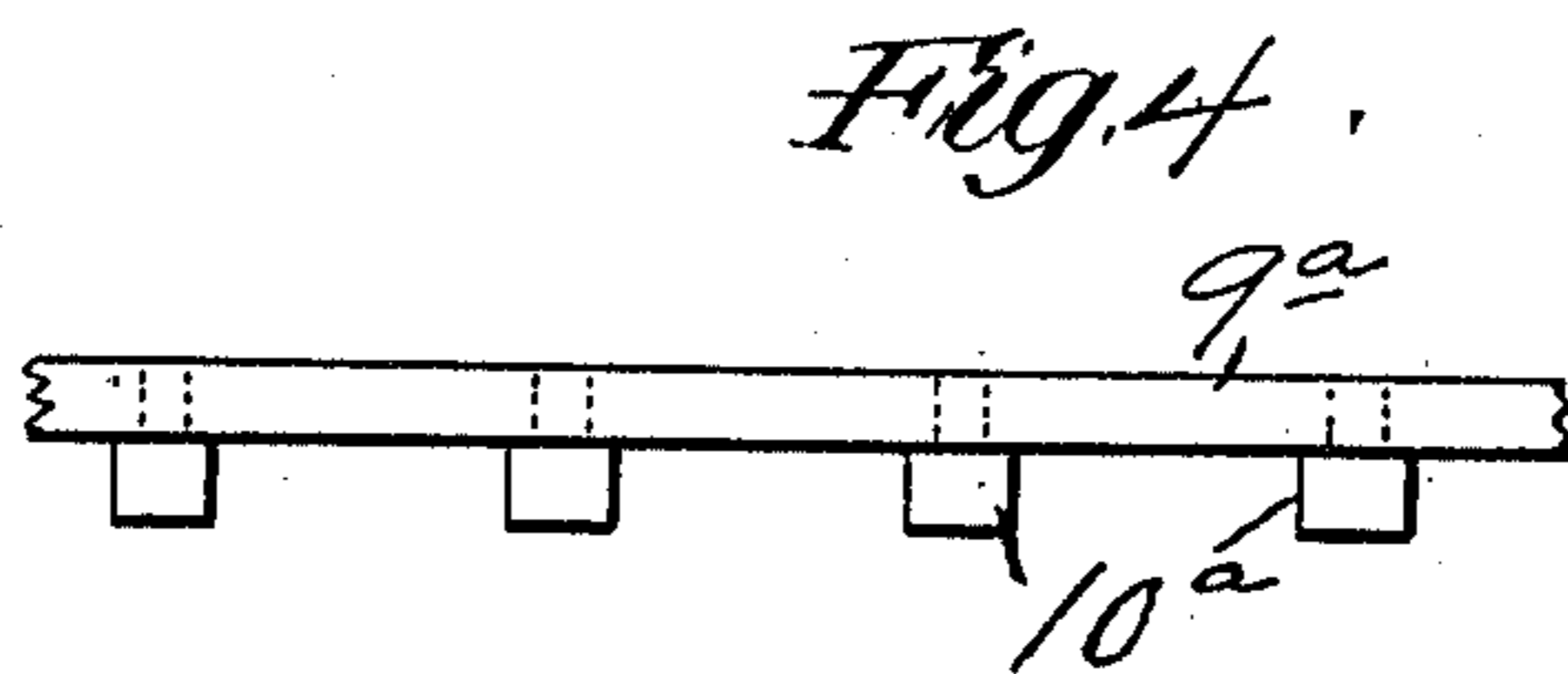
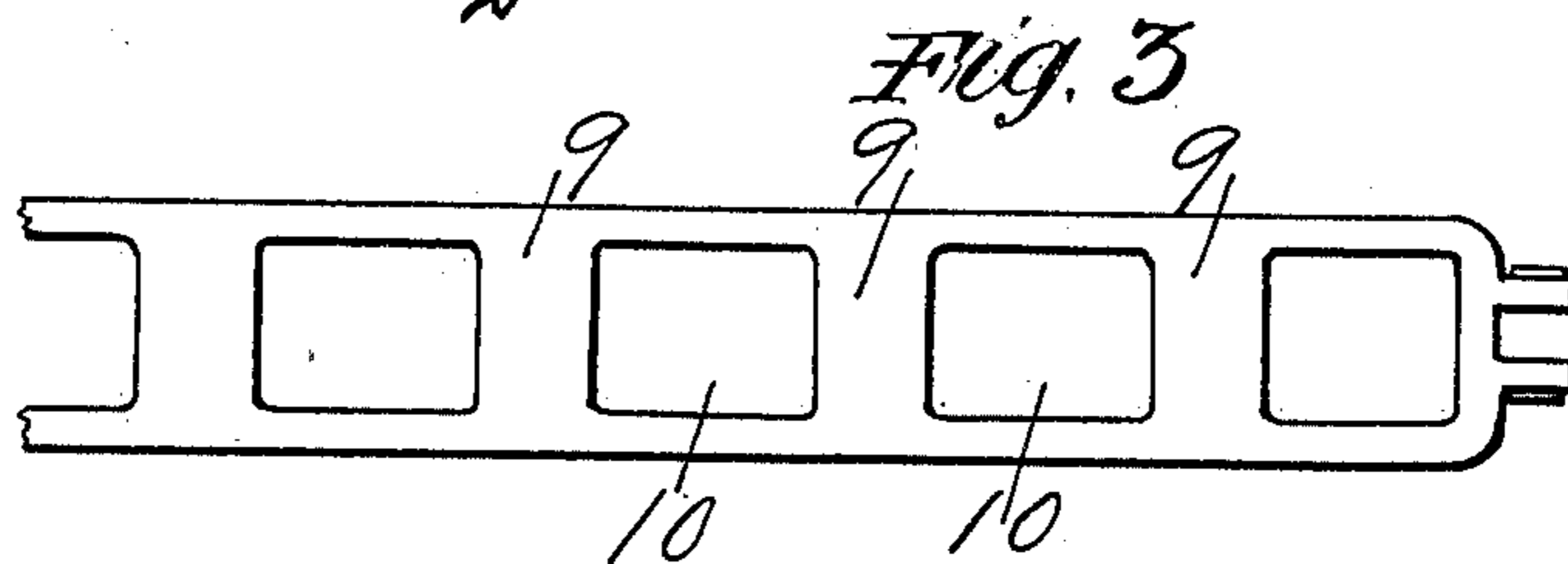
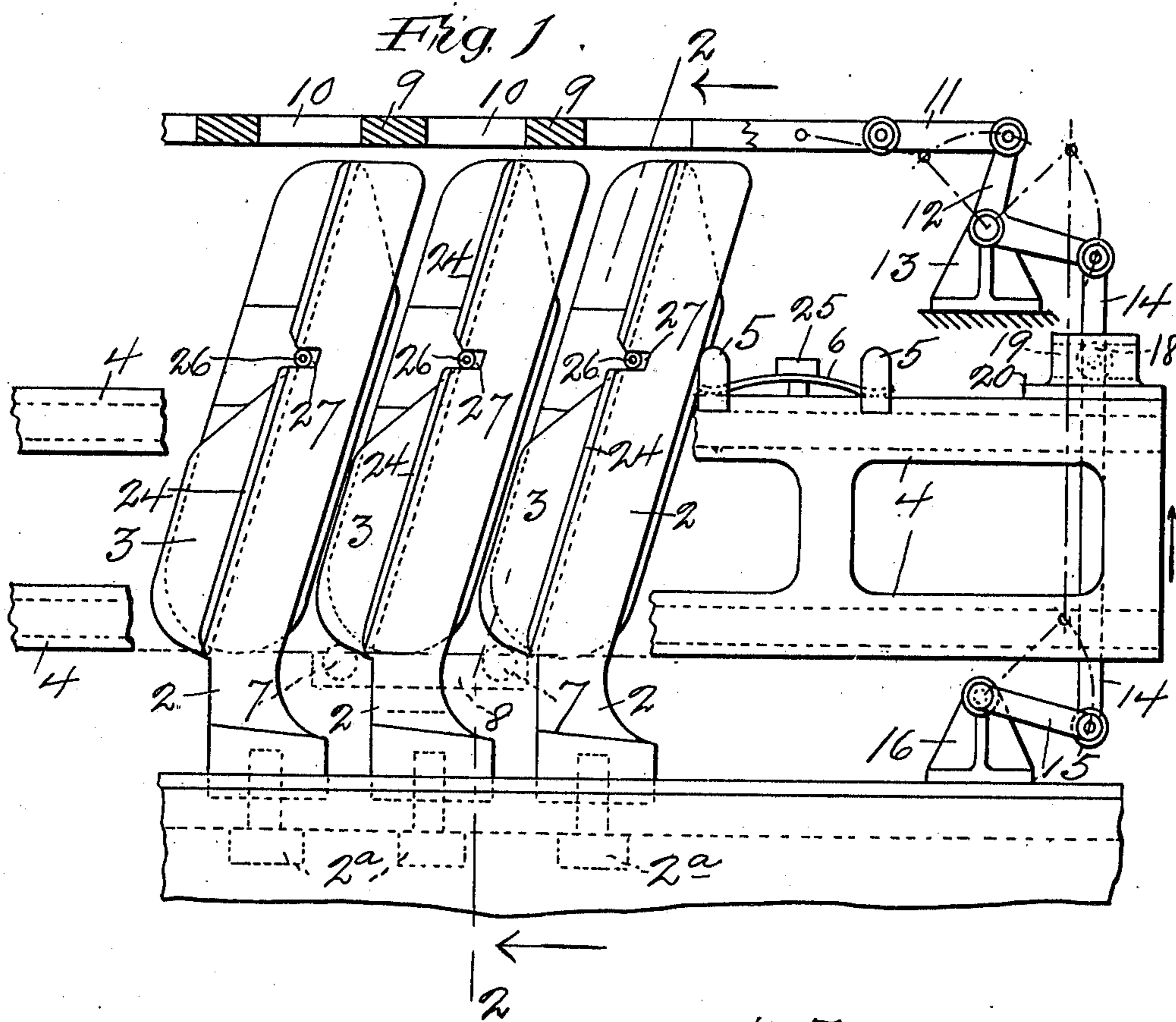


M. SCHOENFELD.
 PROTECTIVE DEVICE FOR EMBROIDERING MACHINE SHUTTLES.
 APPLICATION FILED MAY 21, 1910.

990,301.

Patented Apr. 25, 1911.

2 SHEETS—SHEET 1.



Witnesses:
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H. L. Du Cret

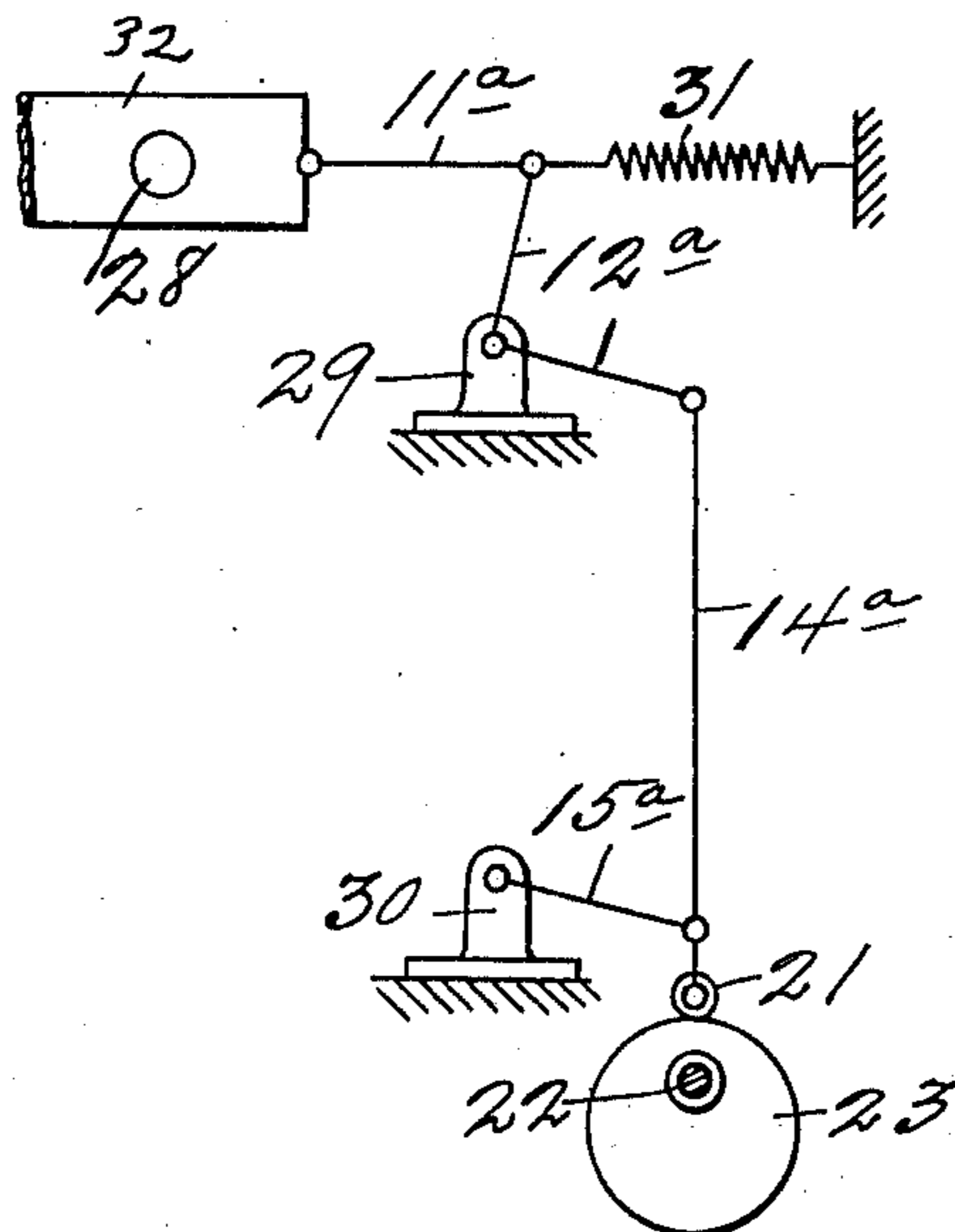
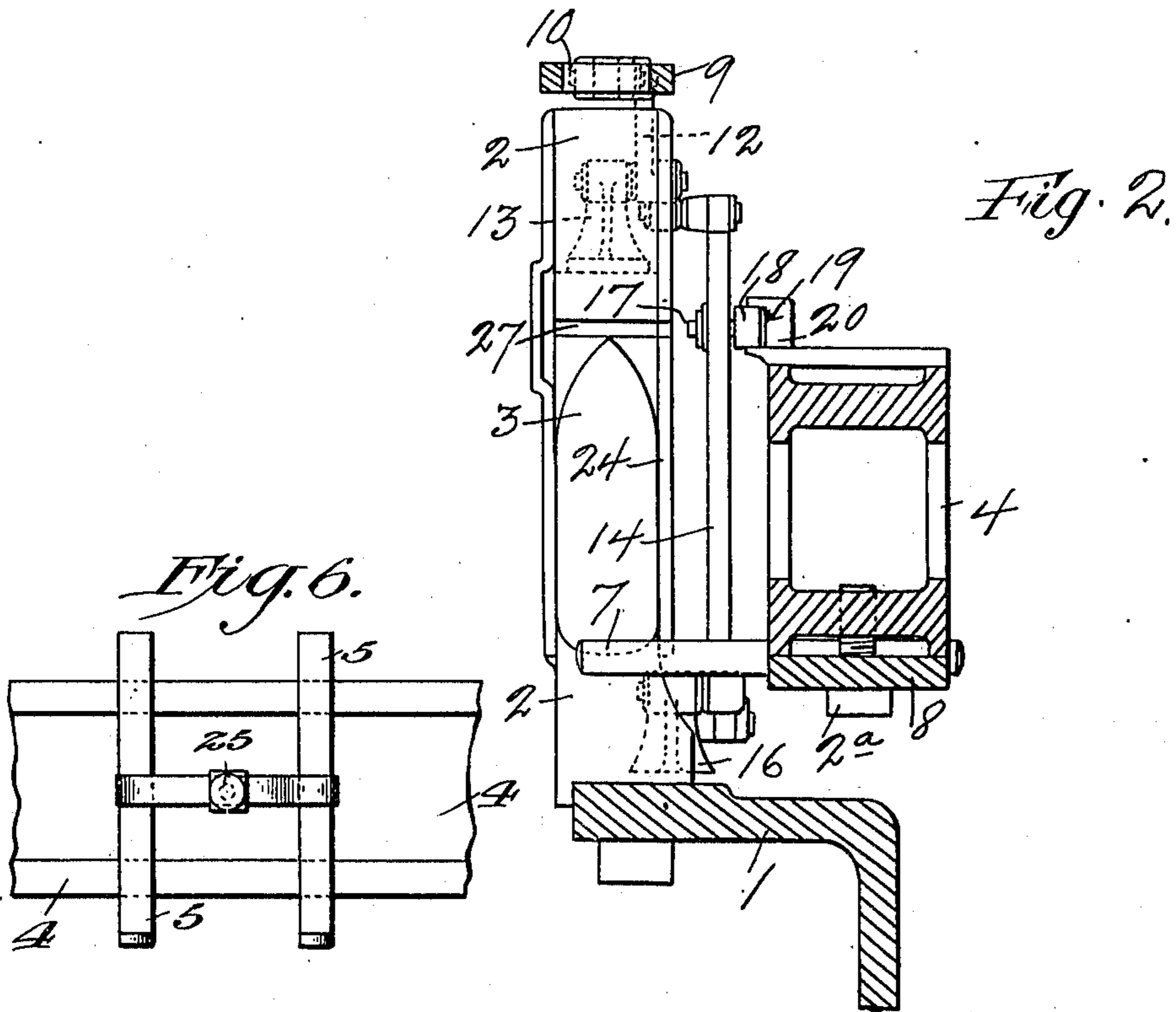
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

MORRIS SCHOENFELD, OF RORSCHACH, SWITZERLAND.

PROTECTIVE DEVICE FOR EMBROIDERING-MACHINE SHUTTLES.

990,301.

Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed May 21, 1910. Serial No. 562,599.

To all whom it may concern:

Be it known that I, MORRIS SCHOENFELD, a citizen of the United States, and a resident of Rorschach, in the Canton of St. Gall, Switzerland, have invented certain new and useful Improvements in Protective Devices for Embroidering-Machine Shuttles, of which the following is a specification.

The present device relates to a mechanism for locking the shuttles in an embroidering machine in such a way that the shuttles can be removed from their races or tracks only at predetermined times.

In embroidering machines of the large type it is customary to take out the shuttles from time to time for the purpose of replenishing the thread supply while the machine is still in operation and this removing of the shuttles requires a certain amount of skill and practice. Unskilled help and even the practiced, cause damage to the machine and to themselves, often resulting in accidents to the machine and the operator, which is a serious annoyance to the employee and the employer. The trouble is generally caused by the operator trying to extract the shuttle while the machine parts are in a disadvantageous position and much can be saved by making it impossible to extract the shuttles at a time when injury is most likely to result.

The object of the present invention is to make it impossible to extract the shuttles at a time when injury to the machine or to the person is likely to result and in the full embodiment of my invention the means for preventing the trouble mentioned is automatically operated by the embroidering machine, or some part of it so that the operator will not have to consider the condition of the machine but will be prevented from withdrawing any shuttle except at the proper time.

The device is simple and in no way modifies the construction or operation of the ordinary embroidering machine. I have arranged the locking device so that the shuttles, in a machine having upright or oblique shuttle tracks, can be removed while the shuttles are in their lowest or starting position as I deem that the most advantageous time for the removal of the shuttles, but so that they can not be removed at any other time during the stitching operation.

I have shown my invention applied to a

machine of ordinary construction, though it is to be understood that the invention may be used on other forms of machines wherein the shuttle tracks are differently arranged.

In the present construction the shuttle tracks or races are shown mounted on a liner at an angle, with the shuttles moving singly in the tracks and preferably above the shuttle tracks there is arranged a movable element which is automatically operated to alternately lock and unlock the shuttles by closing the ends of the shuttle tracks against the removal of the shuttles.

In the drawings forming a part of this application, Figure 1 is an elevation of a shuttle mechanism embodying my invention in the preferred form, Fig. 2 is a cross section taken on the line 2—2 of Fig. 1, Fig. 3 is a plan view of one form of locking bar, Fig. 4 is a plan view of another form of locking bar, and, Fig. 5 is a diagrammatic view of a modified form of operating mechanism. Fig. 6 is a detail view showing the pins which engage the front of the shuttles, and the method of securing them to the drive bar.

In the present illustration I have shown only one application of my invention to a well known form of embroidering machine, it being understood that the same may be adapted to other forms of machine and I have shown only such parts of a complete machine as are necessary to teach the construction and use of the preferred form of my invention.

In the present showing there is a shuttle liner or support 1, longitudinally arranged on the machine frame, on which the shuttle tracks or races 2 are mounted at an angle of about 75° and the tracks are held upon the liner by means of the bolts 2^a in the usual way. The tracks 2 have flanges 24 on each side which guide the shuttles 3 in their longitudinal movement in the tracks, there being one shuttle to each track in the usual way. The upper end of the tracks, so far as the latter are concerned are open so that the shuttles can be removed by sliding them out at the top of their tracks. So far as the shuttles themselves are concerned they may be of any well known form and also the means for driving them. I have shown a drive for the shuttles consisting of a drive bar 4, which is reciprocated in the direction of the shuttle tracks by any well known

mechanism and on this bar are located the drive pins or fingers 7 for engaging the under end of the shuttles for producing the upward movement of the latter; and above these are provided the driven fingers or pins 5 which engage the opposite end of the shuttle so that the shuttles will be driven up and down by their drive. The pins or fingers 5 are shown carried by the bar 4 and pressed down by a spring 6 which is bolted to the bar 4 by means of the bolts 25, whereby the shuttles can be sprung past the fingers 5 when they are being removed from their tracks. So far the construction may be the usual one and need not be modified to permit of the use of the present invention.

Above the shuttle tracks I have arranged an element which is so constructed and so operated that it will alternately lock and unlock the shuttles by closing and opening the upper ends of the shuttle tracks. This bar, shown in plan in Fig. 3 may be modified in construction, but I prefer to employ a bar having openings 10 alternating with cross pieces 9, and the bar is mounted in any suitable way upon the machine frame, so long as it can be operated to lock and unlock the shuttles the position of the bar being shown in Fig. 1. The preferred form of mechanism for operating the bar is shown in Fig. 1 wherein I have provided a connecting link 11, which is fulcrumed to the end of the bar 9, and this in turn is fulcrumed to a bellcrank lever 12 which is suitably mounted as in a block 13 on the machine frame. The other end of this lever is fulcrumed to a link 14, the free end of which is fulcrumed to an idle arm 15 and the latter is connected with a bracket 16 on the machine frame to retain the link 14 in proper position. The link 14 is provided with a laterally extending roller 18 mounted on a pin 17 and so positioned that the roller will engage in a groove 19 of the bracket 20 on the shuttle drive bar 4. The roller remains in the groove 19 at all times.

The operation of this construction is as follows: As the needles 26 are passed through the fabric which is being embroidered and enter their needle channels 27 in the shuttle tracks the shuttles are reciprocated across the needles and their pointed ends taken in the thread loops and pass therethrough in the usual way. The reciprocation of the shuttles is brought about by the reciprocation of the shuttle drive bar 4. Each time the shuttle drive bar is reciprocated the link 14, by reason of the engagement of the roller 18 in the bracket 20, will be reciprocated, and the movement thereof is transmitted through the bellcrank lever 12 to the bar 9. The reciprocation of this bar 9 causes the cross pieces 9 to be presented at the upper ends of the shuttle tracks during the upward movement of the shuttles and thus prevent the latter from

being removed during this movement of the shuttles, which it is desirable to prevent. When the bar 4 returns the shuttles to their lower position again the lever 12 will be rocked back again and the bar 9 will be returned so that the apertures 10 will come opposite the ends of the shuttle tracks. It is while these apertures 10 are opposite the shuttle tracks that the shuttles may be removed by forcing them upwardly, past the fingers 5 which are sprung out, and out through the top of the shuttle tracks and through the apertures 10. When the thread supply in the shuttle has been replenished the shuttle may be returned to its track, but it can only be returned when the mechanism is in the condition best suited therefor, that is, in the position where damage will not be caused to the operator or machine when the shuttle is reinserted.

The bar for locking and unlocking the shuttles can be changed as desired and in Fig. 4 I have shown the bar built up of a longitudinal strip 9^a to which is secured cross pieces 10^a and the strips 10^a and the alternating spaces are alternately presented above the shuttle tracks as in the mechanism just described.

In Fig. 5 I have shown a modification of the mechanism for operating the locking device wherein the force for driving the locking member is derived from the shaft of the embroidering machine, instead of from the shuttle drive rod. In this form I have shown the locking bar 32 having round bars 28 which have the same function as the cross pieces 9 in the previously described construction. I have shown a link 11^a connected with the end of the bar 32 and this in turn connects with the bellcrank lever 12^a which latter is suitably supported by a block 29. The other end of the bellcrank lever is connected with a link 14^a which extends down and which has a roller 21 that engages with the cam 23 on the shaft 22 of the embroidering machine. The arm 15^a, connected with the lower end of the link 14^a, and with the bracket 30, guides the link; while a spring 31 operating on the lever 12^a retains the roller 21 in contact with its cam. At each revolution of the shaft 22 and thereby at each stitch of the machine the lever 12^a is rocked and the bar 32 is reciprocated, bringing the bars 28 and the intermediate spaces alternately over the ends of the shuttle tracks.

It will be understood that the bars which lock the shuttles preferably extend over the length of the machine whereby a single bar operates to lock and unlock all the shuttles of a row.

Various changes may be made in the construction especially for adapting the invention to machines of different construction without departing from the broad spirit of

my invention and the scope of the following claims.

Having described my invention what I claim is;

5 1. An embroidering machine embodying a sewing needle, a shuttle mechanism, comprising a shuttle track adapted to guide a shuttle and having an exit by which the shuttle may be removed from the shuttle track, a
10 shuttle for the track adapted to be advanced through the thread loop formed by the sewing needle, and means adapted to prevent the removal of the shuttle and automatically operating to free the shuttle whereby it may
15 be removed from the track before it enters the needle thread loop and whereby the shuttle will be locked against removal when the shuttle is advanced through the thread loop.

2. An embroidering machine embodying a
20 sewing needle, a shuttle mechanism comprising a shuttle track adapted to guide a shuttle and having an exit by which the shuttle may be removed from the shuttle track, a shuttle for the track adapted to be advanced through
25 the thread loop formed by the sewing needle, a shuttle drive and a longitudinal displaceable strip which is so formed that it will alternately lock and unlock the shuttle exit and automatic means for operating said strip
30 whereby the shuttle exit will be unlocked before the shuttle enters the thread loop and locked when the shuttle is advanced through the thread loop.

3. An embroidering machine embodying a
35 sewing needle, a shuttle mechanism, comprising a shuttle track adapted to guide a shuttle and having an exit by which the shuttle may be removed from the shuttle track, a shuttle for the track adapted to be advanced through
40 the thread loop formed by the sewing needle, a shuttle drive for reciprocating the shuttle through the thread loop, said shuttle being removable from the shuttle track during the operation of the shuttle by its drive and au-
45 tomatic means adapted to prevent the removal of the shuttle when the latter is ad-

vanced by the shuttle drive to lock the sewing thread.

4. An embroidering machine embodying a shuttle mechanism comprising shuttle tracks 50 arranged obliquely and having an exit opening for the removal and insertion of the shuttles, shuttles for the tracks and a longitudinal bar above the several shuttle tracks and adapted when reciprocated to alternately 55 lock and unlock the shuttle exits of the several tracks and means for reciprocating said locking bar.

5. An embroidering machine embodying a shuttle mechanism comprising shuttle tracks 60 arranged obliquely and having an exit opening for the removal and insertion of the shuttle, shuttles for the tracks and a longitudinal bar above the several shuttle tracks and adapted when reciprocated to alternately 65 lock and unlock the shuttle exits of the several tracks and means adapted to operate said locking bar and so timed as to its operation as to cause the said locking bar to lock the shuttle exits when the shuttles are in 70 their higher position of operation and to unlock them when they are in their lower position of operation.

6. An embroidering machine embodying a shuttle track adapted to guide a shuttle, hav- 75 ing an exit for the removal of the shuttle, a shuttle for said track, a shuttle drive, for reciprocating the shuttle, said shuttle being adapted to be removed during the operation thereof by its drive, means operating to pre- 80 vent the removal of the shuttle when the latter has been advanced to lock the sewing thread and adapted to be operated by the shuttle drive.

Signed at St. Gall, in the Canton of St. 85 Gall, Switzerland, this 11th day of May, 1910.

MORRIS SCHOENFELD.

Witnesses:

CAESAR LOAG,
FRIEDR. STEINER.