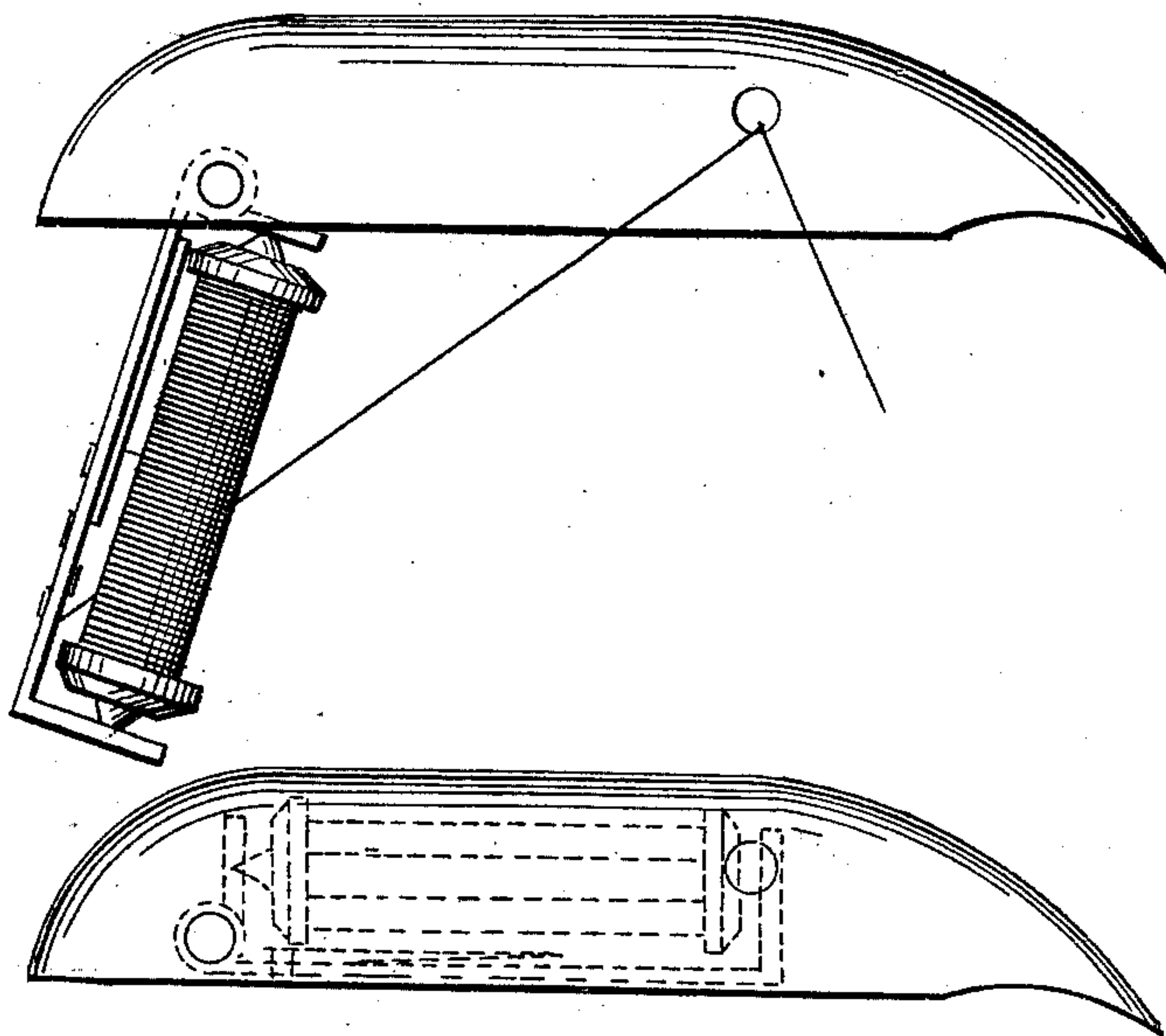
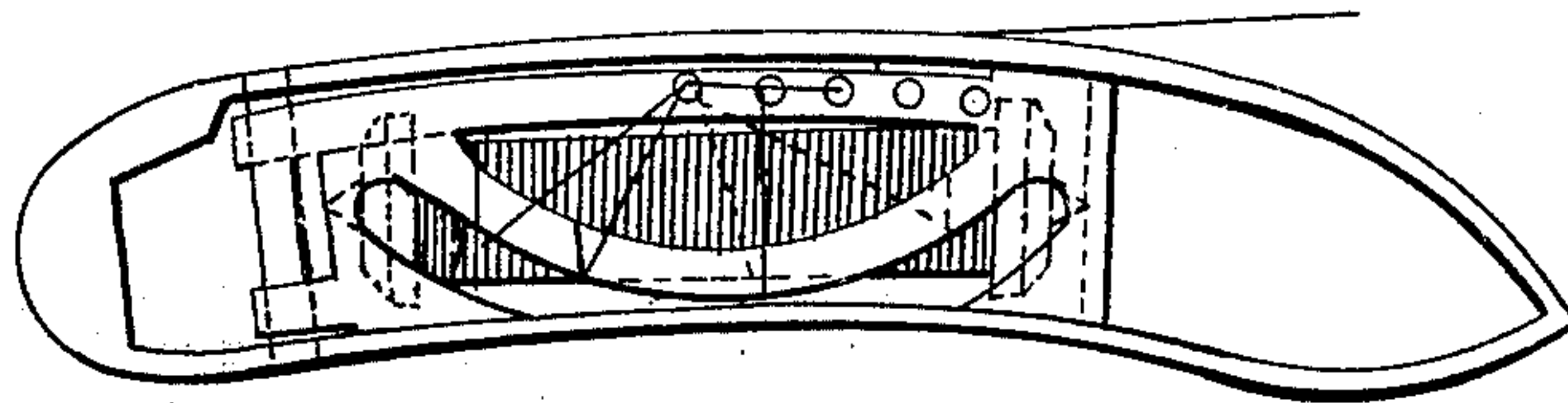


L. BOLLMAN.
Sewing Machine Shuttle.

No. 31,434.

Patented Feb. 19, 1861.



Witnesses,
James C. Wade
J. H. Hinde

Inventor,
Louis Bollman

UNITED STATES PATENT OFFICE.

LOUIS BALLMAN, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **31,434**, dated February 19, 1861.

To all whom it may concern:

Be it known that I, LOUIS BALLMAN, of the city of Boston, county of Middlesex, and State of Massachusetts, have invented certain new and useful Improvements in Shuttles or Bobbin-Cases of Sewing-Machines; and I do hereby declare that the following specification, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings, which are double the size of a working-shuttle, Figure 1 is a plan or top view of the shuttle with the gate and bobbin in place ready for use. Fig. 2 is also a plan, with the gate opened out into the position which it occupies when a bobbin is to be removed or replaced; and Fig. 3 is a side elevation of the shuttle with the gate and bobbin in position for use, showing the equalizing-curve.

My improvements in the shuttle have been devised with a view of affording greater facility for the removal and replacement of bobbins, and also with the object of causing the thread unwinding from the bobbin to leave it in planes perpendicular to its axis, or nearly so, at all times and irrespective of the precise part of the bobbin from which the thread is being unwound; and the nature of the first part of my invention consists in combining with a shuttle or bobbin-case a gate or hinged support, which carries journals on which a bobbin may be mounted, the combination being substantially such as hereinafter described; and the nature of the second part of my invention consists in combining with a bobbin-case and a bobbin located therein an equalizing-curve interposed between the bobbin and an eye or its equivalent, through which thread passes to the cloth, the combination being substantially such as is hereinafter specified.

In the drawings, the shuttle or bobbin-case is shown at *a a a*, constructed of sheet metal, as usual, pointed at one end and inclosing the bobbin, except on one side. The shuttle shown in the drawings is curved at top and bottom, so as to run in a curved race; but its shape is of no importance, provided it has a hollow to contain the bobbin, and is otherwise fitted for use in the precise sewing-machine to which it may be applied. A small pin, *b*, extends across the hollow of the bobbin, and is clasped by two small ears, making part of a gate, *c*. To this gate are fastened projections *d d*, and in each projection is a journal or small hole, into which

small points on the two extremities of the bobbin can enter. The best plan is to make one or both of the projections slightly elastic, so that the bobbin may be sprung into place, and when there retained by the slight approach toward each other of one or both projections. This gate is free to turn on the pin as a center, and the pin and ears constitute a hinge.

The bobbin, with thread wound upon it, is represented at *e*, and when mounted in the journals it can be shut into the case or opened out from it. A small friction spring or latch, or some contrivance answering the same purpose, should be so applied either to the gate or to the shuttle as to hold the gate shut and prevent its opening when the machine is in operation. When the bobbin is thus mounted upon a gate it can be removed and replaced when the gate is open, and shut into working position after it is properly inserted in its journals, and the gate, being attached to the shuttle, cannot be dropped or mislaid, but is always in proper connection with the shuttle, ready for use.

In sewing-machines the thread is usually led from the bobbin directly to a nipper or to one of a series of small holes, and it has sometimes, before passing through such a hole or eye, been passed around a straight wire parallel, or nearly so, with the axis of the bobbin and stationary with respect to the bobbin. The latter plan is an improvement; but even then the thread passes off of the bobbin in planes that are not perpendicular to its axis. When the thread is passing off that part of the bobbin which is directly opposite the hole or eye through which the thread leads, it leaves the bobbin in a plane nearly perpendicular or perpendicular to its axis; but when thread is being unwound from those parts of the bobbin farthest from the eye, then the thread leaves it in planes inclined to its axis, and it consequently requires a greater pull upon the thread to unwind it from the bobbin. The tension on the shuttle-thread is therefore constantly varying, and this variation of tension is unfavorable to precision of action, especially in sewing very thin fabrics. In order to remedy this difficulty, I have applied between the eye through which the thread leads on its way to the cloth, as at *f*, a curved face of metal—such as *g*—and thread is to be passed from the bobbin over the face of this equalizing-curve, and then through the eye, and afterward, if neces-

sary, through other holes or eyes, as shown in the drawings, or through any proper tension-nippers. The thread, as it unwinds, will slide over the curve, its precise position on the curve being governed by the spot on the bobbin from which it is passing. When thread is unwinding from the middle of the bobbin it will pass over the middle of the curve; when it is being delivered from the ends of the bobbin it will slide over the ends of the curve, and experiment proves that the thread will at all times practically leave the bobbin in planes at right angles to its axis. The force transmitted through the thread to turn the bobbin thus remains constant, or nearly so, at all times, and the operation of sewing-machines to which my improved shuttle is applied is improved.

Various positions assumed by that part of the thread between the eye and the bobbin are represented in Fig. 3 by dotted lines colored blue.

I have shown the equalizing-curve as making part of the gate; but intend to use it either in connection with the gate or without it, and to secure it in any manner or to any support, so long as it is interposed between the bobbin and the eye in such manner that thread can pass over it, so as to produce the effect described.

I am aware of the fact that bobbins have been supported in a frame not attached to the shuttle, which could be entirely withdrawn from the shuttle or bobbin-case, and that it is customary when using such a contrivance to withdraw or pull out the frame when bobbins are to be removed or inserted; but I do not claim such a contrivance and consider it objectionable for two reasons: first, because the frame may be mislaid, and, second, because it requires some skill and practice to adjust the

frame quickly and properly to the shuttle before slipping it in, these difficulties being both obviated by my invention, wherein the frame is always attached and hinged fast to the shuttle, and where the hinge always forces the frame to adjust itself properly to the hollow of the bobbin-case. My frame has attached to it a small friction-spring, or some similar contrivance, for holding it in place when shut into the shuttle; but I do not claim such a contrivance, as it has been applied in various ways to frames supporting bobbins which are not hinged fast to the shuttle.

What I do claim as of my invention is—

1. A gate or hinged bobbin-support provided with journals for the pivots of the bobbin, in combination with a shuttle or bobbin-case, the two being so connected that the journals can be moved out of the hollow of the shuttle, so that a bobbin may be removed therefrom without detaching the support or gate from the shuttle, and the combination being substantially such as described.

2. In combination with a bobbin and a bobbin-case or shuttle, an equalizing-curve constructed and placed substantially as described, and so arranged with reference to the bobbin and an eye through which thread is passed that thread passing off of the bobbin and through the eye shall in its transit slide over the equalizing-curve, the combination being substantially such as before recited to produce the effect hereinbefore set forth.

In testimony whereof I have hereunto subscribed my name, in the city of Boston, on this 22d day of December, A. D. 1859.

LOUIS BALLMAN.

In presence of—

JAMES C. WADE,
A. HURD.