

(No Model.)

2 Sheets—Sheet 1.

J. TRIPP.
SEWING MACHINE.

No. 460,295.

Patented Sept. 29, 1891.

Fig. 1

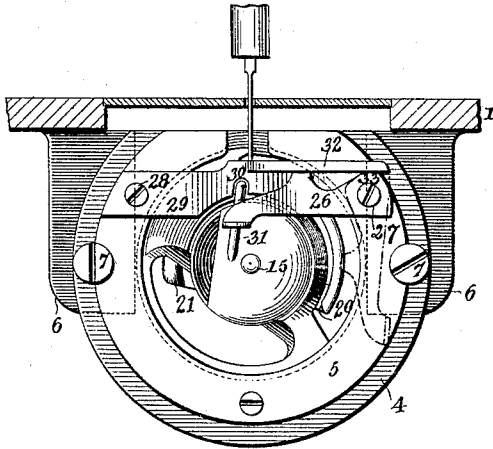


Fig. 2

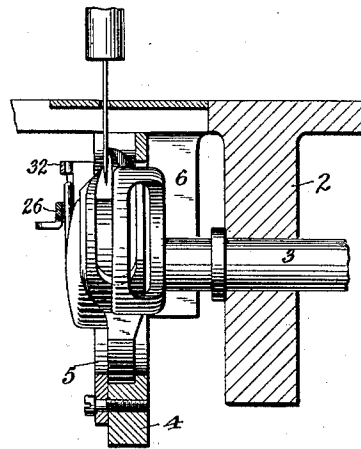


Fig. 4

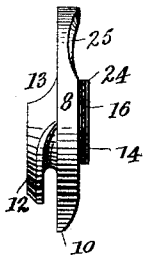


Fig. 5

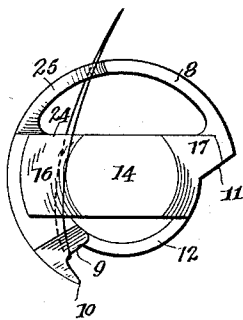


Fig. 6

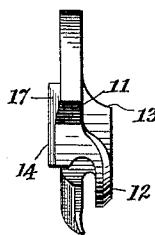
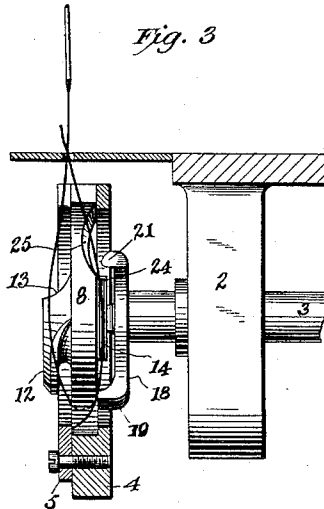


Fig. 3



Witnesses:
Raphael Netter
Robt F Gaylord

Inventor
James Tripp
by Duncan & Page
Attorneys.

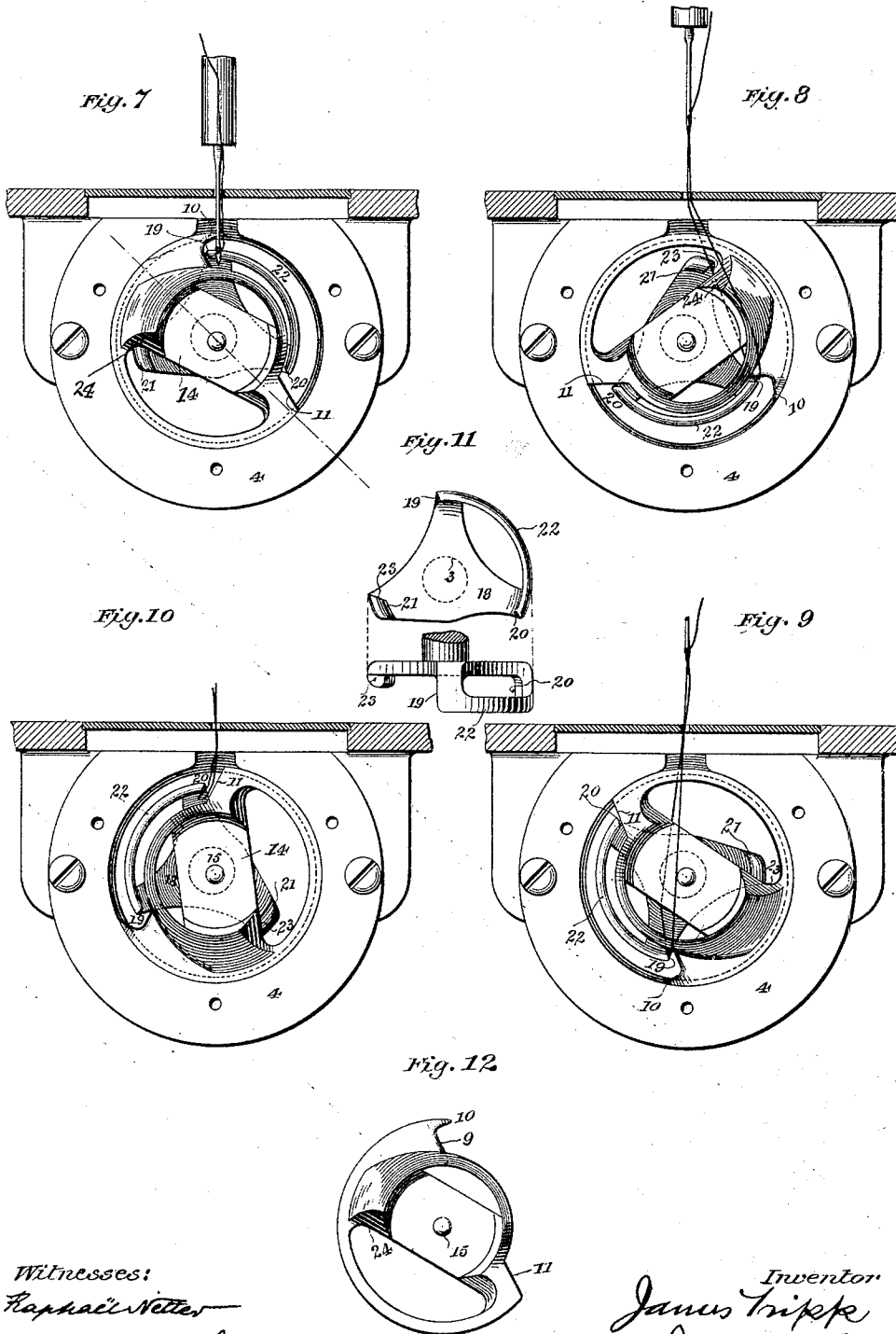
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2 Sheets—Sheet 2.

J. TRIPP.
SEWING MACHINE.

No. 460,295.

Patented Sept. 29, 1891.



Witnesses:
Raphael Weller
Robt. F. Taylor

Inventor
James Tripp
by *James & Page*
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES TRIPP, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 460,295, dated September 29, 1891.

Application filed January 24, 1891. Serial No. 378,944. (No model.)

To all whom it may concern:

Be it known that I, JAMES TRIPP, of the city, county, and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a description, reference being had to the accompanying drawings.

The present improvements relate particularly to that class of sewing-machines in which the needle-loop is engaged by a hook on a rotating shuttle and is carried around the shuttle, the shuttle being supported in a circular race, which is so arranged that the axis of rotation of the shuttle is eccentric with respect to the axis of rotation of the shuttle-driver, so that the shuttle will at predetermined points of its path of revolution separate from the part or parts of the driver that engage it to let the thread-loop pass. Such a shuttle, as is well known, consists, essentially, of a circular hoop or band of metal extending through something more than half a circle, the plane of which I shall call the "plane of the shuttle," and this circular hoop I shall consider as the peripheral or bearing edge of the shuttle, as it is this part of the shuttle that runs or is held in the circular shuttle-race. This peripheral hoop usually has attached to it a diametrically-arranged back plate, which carries the pivot or socket of the bobbin-case, and one end of the hoop is pointed to form the hook that engages the needle-loop. It is desirable, with such a form of shuttle, that as the loop is carried around it the thread be deflected as little as possible from the form of a plain loop—that is, that the thread be not kinked or suddenly bent or forced around projections in its normal path, the path it would tend to take were it, when carried freely around the shuttle, not opposed by other parts than those on the shuttle—and this will be obvious because any such deflection of the loop produces friction and limits the speed of the shuttle, as well as tends to the breaking of the thread and the clogging of the parts. So far as I am aware, all forms of shuttles of this kind heretofore used have been operated by a driver that engaged with the shuttle by parts that projected from the driver to and through the shuttle to the front face of the peripheral hoop of the same, or at least beyond the plane of the shuttle. With

such constructions the portion of the loop passing rearwardly of the shuttle must be deflected abruptly from its natural path to pass over or around at least one of the said projections on the driver. It is therefore one purpose of my invention to construct a shuttle and its driver in such form that the loop will have a free and unobstructed passage around the shuttle, corresponding practically to the normal path of the loop.

A second feature of my invention relates to a novel and cheap form of bobbin-case retainer, whereby the bobbin-case is securely held in position in the shuttle and against rotation, and yet is easily and quickly removed.

These features of invention will be described in detail, and the combinations of parts and constructions regarded as new will be then set forth in the claims to follow the description.

In the drawings, Figure 1 is an elevation view from the front of the shuttle parts of a sewing-machine embodying my improvements, a portion only of the work-plate being shown and the same being sectioned away in front of the shuttle parts. The shuttle and needle are shown in positions when the loop is first being taken. Fig. 2 shows a longitudinal sectional view of the same and in the same position, except that the shuttle and the shuttle-driver and its shaft are shown in full. Fig. 3 is a side elevation view of the same, the shuttle-race being in central vertical section, the bobbin-case being removed, and the shuttle shown as having carried the loop one-third of the way around. Fig. 4 is a side or edge view of the shuttle as seen from the left-hand side of Fig. 5. Fig. 5 is a rear view of the shuttle. Fig. 6 is an edge view of the shuttle from the right-hand side of Fig. 5. Fig. 7 is a front elevation view similar to Fig. 1 with the face-plate of the race and the bobbin removed. Fig. 8 is the same view with the loop shown as carried one-third the way around, as in Fig. 3. Fig. 9 is the same view as Fig. 8 with the loop carried one-half way around the shuttle and to the cast-off point. Fig. 10 is the same view showing the position of the parts as the loop is being taken up and is finally leaving the shuttle. Fig. 11 is an elevation and plan view of the shuttle-driver head, its position being the same as in Figs.

1, 2, and 7. Fig. 12 is a front elevation view of the shuttle in position of taking the loop.

In the views, 1 represents the bed-plate of the machine, from which depends the lug 2, in which the front or shuttle end of the shuttle-driver shaft 3 is journaled.

4 is the shuttle-race, which consists of a circular ring properly grooved in its front face for the reception of the peripheral hoop or circular edge of the shuttle, such groove being closed and the shuttle held in place by the open face-plate 5. This race is adjustably supported by screws 7 on lugs 6, depending from the base-plate. The shuttle is represented by 8, and it consists, essentially, of the peripheral hoop or edge 8, provided at its toe end 9 with a loop-taking hook 10 and at its other end with the heel 11. This hoop runs in the race, and by it alone the shuttle is held in the race. 12 is the thread-guard, which consists of a segmental bridge-like strip gradually rising from the hoop 8 by the bevel 13 to a height about the same as the outer face of the bobbin-case, and it is this guard that expands and directs the outer portion of the loop over the bobbin-holder. These parts are of the usual and well-known construction, and it is also to be understood that the race is so set that the axis of rotation of the shuttle is eccentric to the axis of the driver-shaft, in order to effect a separation of the engaging parts of the driver and shuttle at such positions and times as is required for the loop to pass, and that the driver has a variable though continuous motion, in order to time the shuttle to the motion of the needle and take-up mechanism.

At the rear end of the shuttle-hoop and diametrically spanning it from side to side is the back bar 14, which is socketed to receive the bobbin-case, 15 being the bobbin-axis. This bar is beveled off at each end, as seen at 16 and 17, down to the hoop 8. In constructing the shuttle the position of this bar on the hoop 8 may be somewhat varied, depending upon the position the driving-bearing 24, carried thereon, should have relative to the driving-bearings 9 and 11, which position should be such that any plane including one of these three bearings and the axial line of the shuttle will pass between the other two bearings.

18 is the shuttle-driver, which consists of a segmental disk-like head having three horns 19, 20, and 21 projecting forward from the same. The tops of the toe-horn 19 and the heel-horn 20 are connected by the thread-guard 22 and are of sufficient height to project to and slightly beyond the plane of the shuttle, Figs. 2 and 3, to engage, respectively, the toe and heel of the shuttle, and the distance between the bearings of these horns is slightly less than the corresponding distance between the heel and toe of the shuttle. The horn 21 is shorter than the other horns and is located about midway between them, Fig. 11, and it projects only so far forward as to engage by its bearing-face 23 with the should-

der 24, formed by the edge of the bevel of the shuttle-bar 14 just behind the heel of the shuttle. The distance from the face 23 of this horn to the horn 19 is slightly less than that between the face of the heel of the shuttle and the shoulder 24 on the back bar 14. To afford an ample and normal passage for the inner portion of the loop to pass this horn 24 as the loop is being expanded, and to prevent the thread being deflected by the edge of the shuttle rim or hoop, the inner face of the hoop is slightly cut away or concaved, as seen at 25. This concavity is not an essential, as obviously the shuttle-hoop may be made thinner; but in many cases it is a desirable feature, especially when the shuttle-hoop is made comparatively thick and strong, as shown in the drawings. The operation of these parts will now be plain. As the thread is taken, Figs. 1, 2, and 7, the shortest horn 21 of the driver is driving the shuttle by bearing on the back bar of the same. As this horn passes the plane of eccentricity (the dotted line of Fig. 7) the shuttle begins to separate from it, and the horn 20 begins to engage the heel of the shuttle, so that as the shortest horn approaches the loop, Fig. 8, it is well separated from the shuttle, and the loop falls naturally into the concavity 25 (see Fig. 3) under this horn and between this horn and its bearings 24 and begins to be expanded to pass the bobbin-case by the bevels 13 and 16 on the thread-guard and the back bar of the shuttle. The further movement of the shuttle to the position of one hundred and eighty degrees, Fig. 9, brings the short horn 21 of the driver into contact with the shuttle, begins to relieve the heel-horn 20 from contact therewith, and opens a space between the toe of the shuttle and the toe-horn 9 of the driver, so that the loop slackens by moving along the bevel of the toe of the shuttle and is free to cast off. The further movement of the shuttle through the second one hundred and eighty degrees completely frees the long horn 20 of the driver from the shuttle and leaves a free space between the thread-guards of the driver and shuttle for the loop to pass as it is taken up. (See Fig. 10.) By these means it will be seen that the loop has a full and direct passage around the shuttle. At no point is it abruptly deflected, bent, or doubled. During its entire passage it preserves a normal form. (See the position of the loop in Figs. 3, 5, 8, and 9.) This permits running the machine at a higher speed than is common with other forms of machines having similar forms of shuttles and obviates cutting and pinching the thread. This is largely due to the construction of the shortest driver-horn and its arrangement to engage the shuttle back of the plane of the same. It is also to be noticed that the cast-off takes place at one hundred and eighty degrees—a thing not possible with other similarly-operated shuttles—and the essential advantage thus secured is that the

take-up mechanism can operate through a longer period, and hence have a smoother action with less friction, resulting, also, in simpler parts for the take-up devices. Again, the thread is taken up through one hundred and eighty degrees of the revolution and smoothly and regularly, being not jerked or twitched, and this also permits higher speed than in machines where the take-up is effected through a smaller arc, and this long take-up motion is due to the fact that putting one of the driving-horns behind the plane of the shuttle permits the arrangement of the shuttle-point close to the shuttle-toe. In fact, the point and inner end of the toe are so nearly on the same radial line that just before the hook passes one hundred and eighty degrees the slack of the thread is effected, followed immediately by the beginning of the take-up action. It will also be seen in this connection that the variable character of the speed of the driver can be less than is commonly the case, which, again, adds to the possibilities of high speed of the machine and reduction in wear and friction.

The form of the shortest driver-horn and its relation to the shuttle may be modified, and I do not therefore insist upon the special form here shown. It is essential, however, that it engages the shuttle back of the plane of the rim of the same or back of the bearing-points of the other horn or horns.

It is of course to be understood that the toe-horn is not for driving the shuttle forwardly. It serves a function common to such devices of driving the shuttle when the driver revolves backward, and is not a feature of novelty here.

Referring to Figs. 1 and 2, 26 indicates a finger-lever that holds the bobbin in position in the shuttle. This lever is pivoted by a screw at 27 to the front of the shuttle-race, and behind it and fixed to the race by the screws 27 and 28 is a bar 29, that is notched at 30 to receive a projection 31 on the bobbin-case. 32 is a spring-piece cut from the material of the bar 29 and is bent forward over the lever 26 and bears upon the cam-point 33 of the same, which point is slightly to the right of the pivot of the lever. To remove the bobbin the free end of the lever is forced down, as shown in dotted lines, thus uncovering the bobbin-case, which can be then readily removed. The spring acts upon the cam of the lever to hold it in open or close position, and particularly does it serve to insure the proper return to place of the lever after the bobbin has been put in the shuttle.

What is claimed as new is—

1. The combination, in a sewing-machine-shuttle-operating mechanism, of a shuttle-race, a rotating shuttle supported and running therein by a peripheral hoop 8 and having a driving-bearing 11, located in the plane of the said hoop, and a second driving-bearing 24, located back of the plane of the hoop, and a rotating shuttle-driver 18, arranged with its axis of rotation eccentric to the axis of rotation of the shuttle, and having the horn 20, extending forward to the plane of the shuttle to engage the bearing 11, and a horn 21, projecting forward to back of the said plane to engage the bearing 24, substantially as and for the purpose set forth.

2. The combination of the shuttle, the shuttle-race, and the shuttle-driver arranged with its axis eccentric with respect to the axis of the shuttle, as and for the purpose set forth, the shuttle being provided with a peripheral hoop-rim 8, having in the same plane the heel-bearing 11 and a toe 9 and hook 10, and with the back bar 14, having the bearing 24, and the driver being provided with the horn 20, projecting to and adapted to engage said bearing 11 of the shuttle, with the horn 21 projecting to and adapted to engage the bearing 24, and with the horn 19 engaging the toe 9, substantially as and for the purpose set forth.

3. In combination, the rotating shuttle, the shuttle-race, and the shuttle-driver arranged with its axis eccentric with respect to the axis of the shuttle, the shuttle consisting of the peripheral hoop 8, toe 9, heel 11, arranged in the plane of the hoop, also of the diametrical bar 14, supported on the back of the shuttle, but out of the plane of the same, and having the bearing-edge 24, and the driver consisting of the head 18, having the horns 19 and 20, projecting to the plane of the shuttle and adapted to engage, respectively, the toe and heel of the same, and the horn 21, projecting to the plane of the back bar 14 and adapted to engage the bearing-edge 24 thereof, substantially as and for the purpose set forth.

4. In combination with a rotating shuttle and its race, the bar 29, secured to the race at each end and upon opposite sides of the bobbin-case and having the notch 30 and spring 32 formed thereon, the lever 26, pivoted on said bar and having the cam 33, upon which said spring presses, and the bobbin-case located behind the said lever and provided with the projection 31, entering the said notch, substantially as and for the purpose set forth.

JAMES TRIPP.

Witnesses:

ROBT. F. GAYLORD,
ERNEST HOPKINSON.