

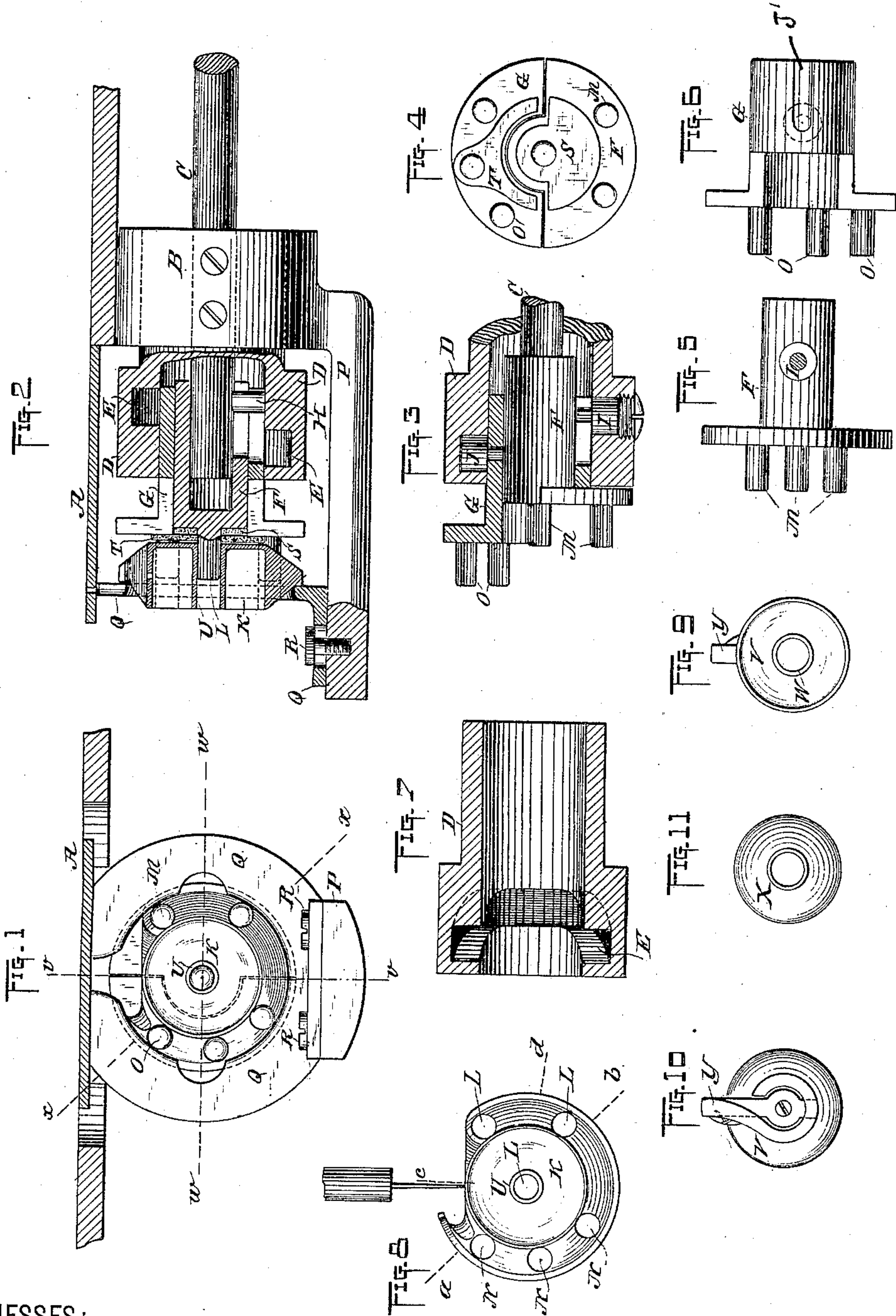
(No Model.)

J. TRIPP.

SHUTTLE OPERATING MECHANISM FOR SEWING MACHINES.

No. 398,291.

Patented Feb. 19, 1889.



WITNESSES:

*Raphael Netter*  
*Robt. F. Gaylord*

INVENTOR:

*James Tripp*

BY

*Duncan Curtis Page*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

JAMES TRIPP, OF NEW YORK, N. Y.

## SHUTTLE-OPERATING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 398,291, dated February 19, 1889.

Application filed May 31, 1888. Serial No. 275,642. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES TRIPP, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Sewing-Machine Shuttles and Mechanism for Operating the Same, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to rotary or rotarily-oscillating shuttles for sewing-machines, and particularly to the class of such shuttles that are bodily carried by the shuttle-operating shaft without the assistance of a race.

The principal object of this construction is to obviate the well-known difficulties incident to the employment of a race in connection with a rotating shuttle, they being, essentially, that the lint and flock, particularly of shoddy and woolen goods, get into the race and clog the same, and the oil that is required to a free and easy running of the shuttle becomes gummed, and besides soiling the stitching-threads collects the dirt and lint and causes friction and hard running of the shuttle and wear of the parts.

Heretofore shuttles of this kind have been mounted on the shuttle-shaft with a view to overcoming these difficulties, and the parts that connect the shuttle to its operating-shaft have consisted of peripheral fingers or pawls grasping the shuttle and actuated to loose it for the passage of the thread; also, the shuttle has been driven by lugs entering recesses therein and the shuttle caused to move to and from the lugs to permit the thread to pass; and the shuttle has been driven by a crank-connection, parts of which have been notched to permit the thread to pass. In all these forms of shuttles and shuttle-actuating devices the necessary play or looseness of the shuttle-driving devices results in an undesirable irregular motion of the shuttle and causes rattling or shaking, thus affecting the speed of the shuttle and causing the thread to catch and be tangled and the parts to be clogged. To overcome these objections it is essential to support the shuttle so that it shall have a steady and regular revolution and not be sub-

jected to any peripheral or lateral pressure tending to deflect it from its plane of revolution, as also to provide that the needle-thread shall have an unobstructed and regular passage around the shuttle.

My invention consists, therefore, of cam-actuated plungers mounted upon the shuttle-shaft and parallel therewith and reciprocating alternately into and out of corresponding holes in the shuttle, whereby the shuttle revolves with the shuttle-shaft and the needle-thread is permitted to pass freely around the shuttle.

In the drawings, Figure 1 is a front or elevation view of the shuttle, shuttle face-plate, and surrounding parts. Fig. 2 is a central section of the parts of Fig. 1 on the plane *vv* of that figure. Fig. 3 is a central horizontal section on plane *ww* of the outer plunger-sleeve, showing the inner plunger-sleeve and shuttle-shaft in full. Fig. 4 is a face or end view of the same. Figs. 5 and 6 are detail views of the plunger-sleeves. Fig. 7 is a central longitudinal section on plane *xx* of the cam-bushing in which the plungers work. Fig. 8 is a face view of the shuttle. Figs. 9 and 10 are reverse face views of the bobbin-case, and Fig. 11 is a face view of the bobbin.

Referring to these views in detail, A represents the work-plate of a sewing-machine.

B is a journal-lug depending from the underneath side thereof, and which serves to support the shuttle end of the shuttle-actuating shaft C.

D is a cam-sleeve, which is fixed in the lug B and has the internal cam-groove, E. Upon the shuttle-shaft is mounted the inner plunger-sleeve, F, and upon this sleeve F is mounted the outer plunger-sleeve, G, which fits closely in the cam sleeve or bushing D. These sleeves are keyed to the shuttle-shaft by key H, which passes up through slots in the sleeves and permits them to have independent longitudinal motion on the shuttle-shaft. They are also provided with cam-rollers I and J, which extend radially into the cam-groove E, the roller I of the inner sleeve being mounted on a pivot projecting from such sleeve up through a slot, J', in the outer sleeve. By this arrangement of these parts it will be seen that as the



shuttle-shaft revolves these sleeves will be independently reciprocated longitudinally and parallel with the shuttle-shaft, according to the direction of the cam-groove.

5 K is the shuttle, which is pierced with longitudinal holes L L L to receive the plunger-pins M M M on the head of the plunger F, and with holes N N N, which are to receive the plunger-pins O O O on the head of the  
10 plunger G.

P is a bracket-arm extending forward from the lug B to just below the shuttle, and its office is to support the face-plate Q of the shuttle, upon which arm this plate is adjustable to and from the shuttle, the set-screws R serving to hold it in any desired position. This face-plate simply bears against the shuttle, constituting its plane of revolution, and holds it against the slight thrust forward due  
20 to the friction of the plunger-pins entering the holes therein. Upon the face of the plunger-heads, and preferably fitted around one or more of the pins thereof, are cushions S and T. I have shown these cushions as being of  
25 leather, felt, or a similar material; but they may be springs and constructed of metal. Their office is to fill the slight space between the plunger-heads and the back of the shuttle and to shield the shuttle from any possible shock, as well as to hold it delicately  
30 pressed against its face-plate and prevent any vibration, while still permitting it to run with the greatest freedom and the least friction.

The shuttle is provided with a central hollow post, U, which receives a central pin, M, of the inner plunger, thus affording a central bearing for the shuttle and further insuring its steadiness of motion. This central pin is not, however, essential, though it affords a  
40 convenient means for centering the shuttle and preventing eccentric motion thereof.

The bobbin-case V is provided with a hollow hub, W, adapted to slide over the post U of the shuttle. The bobbin X is of the usual  
45 form and rides upon the hub W of the bobbin-case. The bobbin-case is provided with a tension-spring, Y, for the bobbin-thread, which spring may be of any approved form, and the bobbin-case may be held in the shuttle by any  
50 of the well-known means.

In Fig. 8 I have indicated the positions relatively to the shuttle of the cam-surfaces by the lines *a b* and *c d*, the shuttle being about to take the loop then forming by the  
55 upward movement of the needle. In this position of the shuttle the outer plunger is carrying the shuttle and the inner plunger is advancing into it. After the shuttle has taken the loop and turned to a position where the  
60 loop would begin to strike the forward pin of the outer plunger—that is, a position where such pin would be nearly under the needle—the cam-roller of this plunger strikes the backward incline of the cam-groove, and in  
65 passing between the positions *a* and *c* withdraws the pins of this plunger from the

shuttle. The cam-roller of the inner plunger has, just previous to the beginning of the backward movement of the outer plunger, passed over the space *b d*, which represents the forward incline of the cam-groove, and its pins have entered the shuttle and it is in position to carry the shuttle before the pins of the outer plunger have begun to withdraw to permit the loop to pass between  
75 them and the shuttle. When the shuttle has revolved to the position that brings the outer plunger-cam to the position *b d*, the pins of this plunger again enter the shuttle and are in position to carry it by the time the shuttle  
80 has made somewhat more than one-half of its revolution and when the loop will be about to strike the center pin of the inner plunger. At this time the cam-roller of the inner plunger will strike the cam-incline *a c* and its pins  
85 will be withdrawn to allow the loop to be taken off the shuttle by the take-up mechanism.

It is to be noticed that at two points in the revolution of the shuttle—namely, the points *a b*—both plungers are projecting forward  
90 into and pressing against the shuttle, and that before either plunger begins to leave the shuttle the other plunger has moved to its advanced position with its pins inserted in the shuttle ready to support and carry it. This  
95 insures the shuttle being at all times held lightly against its face-plate by one of the plungers and concentric with the shuttle-shaft—that is, it is held so that it cannot move from its plane of revolution nor away  
100 from the axis of such shaft. By these means the shuttle is bodily carried with great steadiness and regularity, and the use of and objections to a shuttle-race are obviated. Furthermore, a shuttle thus supported and actuated  
105 can be run at a high speed, and the wear of the same is so slight as to be negligible.

It is obvious that various of the parts I have here shown are susceptible of alteration and change, and that these improvements are  
110 applicable to either oscillating or rotating shuttles. I do not, therefore, limit myself to the exact form and arrangement here shown, which are designed and will suffice to explain the nature of the invention to those skilled  
115 in the art.

What is claimed as new is—

1. The combination, in a sewing-machine, of a shuttle-shaft, two plungers mounted upon the same and each provided with two or more  
120 pins to engage and carry the shuttle, with a shuttle provided with holes to receive the plunger-pins, a face-plate to hold the shuttle against the thrust of its carrying-pins, and a cam for alternately reciprocating the plungers to and from engagement with shuttle to  
125 permit the loop to pass, the plungers and the cam being arranged so that one of the plungers will at all times be advanced with its pins engaging and carrying the shuttle. 130

2. In a sewing-machine, the combination, with the shuttle-shaft carrying plungers which



are each provided with two or more shuttle-  
supporting pins, a shuttle provided with holes  
to receive the plunger-pins, a shuttle face-  
plate, a cam constructed and arranged to al-  
ternately hold one of the plungers in engage-  
ment with the shuttle while the other plunger  
is being withdrawn from the shuttle to let the

loop pass its pins and again inserted therein,  
and a cushion arranged between the shuttle  
and the plungers.

JAMES TRIPP.

Witnesses:

HENRY F. NEWBURY,  
ROBT. F. GAYLORD.