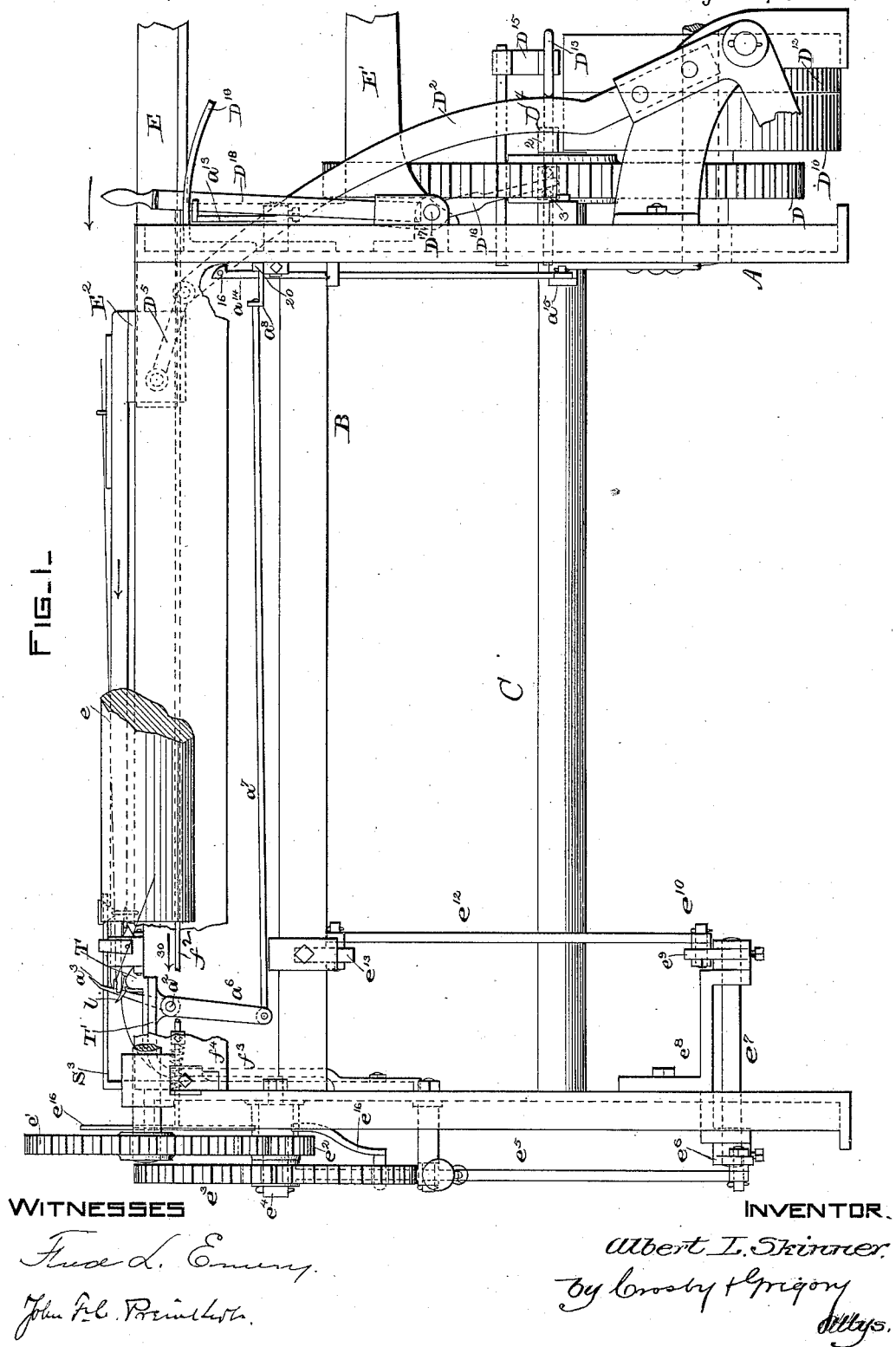


5 Sheets—Sheet 1.

No. 383,079.

Patented May 15, 1888.



(No Model.)

5 Sheets—Sheet 2.

A. L. SKINNER.
NEEDLE LOOM.

No. 383,079.

Patented May 15, 1888.

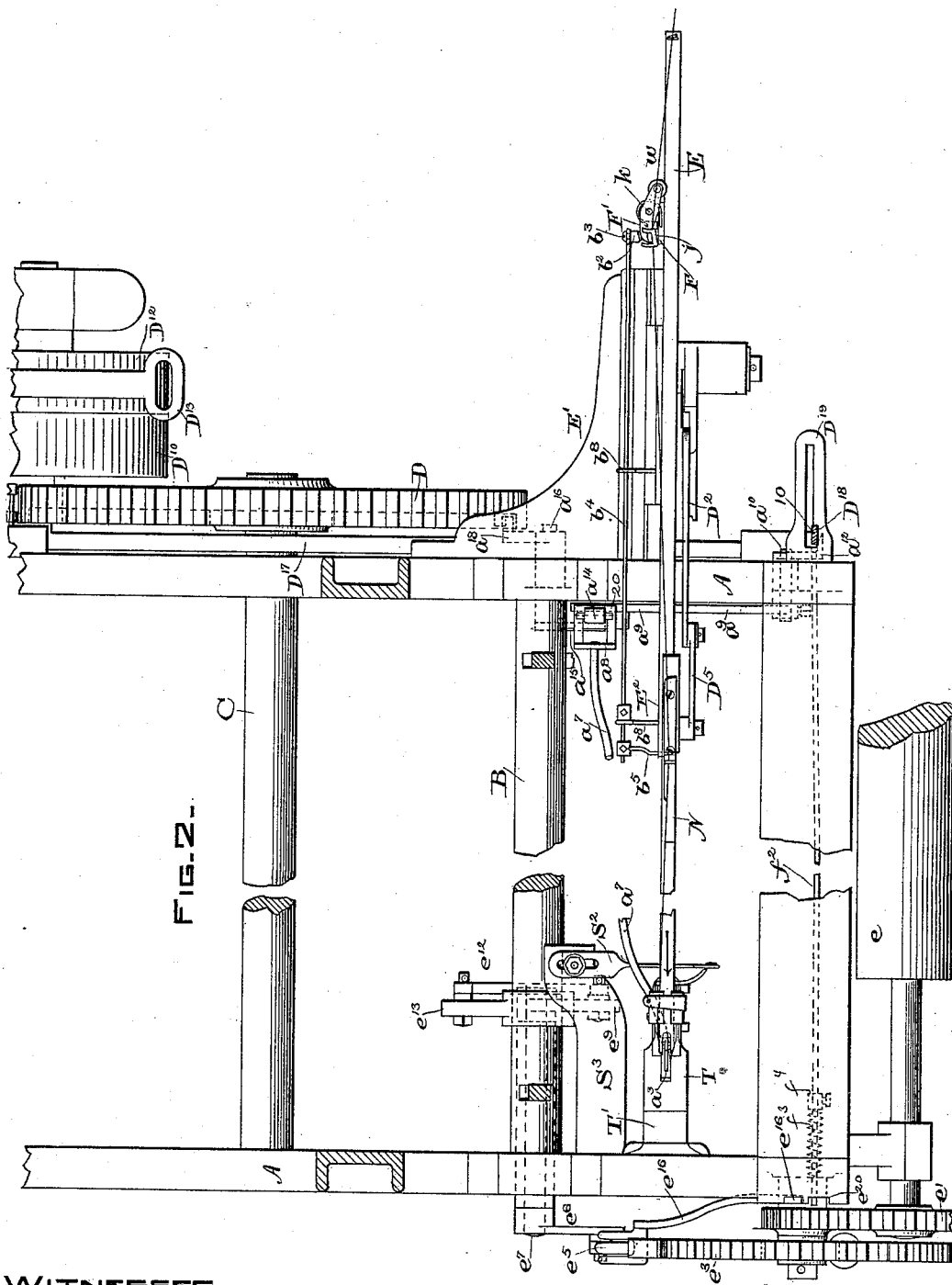


FIG. 2--

WITNESSES,

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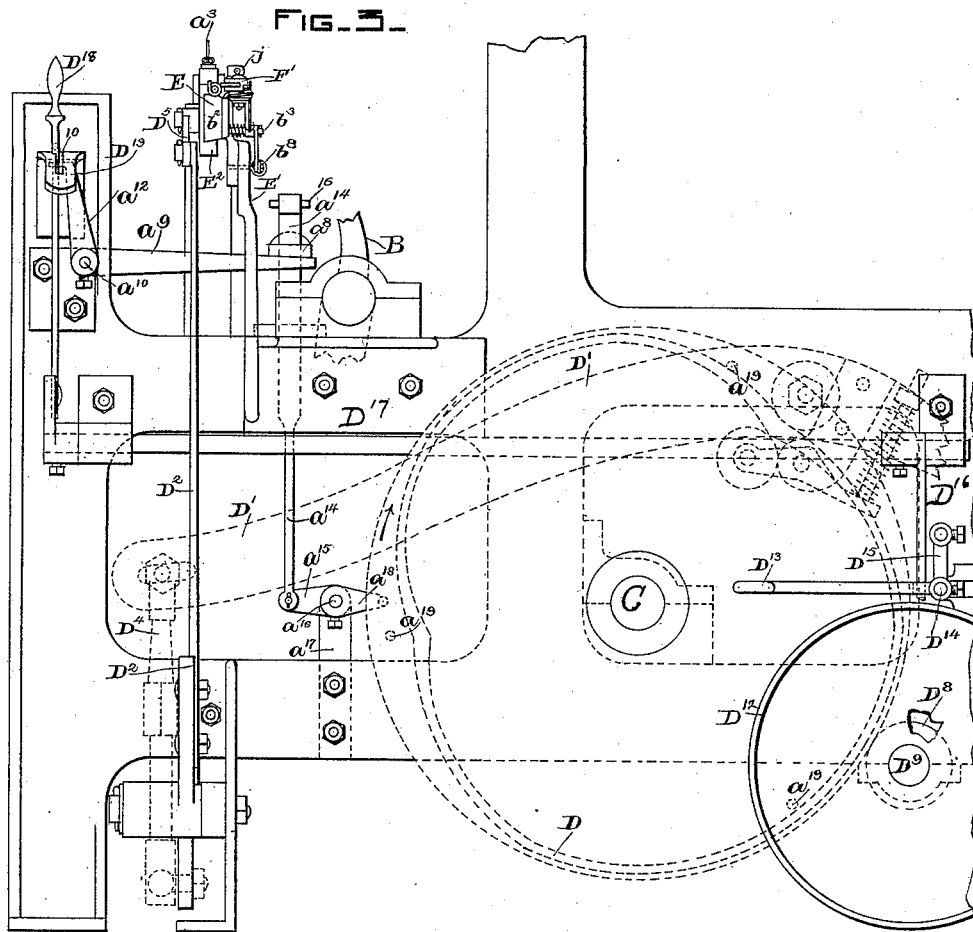
(No Model.)

5 Sheets—Sheet 3.

A. L. SKINNER.
NEEDLE LOOM.

No. 383,079.

Patented May 15, 1888.



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(No Model.)

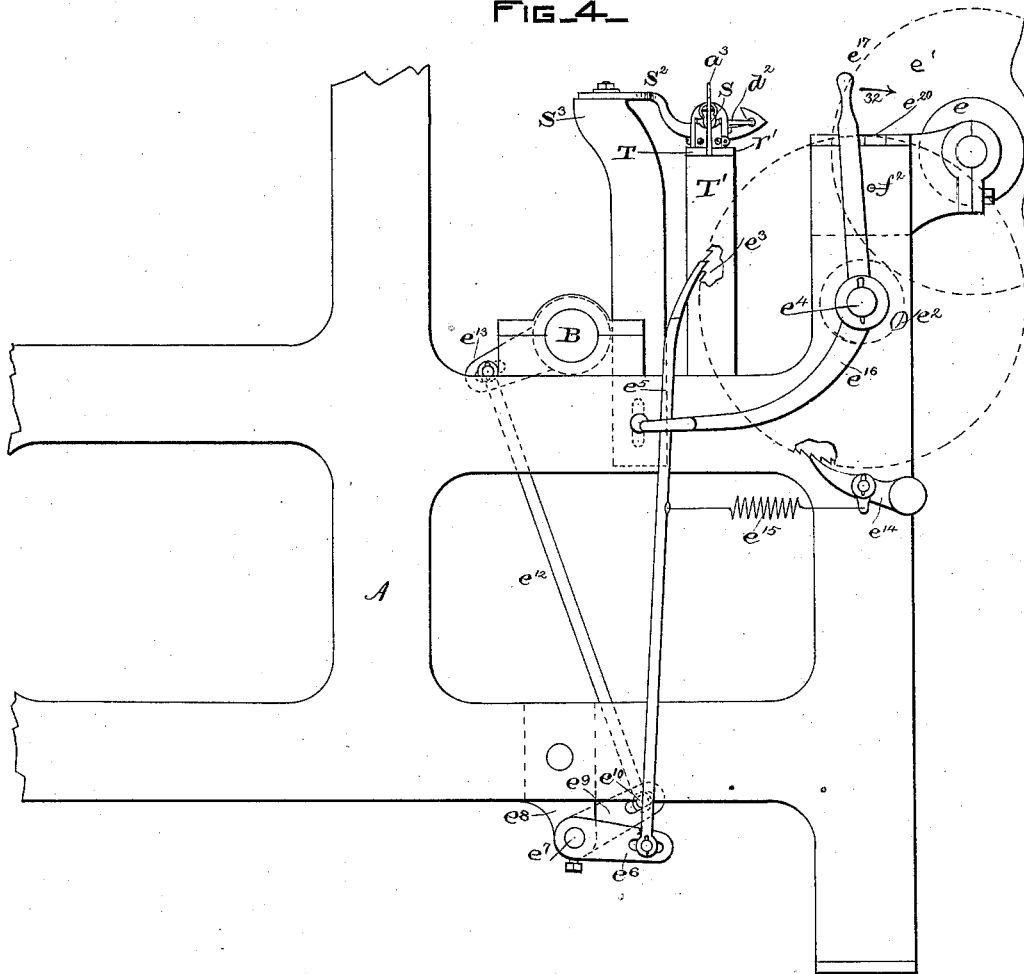
5 Sheets—Sheet 4.

A. L. SKINNER.
NEEDLE LOOM.

No. 383,079.

Patented May 15, 1888.

FIG. 4.



WITNESSES

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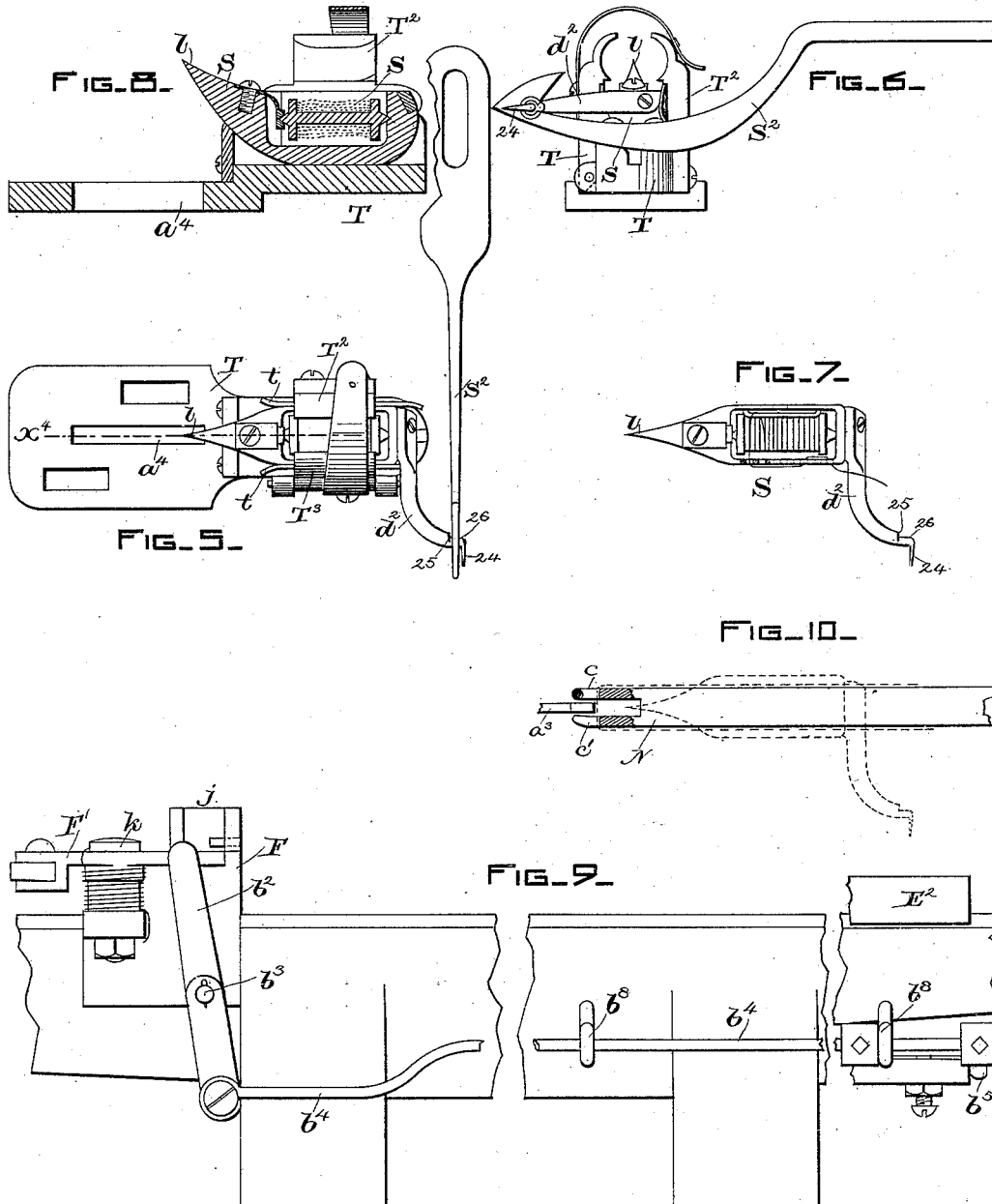
(No Model.)

5 Sheets—Sheet 5.

A. L. SKINNER.
NEEDLE LOOM.

No. 383,079.

Patented May 15, 1888.



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UNITED STATES PATENT OFFICE.

ALBERT LOUIS SKINNER, OF YONKERS, NEW YORK, ASSIGNOR TO THE
BIGELOW CARPET COMPANY, OF CLINTON, MASSACHUSETTS.

NEEDLE-LOOM.

SPECIFICATION forming part of Letters Patent No. 333,079, dated May 15, 1888.

Application filed April 15, 1887. Serial No. 234,971. (No model.)

To all whom it may concern:

Be it known that I, ALBERT LOUIS SKINNER, of Yonkers, county of Westchester, and State of New York, have invented an Improvement in Needle-Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the class of looms described in United States Patent No. 330,070, granted to me November 10, 1885, by providing the same with a weft stop-motion, which becomes effective to stop the loom in case the weft or filling thread breaks or is not correctly supplied.

In accordance with my invention I have provided the loom, near the shuttle containing the selvage-thread, with an arm or feeler, against which, as the weft carrier or needle moves into position to pass the loop of weft-thread over the upturned point of the shuttle, the weft-thread, when contained in the needle or carrier, is pushed, the said weft-thread acting to turn the said arm or feeler, and through intermediate mechanism, to be described, move into inoperative position a device which, if not thus moved, would be acted upon to release the shipper-handle, and thus effect, in usual manner, the stopping of the loom. In the said patent I have shown and described a shuttle having a long thin tail, along which the weft-thread slides as it leaves the heel of the shuttle, the said tail guiding and delivering the said loop of weft-thread to the feed of the cloth. In practice this long thin tail has been found objectionable because of its lack of strength; so to obviate this objection and insure the formation of a perfect uniform selvage at that side of the fabric where the double shot of weft is locked by the selvage-thread, I have provided the shuttle with a rigid arm, which is extended from its heel, the said arm having a delivery-point, the arm co-operating with an arm-holder, the function and purpose of which are to prevent the weft-thread as it is passing along the said arm from drawing the said arm and the shuttle longitudinally toward the selvage, for if the said arm were free to be drawn toward the selvage

to any appreciable degree the selvage would not be straight and uniform.

My invention consists, essentially, in the combination, with a weft carrier or needle and shuttle to lock its thread, of an arm or feeler against which the weft is pressed by the needle just as the weft-thread is to be locked by the thread carried by the shuttle, substantially as will be described; also, in the combination, with a weft carrier or needle, a shuttle-box, and a shuttle having a rigid arm provided with a delivery-point, of a holder to engage the said arm outside the shuttle-box, whereby a perfect selvage may be made, substantially as will be described.

Other features of my invention will be herein described, and claimed at the end of this specification.

Figure 1 is a partial front elevation of a sufficient portion of a loom, taken in connection with my said patent, to enable my present invention to be understood, the feeding-roll of the take-up mechanism and the breast-beam being partially broken out to show parts behind them. Fig. 2 is a top or plan view of Fig. 1, with, however, more of the needle-slide, the central part of the loom being broken out to save space on the drawings. Fig. 3 is a right-hand elevation of Fig. 2. Fig. 4 is a left-hand elevation of Fig. 2. Fig. 5 is an enlarged top view of the shuttle-box, shuttle, and arm-holder removed from the loom; Fig. 6, a right-hand end elevation of Fig. 5; Fig. 7, a view of the shuttle and its arm; Fig. 8, a section of Fig. 5 in the line x' ; Fig. 9, a detail, to be described, referring to the tension device to nip the weft-thread as it is to be pushed against the feeler; and Fig. 10 is a detail showing the weft-thread stretched across the end of the needle N to act against and turn the feeler.

Referring to the drawings, the loom-frame A, lay B, cam-shaft C, needle N, carriage E², to which it is attached, the connecting-rod D⁵, the lever D², represented by full lines and operated from the cam D, through the link D⁴ and lever D¹, (shown by dotted lines in Fig. 3,) the slide E, on which the carriage is reciprocated, the bracket E', the shuttle bed or box T, the bracket T', on which it is made adjust-

able, the projections *t t* of the shuttle bed or box, the rigid guide-plate *T*², the pivoted guide-plate *T*³, both having at their upper ends flanges, under and between which pass the needle *N*, and the shuttle *S*, with the exception of its long thin tail, the weft-clamp consisting, essentially, of a fixed jaw, *j*, having guiding-eyes for the weft-thread attached to the slideway *E*, plate *F*, and a lever, *F'*, for putting tension on the thread, and pivoted at *k*, are all as in my said patent, wherein like parts are designated by like letters, so that the said parts need not be herein further specifically described.

The cam *D*, herein shown as toothed at its periphery to form a gear, derives its motion from a small pinion, *D*³, on a driving or power shaft, *D*⁰, having usual loose and fast pulleys, *D*¹⁰ *D*¹².

The driving-belt (not shown) is extended through an eye in the arm *D*¹³, forming part of a shipper mechanism, the said arm being attached to a rod, *D*¹⁴, free to slide in suitable guides, as *D*¹⁵ and 2. The rod *D*¹⁴ has projecting from it suitable pins, 3, (see Fig. 1,) which form a notch, in which enters an arm, *D*¹⁶, on the rock-shaft *D*¹⁷, supported in suitable bearings at the loom-side, the said rock-shaft having attached to it the shipper-handle *D*¹⁸, which enters a notched lever-holding plate, *D*¹⁹, attached to the loom-side.

The drawings show the shipper-handle in the position it will occupy when the loom is running.

The bracket *T'* has at its under side suitable ears (see Fig. 1) to receive a short shaft, *a*², to which is secured the "arm" or "feeler" *a*³, as I shall call it, of the stop-motion mechanism, the said feeler rising through a slot in the said bracket and through a slot, *a*⁴, of the shuttle bed or box *T* secured thereto, the said feeler standing opposite the upturned point of the shuttle *S*, so that the needle *N*, as it is about to pass the weft-thread *w* over the upturned beveled or diagonally-placed point *l* of the shuttle, will cause the weft-thread held between the eye *c* and open fork *c'* to be borne or pressed against the feeler and turn it and the rock-shaft *a*². Whenever the feeler is so pressed back by the weft-thread, the loom will continue to move; but in case the weft is absent and does not push back the feeler the loom will be stopped, as will be described. Just at the time that the weft-thread meets the feeler, as described, the weft-thread is checked or subjected to an extra nip or tension, so that the weft-thread when it comes to the said feeler will be checked for an instant, so that it cannot rend through the tension device. To effect this nipping of the threads the tension-lever *F'* is acted upon by a spring-arm, *b*², mounted upon a stud, *b*³, of the plate *F*, attached to the slideway *E*. One end of the said arm *b*² has joined to it a rod, *b*⁴, which is extended along the slideway *E* to a point inside the loom-frame where the said rod is provided with an arm, *b*⁵, and as the carriage *E*² arrives nearly at its farthest inward movement it strikes the said arm *b*⁵ and

turns the spring-arm *b*², causing it to travel along in contact with the lever *F'*, thus increasing the tension on the weft-thread, the said arm and its actuating devices constituting a tension-increasing device.

The rock-shaft *a*² has depending from it an arm, *a*⁵, to which is pivoted a rod, *a*⁷, having at its inner end a loop or eye, *a*⁸, which rests upon an arm, *a*⁹, of a rock-shaft, *a*¹⁰, having a second arm, *a*¹², provided with a finger, (see dotted lines, Fig. 2, and full lines, Fig. 1,) which is extended behind the shipper-handle *D*¹⁸.

In practice the friction of the shipper-handle in the notch 10 of the plate *D*¹⁹ is sufficient to enable it to normally keep the inner end of the arm *a*⁹ lifted, and also to enable it to sustain the weight of the loop *a*⁸ and rod *a*⁷. The loop *a*⁸ has extended through it a rod, *a*¹⁴, having near its upper end a hook (see Fig. 1) and a pin or projection, 16. The rod *a*¹⁴ is jointed to one end of a lever, *a*¹⁵, on a short rock-shaft, *a*¹⁶, having its bearings in a stand, *a*¹⁷, the said rock-shaft having an arm, *a*¹⁸, provided at its end with a suitable lug or projection, which is acted upon, in succession, by one of the pins *a*¹⁹, Fig. 3, (see dotted lines,) attached to the inner side of the cam *D*, there being, as herein shown, three such pins, for the cam *D* is made to actuate the needle *N* three times during each rotation of the shaft *C*.

If the weft-thread is present in the needle, as in Fig. 10, and acts upon the feeler *a*³ to turn it and push the loop *a*⁸ to the right, viewing Fig. 1, just as the hook-rod *a*¹⁴ is pulled down, as described, then the outer end of projection 20 of the loop will be carried out from the path of movement of the hook, so that the loop will not be struck by the hook and the arm *a*⁹ will not be depressed; but should the feeler not be pushed back by the weft, then the hook of the rod *a*¹⁴ will, in its descent, strike the loop *a*⁸, and through it depress the arm *a*⁹ and effect the release of the shipper-handle from its holding-notch in the plate *D*¹⁹, enabling the rod *D*¹⁷ to be turned in usual manner to move the shipper to transfer the usual driving-belt upon the loose pulley, or to effect the stopping of the loom or its driving power. The shuttle *S* at its heel has attached to it a rigid arm, *a*², having a discharging-point, 24, and a shoulder, 25, a neck, 26, falling between the shoulder and point. The neck 26 enters a hole in an arm-holder, *S*², attached to a suitable guide, *S*³, attached to the loom-frame.

The shoulder 25 of the shuttle-arm rests against one side of the arm-holder, and, co-operating therewith, prevents such movement of the shuttle or arm-holder as would result in the formation of an uneven selvage, as would be the case were the arm or extension flexible, as in the shuttle described in the said patent.

The feeding-roll *e*, over which is led the woven carpet after passing beyond the breast-beam—such a feeding-roll as is ordinarily used in looms for weaving Moquette and other carpets—has at one end a toothed gear, *e'*, which

engages a pinion, e^2 , attached to the hub of a ratchet-wheel, e^3 , free to be rotated on a stud, e^4 , extended from the loom-side, the said ratchet-wheel being engaged and moved step by step by a pawl, e^5 , adjustably attached to an arm, e^6 , of a rock-shaft, e^7 , having its bearings in a suitable stand, e^8 , secured to the loom-side, the said rock-shaft at its opposite end having an arm, e^9 , to which is adjustably attached by a stud, e^{10} , a connecting-rod, e^{12} , which at its upper end is adjustably attached to an arm, e^{13} , secured to the rock-shaft of the lay B, the pawl being moved in unison with the lay and rotating the ratchet-wheel to effect the take-up of the carpet or other material being woven.

The detent e^{14} , weighted at one end, engages the wheel e^3 and prevents retrograde motion thereof, the pawl e^5 being normally held pressed toward the ratchet-wheel e^3 , so as to engage its teeth by means of a suitable spring, e^{15} .

The stud e^4 , at the left-hand end of the loom, has mounted upon it a pawl-controlling lever, e^{16} , one end of which embraces the pawl e^5 , the upper end of the said lever projecting, as shown in Fig. 4, above the breast-beam, where it has a handle, as e^{17} , which may be grasped and moved by the operator in the direction of the arrow against the spring e^{15} , and held in the notch e^{20} , (see Fig. 4,) when it is desired to stop the operation of the pawl e^5 and of the take-up, as is frequently necessary—as, for instance, when a wrong row of tufts has been inserted or other error has been made in the weaving.

When the loom is stopped, as described, the take-up is permitted to turn backward to enable the feed of the fabric to be brought into correct position for the insertion of the next pick. This may be readily done whenever the pawl e^5 and detent e^{14} are disengaged from the ratchet-wheel. The loom herein described is provided under the breast-beam with a rod, f^2 , which slides in suitable bearings, the said rod being surrounded by a spring, as f^3 , which acts against the loom-side and against a collar, as f^4 , (see Fig. 1,) the spring normally acting to force the rod toward the shipper-handle.

The operator can move the lever e^{16} to disengage the pawl e^5 from the ratchet-wheel e^3 only when the loom is stopped, and in moving the lever in the direction of the arrow upon it in Fig. 4 its upper arm is brought immediately opposite the end of the rod f^2 , so that when the loom is again started the operator, by taking hold of the shipper-handle D^{18} and moving it in the direction of the arrow immediately above it in Fig. 1, causes the said shipper-handle to act against the end of the rod f^2 , forces the said rod in the direction of the arrow 30, (see Fig. 1,) compresses the spring f^3 , and causes the end of the rod just back of the upper arm of the lever e^{16} to force the said lever out of the holding-notch e^{20} , thus permitting the spring e^{15} to resume control of the pawl e^5 and draw it toward and into engagement with the ratchet-wheel e^3 , the pawl in its

movement also turning the lever e^{16} , so that its upper end travels in a direction opposite to the arrow 32. In this way it will be noticed that the movement of the shipper-handle to start the loom also throws into operative engagement the devices for operating the take-up, so that the latter will be correctly started whenever the loom is started.

I have omitted from the drawings many parts which are fully shown in the patent referred to, which parts will be used in connection with the parts herein described.

I claim—

1. The shuttle, a shipper, the feeler, intermediate connecting mechanism, substantially as described, between the feeler and shipper-lever, and the weft carrier or needle, combined with a tension device for the weft-thread, and with means, substantially as described, to temporarily increase or augment the tension on the weft-thread as the latter in the weft-carrier is pushed against the feeler, substantially as described.
2. The weft carrier or needle, the shuttle containing a thread to lock the loop of thread held by the said needle, and a shipper-lever handle, combined with a feeler, a^3 , and with intermediate mechanism between it and the shipper-handle to effect the release of the shipper-handle when the weft fails, substantially as described.
3. The shipper-handle, its notched holding-plate, the lever a^2 , and rock-shaft a^{10} , having an arm, a^{12} , provided with a projection to engage the shipper-handle, the loop or slide piece, a^8 , supported by the lever a^2 , the feeler a^3 , and means to connect it with the said loop, combined with the hooked bar a^{14} and with means to operate the said hooked bar, substantially as described.
4. The slideway E, the carriage thereon, its attached needle, tension device, and spring-arm b^2 , combined with a rod having an arm which is acted upon by the carriage as the latter arrives at the end of its inward movement to effect the temporary nipping of the thread, substantially as described.
5. The combination, with the slideway E, a carriage thereon, a weft carrier or needle, and a shuttle provided with a rigid arm having a neck and a delivery-point, of an arm-holder loosely engaging the rigid arm of the shuttle, to operate substantially as described.
6. The ratchet-wheel e^3 of a take-up mechanism, the pawl e^5 to move it, means to actuate the said pawl, a lever to disengage the said pawl from the said ratchet-wheel, and a rod, f^2 , combined with the shipper-lever handle to actuate the said rod to release the lever and insure the engagement of the pawl with the ratchet-wheel whenever the shipper-handle is moved to start the loom, substantially as described.
7. The combination, with a guide-bar, a carriage, a weft-carrying needle thereon, a shuttle having a thread to lock the weft-thread, and a shipper-handle and notched

plate for holding it, combined with a feeler and intermediate mechanism, substantially as described, forming a weft stop-motion, the feeler being adapted to be moved by the thread
5 held by the weft carrier or needle, substantially as described.

8. The weft-carrying needle provided with the eyes or notches at its inner end to support the weft-thread at two points, a shipper-lever,
10 and a shuttle having an upturned point, combined with a feeler, as *a'*, located opposite the point of the shuttle and in the line of movement of the weft carrier or needle, and inter-

mediate mechanism between the said feeler and shipper-lever, whereby the weft-thread 15 carrier or needle is made to act against the feeler preparatory to passing the weft-thread over the point of the shuttle, substantially as described.

In testimony whereof I have signed my name 20 to this specification in the presence of two subscribing witnesses.

ALBERT LOUIS SKINNER.

Witnesses:

JAMES WARREN GOODALE,
S. H. THAYER, Jr.