

No. 844,819.

PATENTED FEB. 19, 1907.

H. LINDSAY.  
SHUTTLE.

APPLICATION FILED MAR. 15, 1906.

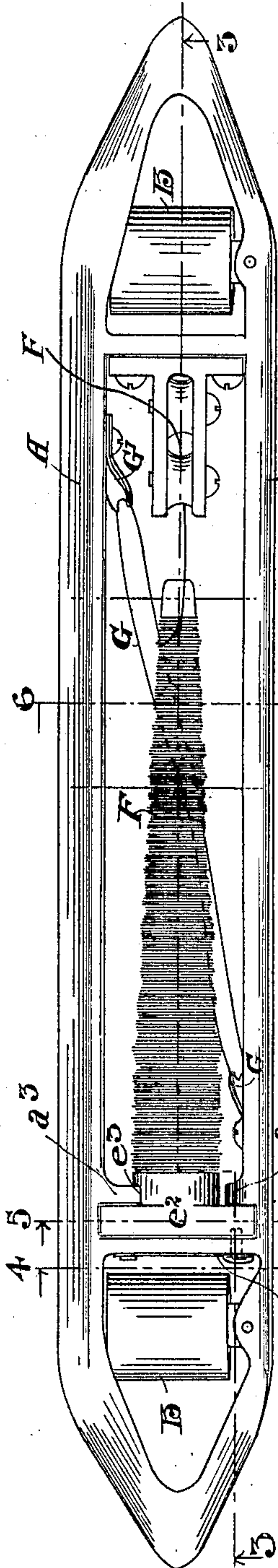


Fig. 1.

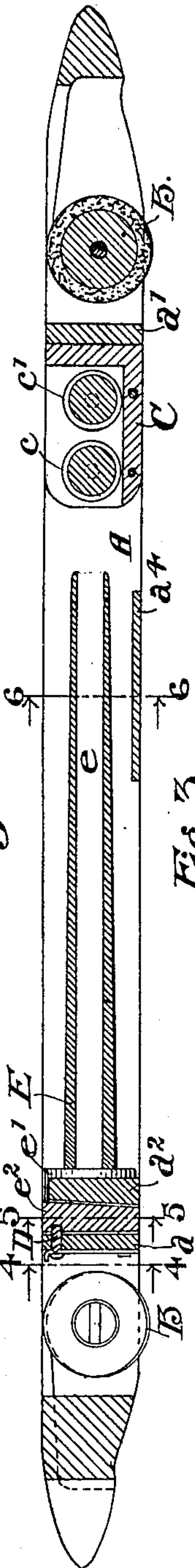


Fig. 3.

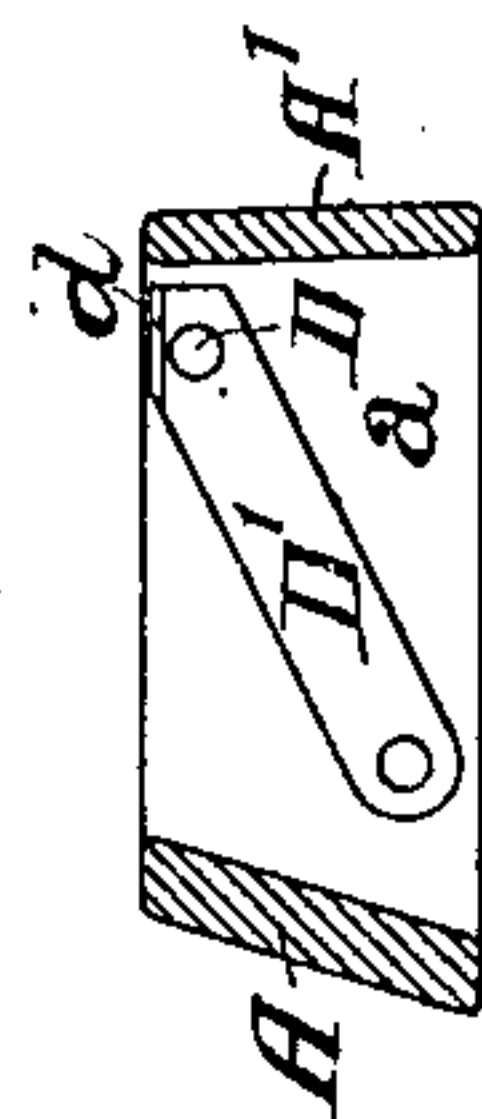


Fig. 4.



Fig. 5.

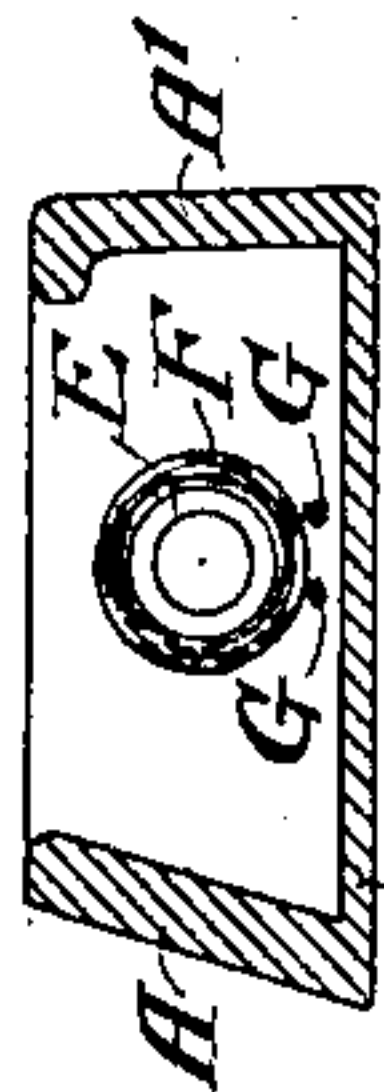


Fig. 6.

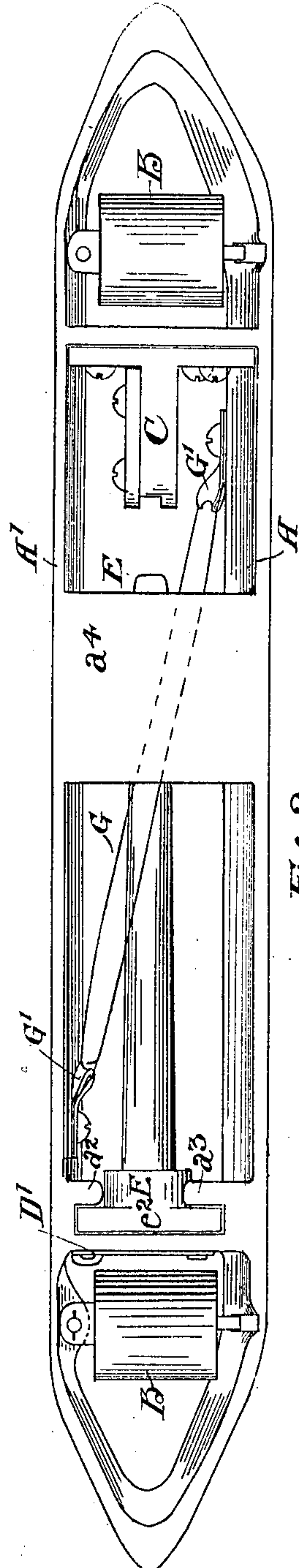


Fig. 2.

Witnesses  
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# UNITED STATES PATENT OFFICE.

HAMILTON LINDSAY, OF CLEVELAND, OHIO, ASSIGNOR TO THE LINDSAY WIRE WEAVING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## SHUTTLE.

No. 844,819.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed March 15, 1906. Serial No. 306,147.

*To all whom it may concern:*

Be it known that I, HAMILTON LINDSAY, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Shuttles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to shuttles for looms. It is well adapted for looms used in weaving wire-cloth and may be employed in other looms.

The object of the invention is to form efficient means for tightly holding the spindle in the shuttle and allowing its convenient removal and replacement when desired.

The particular characteristics of the invention are hereinafter more fully explained, and definitely set out in the claims.

In the drawings, Figure 1 is a plan of a shuttle embodying my invention. Fig. 2 is a bottom view thereof. Fig. 3 is a vertical longitudinal section substantially on the offset line 3 3 of Fig. 1. Figs. 4, 5, and 6 are cross-sections on the correspondingly-numbered lines of Fig. 1.

Referring to the embodiment shown in the drawings, the frame of the shuttle consists of the two sides  $A A'$ , brought together at the ends, and the two cross-bars  $a a'$ . There may also be a bottom brace-plate  $a^1$ . Between the cross-bars and the points of the shuttle are mounted rollers  $B$ . On the inner side of the cross-plate  $a$  is formed a recess or pocket to receive the head of the spindle and hold it in place. This pocket is made by a pair of lugs  $a^2 a^3$ , extending inward from the side members of the frame. The faces of these lugs near the proximate end of the shuttle are beveled downwardly toward such end, as shown in Fig. 3. The sides  $A A'$  are also beveled inwardly toward the base of the shuttle at this point, as shown in Fig. 5.

$E$  represents the spindle, adapted to have wire-thread  $F$  or other material wound on its surface. The spindle has a tubular bore  $e$  of use in the winding-machine, and the exterior is tapered outwardly from the free end to a circular boss  $e'$ , which extends to and forms an integral part of the quadrangular head  $e^2$ , which is tapered on its front side and along its ends to correspond with the taper of the lugs  $a^2 a^3$  and the sides  $A A'$ . By this means the head is made to fit snugly in the

pocket of the frame. The boss  $e'$  may be cut out a little at  $e^3$  to allow its passage across the lug  $a^3$ .

To hold the spindle firmly in place, I provide a locking-pin  $D$ , mounted in the frame-plate  $a$  and pressed toward the pocket by a spring  $D'$ , riveted at its lower end to the frame member. The upper end of this spring is turned over, as shown at  $d$ , allowing the thumb-nail to be inserted between it and the plate  $a$  to withdraw the pin. The spindle may thus be removed whenever desired. To insert it, it is simply placed with its head over the pocket and the head shoved into place, the bevel thereof allowing it to pass over the end of the pin  $D$  and gradually force the same backward until it springs home as the spindle comes into place. The thread from the spindle passes out under the roller  $c$  and over the roller  $c'$ , mounted on a bracket  $C$ , secured to the frame-plate  $a'$ .

It is desirable to provide friction means to prevent the material being pulled off the spindle too freely. The means shown in the drawings are the subject of my divisional application, Serial No. 328,306, filed July 30, 1906, and are there claimed. Briefly, they consist of a flexible metallic friction member  $G$ , which may be a loop of piano-wire the ends of which are carried by a pair of rubber straps  $G'$ , which are held by screws on the inner faces of the sides  $A$  and  $A'$  in such position that the wire passes diagonally across the spindle and bears against the material thereon. Elasticity of the straps maintains the proper tension.

I claim—

1. The combination with a shuttle-body having a tapered recess with lateral extensions, of a spindle having a tapered T-head adapted to seat in such recess, and means for holding the same therein.

2. A shuttle-body having a tapered recess, a spindle having a tapered head adapted to seat in such recess, a pin adapted to lock the spindle in the shuttle, and a spring acting on such pin.

3. A shuttle-body having a recess, a spindle having a head adapted to seat in such recess, a pin carried by the shuttle-body adapted to engage such head when properly positioned in the recess, and a spring tending to force the pin toward the head.

4. In a shuttle, the combination of a cross



member, a pin mounted therein, a spindle having a head adapted to bear against the cross member, and means for holding the spindle with its head against the cross member.

5 5. The combination of a shuttle-body having a pair of side members and a cross member, lugs extending inwardly from the side members in advance of the cross member to make an open recess, and a spindle having a head adapted to occupy said recess, the spindle extending from the head between said lugs.

15 6. The combination of a shuttle-body having near one end a cross-recess opening toward the center of the shuttle-body, a spindle having a head adapted to occupy said recess, the spindle-shank extending out of the recess, and a pin carried by the frame and adapted to engage the spindle when its head is properly positioned in the recess.

20 7. The combination of a shuttle having a pair of side members and lugs extending inwardly from the side members to make a recess between them and the end of the shuttle, a spindle having a head adapted to occupy said recess, the spindle extending from the head between said lugs, and the recess and the head being tapered to cause the head to fit snugly in the recess.

30 8. A shuttle having a pair of side members and a cross member, lugs extending inwardly to the side members in advance of the cross member to leave an open pocket between them, the cross members being tapered in-

wardly at such pocket and the lugs being tapered on their sides toward the end of the shuttle, the flare of the taper extending toward the top of the shuttle, combined with a spindle having a quadrangular head adapted to occupy such pocket with its ends engaging the sides of the shuttle and its face engaging such lugs, the shank of the spindle being adapted to extend between the lugs.

9. The combination of a shuttle-body having a cross-recess with a contracted opening and a spindle having a head adapted to occupy said recess, the shank of the spindle extending through such opening, said head and recess being correspondingly tapered.

50 10. The combination of a shuttle-body having a cross-recess with a contracted opening and a spindle having a head adapted to occupy said recess, the shank of the spindle extending through such opening, and means for locking said head in said recess.

11. The combination with a shuttle-body having side bars and a tapered recess provided by a cross-bar and lugs projecting inwardly from the side bars respectively, of a spindle having a tapered head adapted to seat in such recess, and means for holding the same therein.

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

HAMILTON LINDSAY.

Witnesses:

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