(No Model.)

E. F. HAZARD & F. W. GREENHALGH.

TENSION REGULATING DEVICE FOR LOOM SHUTTLES.

No. 346,912. Patented Aug. 10, 1886.

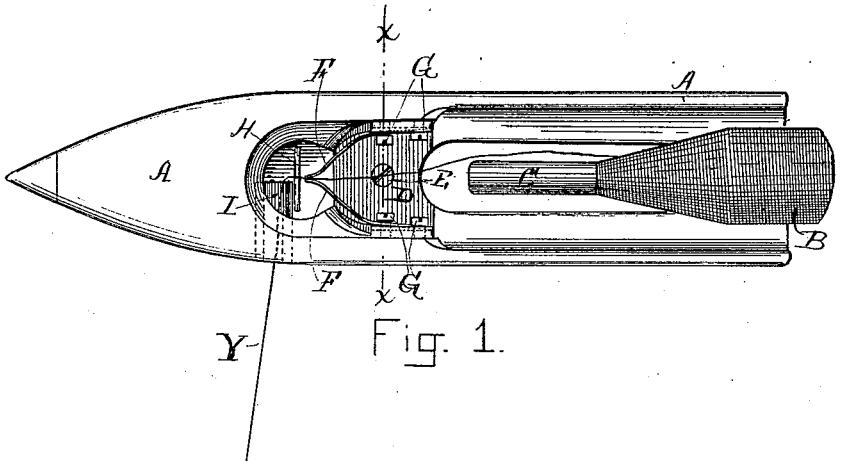

Fig. 1.

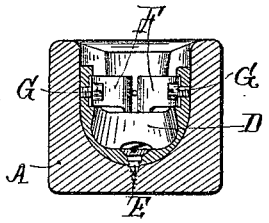

Fig. 2.

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EUGENE F. HAZARD AND FREDRICK W. GREENHALGH, OF PEACE DALE, RHODE ISLAND.

TENSION-REGULATING DEVICE FOR LOOM-SHUTTLES.

SPECIFICATION forming part of Letters Patent No. 346,912, dated August 10, 1886.

Application filed October 26, 1885. Serial No. 180,936. (No model.)

To all whom it may concern:

Be it known that we, EUGENE F. HAZARD and FREDRICK W. GREENHALGH, both of Peace Dale, Washington county, Rhode Island, have invented certain new and useful Improvements in Tension-Regulating Devices for Loom-Shuttles, of which the following is a specification, reference being had to the accompanying drawings, making part thereof.

The object of this improvement is to provide a loom-shuttle with an elastic and adjustable tension-regulating device which, acting constantly and uniformly, shall serve to keep the filling-yarns from "paying out" too freely in weaving, and thereby becoming kinked and forming imperfections in the goods.

Our invention consists in the devices and combination of devices set forth in the appended claim.

In the drawings, Figure 1 is a top plan of one end of a shuttle; and Fig. 2, a transverse section on line *x x* of Fig. 1, looking away from the spindle.

A is the shuttle-body, and B the bobbin on the spindle C.

D is a spring-holder, preferably a metal casting, fitted into the concavity at one end of the shuttle, between the tip of the spindle and the lateral aperture through which the yarn Y is drawn. This casting is shown as secured in place by a screw, E. In the sides of this casting D two steel springs, F, are mounted, and held adjustably by screws G G. The free ends of these springs approach each other and bear on the opposite sides of the yarn with such degree of pressure as is desired, regulated by the screws G, or by bending the springs more or less, without removal from the shuttle-body.

We prefer to broaden the springs at the tip or form them with downwardly-projecting lips beyond the casting D, as indicated in Fig. 2, to keep the yarn from dropping down beneath the springs. This is also guarded against by a transverse wire guide, H, over which the yarn passes to the exit-tube I, Fig. 1. It is obvious that this device can be applied to either new or old shuttles, the removability of the spring-holder admitting of its easy removal from or fitting into the shuttle.

We are aware that in some cases the yarn is pressed upon before leaving the shuttle by a cylindrical weight loosely held in a frame carried in the shuttle; but this arrangement gives no uniform and constant pressure while in use, nor is the device at all adjustable. It also causes an objectionable rattling.

Our device is perfectly noiseless, bears with a uniform pressure both while the shuttle is moving and when it is suddenly stopped, and the springs can be adjusted to the yarn before the spring-holder is secured to the shuttle-body, and changed afterward as desired. This advantage has not been attained by any spring-tension device heretofore used in shuttles.

Having thus described our improvement in loom-shuttles, we claim as our invention—

In combination, the shuttle-body, the spring-holder, the screw E, whereby it is removably secured therein, the plate-springs, and the screws G, whereby they are adjustably secured to the spring-holder, as set forth.

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