

C. F. BOSWORTH.

SEWING-MACHINES FOR SEWING STRAW-BRAID.

No. 174,108.

Patented Feb. 29, 1876.

fig 1

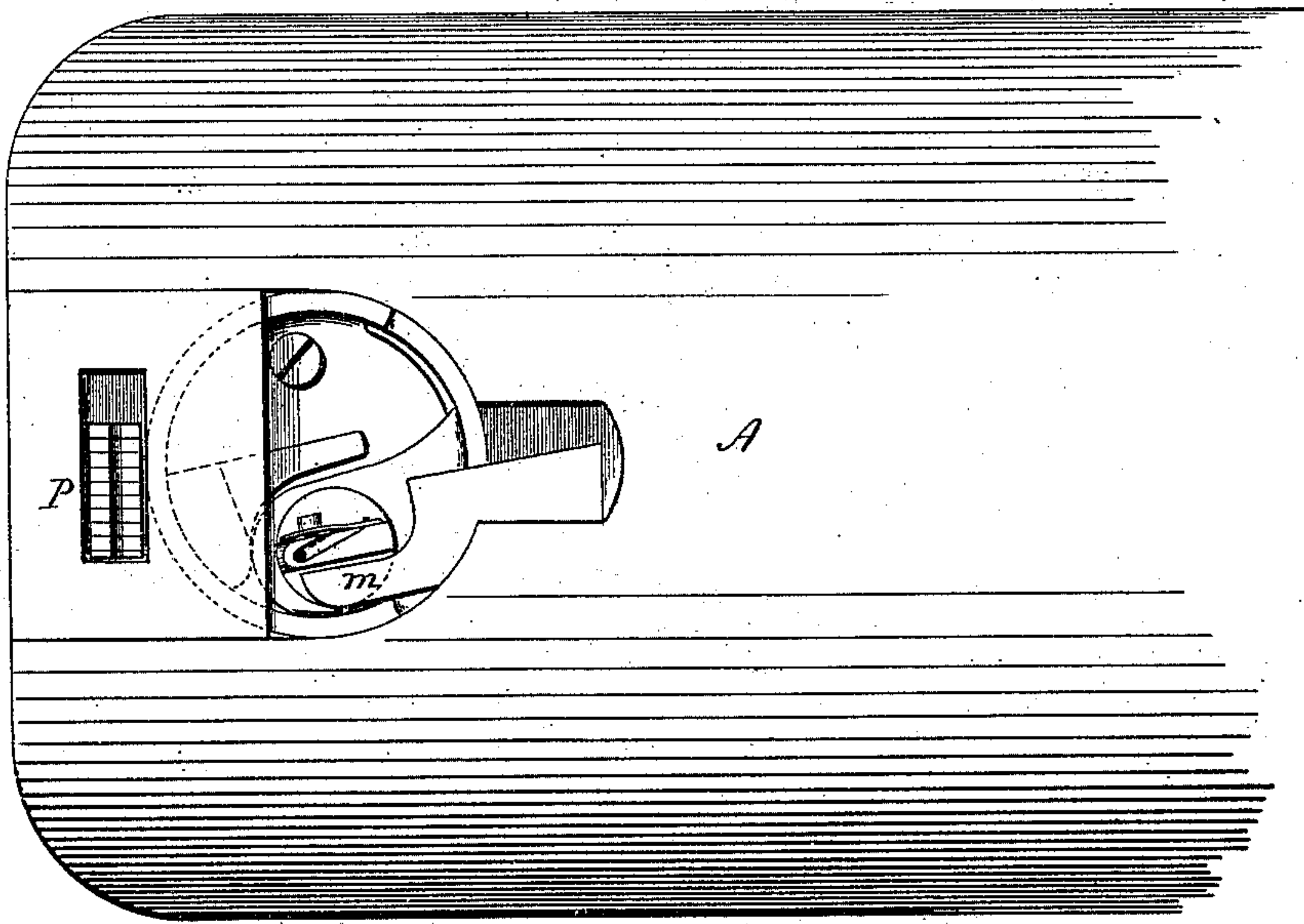


fig 2

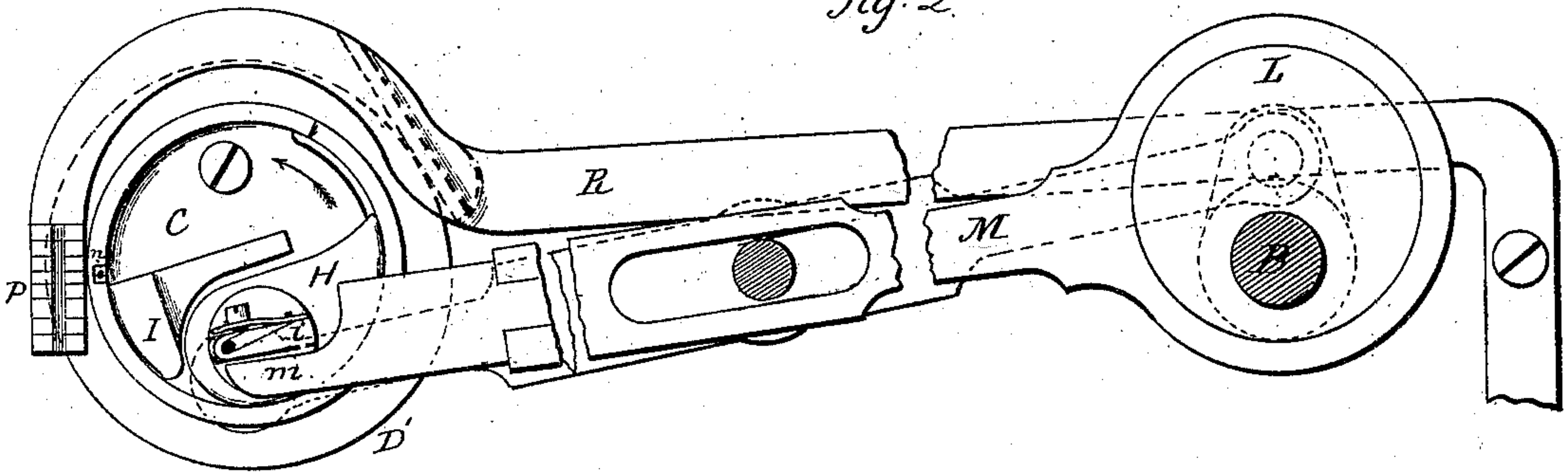


fig 7

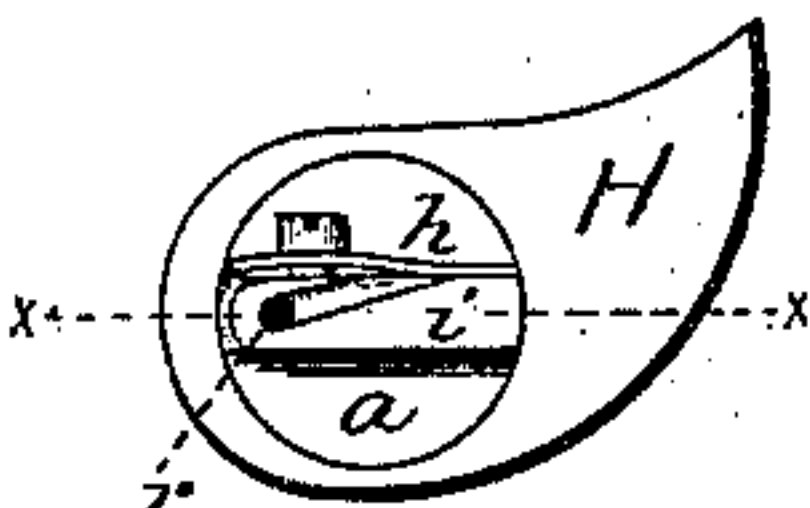
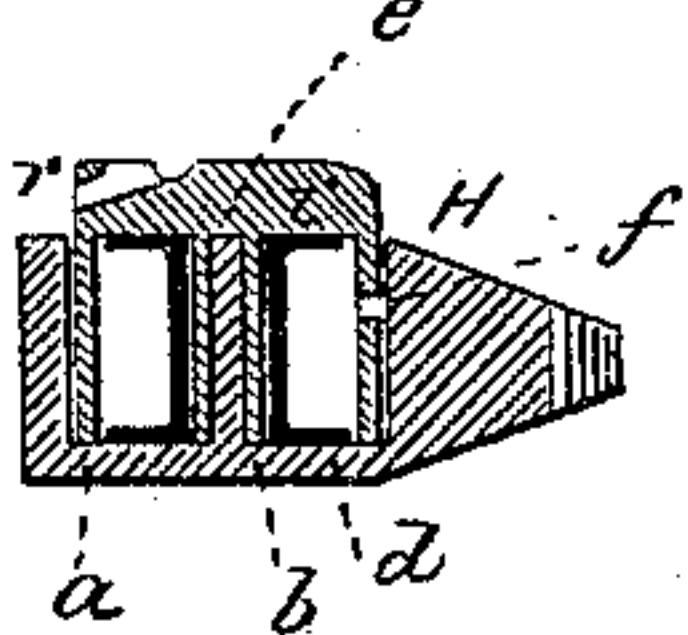


fig 8



Witnesses.

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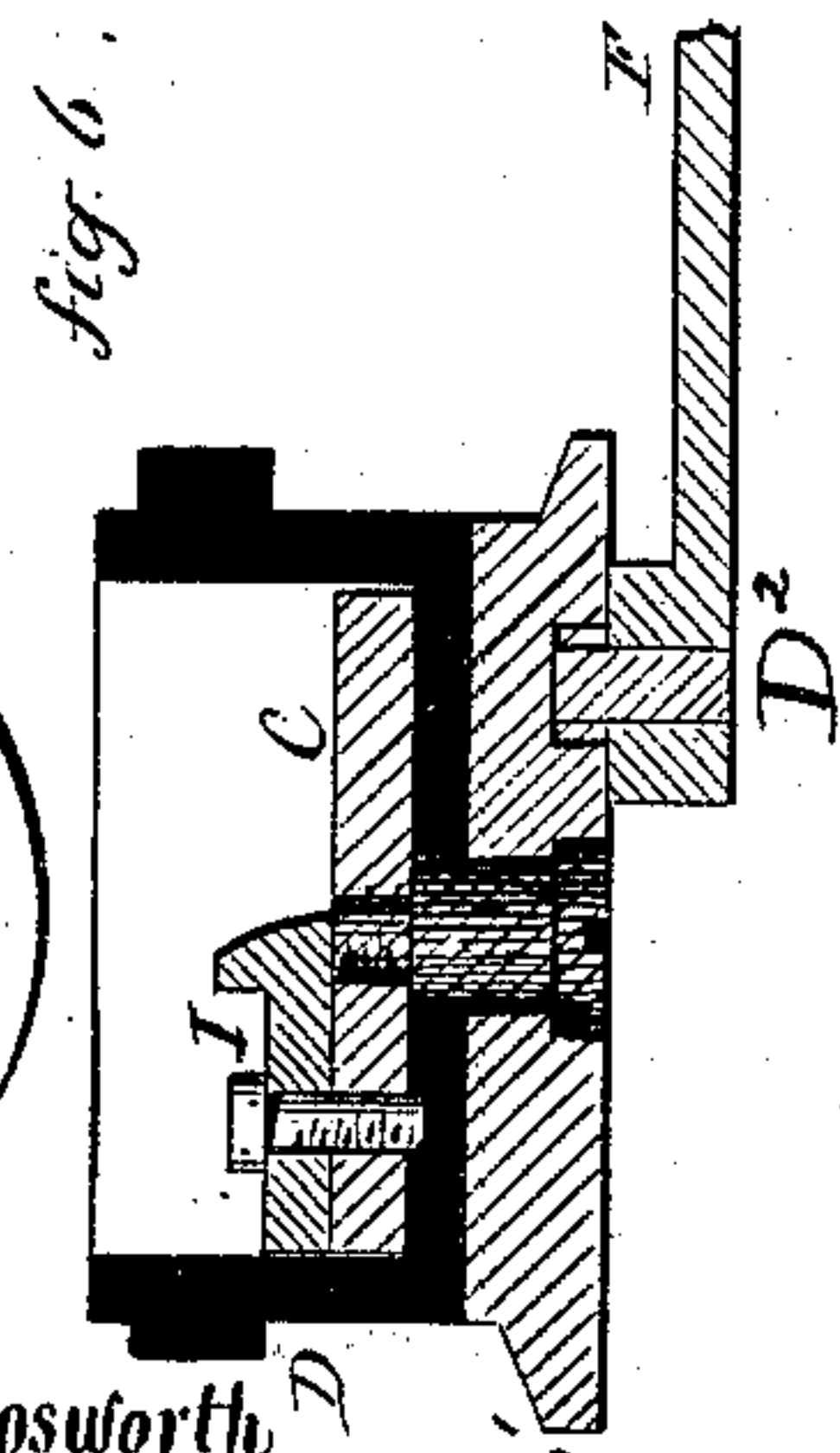
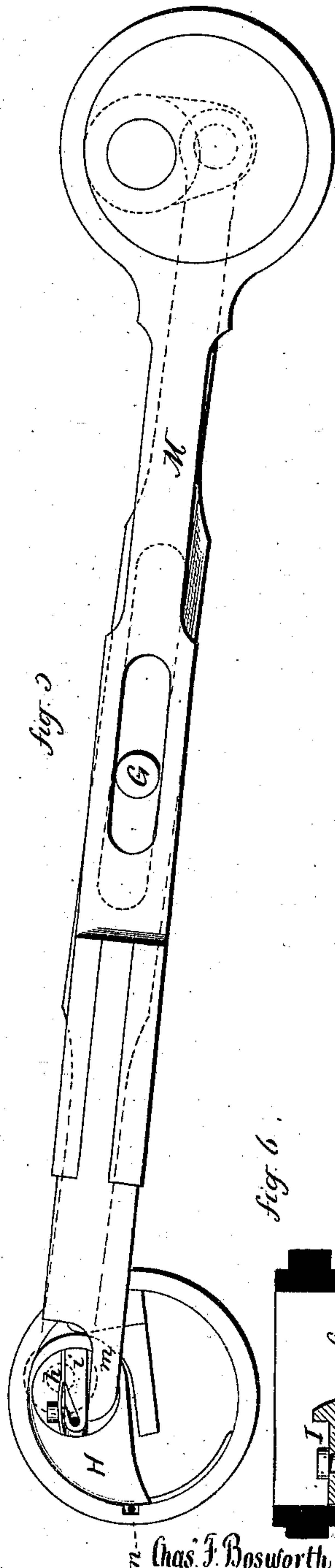
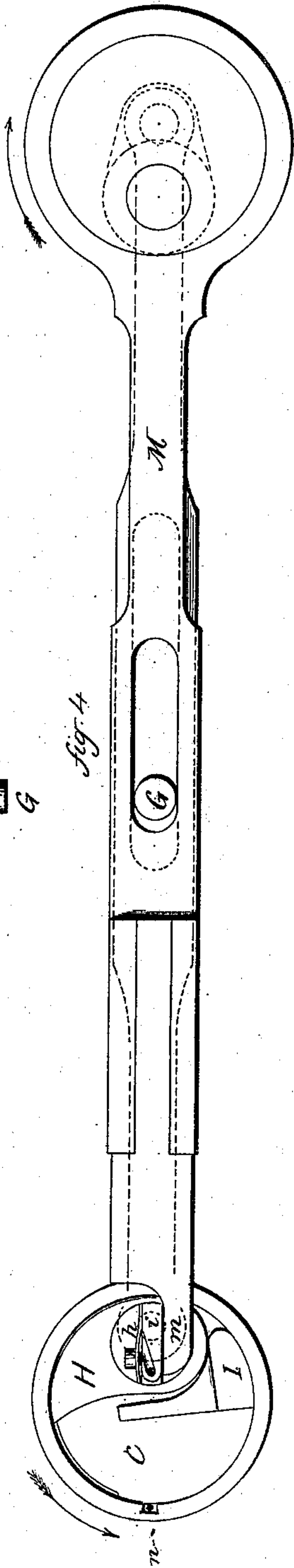
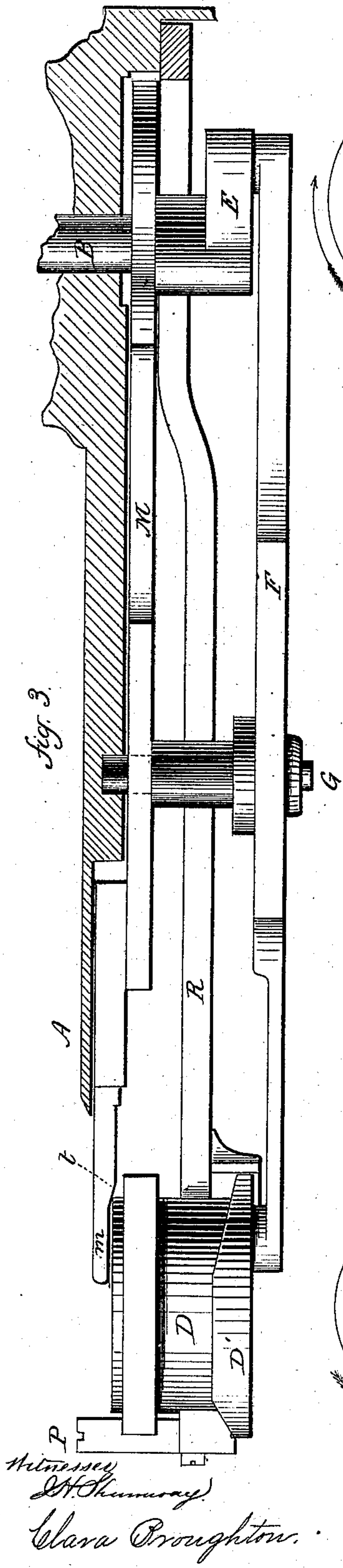
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UNITED STATES PATENT OFFICE.

CHARLES F. BOSWORTH, OF MILFORD, CONNECTICUT.

IMPROVEMENT IN SEWING-MACHINES FOR SEWING STRAW BRAID.

Specification forming part of Letters Patent No. **174,108**, dated February 29, 1876; application filed August 16, 1875.

To all whom it may concern:

Be it known that I, CHARLES F. BOSWORTH, in the county of New Haven and State of Connecticut, have invented a new Improvement in Sewing-Machines; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, plan view, with a portion of the work-table removed; Fig. 2, plan view, with the whole of the work-table removed; Fig. 3, longitudinal section of the work-table, showing a side view of the improved mechanism; Figs. 4, 5, 6, detached views; Figs. 7, 8, shuttle.

This invention relates to an improvement in that class of sewing-machines known as lock-stitch, and in which the second thread is carried upon a bobbin within a shuttle reciprocating at right angles to the needle.

The object of this invention is to impart to the shuttle a rotative movement in a plane at right angles to the needle; and it consists, first, in a shuttle provided with a rotative tension or thread-controller independent of the bobbin, the axis of which is at right angles to the plane of the shuttle, as more fully herein-after described; second, in combining in a sewing-machine a revolving shuttle-carrier, with a shuttle provided with a rotative tension or thread-controller, the axis of which is at right angles to the plane of the shuttle, and an active mechanism to automatically follow said tension device and prevent its rotation during the revolution of the shuttle, as hereinafter described.

A represents the bed or work plate of the machine, here shown as a cylindrical arm; but the form of this surface is immaterial to this invention. Through the post which supports the needle-arm a vertical shaft, B, is arranged, to which a revolution is imparted from the driving-shaft, said driving-shaft being arranged in the overhanging arm in the usual manner, too well known to require description here. C is the shuttle-carrier, which consists of a circular plate within a cylinder,

D, as seen in Fig. 6, the axis of the cylinder being vertical to the work-plate. The carrier C is attached to a plate, D¹, beneath the cylinder, and so as to revolve with it. The rotary movement is imparted to the carrier C by means of a crank, E, on the vertical shaft B, through a connecting-rod, F, to a crank-pin, D², on the plate D¹, and in order to avoid the dead-centers the rod F is hung upon a pivot, G, intermediate between the crank E and the carrier, and slotted so as to allow free longitudinal movement; hence the direction of revolution of the crank and the carrier are in opposite directions, the connecting-rod serving as a lever at the dead-centers, of which the pivot becomes the fulcrum, and thus a continuous revolution is imparted to the shuttle-carrier.

The shuttle H, which is of peculiar construction, is shown in Figs. 7 and 8, Sheet 1. The outer edge of the shuttle is the arc of a circle, corresponding to the interior of the shuttle-driver, and is made broad at the rear end to receive the bobbin-case *a*, the forward end pointed so as to easily enter the needle-loop.

The bobbin-case consists of a cylinder, *a*, fitted into a corresponding cavity in the rear end of the shuttle, the axis of the cylinder being vertical to the plane of the shuttle—that is, the path in which the shuttle moves. The case is closed upon its upper or outer end, and is constructed with a spindle, *b*, in its center. Onto this spindle *b* the bobbin *d*, denoted in solid black, is set, and so as to revolve freely thereon, the lower head of the bobbin practically closing the open end of the case *a*. The spindle *b* is preferably made hollow, so as to fit a central spindle, *e*, in the cavity of the shuttle, the said spindle *e* forming the axis upon which the case *a* will turn.

The bobbin is wound in the usual manner, and placed in the case *a*, the end of the thread being first passed through the perforation *f*, then the case and bobbin set into place, as seen in Fig. 7, the thread passing out through a recess in the case, and interlaced with the tension *h* on the top of the case *a*.

The heel of the shuttle rests against an abutment, I, so as to be rotated with the shuttle-carrier, the abutment extending around to

the inside of the shuttle, so as to hold the shuttle in its proper position, but yet allow it to pass freely through the needle-loop.

In order that the tension shall be uniform, it is necessary that the bobbin-case or the tension be prevented from turning, so as to prevent twisting the thread. To do this a tension-block, *i*, is formed across the top of the bobbin-case *a*, and on the shaft B is an eccentric, L, the throw of which is in the same line of the crank E. From this eccentric a rod, M, extends over the shuttle-race, and hung upon the same pivot as the connecting-rod F, so that the movement of the rod M substantially corresponds to the movement of the connecting-rod F, the throw of the eccentric, however, being less than that of the crank. The outer end *m* of the connecting-rod N passes over the shuttle-carrier, and so as to lie against the side of the block *i* of the bobbin-case in the shuttle, as shown, the bearing of the end *m* upon the block being sufficient to prevent the rotation of the bobbin-case within the shuttle, and its extent of movement relatively to that of the shuttle-carrier is such that it will throughout the revolution of the shuttle-carrier follow close to the block *i* of the bobbin-case, as, for instance, starting from the point in Fig. 4, which is, when the tension is at its greatest, the shuttle-carrier, carries the shuttle in the direction denoted by the arrow toward the needle *n*. At that position the block *i* lies parallel to a line drawn from the needle through the pivot G.

As the point of the shuttle passes the needle, which is one-fourth of the revolution, as seen in Fig. 5, the tension-block *i* on the bobbin-case still retains substantially its same parallel position, and so on around to the opposite side, as in Fig. 2, and to the place of beginning, as in Fig. 4. The end *m* of the connecting-rod F follows closely to the block *i*, and thus prevents the bobbin-case from turning within the shuttle, and by which operation the twist of the thread is avoided, which would be put into it did the eye or aperture through which the thread leaves the shuttle turn with the shuttle.

The tension device consists of a spring, *h*, on the side of the block *i*, between which and the block the thread is passed, thence through an eye, *r*, to the work.

The arm *m* of the connecting-rod F serves to hold down the shuttle at the time of the tension; but in order that it may not so bear upon the shuttle as to prevent the free pass-

age of the needle-loop, the under surface of the arm *m* is inclined, as at *t*, Fig. 3, so that as the arm *m* advances toward the needle it rises over the upper edge of the cylinder, leaving sufficient space between it and the shuttle for the thread to pass freely, but as it reaches its extreme rear movement or time of tension the incline passes off from the cylinder and allows it to fall directly upon or close to the shuttle.

P is the feed, which is substantially the same as the usual sewing-machine feed, attached to a lever, R, and receives both its forward-and-back and up-and-down movement from the cam-shaped edge and upper surface of the plate D¹.

It will be understood that the prime object of the independent cylinder for the bobbin is to prevent the turning of the tension during the revolution of the shuttle; therefore, a head only which would support the tension-block *i* would accomplish the object.

By this construction and arrangement of shuttle the tension of the shuttle-thread is brought directly at right angles to the seam being made; hence a positive tension, at all times alike, is attained, and a shuttle moving at substantially right angles to the needle in much less space than the usual reciprocating shuttle.

I do not wish to be understood to broadly claim preventing the bobbin in a revolving shuttle from rotating.

I claim—

1. The combination, in a sewing-machine shuttle, of the bobbin-case, the bobbin, the axis of which is at right angles to the plane of the shuttle, a tension or thread controller attached to, or made a part of, the case, but independent as to tension of both bobbin and case, substantially as described.

2. The combination, in a sewing-machine, of a revolving shuttle-carrier, the shuttle-case, the bobbin, the axis of which is eccentric to but parallel to the axis of the carrier, the tension or thread controller, the axis of which is concentric with the axis of the bobbin, but independent as to tension of the carrier, case, and bobbin, and the follower having a combined reciprocating and vibratory movement to follow and prevent the rotation of the tension, substantially as specified.

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Witnesses:

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