(No Model.)

H. A. WILLIAMS.

LOOM SHUTTLE.

No. 264,390. Patented Sept. 12, 1882.

Fig. 1.

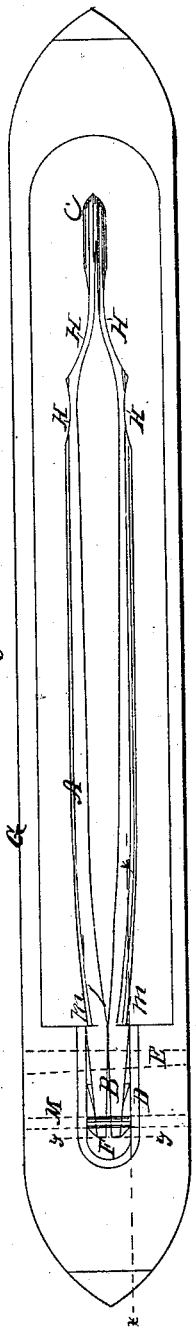


Fig. 2.

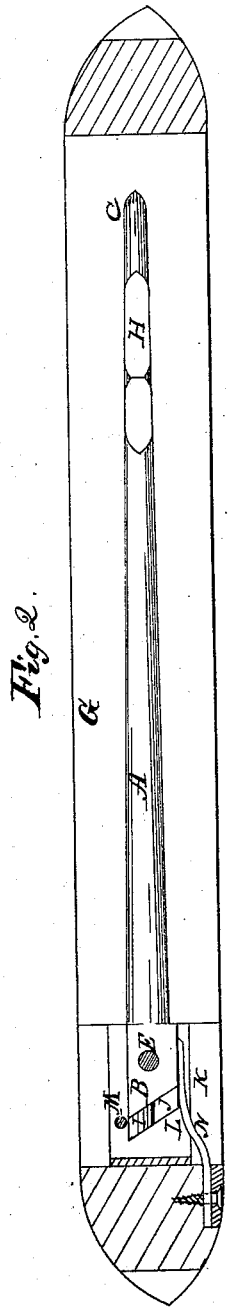


Fig. 4.

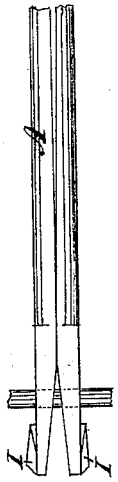


Fig. 5.

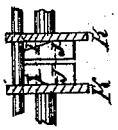
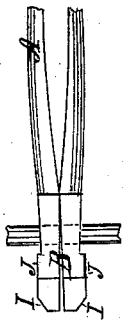


Fig. 3.



Witnesses

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LOOM-SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 264,390, dated September 12, 1882.

Application filed July 13, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WILLIAMS, of Taunton, Bristol county, Massachusetts, have invented a new and useful Improvement in Loom-Shuttles, of which the following is a specification.

My invention relates to that class of shuttles which have spindles split from near the point to and through the heel and expanded or bowed by the contraction of the heel when closed down in the shuttle to secure the cop by the friction or pressure of the expanded or bowed parts against the sides of the hollow core of the cop.

The first part of the invention consists of a split spindle having one or more places along the outside of one or both members scalloped or notched, and thus made materially thinner than the rest, the said scallops or notches being located upon the exterior surfaces and in such relation to the direction in which the spindle expands when closed into the shuttle that some of the threads along the hollow core of the cop will be pressed or contracted into said notches by the tension of the outer portions of said cop, and thus the cop will be still more securely fixed upon the spindle.

The second part of the invention consists of the construction and arrangement of the split heel of the spindle and the means of contracting the same, and thereby expanding the body of the spindle when closed down in the shuttle-body, whereby the same may be constructed more cheaply and will work better than as heretofore made.

Figure 1 in the accompanying drawings is a top or plan view of the shuttle and spindle constructed and arranged according to my invention. Fig. 2 is a longitudinal sectional elevation of Fig. 1. Fig. 3 is a plan of an inverted portion of the spindle with the parts as they appear when the split heel is contracted for the expansion of the body beyond the pivot to secure the cop. Fig. 4 is a plan of a portion of the spindle of Figs. 1 and 2 when the body is not expanded. Fig. 5 is a cross-section on line *y y* of Fig. 1.

A represents the body of the spindle, which is split from near the point C through the heel B and arranged in the yoke D, with its heel-portions extending back of the pivot-pin E into the space F of the yoke, by which the body A is made to expand when it is pressed down into its working position in the shuttle-body G. In the exterior sides of the spindle A of this kind, anywhere between the middle and the point, I propose to cut or otherwise form one or more scallops, H, or other equivalent notches, sufficiently thinning the metal thereat to cause all or nearly all of the bend of that part of the spindle to take place thereat, which has the effect of causing the parts to spring asunder nearer to the point than before, thrusting out the notched part, so as to engage the yarn in the notches. Besides that, rearward of such bends the sides of the spindle are parallel, or thereabout, for a greater distance along the middle and each way therefrom than in the spindles of this kind not having such notches, particularly when the notches are located near the point, as here shown, which I prefer.

The construction of the form of spindle here represented and its expanding contrivance has been too expensive as heretofore arranged to compete successfully with others, and, besides, it has not been as successful in operation as desirable. The principal difficulty has been in the location or arrangement of the cam shapes or inclines employed to contract the heel of the spindle upon the inner walls of the yoke-shaped device within which the heel-extensions B swing when the spindle is shifted down into the shuttle-body, while the sides of said heel-extensions acted upon by said cam shapes or inclines have been plain. Besides, the yoke has been made of size, strength, and material having capacity to wholly overcome the resistance of the heel of the spindle to contraction without any dependence upon or aid of the shuttle-body, which of itself possesses ample strength for this purpose without the need of any yoke at all. In the arrangement which I propose, which is making the cam shapes or inclines on the spindle and the plain walls L for them to work upon either on the yoke or shuttle-body, the latter will serve well without such yoke; and I propose to dispense with the yoke in some cases for light service, although for heavier work it will be best to line the walls of the wood body with thin metal to sustain the wear merely, while the body itself affords the resistance that effects the contraction of the spindle. For convenience I prefer to arrange the metal plate

in U or yoke shape, as represented at D, the same being formed of a plain strip of thin sheet metal of suitable length and breadth, which has for its entire preparation only to be bent and drilled for the pivot E. It may not even be bent, for two pieces may be used, one on each side of the cavity of the shuttle-body, being suitably secured therein. Thus the yoke or its equivalent device or devices may be produced and applied in the most simple and inexpensive manner. It will be readily understood that it is easier and cheaper to make these cam shapes I on the exterior sides of the heel of the spindle, where any kind and size of tools can be applied and worked, than within the narrow space between the bars of a yoke, where they must be made when the yoke is of such rigid form and material as are necessary to contract the spindle-heel as heretofore made. The heel portions of the spindle have to be so strong and substantial for expanding the body of the spindle that they afford sufficient quantity of metal to allow of the cams or inclines being formed on them without increasing the size, and it is evident the cams or inclines can be formed on said exterior sides by die-rolls or drop-presses at little or no cost beyond the expense of shaping the parts for the spindle itself—a saving which, together with the economy in the cost of the yoke which this arrangement of said cams admits of, will effect a material economy in the whole cost of this form of spindle. Besides these inclines, I also make flat facets J at the termination of the said inclines, so shaped that they become parallel with the plain walls of the yoke or equivalent device between which the spindle is contracted, and bear fairly or flatly upon them, as shown in Figs. 1 and 5; and it is an essential feature of these facets that the portions of the heel on which they are formed are wider when contracted than any other part of the spindle between the walls in which the heel works, in order that they may take and sustain the bearing against the walls while the spindle is at work. (See Fig. 1.) For this purpose the said facets are extended from the sides of the heel in the manner shown in Fig. 4, which represents the spindle when the heel is not contracted. In this contrivance of the inclines I on the spindle and the plain walls between which they are contracted on the yoke or shuttle-body the arrangement is such, of course, that said inclines swing down past the lower edges, K, of said plain walls to allow the spindle to expand at the heel when the body is up to adjust the cop.

I am aware that one or both the members of split spindles have been reduced in thickness upon the inside of the split members for regulating the form of the expanded part; but what I seek to accomplish is the arrangement and location of the cuts or notches for producing that effect, so as also to serve for notches that will afford additional means of retaining the cop by the lodgment of the interior threads of the cop, to some extent, in said notches, caused by the inward pressure of the outer portions of the cop.

With this form of spindle, which requires more force to close it down in the shuttle than others, because of the resistance which the heel offers to contraction, it is desirable to employ, in addition to the usual spring, N, a more positive stop than said spring is, to arrest the spindle in the working position, which I propose to apply in the form of the pin M, or any equivalent device located over the yoke, so that the heels of the spindle will strike and bear against it when the spindle comes to the working position in the shuttle. This stop is to be applied when the recess in the shuttle-body for the application of the spindle is made from the top.

I am aware that a ledge of the shuttle-body has been used for the purpose of such a stop to a spindle applied in a recess made in the bottom of the shuttle-body; but such a device cannot be had when the recess is made in the top, which is the arrangement to which the stop of my invention belongs. The cross-bar of a yoke arranged vertically in the shuttle-body has also been employed for such stop; but that is not available with the spindle arranged as I propose.

What I claim, and desire to secure by Letters Patent, is—

1. A shuttle-spindle split from near the point through the heel and adapted to expand, as described, for securing the cop, and having the scallops or notches H made in the exterior sides of its members, between the heel and point of the spindle, substantially as described.

2. A spindle split through the heel and nearly to the point, and having the inclines I formed on the exterior of the heel, in combination with the shuttle-body having plain bearing-walls, as described.

3. A spindle split through the heel and nearly to the point, and having the inclines I and flat facets J formed on the exterior of the heel, in combination with the shuttle-body having plain bearing-walls, as described.

4. A yoke, D, made of a plain flat plate of uniform thickness, in combination with the spindle having the inclines I formed on the exterior sides of its heel, substantially as described.

5. A spindle split through the heel nearly to the point, in combination with the shuttle-body, and the yoke made of a thin flat piece of metal inserted in a recess in said body, substantially as described.

6. The stop-pin M, combined with the split shuttle-spindle and with the shuttle-body, having the recess for inserting the spindle cut through the top and formed with the contracting walls, substantially as described.

HENRY A. WILLIAMS.

Witnesses:
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H. E. CUSHMAN.