No. 729,046. PATENTED MAY 26, 1903.

C. H. DRAPER.

SELVAGE MOTION FOR LOOMS.

APPLICATION FILED NOV. 13, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig: 1.

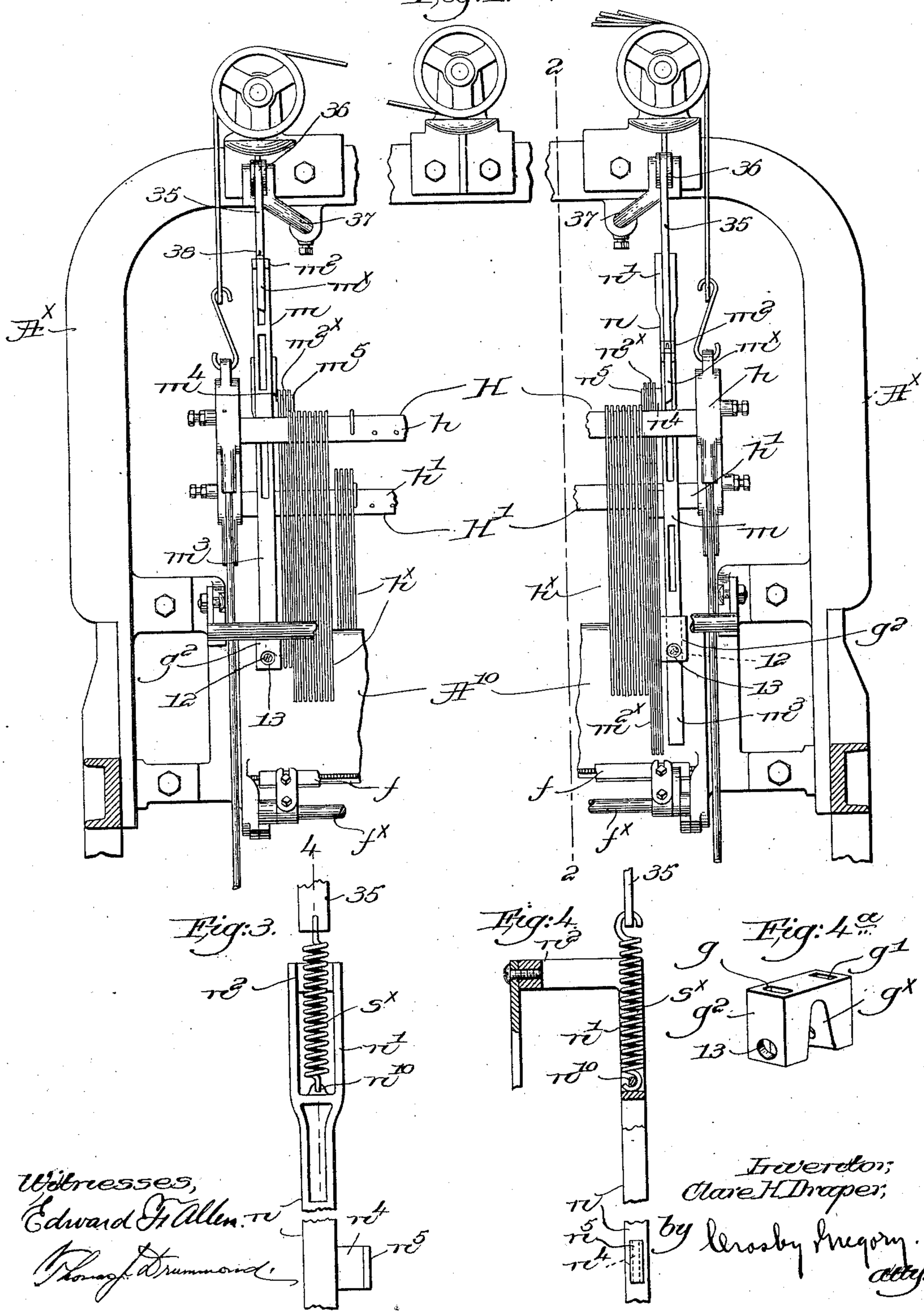

Fig: 3.

Fig: 4.

Fig: 4a.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig: 5.

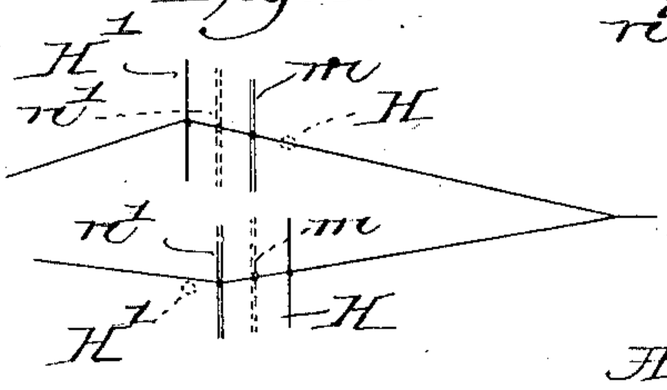
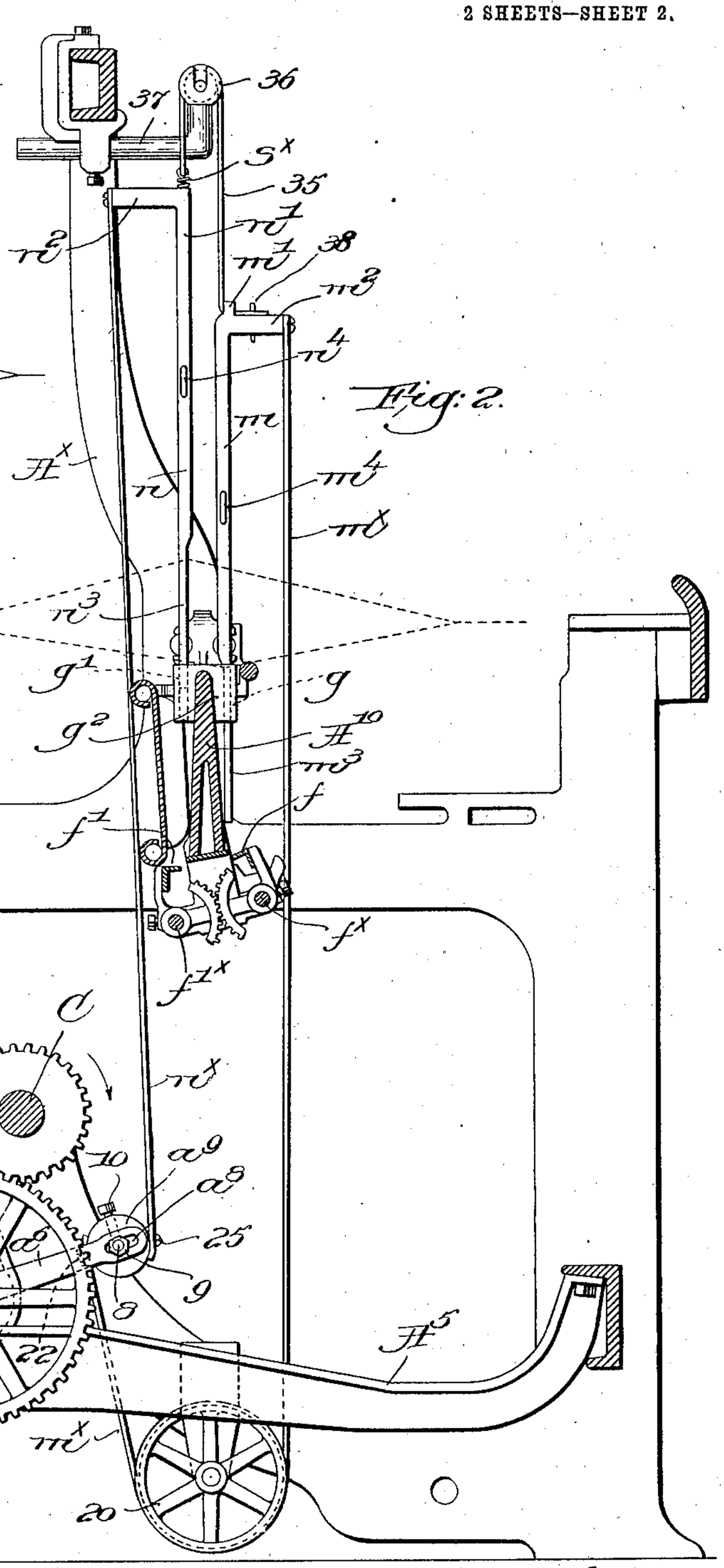


Fig: 2.



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UNITED STATES PATENT OFFICE.

CLARE H. DRAPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

SELVAGE-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 729,046, dated May 26, 1903.

Application filed November 13, 1902. Serial No. 131,101. (No model.)

To all whom it may concern:

Be it known that I, CLARE H. DRAPER, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Selvage-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of a novel selvage-motion for looms whereby the production of a uniform smooth selvage is effected without crinkles or wrinkling and whereby faults and accidents sometimes occurring from improper action of the selvage-motion are obviated.

It frequently happens that the shuttle is diverted from its proper path because the opening of the selvage-shed is not substantially the same as the main-shed opening, and this is particularly apt to happen if some of the selvage-warps should happen to become unduly slack. Because of the narrower opening of the selvage-shed the point of the shuttle will sometimes catch in such slack threads, and be thereby thrown out of the loom, or it may pass over the warps, making an imperfection in the cloth.

In my present invention I have provided means to cause the planes of the selvage-shed to be substantially in alinement with the planes of the main shed, so that such accidents cannot occur. Furthermore, the selvage-warps are not subjected to undue strain or stretching and the cloth produced is more uniform in appearance and character. I have also provided in connection with the selvage-motion warp-stop-motion-controlling detectors, whereby the loom may be stopped automatically upon breakage or failure of a selvage-warp.

The various novel features of my invention will be described fully in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a front elevation, centrally broken out, of a portion of a loom, principally the shed-forming mechanism, with one embodiment of my present invention applied thereto. Fig. 2 is a transverse sectional view of the loom on the line 2 2, Fig. 1, looking toward the right, the main harness members being omitted and other parts of the loom illustrated which are not shown in Fig. 1. Fig. 3 is an enlarged detail, broken out and in front elevation, of a portion of the back harness member of the selvage-motion to be described. Fig. 4 is a partial vertical section thereof on the line 4 4, Fig. 3. Fig. 4ª is an enlarged perspective view of one of the guides for the selvage harness members, and Fig. 5 is a diagrammatic view of the shedding mechanism to be referred to.

I have herein shown my invention in connection with a loom wherein warp-stop-motion-controlling detectors are employed of the type shown in United States Patent No. 536,969, dated April 2, 1895, the heddles serving also as detectors; but it is to be understood that my invention is not restricted to such particular type of apparatus.

The arch $A^{\times}$ of the loom-frame is shown in Fig. 1 as having means for overhead suspension of the main harness-frames H H′, two only being shown for convenience, said frames having cross-bars $h\,h'$, upon which are mounted heddle-detectors $h^{\times}$, which may be substantially as in the patent referred to. At their lower ends the two series of heddle-detectors are divided by a transverse separator A^{10}, extended across the loom and serving as a back-stop for a released detector. Vibratable feelers $f\,f'$ (see also Fig. 2) are mounted on rock-shafts $f^{\times}\,f'^{\times}$, geared together, as therein shown, and operating in well-known manner, a released detector engaging and arresting a feeler and effecting automatically the stoppage of the loom.

In Fig. 1 the front harness-frame H is shown as up and the back frame H′ down, and, as is well understood by those skilled in the art, the front harness-frame has a shorter stroke than the one or more behind it in order that the shed-opening may be the same whether the front harness is up or down.

The usual selvage-motion comprises two oppositely-movable vertically-reciprocating harness members for the selvage-warps and arranged at the sides of the main-shed-forming mechanism, somewhat back of the front main harness member. These selvage har-

ness members have heretofore been given strokes of practically equal length, so that the selvage-shed has not had the same opening as the main shed, and the faults and accidents in operation hereinbefore referred to have been largely due to this fact.

In my present invention I have provided means to effect a differential movement of the selvage harness members, whereby the back harness member has a longer stroke than the front one, the latter member having a stroke slightly longer than that of the front main harness member, so that the selvage and main shed openings will be substantially the same—that is, by my invention the planes of the selvage-sheds will coincide or be in substantial alinement with the planes of the main shed whether the back harness member of the selvage-motion be up or down.

Referring to Fig. 2, the usual cam-shaft C has a gear c fast upon it in mesh with a larger gear c' on a selvage cam-shaft C', the latter being provided with the selvage-motion cams C^2, one adjacent each side of the loom, only one of the cams being shown in Fig. 2. On the adjacent cross-girth A^5 is fulcrumed at a^5 a swinging actuating-arm a^6, extended toward the front of the loom and provided with a roller or other stud a^7 in engagement with the groove c^2 of the selvage-motion cam. The free inner end of the arm a^6 has a longitudinal slot a^8 to receive a stud 8, held fast by a nut 9, said stud having mounted upon it a sheave or drum a^9, rigidly held on the stud by a set-screw 10.

I have shown a guide-block g^2 mounted on the separator A^{10}, at each end thereof, one of the blocks being shown separately in Fig. 4^a, it having a notch or recess $g^\times$ in its under side to straddle the top of the separator, and being held in place thereon by a short screw 12, access to the head thereof being had through a hole 13 in the guide-block. Parallel upright slots or guideways g g' are made in each guide-block at each side of the notch $g^\times$, (see Figs. 2 and 4^a,) so that when the blocks are in position the guideways will be located in front of and behind the separator, respectively. The guideways receive the lower ends of the reciprocating vertically-movable harness members of the selvage-motion, two of such members at each side of the main-shed-forming harnesses. The front harness member of each pair consists as herein shown of an elongated rigid metal bar m, having an eye m' at its upper end and a forwardly-projecting offset m^2, the lower portion of the bar being reduced in thickness, as at m^3, to enter and slide freely in the guideway g. A flexible strap or band $m^\times$, of leather, metal, or other suitable material, is secured at its upper end to the offset m^2 and is carried down in a substantially vertical path to and around a guide-sheave 20, mounted on the cross-girth A^5, the strap or band being then upturned and having its lower end secured to the drum or sheave a^9 by a fastening 22, Fig. 2, on the part of the drum nearer the fulcrum of the arm a^6. A lateral projection m^4 on the inner face of the bar m, above the guide-block g^2, has a slightly-enlarged head m^5, Fig. 1, and onto this projection or support m^4 are strung the desired number of selvage-heddles $m^{2\times}$, the latter in the present instance also serving as warp-stop-motion detectors and being longitudinally slotted to have a limited longitudinal movement relative to the support. The head m^5 of the support prevents the heddles from slipping off, the heddles being snapped over the head onto the support.

In Fig. 1 the front selvage harness member m is shown raised at the left, and at the right the corresponding member is down, the flexible connection $m^\times$ being broken off in each instance. The back selvage harness member is also shown as an elongated bar n, having a rearwardly-extended offset n^2 at its upper end, and the bar is reduced in thickness at its lower end at n^3 to enter and slide freely in the guideway g', and the bar is provided with an inturned lateral heddle-support n^4, provided with a slightly-enlarged head n^5 to sustain the back set of selvage-heddles $n^{2\times}$. (Shown at the right, Fig. 1.) A flexible band or strap $n^\times$ is attached at its upper end to the offset n^2 and is carried thence directly to the sheave or drum a^9 and secured thereto by a fastening 25 on its front portion farthest from the fulcrum of the arm a^6. The upper end of the bar n is somewhat differently shaped, as will be manifest from Figs. 3 and 4, the bar being forked or bifurcated to form an open head n', the offset n^2 being shown as a continuation thereof. A spring $s^\times$ is housed within the head and secured at its lower end to an eye n^{10} at the lower end of the head, the upper end of the spring being attached to a flexible band or strap 35, which is carried up and over a sheave 36, rotatably mounted in a bracket 37 on the arch, the other end of the strap being passed through the eye m' of the front member m and secured by a pin 38. The strap thus constitutes an overhead connection between the front and back selvage harness members, and by virtue of the spring $s^\times$ said connection is longitudinally yielding or extensible.

By reference to Fig. 2 it will be obvious that the swinging movement of the arm a^6 will, through the flexible connections $m^\times$ $n^\times$ and the overhead connection 35, impart a longitudinal reciprocation to and oppositely move the selvage harness members of each pair, alternately raising and lowering them to form the selvage-shed. It will also be obvious that the fastening 25 moves through a longer arc than will the fastening 22, and consequently the back harness member of the selvage-motion will have a longer stroke imparted to it than is imparted to the front member. Owing to this difference in their strokes the overhead connection between the two members must be capable of extensibility

or longitudinal yielding, and to this end the spring $s^{\times}$ is employed, the tension thereof being great enough to keep the flexible connections taut, while expanding for the difference in strokes.

The selvage-motion is so arranged that when the front harness member is up its selvage-warps will be in the upper plane of the main shed, such position being indicated at *m*, Fig. 5, and when it is down, as in dotted lines, its warps will be in the lower plane of the main shed. In order to effect this, the stroke of the front harness member of the selvage-motion is a little longer than that of the main front harness H, Fig. 5, owing to the relative positions of the latter and the front selvage harness member. Of course this difference will be slight, for herein the distance between the front, main, and selvage harnesses is very slight. The back harness member of the selvage is farther back, however, and it is given a considerably longer stroke than its fellow, as will be manifest from an inspection of Fig. 5, the stroke being long enough to bring the selvage-warps into substantial coincidence or alinement with the upper or lower plane of the main shed, depending upon whether the member *n* is in dotted-line or full-line position, respectively, Fig. 5.

The selvage-heddles move up and down at the sides of the main heddles, the separator A^{10} being interposed between the front and back groups of the selvage-heddles, and upon failure of a selvage-warp its heddle, acting as a detector, drops and arrests the movement of the proper feeler, effecting loom stoppage automatically in well-known manner.

While I have shown my selvage-motion in connection with a particular type of heddle, both for main and selvage warps, my invention is by no means restricted thereto, for the selvage-motion is equally well adapted for employment with other forms of heddles and without the warp-stop-motion feature.

So far as I am aware it is broadly new to provide a selvage-motion wherein means are provided for effecting substantial alinement between the planes of the main and selvage sheds.

By loosening the set-screw 10 the drum or sheave a^9 can be turned in one direction or the other to adjust the connected harness members of the selvage.

The main harness members can be operated in the same way that I have herein devised for operating the selvage mechanism, as will be manifest to those skilled in the art.

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

1. In a loom, main-shed-forming mechanism, independent-shed-forming mechanism for each selvage, and means to cause the planes of the selvage-sheds to substantially coincide with the planes of the main sheds.

2. In a loom, main-shed-forming mechanism, independent-shed-forming mechanism for each selvage, including oppositely-moving harness members for the selvage-warps, and means to impart to the back harness member of each selvage mechanism a greater stroke than to its corresponding front member, to thereby bring the planes of the selvage and main sheds into substantial coincidence.

3. In a loom, main-shed-forming mechanism, independent-shed-forming mechanism for each selvage, including oppositely-moving harness members for the selvage-warps, and means to cause a differential reciprocating movement of the selvage harness members, to thereby bring the planes of the selvage-sheds into substantial alinement with the planes of the main shed.

4. In a loom, main-shed-forming mechanism, independent-shed-forming mechanism for each selvage, each selvage mechanism including two oppositely-moving harness members, and means to positively reciprocate them and to impart to the back harness member the longer stroke, to effect substantial alinement of the planes of the main and selvage sheds.

5. In a loom, main-shed-forming mechanism, independent-shed-forming mechanism for each selvage, including oppositely-moving harness members for the selvage-warps, an overhead, longitudinally-extensible connection between each pair of such members, and means to positively reciprocate them and impart to the back harness member of each pair the longer stroke.

6. In a selvage-motion for looms, two vertically-reciprocating and oppositely-movable harness members for the selvage-warps, a flexible connection, including a spring, between said harness members, a positively-actuated swinging arm, and connections between the harness members and the arm, the connection between the back harness member and said arm being the farther from the fulcrum of the latter, to impart the longer stroke to said harness member.

7. In a selvage-motion for looms, two vertically-reciprocating and oppositely-movable harness members for the selvage-warps, a flexible connection, including a spring, between said harness members, a common, positively-moved actuator operatively connected with both harness members, to reciprocate them and means to effect a longer stroke of one than of the other of said harness members.

8. In a selvage-motion for looms, two reciprocating, oppositely-movable harness members each consisting of a rigid, elongated bar, a laterally-extended support thereon, and one or more detector-heddles sustained by the support and having a limited vertical movement relatively thereto, and means to reciprocate the harness members and impart to the back member the longer stroke.

9. In a selvage-motion for looms, two reciprocating, oppositely-movable harness members each consisting of a rigid, elongated bar, an inturned, lateral support thereon having an enlarged end, and one or more detector-heddles having longitudinal slots to be loosely entered by the support and sustained thereby, a longitudinally-extensible connection between the harness members, and means to positively reciprocate them and impart the longer stroke to the back member.

10. In a loom, main-shed-forming mechanism, a separate selvage-motion at each side thereof, each selvage-motion including two oppositely-movable, reciprocating harness members for the selvage-warps, and means to cause the planes of the selvage-sheds to be substantially in alinement with the planes of the main shed when open for the passage of the shuttle.

11. In a loom, main-shed-forming mechanism, a separate selvage-motion at each side thereof, each selvage-motion including two oppositely-movable, reciprocating harness members provided with warp-stop-motion-controlling detectors for the selvage-warps, and means to cause the planes of the selvage-sheds to be substantially in alinement with the planes of the main shed when open for the passage of the shuttle.

12. In a loom, main-shed-forming mechanism, including warp-stop-motion-controlling detectors, selvage-shed-forming mechanism, also including warp-stop-motion-controlling detectors, a common feeler to coöperate with a main or a selvage detector when released, and means to cause the planes of the selvage-sheds to be substantially in alinement with the planes of the main shed when open for the passage of the shuttle.

13. In a loom, shed-forming mechanism, including oppositely-moving harness members for the warps, a flexible connection, including a spring, between such members, and a common, positively-moved actuator operatively connected with the harness members, to reciprocate them and impart a longer stroke to one than to the other.

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

CLARE H. DRAPER.

Witnesses:
FRANK J. DUTCHER,
O. H. LANE.