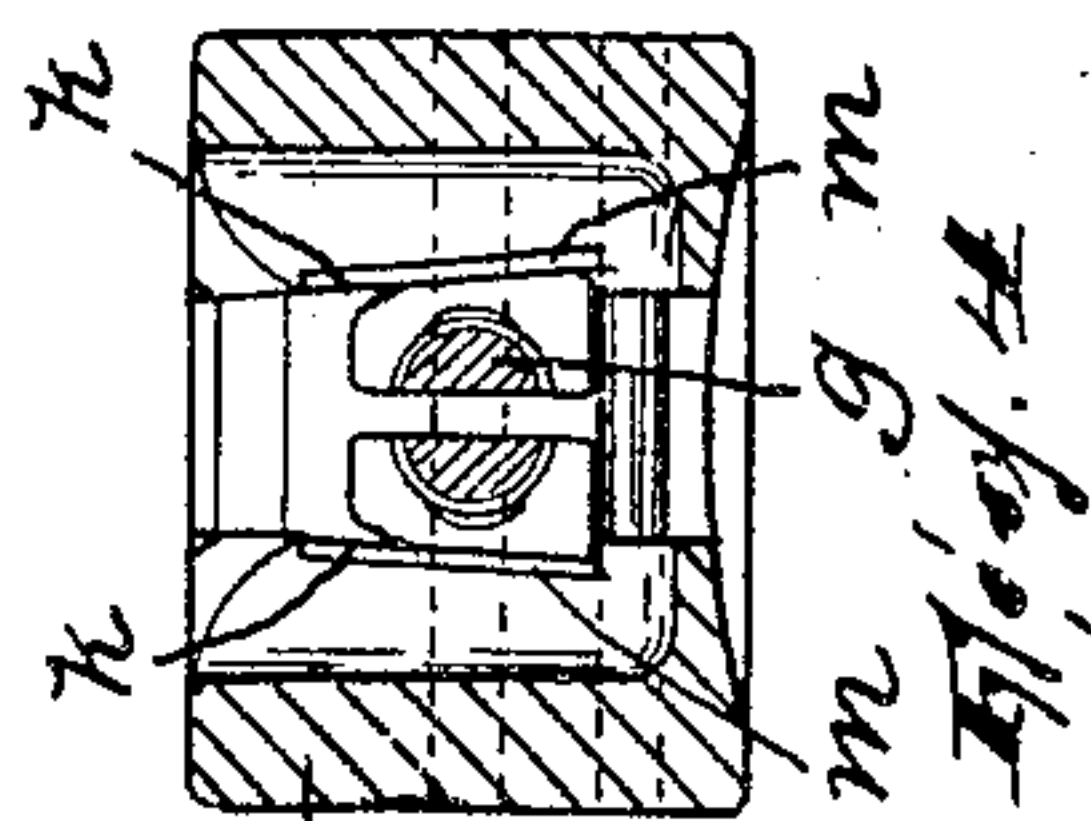
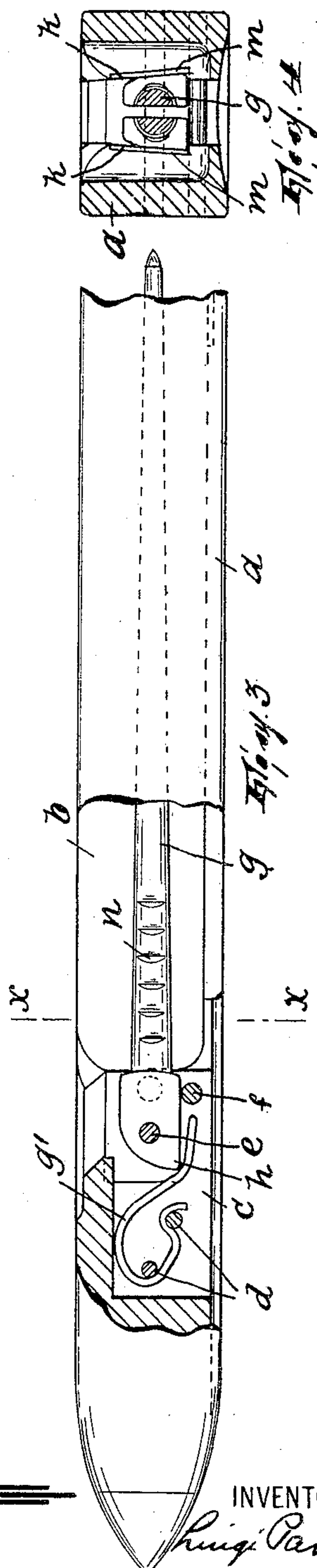
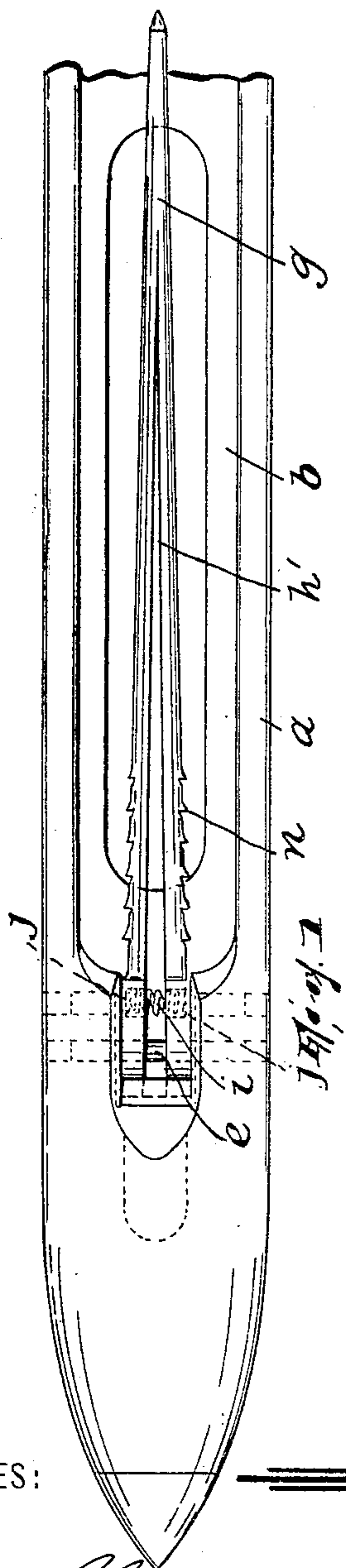


L. PAVIA.
SHUTTLE.

APPLICATION FILED JULY 21, 1906.

940,271.

Patented Nov. 16, 1909.



WITNESSES:

Wm. D. Bell.
Adele Blatt.

INVENTOR,

Luis Pavia.

BY

Arthur L. Luvain
ATTORNEYS,

UNITED STATES PATENT OFFICE.

LUIGI PAVIA, OF ALLENTOWN, PENNSYLVANIA.

SHUTTLE.

940,271.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed July 21, 1906. Serial No. 327,142.

To all whom it may concern:

Be it known that I, LUIGI PAVIA, a subject of the King of Italy, residing in Allentown, county of Lehigh, State of Pennsylvania, have invented certain new and useful Improvements in Shuttles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My present invention is an improvement in shuttles for looms weaving broad goods and it has for its object to provide a novel and practical expedient for holding the cop against lengthwise movement on the shuttle spindle or skewer. This object I accomplish by, in effect, forming a split in the spindle extending from its butt end to substantially its free end and providing means whereby when the spindle is down, *i. e.*, in the axial line of the shuttle, it is automatically expanded as to its split portion, whereby to hold the cop, but when the spindle is elevated, it is contracted as to its split portion, so that a cop may be freely placed thereon or removed therefrom.

My invention will be found fully illustrated in the accompanying drawings, wherein,

Figure 1 is a plan view; Fig. 2 is a plan view of the spindle removed from the shuttle and contracted; Fig. 3 is a view of the shuttle in side elevation, a part thereof being broken away to show the internal mechanism; and, Fig. 4 is a transverse sectional view on the line *x-x* in Fig. 3.

Referring to the drawings, *a* is the shuttle having the usual bobbin-cavity *b* and the extension-cavity *c* communicating with the cavity *b* and traversed by the pins *d* and *e*, *f*. On the pin *e* is pivoted in the usual manner the butt end of the spindle *g* which, in its closed position, stands in abutment with the pin *f*, which thus acts as a stop. The usual bent spring *g'*, engaging with the pins *d*, is employed to maintain the spindle in either its closed or open position, for this purpose taking against the usual angular nose *h* on the butt thereof.

The spindle in the present instance is formed split from its butt to nearly its free

end, as shown at *h'*, being normally expanded; this condition may be maintained by a spiral spring *i* arranged in opposed sockets *j* in the butt of the spindle, or in any other suitable manner. Viewing the butt endwise, it is wedge-shaped or tapering (see Fig. 4) the converging sides *k* thereof being held by the spring *i* against the sides of the extension-cavity *c*. Said sides may be lined with metallic plates *m* to take the wear, and they are convergently disposed, as shown in Fig. 4, in such manner that when the spindle is down the side faces of the butt of the spindle bear squarely against them and at substantially all points. The result of this arrangement is that when the spindle is down it is caused to be expanded by the spring *i*; when, however, the spindle is raised and the portion of the butt which immediately adjoins the spindle proper is thus brought into the narrower space between the upper portions of the plates *m* the spindle is caused to contract.

When the spindle is in the raised position, the cop may be then placed thereon or removed therefrom freely, but when in its closed position, or down, then the expanded spindle holds the cop against longitudinal movement, and this may be augmented by forming serrations or teeth *n* on the spindle to engage the bore of the cop.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A shuttle having an extension cavity formed with upwardly converging side walls, a spindle pivoted in the shuttle and having its butt within the converging side walls of said cavity, the sides of the spindle converging upwardly to seat against the converging walls of the cavity, said spindle being split longitudinally from its butt and tending normally to remain collapsed or contracted from end to end of its split portion, and means, operative on the split portion of the spindle at the butt thereof, for forcing apart the sides of the latter when the spindle is closed, substantially as described.

2. A shuttle having an extension cavity formed with upwardly converging side walls, a spindle pivoted in the shuttle and having its butt within the converging side walls of said cavity, the sides of the spindle converging upwardly to seat against the

converging walls of the cavity; said spindle
being split longitudinally from its butt and
tending normally to remain collapsed or
contracted from end to end of its split por-
5 tion, a spring arranged in the split portion
of the spindle at the butt thereof for forcing
apart the sides of the latter when the spindle
is closed and plates arranged against the
side walls of said cavity for taking the wear

of the sides of said spindles, substantially as 10
described.

In testimony that I claim the foregoing, I
have hereunto set my hand this eighteenth
day of July, 1906.

LUIGI PAVIA.

Witnesses:

CHAS. C. COZZENS,
P. W. WERTH.