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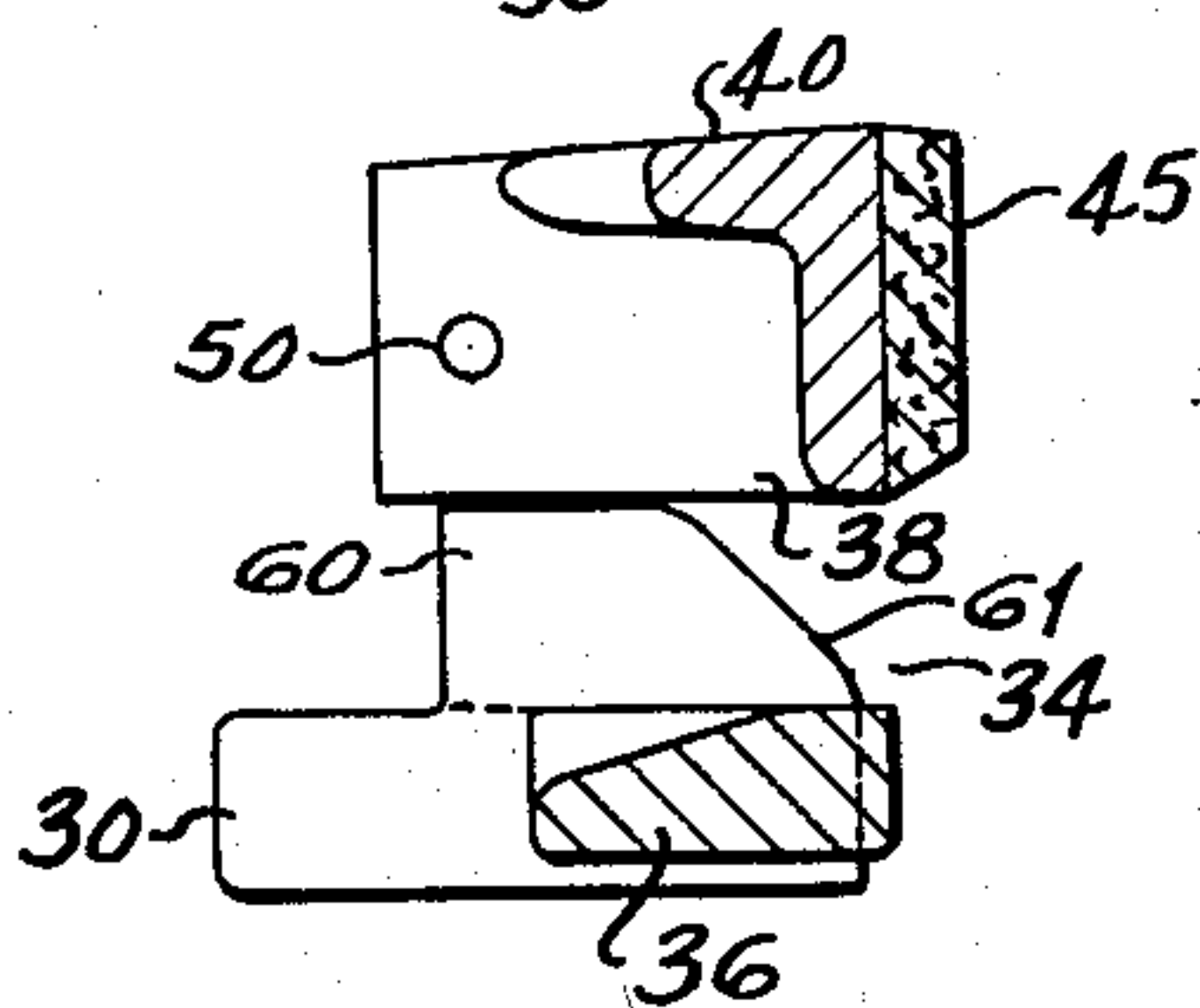
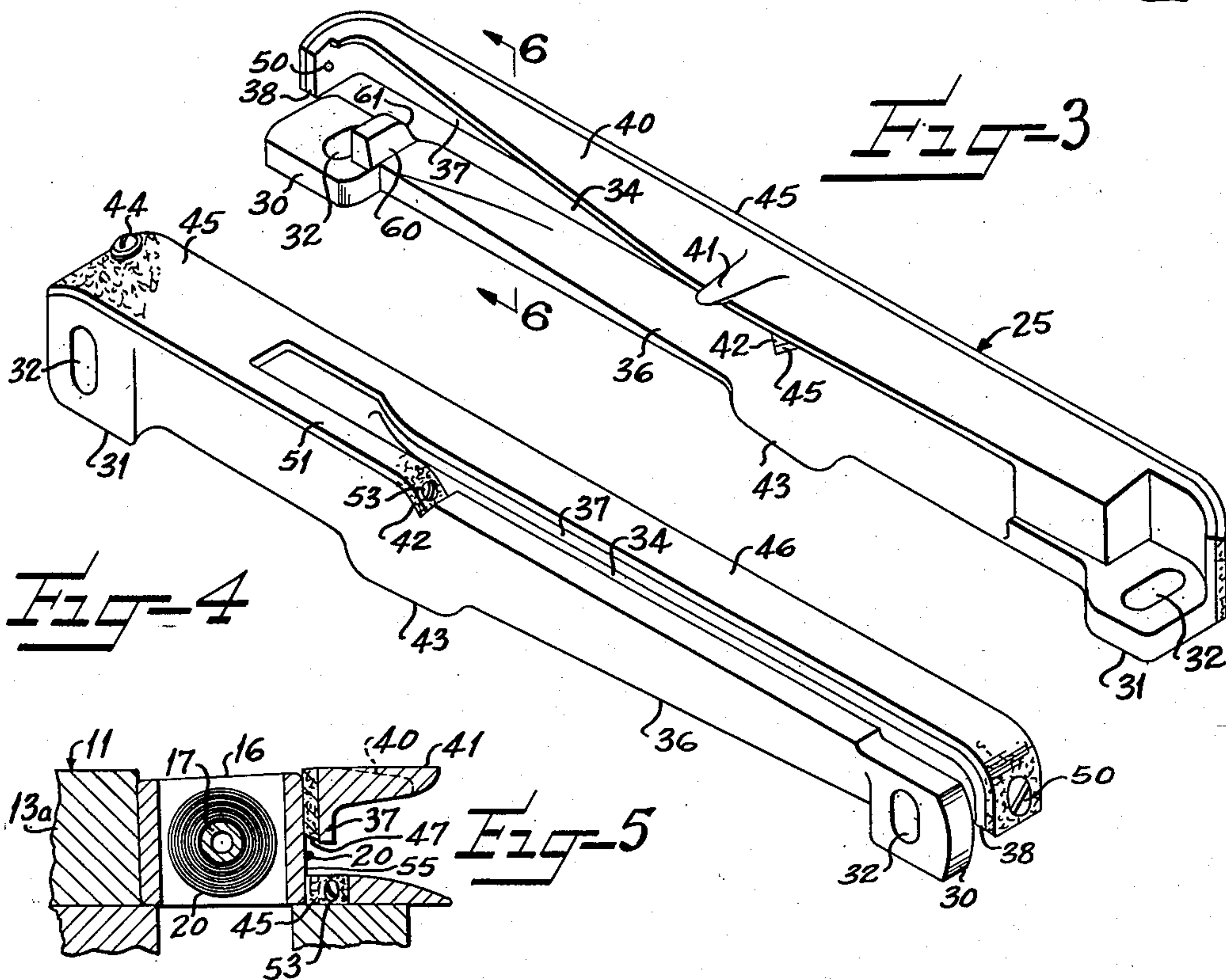
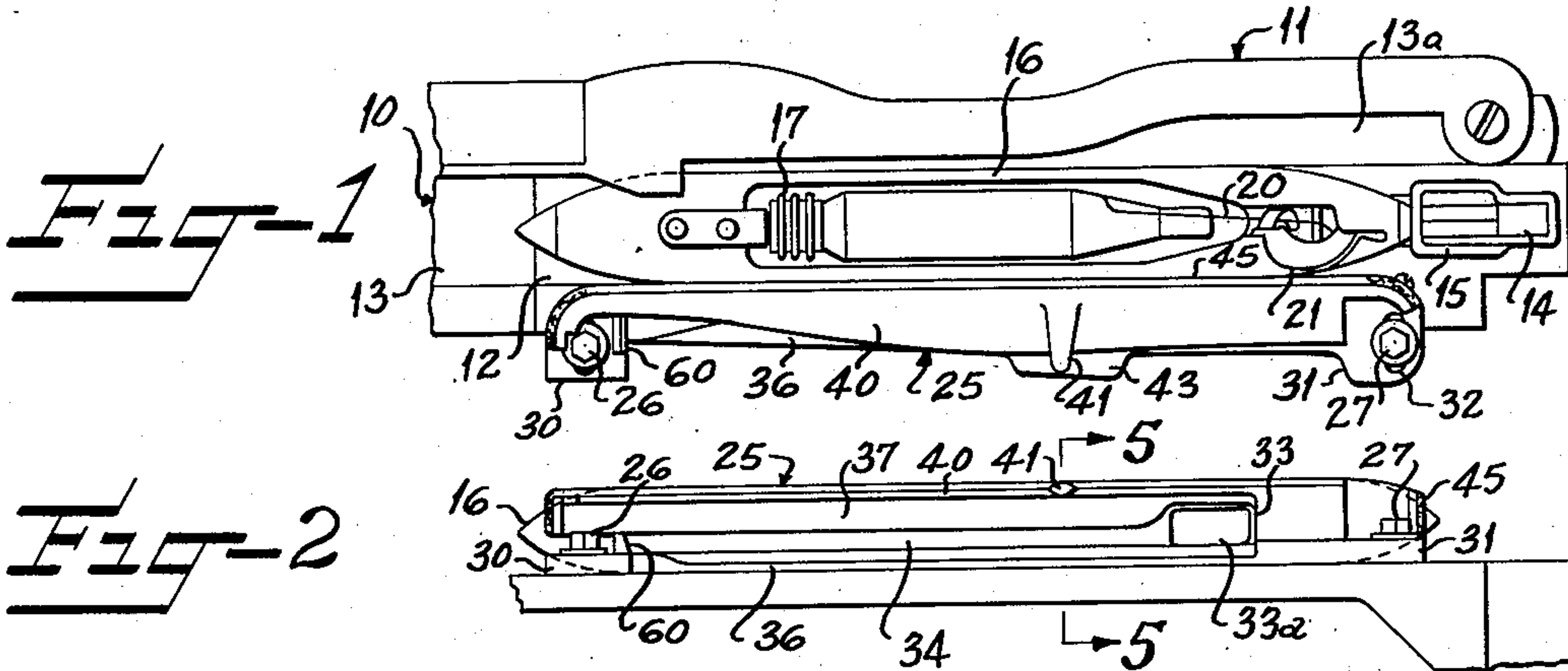
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2,626,636

SHUTTLE BOX FRONT FOR LOOMS

Filed Dec. 19, 1949

2 SHEETS—SHEET 1



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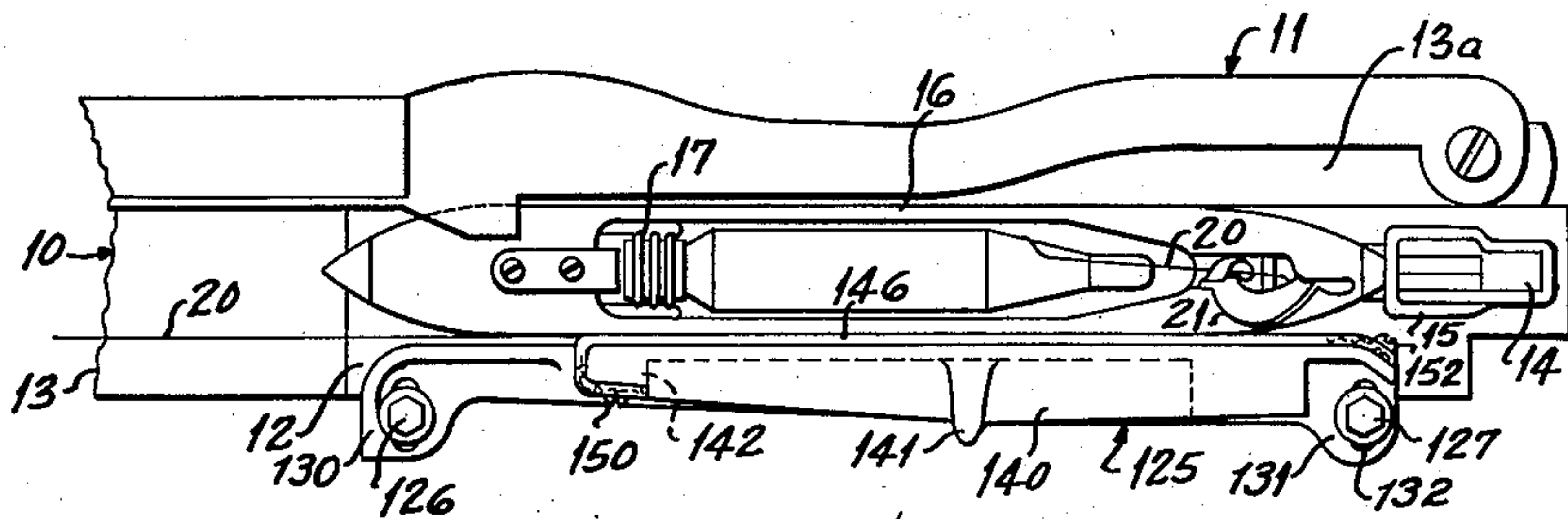
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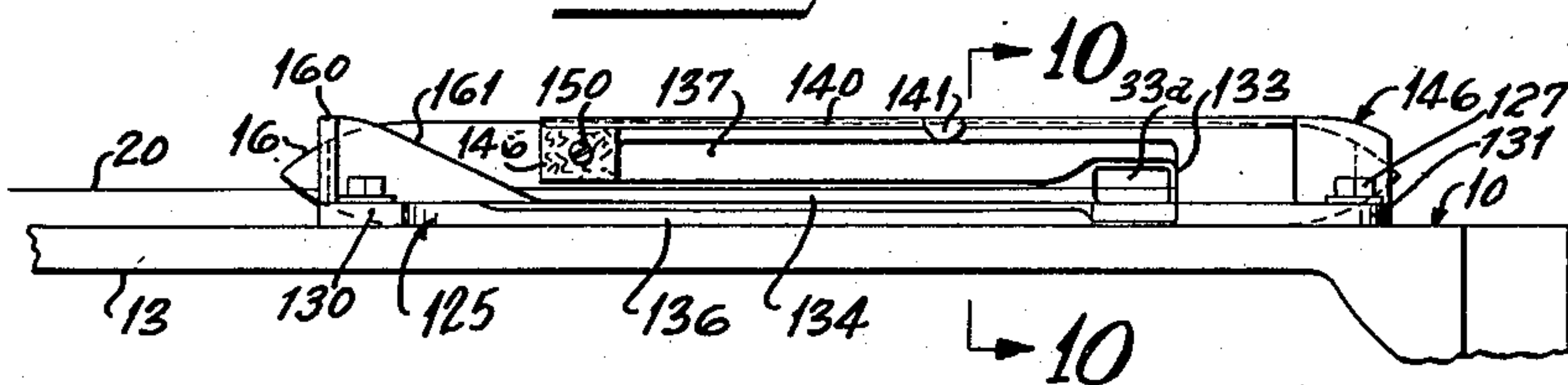
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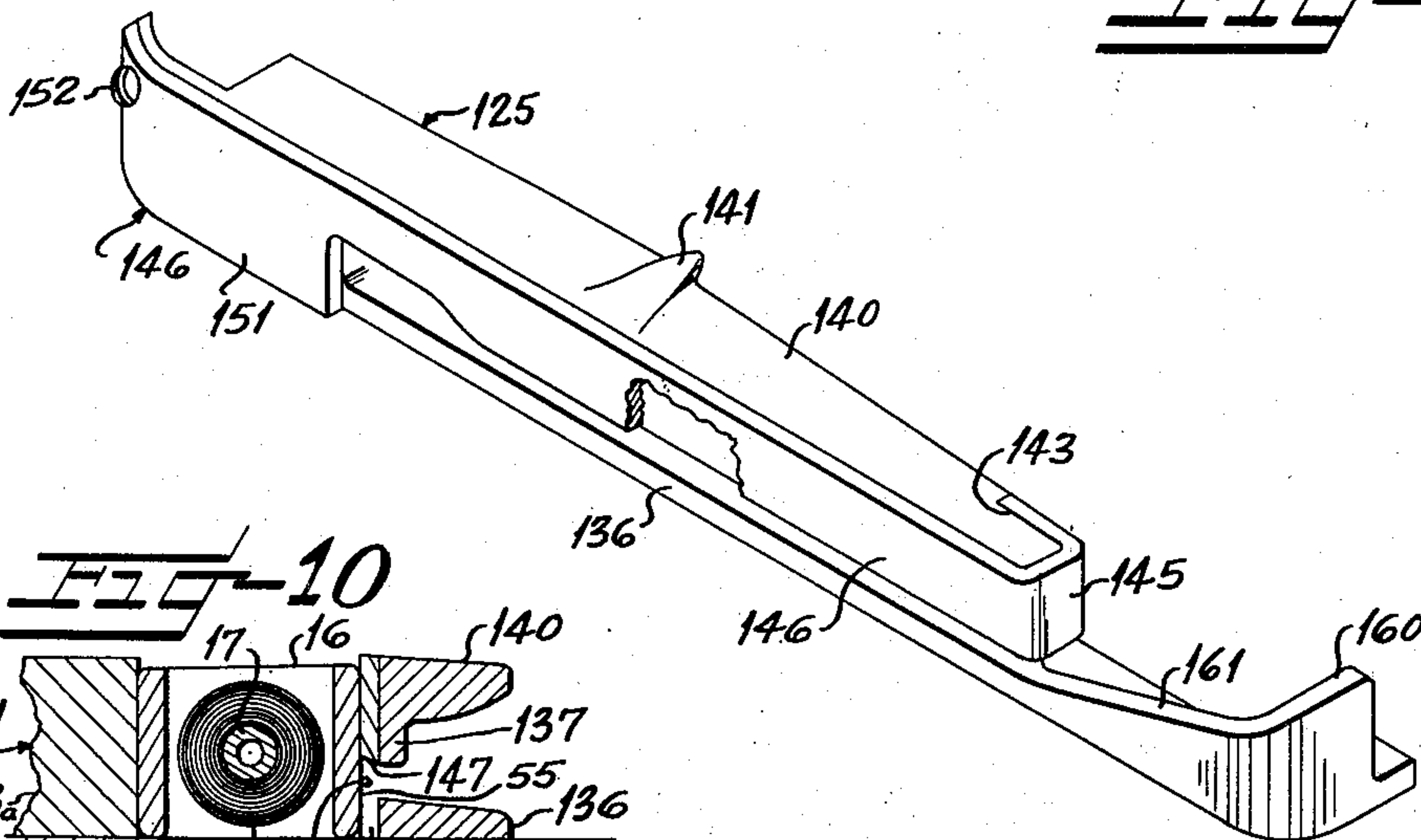
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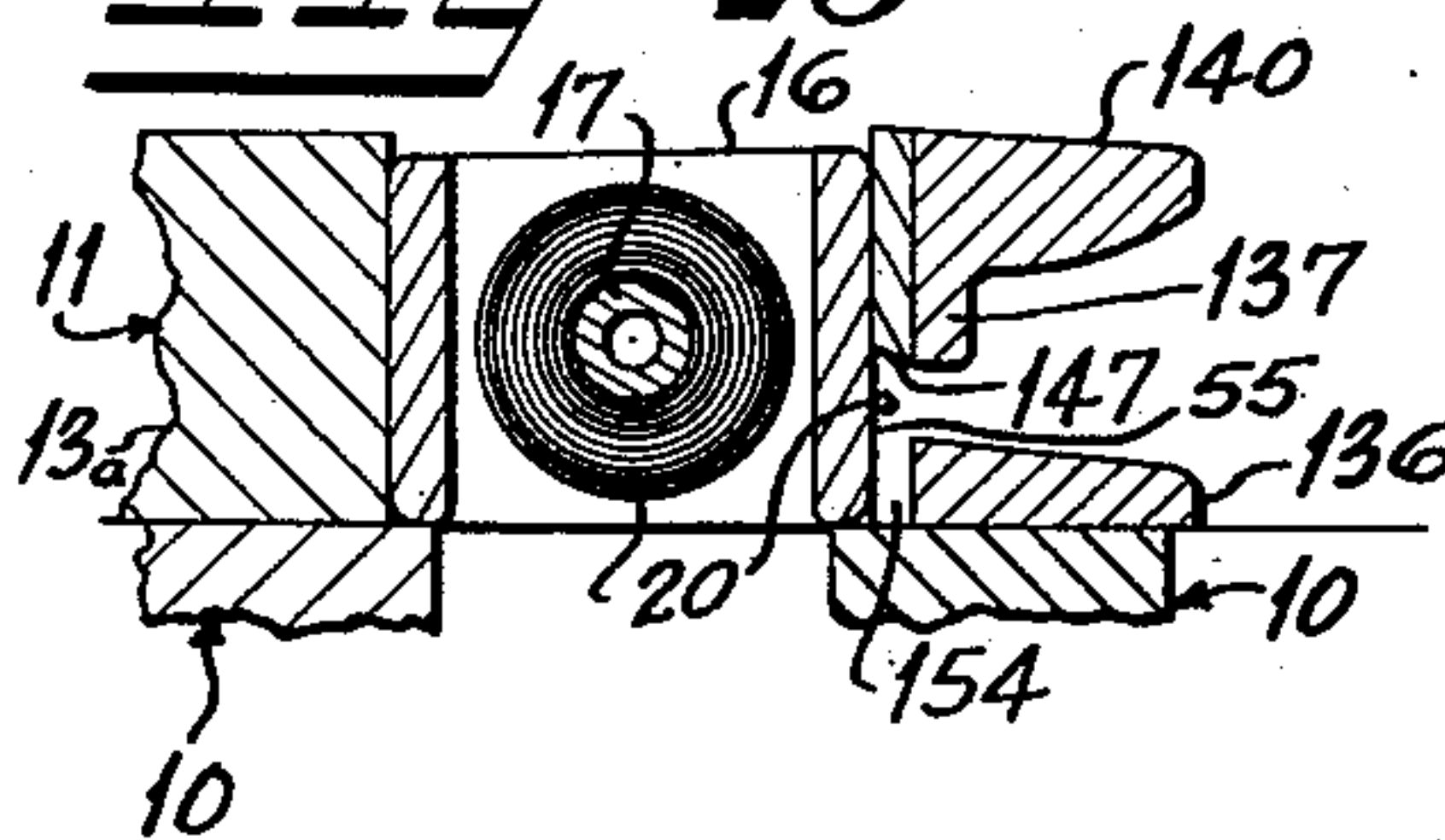
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UNITED STATES PATENT OFFICE

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SHUTTLE BOX FRONT FOR LOOMS

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5 Claims. (Cl. 139—183)

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This invention relates to shuttle boxes and more especially to a shuttle box front for the shuttle boxes of looms of the filling replenishing type.

The most prevalent reason for the breakage of weft yarns in weaving on a loom is due to the fact that immediately after a shuttle is boxed in a shuttle box and following the departure of a shuttle from the shuttle box, the tension in the outgoing yarn from the shuttle is momentarily relaxed between the adjacent selvage of the woven material and the shuttle eye as the shuttle moves out of the shuttle box. This relaxing of the tension of the weft yarn permits the weft yarn to fall downwardly, by gravity, intermediate its points of suspension thus resulting in the filling or weft yarn being caught between the shuttle and the front wall of the box and thus becoming broken or knotted. Also, in the event of a transfer operation taking place, the old or spent filling may also be caught between the shuttle and the front wall of the shuttle box and subsequently carried into the shed of the woven material.

It is therefore an object of this invention to provide a shuttle box front having a longitudinally extending slot therein which is open at the inner end thereof, or at its end nearest the selvage of the material being woven, and to provide a groove in the shuttle box front below the longitudinally extending slot which groove extends all the way to the bottom of the shuttle box front, the longitudinally extending slot serving to provide means for removing a spent filling from the shuttle box and the longitudinally extending groove below the slot serving to provide a recess between the proximate faces of the shuttle and shuttle box front so that upon the tension in the weft yarn being relaxed, the weft yarn may fall, by gravity, into engagement with the upper surface of the lay but will not be caught between the shuttle and the proximate wall of the box front as the shuttle is thrown out of the shuttle box.

It is another object of this invention to provide a shuttle box front having a longitudinally extending slot therein which terminates a substantial distance short of the outer end of the shuttle box front but extends all the way to the inner end of the shuttle box front thus providing an upper and a lower longitudinally extending portion. The lower longitudinally extending portion has a tapering projection on the inner end thereof for directing the yarn upwardly as it is withdrawn through the longitudinally extending slot

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between the upper and lower portions and this projection also serves as a bunter for intercepting a shuttle which may be thrown out of the shed formed by the warp yarns as the shuttle moves toward this particular shuttle box.

It is another object of this invention to provide a shuttle box front of the type having a longitudinally extending slot therein, with an improved liner adapted to be secured to the rear face of the shuttle box front and the lower portion of which is cut away so as to form a recess extending longitudinally for substantially the entire length of the shuttle box front to thus provide a recess formed by this cut away portion of the liner for the shuttle box front whereby, upon a shuttle being boxed and upon the shuttle again being thrown out of the shuttle box, the yarn may fall between its points of suspension, by gravity, against the upper surface of the lay and between the shuttle and the shuttle box front to thus prevent the yarn from being caught between the shuttle and the shuttle box front as movement of the shuttle out of the shuttle box is being effected.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings in which—

Figure 1 is a top plan view of a shuttle box of a type adapted to be associated with the usual filling replenishing means of a loom and showing the improved shuttle box front in association therewith;

Figure 2 is a fragmentary front elevation of the improved box front showing the same in association with a portion of the shuttle box, other parts of the shuttle box and the loom being omitted for purposes of clarity;

Figure 3 is an isometric view of the improved box front removed from the loom and showing the front, top and outer end of the box front;

Figure 4 is another isometric view of the improved box front but showing the same as though turned over on its side and showing the rear surface which is engageable by the shuttle and also showing the bottom and outer end thereof;

Figure 5 is an enlarged vertical sectional view taken substantially along the line 5—5 in Figure 2;

Figure 6 is an enlarged vertical sectional view taken substantially along the line 6—6 in Figure 3;

Figure 7 is a top plan view of a shuttle box similar to Figure 1 but showing a modified form of improved shuttle box front associated therewith;

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Figure 8 is a fragmentary front elevation of the shuttle box front shown in Figure 7 but omitting various parts of the shuttle box which are not pertinent to the present invention;

Figure 9 is an enlarged isometric view of the modified form of improved box front removed from the loom and with a portion thereof broken away and showing the inside surface of the box front;

Figure 10 is an enlarged vertical sectional view taken substantially along the line 10—10 in Figure 8.

Referring more specifically to the drawings, the numeral 10 indicates an oscillatable lay of a loom which is supported on the usual swords, not shown, and on the lay 10 there is shown a shuttle box broadly designated at 11. The shuttle box 11 comprises a bottom plate 12 which is connected to a race plate 13 of the lay 10 in a conventional manner and on which a conventional back binder 13a is mounted. The upper end of conventional picker stick 14 having a picker 15 thereon is shown in Figure 1 and this picker 15 is adapted to intermittently engage a shuttle 16, having a bobbin 17 mounted therein, in the usual manner. Weft or filling yarn 20 is withdrawn from the bobbin 17 and passes through a suitable shuttle eye indicated at 21 (Figure 1) and then extends to the selvage of a woven material, not shown, being woven on the loom.

The structure heretofore described is a usual part of looms of this type and the usual type of shuttle box front is not shown in the present drawings, the present drawings showing an improved box front broadly designated at 25. This shuttle box front 25 is secured to the upper surface of the bottom plate of the shuttle box 11, as by screws 26 and 27, the improved shuttle box front 25 having enlarged end portions 30 and 31 each provided with a forwardly and rearwardly extending adjustment slot 32 which are loosely penetrated by the screws 26 and 27 for securing the improved shuttle box front 25 to the upper surface of the bottom plate 12 of the shuttle box 11.

The shuttle box front 25 has a suitable opening 33 therethrough which is provided for reception of the usual type of thread cutter such as is shown in U. S. Patent No. 2,028,560 of January 21, 1936. The shuttle 16 is also provided with an opening 33d for reception of cutter and clamp means, not shown. The shuttle box front 25 has a longitudinally extending slot 34 therein closed at its end nearest the outer end of the lay and being open at its inner end and communicating at its outer end with the opening 33, the lower wall of the slot 34 being defined by a lower longitudinally extending planar portion 36 and the upper wall being defined by a flange portion 37 integral with and projecting downwardly from an upper longitudinally extending planar portion 40. The upper surface of the upper longitudinally extending planar portion 40 has a forwardly projecting thread catcher 41 which is not a part of the present invention but is conveniently provided and which will engage the new filling end as the lay moves forwardly after the first pick movement following a bobbin transfer operation.

It will be noted that the lower wall of the slot 34 and the opening 33 extend in the same horizontal plane while the upper walls thereof are off-set relative to each other. The inner end of the flange portion 37 curves forwardly to form a shuttle guiding projection 38 which is provided to

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guide a shuttle which may have been thrown out of its normal path across the lay.

The rear surface of the lower longitudinally extending planar portion of the shuttle box front 25 has a V-shaped cavity 42 therein, for purposes to be presently described, and is also provided with an enlarged reinforcing portion 43 disposed forwardly of the cavity 42 so as to prevent breakage of the lower planar portion 36 at this point. A suitable liner 45, preferably of leather, is secured to the inner portion of the improved shuttle box front 25 and to the outer end thereof as by a screw 44. This liner 45 has a longitudinally extending upper portion 46 the lower surface of which is cut to substantially the same configuration as the lower surface of the flange portion integral with the upper planar portion 40 but is beveled inwardly and upwardly, as at 47, at the lower edge thereof. This upper portion of the liner 45 curves around the inner end of the flange 34 of the upper planar portion 40 and is secured to the innermost end thereof, as by a screw 50. The liner 45 has a lower longitudinally extending portion 51 which is relatively shorter than the upper portion 46 and the free end of which enters the cavity 42 and is secured therein as by a screw 53.

It is preferable that the shuttle 16 be provided with a smooth front wall 55 because the usual shuttle groove through which the yarn 20 would normally pass is not required in combination with the present structure since the longitudinally extending groove 34 between the upper and lower planar portions 40 and 36 of the improved box front 25 is disposed at a lower plane than the usual types of grooved shuttle box fronts and, the beveled lower edge 47 of the portion 46 tends to lead the yarn 20 from the shuttle eye 21 downwardly, upon the shuttle 16 being thrown out of the shuttle box 11, from the point at which the yarn 20 extends across the opening 33 in the shuttle box front 25.

It will be observed that the lower planar portion 36 of the shuttle box front 25 has a thread guiding projection 60 thereon projecting upwardly therefrom and which partially closes the inner end of the longitudinally extending groove 34. This thread guiding projection 60 has an inclined rear surface 61 which is adapted to be engaged by the spent filling of an ejected bobbin upon a new bobbin being transferred to the shuttle 16. Upon movement of the lay 10 away from the beat-up point of the woven material the spent filling will slide upwardly against the inclined surface 61 and will ultimately fall, by gravity, forwardly of the front surface of the thread guiding projection 60 thus preventing this length of spent filling from being pulled back into the shuttle box inadvertently.

Modified form of box front.

The shuttle box shown in Figures 7 and 8 is identical to the shuttle box shown in Figures 1 and 2 with the exception of the modified form of shuttle box front shown in Figures 7 and 8 and, therefore, the same reference characters will apply to the shuttle box shown in Figures 7 and 8 and also to the shuttle and the bobbin shown in Figures 1 and 2. The shuttle box front in Figures 7 to 10, inclusive, is broadly designated at 125 and is secured to the bottom plate 12 of the shuttle box 11, as by screws 126 and 127, there being enlarged end portions 130 and 131 each of which is provided with a slot 132 which are loosely penetrated by the screws 126 and 127 for securing the

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modified form of shuttle box front 125 to the upper surface of the bottom plate 12 of the shuttle box 11.

As in the original form of the invention, the modified shuttle box front 125 is provided with an opening 133 which is adapted to be penetrated by the now well known cutter and clamp for parting the filling adjacent the shuttle eye and clamping it for outward movement by the cutter and clamp as the latter moves forwardly. The shuttle 16 is also provided with the opening 33d, as in the original form of the invention, for reception of the cutter and clamp means not shown. The shuttle box front 125 has a longitudinally extending groove 134 therein which communicates with the opening 133 and the lower wall of which is defined by a lower longitudinally extending planar portion 136, the upper wall of the slot 134 being defined by the lower edge of a flanged portion 137 of an upper longitudinally extending planar portion 140. This upper planar portion 140 is also provided with the usual type of thread catcher 141 which is identical to the thread catcher 41 shown in the original form of the invention.

The inner end of the upper longitudinally extended portion 140 of the modified form of shuttle box front 125 terminates a substantial distance short of the inner end of the lower longitudinally extending portion 136. The flanged portion 137 has an enlarged inner end portion 142 integral therewith the outer surface of which is disposed in the vertical plane and slightly rearwardly of the front edge of the upper planar portion 140 so as to provide a notch 143 for reception of the free end of a longitudinally extended upper portion 145 of a friction liner 146 which is preferably made of a leather material. The free end of the longitudinally extended upper portion 145 of the liner 146 is secured, as by a screw 150, to the front face of the notch 143 in the longitudinally extended portion 145 and is then folded back upon the inner surface of the flange 137 on the upper planar portion 140. The lower edge of the longitudinally extended portion of the liner 146 conforms to the configuration of the lower edge of the flange portion 137. However, its lower surface is cut at an angle, as at 147, in Figure 10 and the lower surface of the longitudinally extended portion 145 of the liner 146 is also cut away to conform to the opening 133. The liner 146 has a relatively wide portion 151 which is of the same vertical height as the box front 125 and is secured, as by a screw 152, to the end of the box front 125 remote from the center of the lay.

The lower planar portion 136 of the modified form of box front 125 extends a substantial distance inwardly beyond the upper planar portion 140 and has an upwardly extending shuttle guiding projection 160 integral therewith which is provided with a tapering surface 161 which merges into the upper surface of the lower planar portion 136. The shuttle guiding projection 160 on the modified shuttle box front 125 serves the purpose of both projections 38 and 60 on the original form of box front 25 shown in Figures 1 to 6, the tapering surface 161 being provided for the same purpose that the tapering surface 61 is provided in the original form of the invention shown in Figure 6.

It will be noted that the lower portion of the guide portion 131 of the liner 146 is not provided with a lower extended portion similar to the upper extended portion 145 and therefore a space indicated at 154 is provided between a boxed

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shuttle 16 and the inner surface of the lower planar portion 136 to thus prevent the filling yarn 20 from being caught between the inner surface of the shuttle box front 125 and the proximate surface of the shuttle 16.

As in the original form of the invention, the shuttle 16 need not be provided with the usual shuttle groove through which the weft yarn 20 usually extends since the recess space 154 between shuttle 16 and shuttle box front 125 as well as the longitudinally extending groove 134 are provided for this purpose and the usual type of longitudinally extending shuttle groove would not be required.

Throughout the specification and claims the terms "inwardly" and "outwardly" and "rear" or "rearwardly" and "front" or "forwardly" are used. The meaning of these terms is commonly understood in weaving, i. e., the inner end of the shuttle box is that portion disposed nearest the selvage of the fabric being woven and the outer end of the shuttle box is that end in which the picker comes to rest after boxing a shuttle. The inner surface of the shuttle box front would, of course, be that surface nearest the boxed shuttle and the front surface would be that surface nearest the front of the loom or at the side of the lay which is the forward side upon a beat-up stroke thereof.

It is thus seen that I have provided an improved shuttle box front and an improved liner therefor which liner is cut away at the lower portion thereof adjacent the shuttle so that, upon the shuttle being boxed and as the shuttle leaves the shuttle box, the weft yarn may become slackened between the shuttle eye and the selvage of the fabric being woven without the yarn being caught between the shuttle and the rear face of the shuttle box front thus eliminating one of the most prevalent reasons for breakage of weft yarns and also preventing one of the causes of "jerked-in filling."

In the drawings and specifications there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. In a loom having a shuttle box and a shuttle adapted to be boxed in the shuttle box, an improved box front provided with a longitudinally extending thread slot extending from the inner end of the box front and disposed closely adjacent the lower edge of the shuttle box front and dividing the box front into upper and lower longitudinally extending portions, a liner suitably secured to the inner surface of the shuttle box front, said liner having a longitudinally extending upper portion whose lower surface conforms to the lower surface of the upper longitudinally extending portion of the shuttle box and extending throughout the length of the upper portion, the lower half of the liner extending over and covering less than one-half of the surface of the lower longitudinally extending portion of the box front, so that when a shuttle is boxed in the shuttle box, a space will be provided between the proximate lower surfaces of the shuttle and the lower portion of the shuttle box front to thus permit a weft yarn to sag intermediate its points of support and whereby upon the shuttle being thrown out of the box, the weft yarn

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will not be caught between the shuttle and the proximate face of the shuttle box front.

2. A box front for looms adapted to be secured to the top of the lay of a loom and having a slot extending from the inner end of the box front to a point beyond the medial portion of the box front, a liner secured to the inner face of the box front and being cut away at its lower portion, the lower wall of the liner conforming substantially to the upper wall of the longitudinally extending slot in the shuttle box front and said liner covering less than one-half the surface of the lower portion of the box front.

3. In a loom having a lay and a shuttle box on the lay and also having a shuttle for carrying weft yarn, an improved shuttle box front having an opening intermediate the ends thereof and also having a longitudinally extending slot therein communicating with said opening, said slot extending to and being open at the inner end of the box front, the vertical height of said slot being substantially less than the vertical height of said opening and the slot and the opening dividing the shuttle box front into an upper portion and a lower portion, the lower portion being substantially of the same vertical height throughout its length and the upper portion having its lower edge disposed at a lower elevation than the uppermost portion of the opening so that the lowermost portion of said slot will be disposed in the same plane as the lowermost portion of said opening, a liner adapted to be secured to the inner surface of said shuttle box front, said liner having a longitudinally extended upper portion conforming generally to the configuration of the upper portion of the shuttle box front and means for securing the liner to the inner surface of the shuttle box front, said liner having a lower extended portion of substantially shorter length than the upper extended portion.

4. In a loom having a lay and a shuttle box on the lay and also having a shuttle for carrying weft yarn, an improved shuttle box front having an opening intermediate the ends thereof and also having a longitudinally extending slot therein communicating with said opening at one end and extending to the inner end of the box front, the vertical height of said slot being substantially less than the vertical height of said opening and the slot and the opening dividing the shut-

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tle box front into an upper portion and a lower portion, the lower portion being substantially of the same vertical height throughout its length and the upper portion having its lower edge disposed at a lower elevation than the uppermost portion of the opening so that the lowermost portion of said slot will be disposed in the same plane as the lowermost portion of said opening, a liner adapted to be secured to the inner surface of said shuttle box front, said liner having a longitudinally extended upper portion conforming generally to the configuration of the upper portion of the shuttle box front, means for securing the liner to the shuttle box front, said liner having a lower extended portion of substantially shorter length than the upper portion, the inner surface of the lower portion of the shuttle box front having a cavity therein into which the free end of the lower extended portion of the liner is adapted to be inserted and means securing the free end of the lower extended portion of said liner in said cavity.

5. In a loom having a lay and a shuttle box on at least one end of said lay and a shuttle adapted to be boxed in the shuttle box and a weft yarn carried by said shuttle, an improved shuttle box front having a longitudinally extending slot therein closed at its end nearest the outer end of the lay and open at the other end, said slot being disposed a substantial distance closer to the lower edge of said shuttle box front than to the upper edge thereof, a liner adapted to be secured to the inner surface of the shuttle box front and extending throughout the length of that portion of the box front which is disposed above said slot, the liner covering the entire upper inner surface of the box front, but extending over less than half the length of the lower portion of the box front.

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