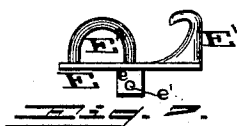
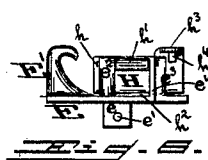
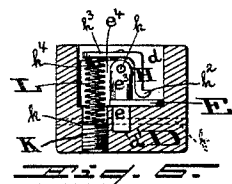
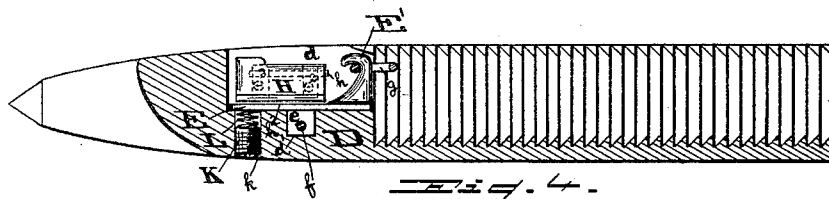
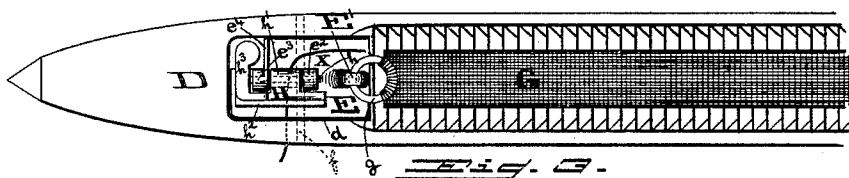
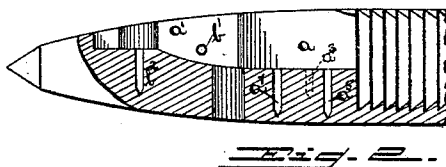
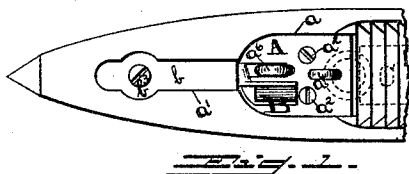


(No Model.)

F. J. HALL.
LOOM SHUTTLE.

No. 467,803.

Patented Jan. 26, 1892.



WITNESSES

George Twiss
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INVENTOR

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UNITED STATES PATENT OFFICE.

FRANK J. HALL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO JAMES H. BILLINGTON, OF SAME PLACE.

LOOM-SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 467,803, dated January 26, 1892.

Application filed December 20, 1890. Serial No. 375,360. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. HALL, a citizen of the United States of America, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Loom-Shuttles, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to loom-shuttles, and has for its object to improve the construction and increase the efficiency of the same, having reference particularly to the details of construction and the combinations of parts, as hereinafter fully described, and as illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of the ordinary shuttle partly broken away, and Fig. 2 is a vertical longitudinal section of the same with its attachments removed. Fig. 3 is a plan view of a portion of a shuttle with my improvements applied thereto, and Fig. 4 is a vertical longitudinal section of the same. Fig. 5 is a vertical transverse section of a shuttle with my improvements therein, showing in end elevation. Fig. 6 is a rear view of my improvements detached, and Fig. 7 is a side elevation of a modification.

Heretofore loom-shuttles have usually been formed with a recess *a* for reception of the tension-plate *A* and a long narrow extension *a'* thereof, extending almost to the end of the shuttle, for reception of the flat spring *b* for the tension *B*, the latter being hinged on a transverse rod secured in holes *b'* in the walls of the extension, such extension and holes lessening the solidity of the end of the shuttle, while the hole *b''* for the screw *b''* further weakens such end. The plate *A* has formed therein four openings for the passage of the screws *a''*, which secure it in its recess into the holes *a''*, the hook *a''* into the hole *a''*, and the eye *a''* into the hole *a''*, such screws by the incessant jar of the shuttle becoming loosened, and the hook, under strain of the strap *C* or a sudden blow, breaking off close to the body of the shuttle, necessitating the digging out of the wood around the broken-off end of the hook in order to get hold of the same to

withdraw it, enlarging the hole and requiring the plugging up of the same before the hook can be replaced. This operation, obviously, is very troublesome and expensive, as is the manufacture of the shuttle in its original state, and requires the removal of the plate *A* every time, while the great number of holes in the shuttle-body greatly decreases its strength; also, the particular means for varying the pressure of the tension renders it impossible to attain a nicety of adjustment.

My invention contemplates the obviation of the disadvantages hereinbefore mentioned and cheapens the manufacture of the shuttle, at the same time conducing to a perfect construction; and it consists of the formation of a recess *d* in the shuttle-body *D* of about the same dimensions as the recess *a*, but without the extension, and the formation of a centrally-located rectangular socket *d'* in the bottom of recess *d*, such socket being for the reception of a similarly-shaped depending lug *e*, formed integral with the tension-plate *E*, such plate resting on the bottom of recess *d*, and being secured rigidly in such position by the rod or pin *f*, passing through from side to side of the shuttle-body *D* and through a transverse opening *e'* in said lug, said rod or pin being driven into position, and said opening, being originally slightly out of alignment with the rod-openings, causes the rod to spring or bend slightly at its center and insures its being the more tightly retained in said openings.

E' is the hook for retention of the outer end of the elastic strap or cop-cover *G*, through the medium of the ring *g*, said hook being also formed integral with the plate *E*, being of a thickness sufficient to resist any strain thereon and having its base thickened considerably for adding strength thereto. Plate *E* has also formed integral therewith a pair of aligned standards *e'' e''*, with openings therein near their free ends for reception of a pin *h*, upon which is journaled the tension device *H*, said standards being a distance apart which allows of the passage between them of the yarn from the cop or bobbin forming a guard, as shown at *x* in Fig. 3, taking the place of the usual eye for the guidance of

said yarn to the tension device, the standards being rounded at their corners, so as to prevent wear on the yarn, while the bearing h' of the tension device prevents said yarn from dislodgment from between the standards.

The lower edge of tension device H has a lateral flange h^2 formed thereon with its face rounded, as shown, facilitating the passage thereunder of the yarn, and its upper edge at one end is formed with a laterally-extending arm h^3 , which extends at right angles with the main portion of the tension device H, the two forming a lever, said arm having formed on its under side near its free end a teat h^4 , which is in vertical alignment with a threaded opening k , extending upwardly from the bottom of the shuttle-body D and terminating at the bottom of recess d , said opening k having therein a screw K, which receives the impact of the lower end of the spiral spring L, the upper end of the latter impinging against the arm h^3 , and is secured against disengagement therewith by encircling the teat, said screw serving to vary the stiffness of the spring, and consequently its pressure on the arm h^3 , thus regulating the amount of pressure exerted by the tension device H on the yarn passing thereunder, permitting of a more positive adjustment of such tension than is possible by the use of a flat spring with a screw passing through one of its ends.

As will be observed, the plate E has a portion removed therefrom at the point where the threaded opening k registers with the bottom of the recess d , allowing clearance for the spring L, and has formed integral therewith and with the standard e^3 a vertical wall or partition e^4 , the same being of equal height with said standard and extending to the edge of said plate for the purpose of preventing the entanglement of the yarn with the spring.

The operation of placing the improved attachment in position in the shuttle-body is but the work of a moment, as is the removal thereof, yet when in position it is rigidly so, while the end of the said body is perfectly solid and unbroken by any holes whatever, and consequently is not weakened in the least; also, the thickness of the hook E' and the breadth of its base preclude the probability of the breaking of the same, yet should such be the case, the removal of the plate E and all of its appurtenances is accomplished through the simple driving out of the pin f without in anywise injuring the shuttle-body.

In Fig. 7 is shown a modification of my invention, wherein, in lieu of forming standards for the support of the tension integral with the plate E, an eye or guide E^2 is formed integral with such plate for the passage thereof of the yarn, instead of between such standards. In this case the plate with its appurtenances, as shown in the last-mentioned figure, can be applied to an old shuttle with the ordinary tension therein, and still the re-

sult will be greatly improved over having the eye or guide and the hook separate from the plate.

What I claim as my invention is as follows:

1. In a loom-shuttle, the combination, with the tension-plate having a lug integral therewith, of a shuttle-body provided with a recess adapted to receive said plate and a socket for reception of said lug, a retainer for the lug in such position, and a hook for retention of the free end of the cop-cover integral with said plate, for the purpose specified.

2. In a loom-shuttle, the combination of the tension-plate, the shuttle-body provided with a recess in which is secured said plate, a yarn-guide integral with the plate, and a hook for retention of the free end of the cop-cover integral with said plate, for the purpose specified.

3. In a loom-shuttle, the combination of the tension-plate having a lug integral therewith, the shuttle-body provided with a recess for said plate and a socket for said lug, a retainer for the lug in such position, a yarn-guide integral with the plate, and a hook for retention of the free end of the cop-cover integral with said plate, for the purpose specified.

4. In a loom-shuttle, the combination of the tension-plate, the shuttle-body provided with a recess in which is secured said plate, the tension device, a support for such device integral with the plate, and a hook for retention of the free end of the cop-cover integral with said plate, for the purpose specified.

5. In a loom-shuttle, the combination of the tension-plate having a lug integral therewith, the shuttle-body provided with a recess for said plate and a socket for said lug, a retainer for the lug in such position, the tension device, a spiral spring controlling the latter, and a screw in said body receiving the impact of said spring, for the purpose specified.

6. In a loom-shuttle, the combination of the tension-plate having a lug integral therewith, the shuttle body provided with a recess for said plate and a socket for said lug, a retainer for the lug in such position, the tension device, a support for the latter integral with the plate, a spiral spring controlling the tension device, and a screw in said body receiving the impact of said spring, for the purpose specified.

7. In a loom-shuttle, the combination of the tension-plate having a lug integral therewith, the shuttle-body provided with a recess for said plate and a socket for said lug, a retainer for the lug in such position, a hook for retention of the free end of the cop-cover integral with the plate, the tension device, a support for the latter integral with said plate, a spiral spring controlling the tension device, and a screw in said body receiving the impact of said spring, for the purpose specified.

8. In a loom-shuttle, the combination of the tension-plate, the shuttle-body provided with a recess in which is secured said plate, the tension device H, a support for the latter, the

screw K in the opening *k*, and the spring L, intermediate the screw and tension-arm *h*³, for the purpose specified.

9. In a loom-shuttle, the combination of the
5 tension-plate having the lug *e*, the shuttle-body provided with the recess *d* and socket *d'* for said plate and lug, the pin *f*, passing through the latter and the body, the tension device H, the standards *e*² *e*³, supporting the
10 pin *h*, the screw K in the opening *k*, and the spring L, intermediate the screw and tension-arm *h*³, for the purpose specified.

10. In a loom-shuttle, the combination of
15 the tension-plate having the lug *e*, the shuttle-body provided with the recess *d* and socket *d'* for said plate and lug, the pin *f*, passing through the latter and the body, the tension device H, the standards *e*² *e*³, supporting the pin *h*, the screw K in the opening *k*, the

spring L, intermediate the screw and the tension-arm *h*³, and the hook E', for the purpose specified.

11. In a loom-shuttle, the combination of the plate E, having the lug *e*, the shuttle-body D, provided with the recess *d* and the socket
25 *d'*, the pin *f*, passing through the body and said lug, the tension device H, the standards *e*² *e*³, supporting the pin *h*, the wall *e*⁴, the screw K in the opening *k*, the spring L, intermediate the screw and the tension-arm *h*³,
30 the hook E', and the cover-ring *g*, for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK J. HALL.

Witnesses:

R. DALE SPARHAWK,
WM. H. POWELL.