lift the crank of the shipper rod 38 and partially rotate this rod. The link rod 41 transmits the movement of the shipper rod to the lifter rod 43 to swing the crank 46 upwardly from the plate 45 and lift the dagger 47 into the path of movement of the bunter 48. As the bunter 48 moves forwardly it strikes the dagger and forces the same forwardly to rock the knock-off lever 50. The free arm of the knock-off lever releases the shipper-lever in the usual manner so that the loom is automatically stopped at the first pick after the feeler point is tripped. The defect may, therefore, be conveniently repaired. It is to be particularly noted that as the feeler point has a yielding lateral swinging movement in the direction of its reciprocation, there will be no liability of the point injuring the cloth when it is caught in an inequality therein. The stop motion is similarly set in motion when any one of the feeler points drops through a thin place in the cloth. The feeler point has a yielding longitudinal swinging movement so as to move slightly with the cloth until the loom is brought to a standstill. Any damage to the cloth is thus effectually precluded.

It is to be understood that the carrier rod may be reciprocated in any suitable manner and that any suitable means may be employed for releasing the shipper-lever by and upon the independent rotary movement of any one of the detectors. The essential feature of the present invention is the series of detectors which are reciprocated across the cloth so as to test the same from selvage to selvage and to positively detect any defect in the cloth between the reed and the breast-beam. The manner of mounting the feeler point is also quite important so as to insure against damage to the cloth. The arms 22 of the detectors may be readily adjusted with relation to the body portions 18 to cause the feeler points to bear upon the cloth at any desired distance from the breast-beam.

Having thus described the invention, what I claim is:

1. In a loom, a detector, means for both supporting the detector and moving the same across the cloth, and means controlled by the detector and operating independently of the aforesaid means, for automatically stopping the loom.

2. In a loom, a detector bearing against the cloth, means for supporting the detector and moving the same across the cloth, means

permitting the detector to have an independent movement relative to the said means upon encountering a defect in the cloth, and means actuated by the independent movement of the detector and operating independently of the first-named means for automatically stopping the loom.

3. In a loom, a support, a detector mounted on the support and bearing against the cloth, means for moving the detector across the cloth, means permitting the detector to move in another direction and relatively to the support upon engaging a defect in the cloth, and means to which the last-mentioned movement is imparted to stop the loom.

4. In a loom, a series of detectors bearing against the cloth, means for carrying the series of detectors across the cloth, and means actuated by any one of the detectors and operating independently of the carrying means, to stop the loom.

5. In a loom, a carrier rod extending transversely of the loom, a series of detectors projecting laterally from the carrier rod and extending longitudinally of the loom, said detectors being rotatably mounted on the carrier rod for movement in a vertical plane, means for confining each detector against longitudinal movement on the rod, means for reciprocating the carrier rod in the direction of its length, and means actuated by the vertical movement of any one of the detectors for stopping the loom.

6. In a loom, a carrier rod provided with a plurality of pairs of longitudinally spaced collars, a detector rotatably mounted on the rod between the collars of each pair and confined thereby against longitudinal movement on the rod, means for reciprocating the rod in the direction of its length, and means controlled by the detectors for automatically stopping the loom.

7. In a loom, a series of pivoted detectors bearing against the cloth and provided with tails projecting beyond the pivotal axis of the detectors, means for reciprocating the series of detectors across the cloth being woven, means permitting the detectors to have an independent movement relative to the reciprocating means upon encountering a defect in the cloth, and loom stopping means normally out of engagement with all of the detector tails but arranged in operative relation thereto and adapted to be actuated by the independent movement of any one of the detectors to stop the loom.

8. In a loom, a series of detectors bearing against the cloth, means for moving the series of detectors across the cloth, means for permitting each detector to have an individual movement upon engaging a defect in the cloth, and loom stopping means arranged in operative relation to each one of

the detectors and actuated by the individual movement of any one of the same to stop the loom.

9. In a loom, a reciprocating carrier rod, a detector arm rotatably mounted on and projecting at right angles from the carrier rod and bearing against the cloth, means for confining the detector arm against longitudinal movement relative to the carrier rod, means controlled by the rotary movement of the detector arm for automatically stopping the loom, a feeler point pivotally connected to the extremity of the detector arm and having free movement in a plane parallel to the plane of movement of the carrier rod, and means for yieldingly holding the point against movement independent of the carrier rod.

10. In a loom, a detector arm, means for supporting the detector arm and moving the same across the cloth, means for permitting the detector arm to move independently of the said means to stop the loom, a feeler point carried by the detector arm and bearing against the cloth to hold the arm against said independent movement, means for permitting the feeler point to be tripped in the direction in which the arm is moved by the first-named means, and means for yieldably holding the feeler point in normal position.

11. A detector including a detector arm mounted to swing longitudinally, a feeler point connected to the arm for lateral movement relative thereto, means for normally holding the feeler point against said relative movement, and means for moving the arm laterally across the cloth.

12. A detector including a pivotally mounted detector arm, a feeler point connected to the detector arm and having an independent movement in a plane at an angle to the plane of movement of the detector arm, and means for yieldably holding the point against independent movement.

13. A detector including a detector arm and a feeler point connected to the detector arm for independent movement in substantially perpendicular planes.

14. A detector including a detector arm, a feeler point connected to the detector arm for independent movement in substantially perpendicular planes, and means for yieldably holding the point against independent movement in both planes.

15. A detector including a detector arm, a block movably connected to the arm, a feeler point connected to the block and movable therewith in one plane, the feeler point being movable relative to the block in another plane, and means for yieldably holding both the block and the feeler point against movement.

16. In a loom, a detector bearing against

the cloth, means for supporting the detector and moving the same across the cloth, a shipper rod mounted independently of the detector and having a crank disposed in the direction of movement of the detector and arranged at all times in an operative relation thereto, and means for permitting the detector to move independently of the sup-

porting means to turn the crank of the shipper rod to stop the loom.

In testimony whereof, I affix my signature in presence of two witnesses.

GEORGE W. C. CHAPMAN. [L. S.]

Witnesses:

JOHN WINY,

FRANK L. McILWAIN.

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