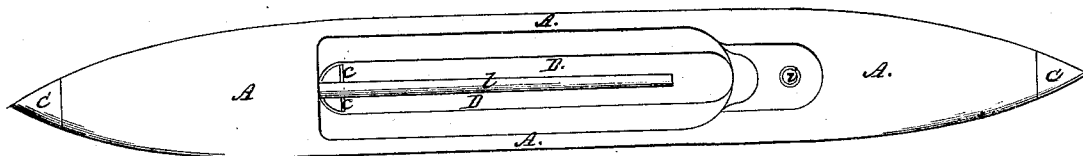


*N. J. Willis.*  
*Shuttle.*

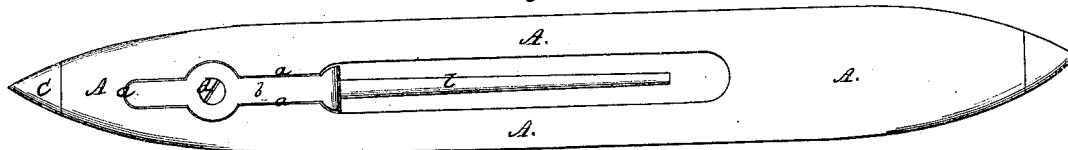
*N<sup>o</sup> 22,221.*

*Patented Nov. 30, 1858.*

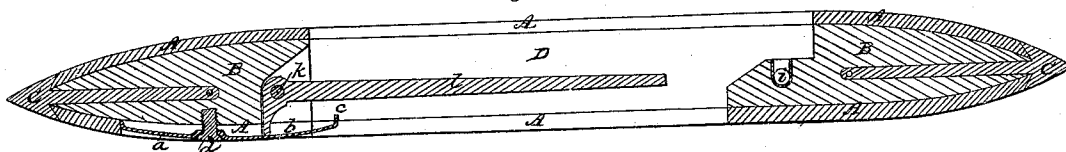
*Fig. 1.*



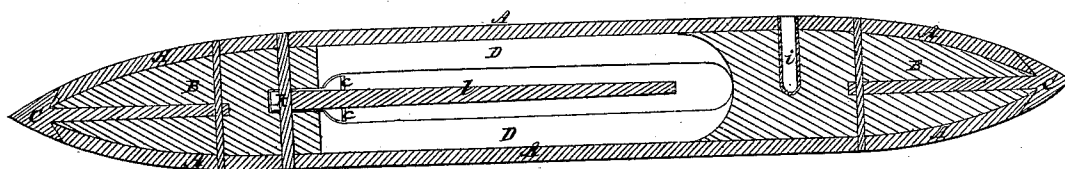
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*

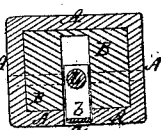


*Witnesses.*

*R. H. Ledy*

*E. P. Hale Jr.*

*Fig. 4.*



*Inventor.*

*N. J. Willis.*

# UNITED STATES PATENT OFFICE.

N. J. WILLIS, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR TO SIDERA CHASE, OF BROOKLYN, NEW YORK, AND GEO. A. FULLER, OF LAWRENCE, MASSACHUSETTS.

## MANUFACTURE OF WEAVERS' SHUTTLES.

Specification of Letters Patent No. 22,221, dated November 30, 1858.

*To all whom it may concern:*

Be it known that I, NEWIEL J. WILLIS, of Lawrence, in the county of Essex and State of Massachusetts, have invented an Improvement in the Manufacture of Weavers' Shuttles, and do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, which together constitute a full and complete specification of it.

The nature of the said invention consists in an improved shuttle made of a "hard rubber" shell, and separate wooden nose blocks molded together and arranged in manner as hereinafter described. What is meant by the term hard rubber is the caoutchouc composition, which by heat is rendered soft and easy to be molded, but when cold becomes stiff and hard like ebony or bone, this substance being well known to persons engaged in the manufacture of caoutchouc.

Figure 1 of the said drawings denotes a top view, and Fig. 2, a bottom view of a shuttle made in accordance with my invention. Fig. 3 is a longitudinal section; Fig. 4 is a transverse section, and Fig. 5, a horizontal section of it.

In such drawings, A, represents the hard rubber shell or case, while B, B, are the wooden nose blocks into each of which a metallic nose C, is fastened. The shell is made with a recess or space, *a*, for the reception of the spring, *b*, of the bobbin holder, *c*, such spring being fastened to one of the wooden nose blocks by a screw *d*. If desirable, a thin strip of metal or a steel facing may be applied to each of the sides of the bobbin recess, D, and to extend from one of the wooden parts B, to the other, such being to increase the stiffness of the sides of the bobbin recess and to prevent breakage of the same. This, however, I do not consider necessary in most shuttles, as experience has demonstrated that without such the shuttle, generally speaking, is sufficiently durable

without it. The hard rubber case is capable of receiving a very smooth external surface one, which will not only facilitate the flight of the shuttle over the race beam of a loom, but be capable of great resistance to blows and wear while in use.

Although a shuttle made on my improved plan costs more than the ordinary shuttle, it is much cheaper in the end, as it not only works much better through the loops and does not abrade or injure them but will last longer than several wooden shuttles.

In making the article, a suitable mold is employed, the wooden nose blocks being laid therein and the india rubber composition being run or introduced into the mold, so as to be formed by the matrix into the shape required, and to cover the external conical surface of the nose blocks, on all sides. The wooden nose blocks render the shuttle much cheaper of construction and better than if made entirely of the hard rubber composition, for they serve to hold the metallic nose points, the metallic thread eyes, *i*, *i*, all of which, as well as the metallic holder, *k*, of the spindle, *l*, are placed and fixed in the wood, preparatory to the india rubber or vulcanizable caoutchouc composition being cast or molded thereon. The wooden nose blocks, besides presenting other advantages render the shuttle lighter than it would be if the space occupied by them was made of rubber.

I claim—

The improved manufacture of weaver's shuttle made substantially as described, viz., of separate nose blocks, and a hard rubber or indurated vulcanized caoutchouc shell or body (or equivalent) cast or molded on the nose blocks arranged substantially in manner as described.

NEWIEL J. WILLIS.

Witnesses:

R. H. EDDY,  
F. P. HALE, Jr.