# E. P. Marble.

## Shuttle.

No. 76090 Patented Mar. 31, 1868

Fig. 1.

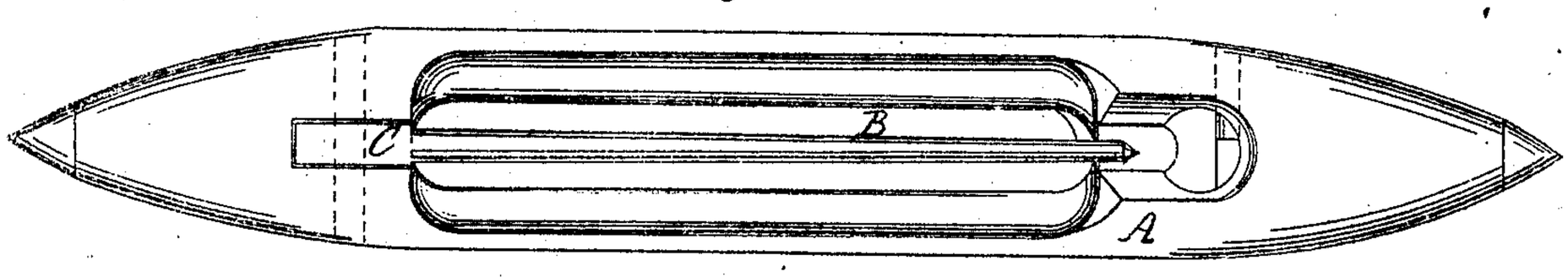
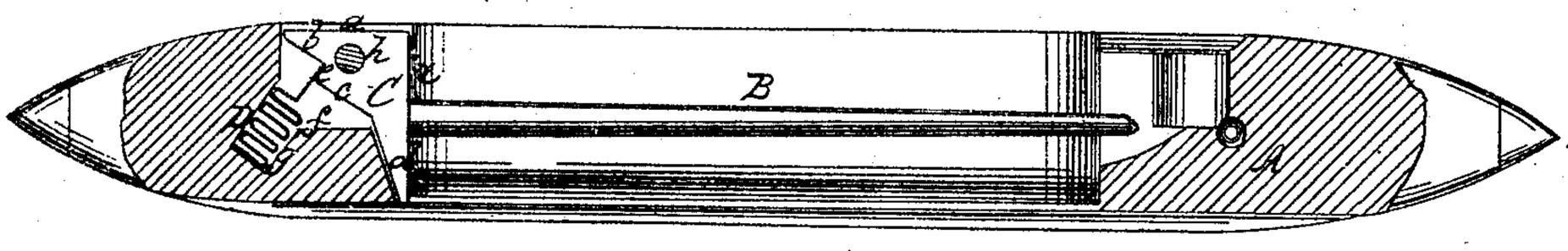



Fig. 2.

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EZRA P. MARBLE, OF SUTTON, MASSACHUSETTS.

*Letters Patent No.* 76,090, *dated March* 31, 1868

## IMPROVEMENTS IN SHUTTLES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, EZRA P. MARBLE, of Sutton, in the county of Worcester, and State of Massachusetts, have invented a new and useful Improvement in Shuttles; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved application of a spring to the spindle of a shuttle, as hereinafter fully shown and described, whereby the spring is fully concealed and entirely out of the way, so that when the shuttle is in use the spring cannot catch and cut or break the threads, either of the warp or filling. In the accompanying sheet of drawings—

Figure 1 is a plan or top view of a shuttle provided with my improvement.

Figure 2 a side sectional view of the same.

Similar letters of reference indicate corresponding parts.

A represents a shuttle constructed in the usual manner, and B is the spindle, the inner or pivoted end of which is provided or formed with a head, C, two sides, *a a*, of which are at right angles with each other, and the other side composed of three plane surfaces *b*, *c*, *d*, the surfaces *b c* being in two different planes, which are parallel with each other, but sufficiently far apart to leave a shoulder, *e*, (see fig 2,) while the other surface, *d*, forms an obtuse angle with *c*. This head C is fitted in a recess, *f*, in the shuttle, the main portion of which is of rectangular shape, the lower part being bevelled, to form a bearing for the surface *d* of the head, when the spindle is fitted down in the shuttle, as shown in fig. 2. D represents a spring, which is formed of a steel plate bent in serpentine form, as shown in fig. 2, and fitted in a recess, *g*, in the shuttle, at an angle of about forty or forty-five degrees, the upper end of the spring bearing against the surface *b* of the head, and the shoulder *e* at the lower end of *b*. This spring works or exerts a force or pressure in the direction of its length, similar to a spiral spring, but it is far more efficient, and not so liable to lose its elasticity as a coiled wire, and a more powerful spring may be obtained in a given length.

When the spindle is raised the spring is compressed, the surface *c* of the head sitting on the bottom of the main part of the recess *f*; but when the spindle is shoved or pressed a trifle downward, the spring will force the spindle entirely down to a horizontal position, parallel with the axis of the shuttle, so that the surface *d* of the head will bear against the lower bevelled part of the recess *f*, (see fig. 2.) The pin *h*, which secures the spindle in the shuttle, passes through the head C, near its upper part, as shown in fig. 2. By this arrangement the spring D, it will be seen, is entirely out of the way, and cannot, as in the old plan, catch the threads while the shuttle is in use. The recesses *f g* in the shuttle, to receive the head of the spindle and the spring D, are quite small, and do not weaken the shuttle, as but a small portion of it is cut away.

I claim as new, and desire to secure by Letters Patent—

The spindle B and head C, provided with the inclines, as shown, in combination with the volute spring D, arranged and operating as and for the purpose set forth.

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Witnesses:

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