

J. E. BERTRAND.
SHUTTLE FOR SEWING MACHINES.

No. 445,655.

Patented Feb. 3, 1891.

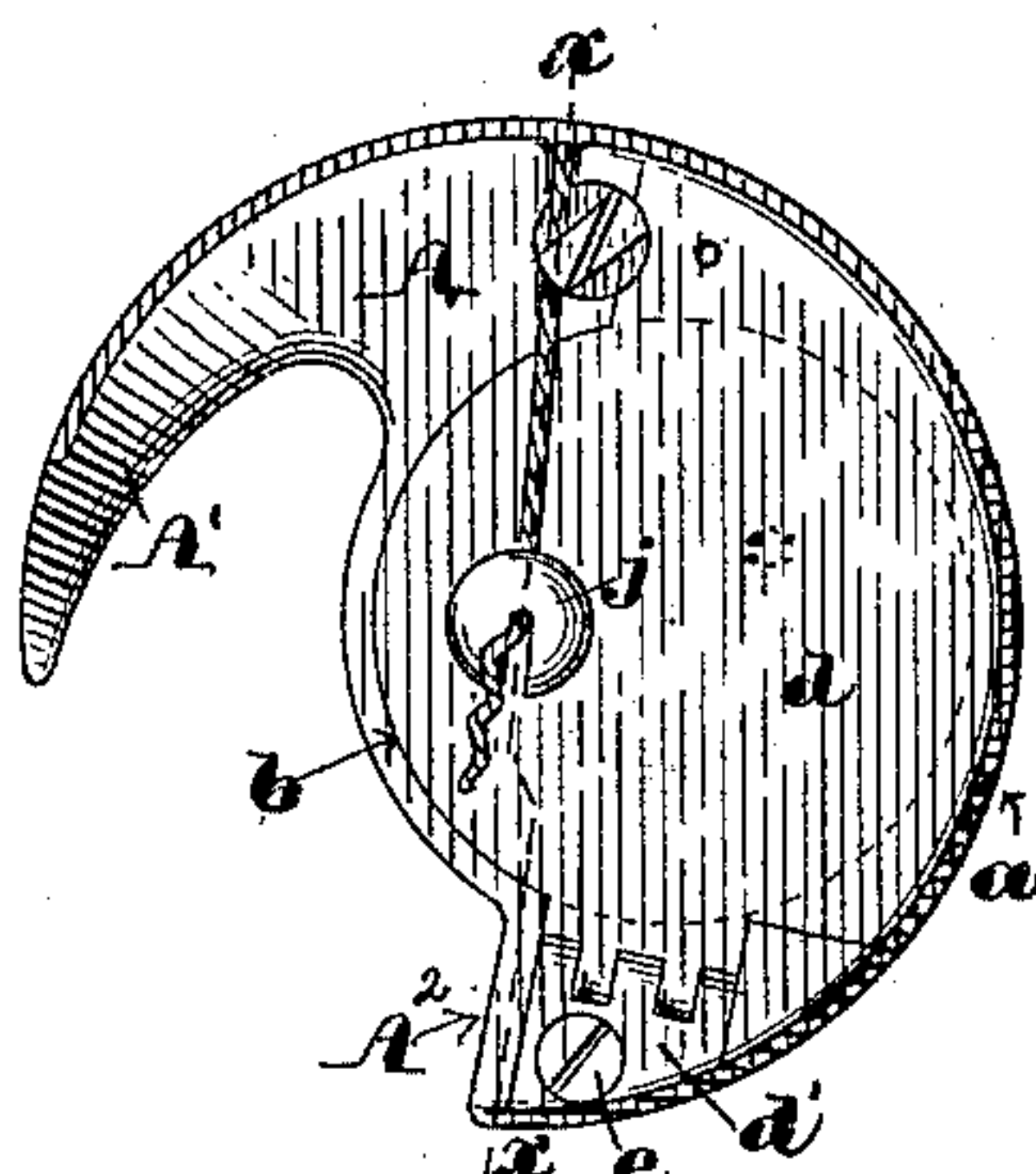
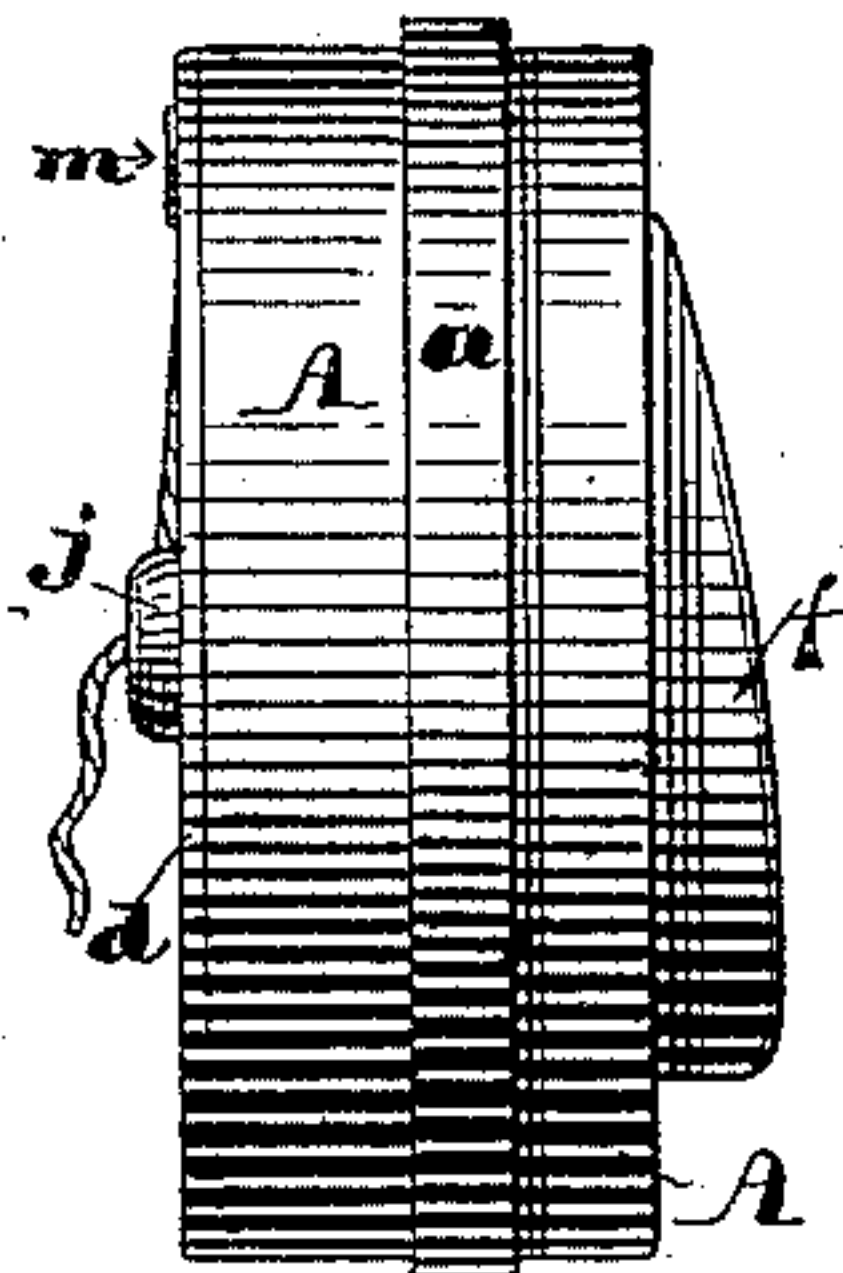


Fig. 1.



(No Model.)

2 Sheets—Sheet 2.

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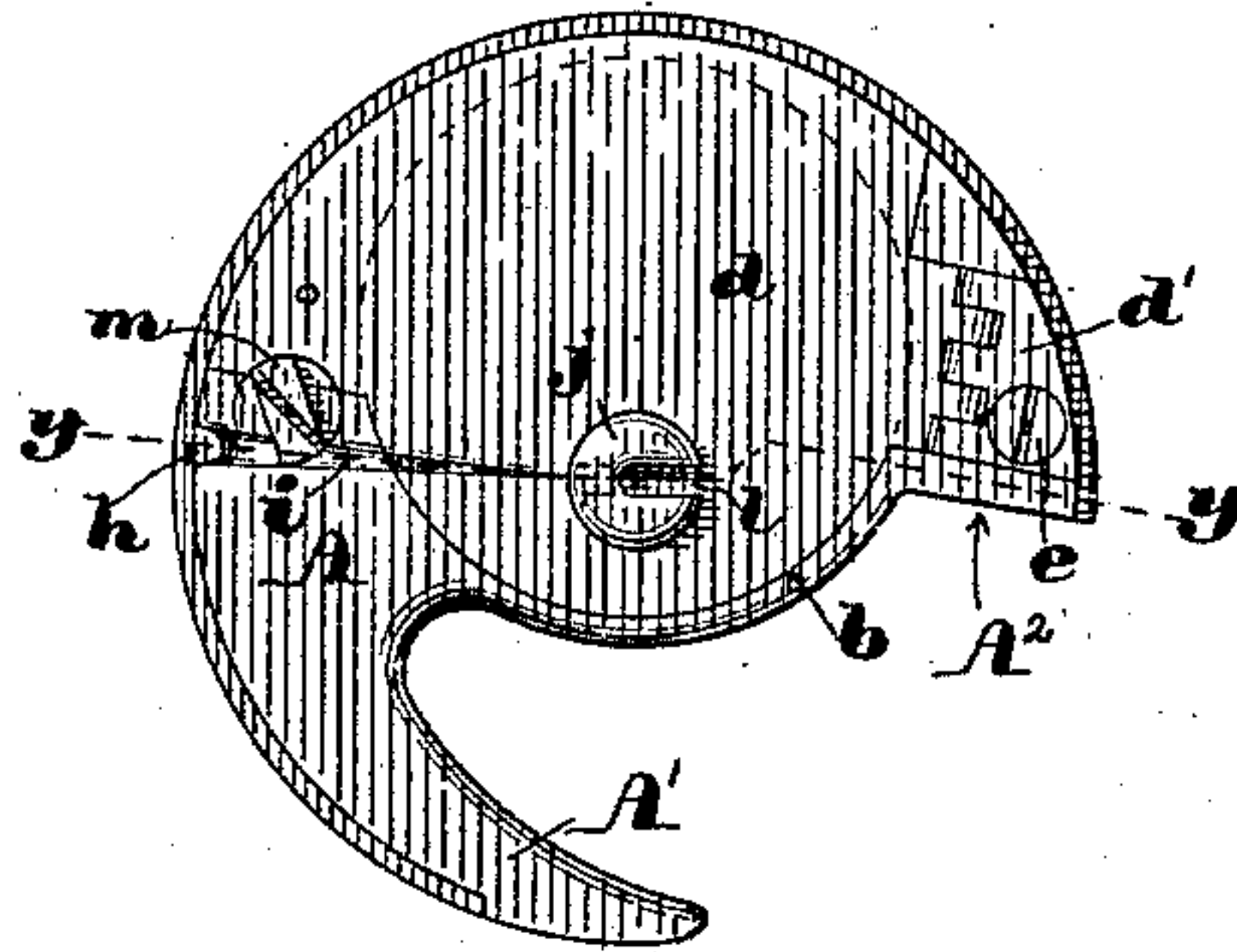


Fig. 12.

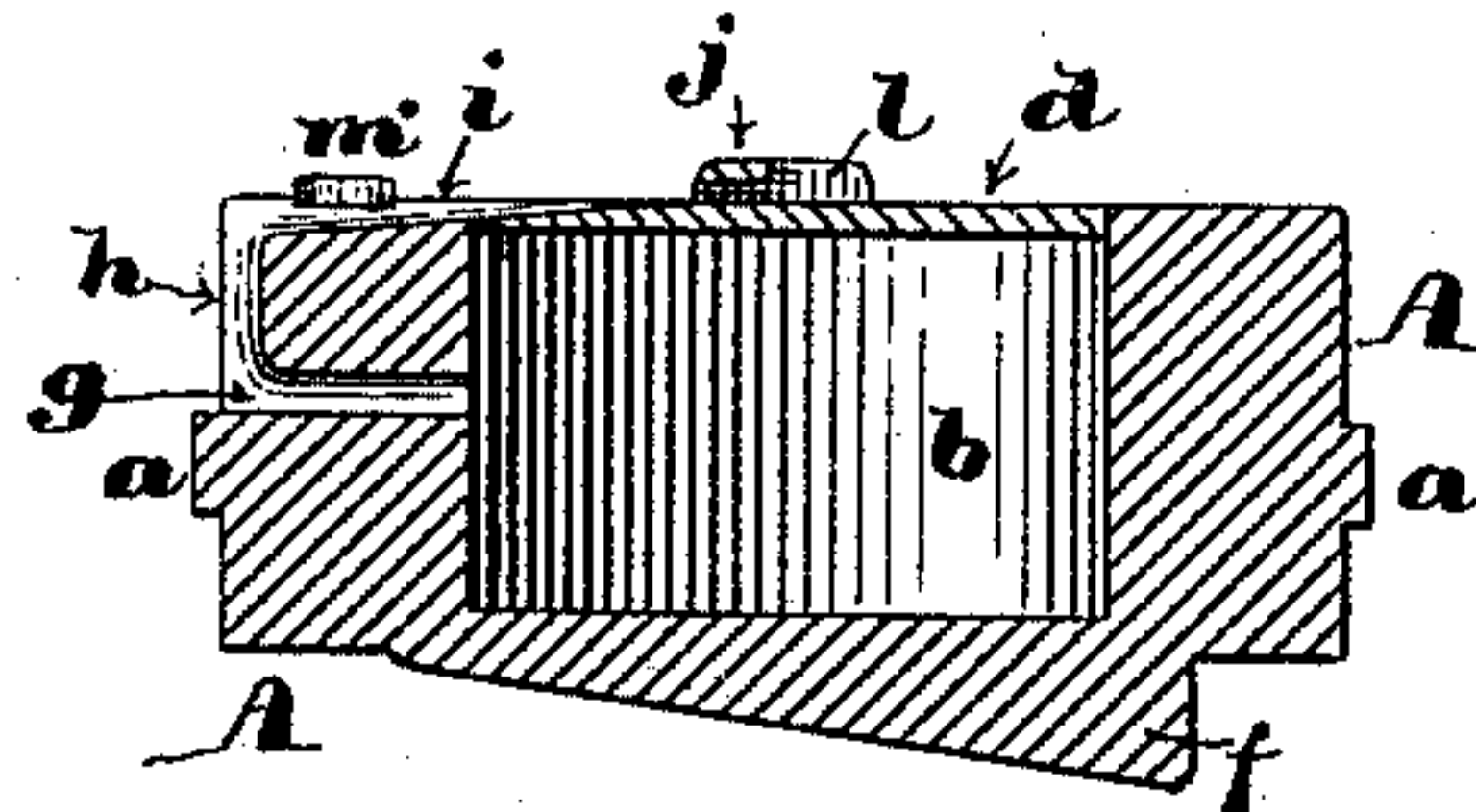


Fig. 13.

Witnesses:
Walter E. Lombard,
John B. Hadaway.

Inventor:
Joseph Eli Bertrand,
by N. C. Lombard
Attorney.

UNITED STATES PATENT OFFICE.

JOSEPH ELI BERTRAND, OF BOSTON, ASSIGNOR OF ONE-HALF TO MELLEN BRAY, OF NEWTON, MASSACHUSETTS.

SHUTTLE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 445,655, dated February 3, 1891.

Application filed April 10, 1890. Serial No. 347,298. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ELI BERTRAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machine Shuttles, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to sewing-machine shuttles of the class termed "revolving" or "oscillating" shuttles or hooks; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings and to the claims hereinafter given, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a front elevation of my improved shuttle. Fig. 2 is an elevation of the back or rear side of the same. Fig. 3 is an edge view of the same, looking at the right hand of Fig. 1. Fig. 4 is an edge view, looking at the under side of Fig. 1. Fig. 5 is a plan of Fig. 2. Fig. 6 is an edge view, looking at the left side of Fig. 1. Fig. 7 is a section on line $x x$ on Fig. 1, and Figs. 8, 9, and 10 are diagram views illustrating the operation of the shuttle and are to be hereinafter referred to. Fig. 11 is a front elevation of the shuttle in the position which it occupies at the time the loop is cast off the barb of the needle. Figs. 12 and 13 are respectively a side elevation and a section of the shuttle, with the thread and its bobbin omitted in order to more clearly show the tapered groove in the face of the shuttle.

In the drawings, A is the main body of the shuttle, made in the form of a circular disk, with a portion of its periphery cut away to form the nose or hook A' and the heel A², and afford a bearing for the shuttle driver or carrier B, (shown in Figs. 8 and 9,) and operated in any well-known manner.

This shuttle is an improvement upon the shuttle shown and described in another application of mine, filed January 18, 1890, Serial No. 337,289, and has formed upon its periphery the circumferential lip or rib a to guide it in its race in a well-known manner.

The shuttle A has formed in its front face

the cylindrical chamber b to contain the thread-carrying bobbin c , which chamber is closed by the door d , hinged to the block d' , fitted in a recess formed in the thick part of the wall of said chamber at the heel of the shuttle, and secured therein by a screw e , as shown in Figs. 1 and 4.

So far the shuttle is constructed and arranged substantially like the shuttle shown and described in my prior application, before cited, except that the nose or hook is made somewhat longer and the distance from the heel of the shuttle A² to the root of the nose or hook A' is somewhat greater than in the shuttle of said prior application.

The shuttle shown and described in my before-cited prior application had formed upon its back or rear side two parallel ribs arranged concentric to the axis of revolution of the shuttle, and their outer edges from a point near the root of the nose or hook of the shuttle to near the end of the outer rib were parallel to the plane of revolution, the ribs acting in conjunction with the forward movement of the needle just after the hook had fairly entered the loop of thread to cast off the loop from the barb of the needle. This took place immediately after the point of junction of the two ribs at or near the root of the hook had passed the path of the needle, and was found to be objectionable on account of the danger of the thread of the loop being carried around by the shuttle after the loop was cast off. To obviate this objection is the object of one portion of my invention, and to this end, instead of using the two parallel ribs on the back or rear face of the shuttle, I form on said back or rear face a central hub f , having a segmental peripheral surface of a radius slightly less than the distance between the axis of the shuttle and the path of reciprocation of the needle at a point directly over said hub and having its rear face oblique to the plane of revolution of the shuttle, with the smallest projection of said hub at or near the root of the hook A' and the greatest projection at a point diametrically, or nearly so, opposite said root of the hook, as shown in Figs. 5, 6, and 7. By this construction of the rear face of the shuttle and a proper timing of the movement of

the shuttle relative to the movements of the needle, which is substantially the same as in my before-cited application, the thread is retained in the barb with the needle on that side of the thread toward which the shuttle is moving until the shuttle has made nearly a half-revolution from the position shown in Figs. 1 and 2, or until the shuttle assumes the position shown in Fig. 11, at which time the take-up begins to draw up upon the loop and the loop slips over the heel portion of the shuttle and away from the barb of the needle just at the time when the point of greatest projection of the hub *f* has reached or nearly reached the vertical plane in which the needle reciprocates, as shown in Fig. 11.

By the use of the shuttle constructed as above described a positive cast off of the loop from the barb of the needle is assured without the employment of a special cast-off device independent of the shuttle and without danger of the loop being carried forward by the shuttle in its rotation, with the result of drawing out more thread than had previously been measured off for forming the loop.

Another advantage of this form of shuttle is that a considerable increase in the size of the shuttle sufficient to nearly double the capacity of the shuttle-bobbin may be made without increasing the length of thread drawn out to form the loop for the passage of the shuttle. This is a very important advantage, especially in wax-thread sewing-machines.

Another part of my invention is the means employed for delivering the thread from the shuttle-bobbin to the work through or at the axis of revolution of said shuttle and preventing said shuttle-thread becoming entangled with the needle-thread except as required to form the stitch. To this end I pass the thread from the bobbin *c* through the hole *g*, formed in the thick portion of the shuttle near the root of the hook *A'*. (See Figs. 5 and 7.)

A channel *h* is formed in the periphery of the shuttle from the outer end of said hole *g* to the front face of the shuttle, and a similar channel or groove *i* is formed in the front face of the shuttle and extending from the front end of the channel *h* to the edge of the door *d*, and a tapering channel or groove forming an extension of groove *i* is made in the outer face of the door *d*.

On the door *d*, at a point coinciding with the axis of the shuttle, is formed or secured a rounded outwardly-projecting boss *j*, having a thread-guiding eye or hole *k* drilled transversely through the same just outside of the front face of said door and a slot *l* cut through the outer rounded face of said boss from its periphery on the side toward the hinged edge of said door to a short distance beyond the center of said boss, as shown in Figs. 1, 4, 5, and 7.

The side of the door *d* opposite to its hinged connection to the body of the shuttle is secured in closed position by the screw-button

m, having one side of its head slabbed off or cut away in a well-known manner.

A feature of my invention in this connection, however, is slabbing or cutting away two opposite sides of the head of the screw-button *m* and locating it between the edge of the door and the thread-guiding groove *i*, and in such near proximity to each that when turned obliquely to the groove *i* one corner of the head of said screw will project over said door and secure it in a closed position, and the diagonally-opposite corner will project over the groove *i* and confine the thread therein, as shown in Fig. 1, and when turned, so that its parallel sides are parallel to the groove *i*, the thread and the door will both be released. The bobbin-thread is passed from the bobbin through the hole *g* along the grooves *h* and *i* beneath the head of the screw *m* through the hole or eye *k* in the boss *j*, and drawn out at the center of said boss through the slot *l*. This arrangement of the slot *l* and hole *k* in the boss *j* facilitates very much the threading of the shuttle-thread.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A rotary sewing-machine shuttle provided with a loop-engaging hook tapered to a point both circumferentially and in the direction of the length of its axis, and having formed on its rear face a rearwardly-projecting boss or hub nearly semicircular in shape, with the periphery of its circular portion concentric with and at a distance from the axis of the shuttle corresponding, or nearly so, to the distance of the inner face of the hook of the shuttle at its root from said axis, and having its rear face oblique to the plane of revolution of the shuttle, with its least projection at or near the root of the shuttle-hook and its greatest projection at or near a point diametrically opposite the root of said hook.

2. In a rotary sewing-machine shuttle, the thread-delivering hole *g*, the grooves *h* and *i*, the rounded boss *j*, projecting from the front face of the shuttle, with its center in line with the axis of the shuttle, and provided with the transverse hole or eye *k*, and the radial slot *l*, extending from the center of the boss *j* to its periphery in one direction only, all combined and arranged to operate substantially as and for the purposes described.

3. The combination, in a sewing-machine rotary shuttle, a bobbin-holding chamber, a hinged door for closing said chamber, a thread-carrying bobbin mounted in said chamber, the thread-delivering orifice *g*, the channels *h* and *i*, formed, respectively, in the periphery and front face of the shuttle-body, and the screw *m*, having a head the two opposite sides of which are slabbed off or otherwise made parallel to each other, and so arranged relative to said door and the groove

i that one corner of said head shall serve to
secure said door in a closed position and at
the same time another corner of said head
shall bridge said groove i and serve to retain
5 the thread therein.

In testimony whereof I have signed my
name to this specification, in the presence of

two subscribing witnesses, on this 7th day of
April, A. D. 1890.

JOSEPH ELI BERTRAND.

Witnesses:

N. C. LOMBARD,

WALTER E. LOMBARD.