No. 828,360.

PATENTED AUG. 14, 1906.

W. WILLIAMSON & J. COLLINSON.

LOOM SHUTTLE AND MECHANISM OPERATED THEREBY.

APPLICATION FILED MAR. 10, 1903.

2 SHEETS—SHEET 1.

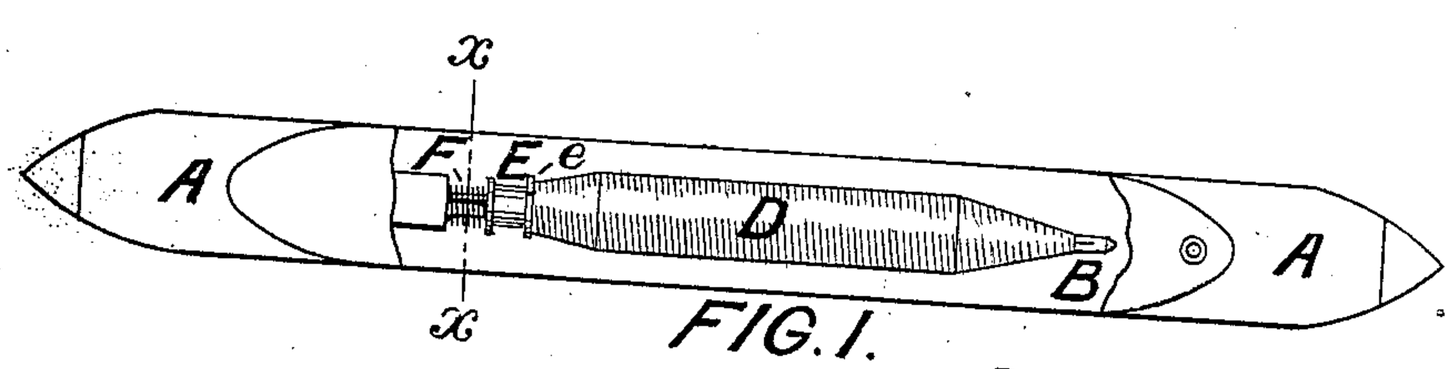

FIG. 1.

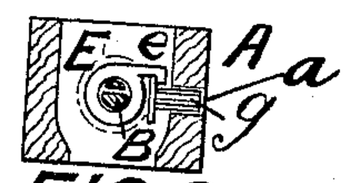

FIG. 3.

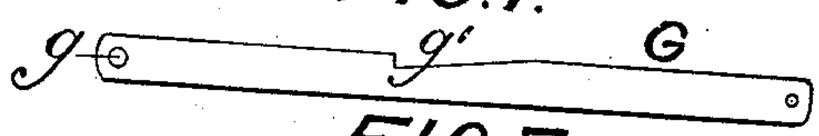

FIG. 7.

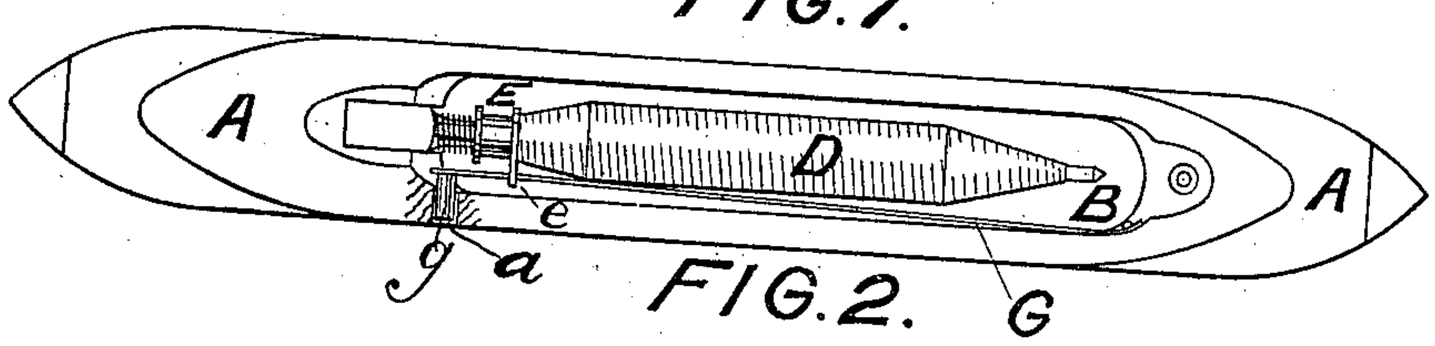

FIG. 2.

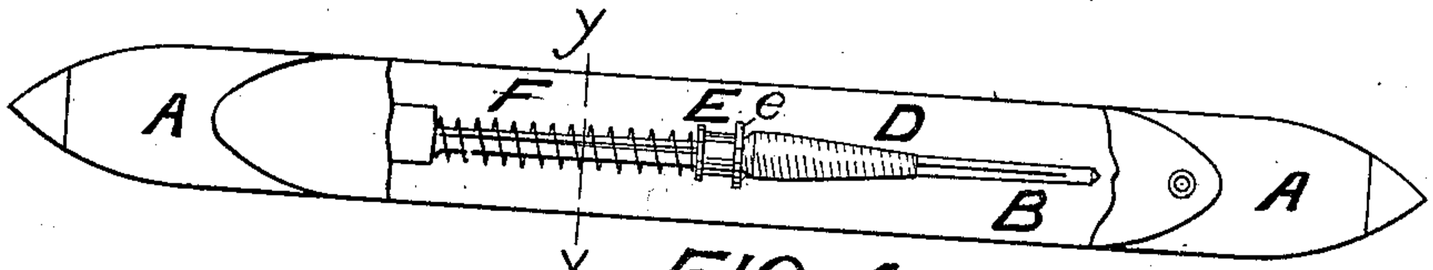

FIG. 4.

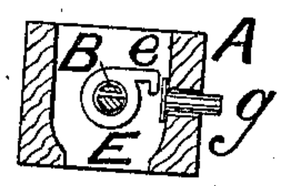

FIG. 6.

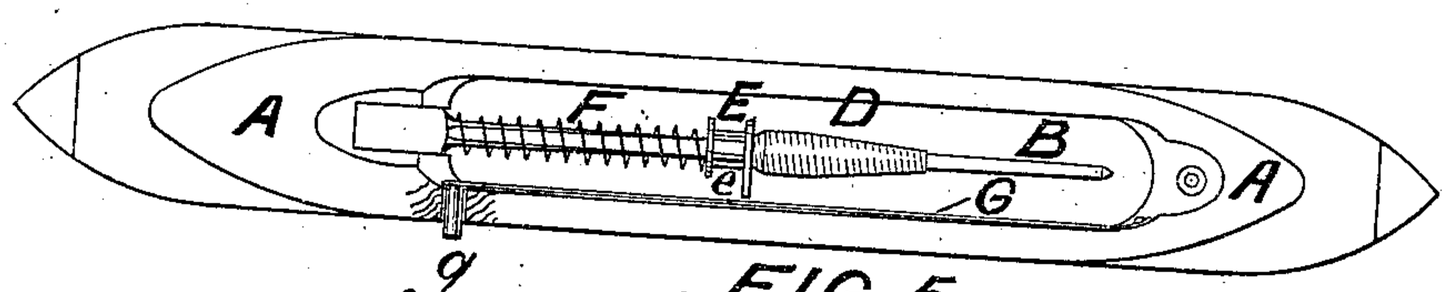

FIG. 5.

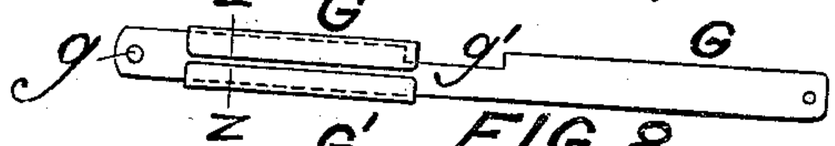

FIG. 8.

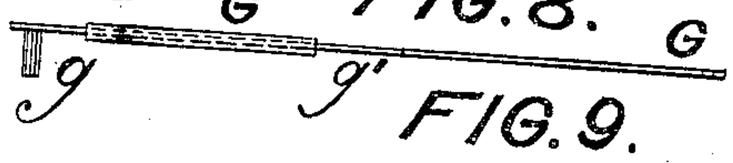

FIG. 9.

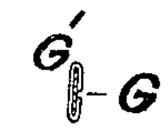

FIG. 10.

WITNESSES.

Joseph Bates.

E. Howard.

INVENTORS.

Wm Williamson

John Collinson

by Owens O'Brien

Atty.

No. 828,360.

PATENTED AUG. 14, 1906.

W. WILLIAMSON & J. COLLINSON.

LOOM SHUTTLE AND MECHANISM OPERATED THEREBY.

APPLICATION FILED MAR. 10, 1903.

2 SHEETS—SHEET 2.

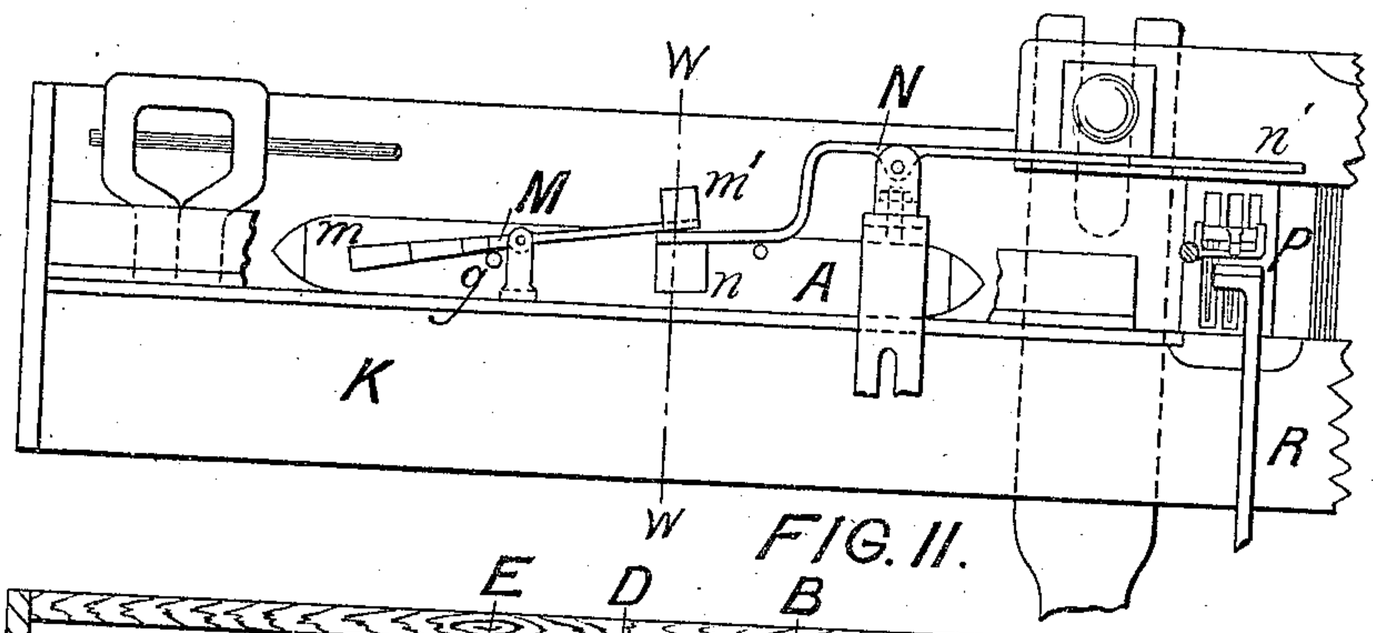

FIG. II.

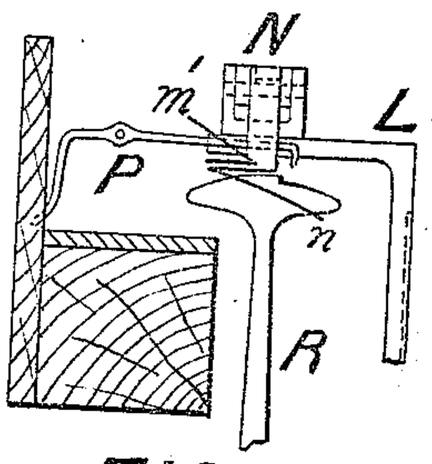

FIG. 13.

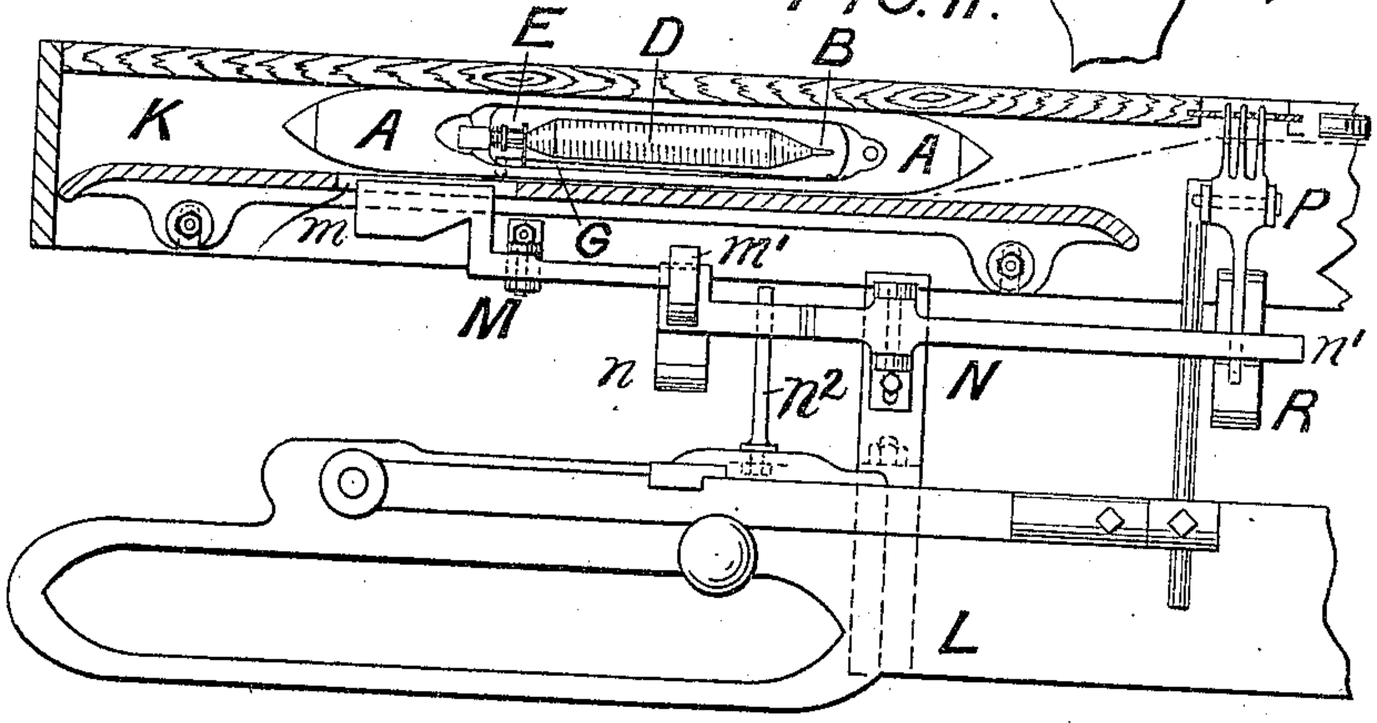

FIG. 12.

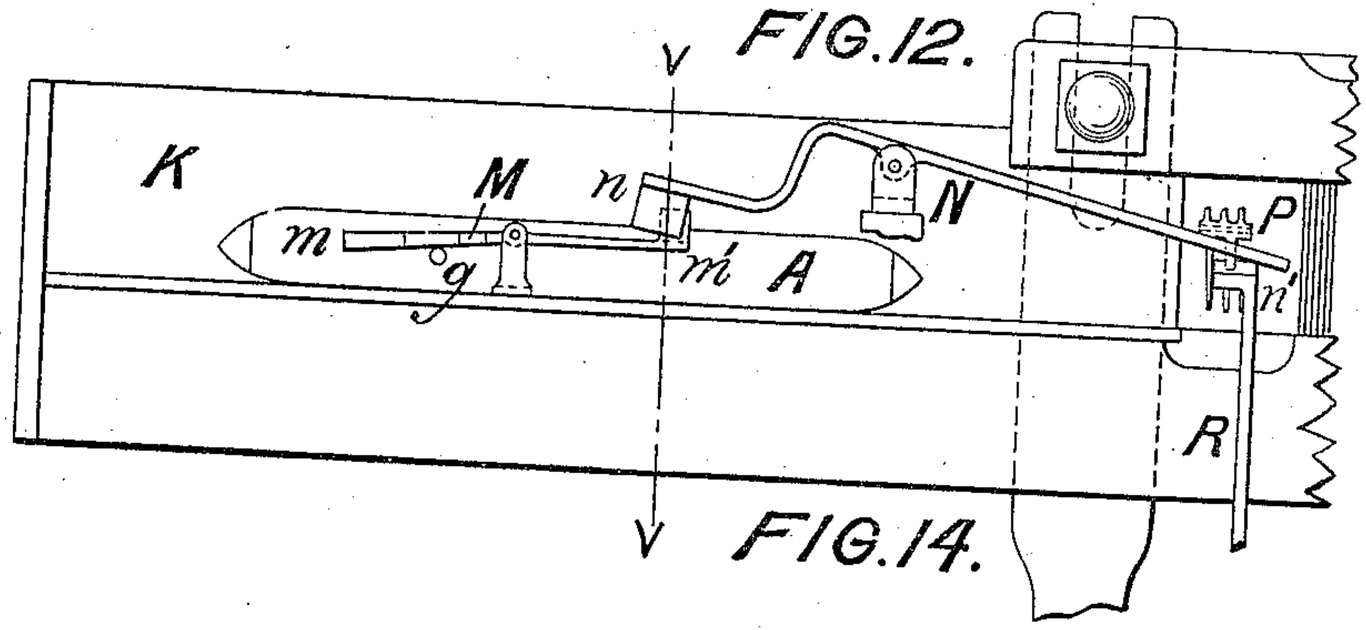

FIG. 14.

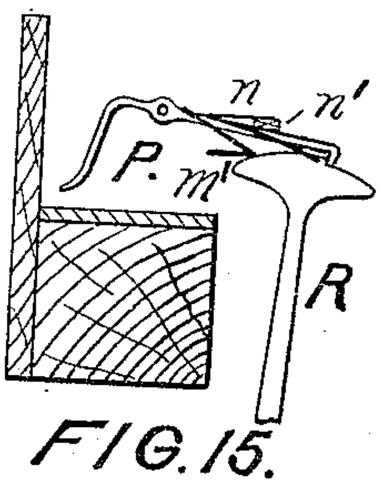

FIG. 15.

WITNESSES:

Joseph Bates.

C. Howard

INVENTORS.

Wm Williamson

John Collinson

by O'Brien & O'Brien

attys

UNITED STATES PATENT OFFICE.

WILLIAM WILLIAMSON AND JOHN COLLINSON, OF MANCHESTER, ENGLAND.

LOOM-SHUTTLE AND MECHANISM OPERATED THEREBY.

No. 828,360. Specification of Letters Patent. Patented Aug. 14, 1906.

Application filed March 10, 1903. Serial No. 147 168.

To all whom it may concern:

Be it known that we, WILLIAM WILLIAMSON and JOHN COLLINSON, British subjects, and residents of Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Loom-Shuttles and Mechanism Operated Thereby, of which the following is a specification.

In the process of weaving it is desirable that the exhaustion of the yarn in the shuttle should be made known before it comes completely to an end in the case of ordinary looms by stopping the loom and in the case of automatic weft-replenishing looms by changing the shuttle or supplying it with a fresh cop or bobbin of yarn.

This invention is designed to provide means to bring the shuttle into communication with the weft-fork or into communication with other operative part of the loom when the weft-cop becomes nearly exhausted for the purpose of either stopping the loom or changing the shuttle or otherwise replenishing the weft or of merely indicating by signal to the attendant that the weft-yarn requires replenishing.

It consists, essentially, in constructing the shuttle with a sliding bush upon the shuttle tongue or peg provided with a laterally-projecting hooked catch or finger and pressed forward against the cop by a spring and also with a stud or pin projecting through the shuttle side mounted upon a spring with which the hooked finger on the shuttle-tongue engages to hold it back until the cop is nearly exhausted, (and, further, in a pivoted lever or levers, one on the shuttle-box front and one on the breast-beam of the loom, the end of one lever placed to engage the pin when it projects from the shuttle and the end of the other lever to engage the weft-fork irrespective of the function thereof.)

The invention will be fully described with reference to the accompanying drawings.

Figure 1 is a side elevation of shuttle with part of side broken away, showing full cop in position; Fig. 2, a plan of shuttle with full cop in position; Fig. 3, a transverse section on line *x x*, Fig. 1; Fig. 4, a side elevation of shuttle with part of side broken away, showing position of cop-bottom when nearly exhausted; Fig. 5, a plan of shuttle, showing position of cop-bottom when nearly exhausted; Fig. 6, a transverse section on line *y y*, Fig. 4; Fig. 7, a side elevation of spring G and stud *g* detached from shuttle; Fig. 8, a side elevation, detached, of modified construction of spring G; Fig. 9, a plan of spring G, Fig. 8; Fig. 10, a transverse section of spring G on line *z z*, Fig. 8; Fig. 11, a front elevation of shuttle-box, showing the position of the parts when in normal position and the cop is full; Fig. 12, a plan of same; Fig. 13, a transverse section of same on line *w w*, Fig. 11; Fig. 14, a front elevation of shuttle-box showing the position of parts after the cop is exhausted; Fig. 15, a transverse section of same on line *v v*, Fig. 14.

The shuttle A is constructed with a tongue or peg B, pivoted or otherwise attached thereto in the ordinary way to carry the cop D of weft-yarn.

Upon the shuttle tongue or peg B is placed a sliding bush or sleeve E, furnished with a hooked finger or catch *e*, projecting to one side of the shuttle-tongue nearly to the side of the shuttle. Behind the bush or sleeve E is placed a spring F, which presses it forward and as the cop D becomes reduced in size gradually forces the cop and moves with it toward the point of the shuttle tongue or peg. The sliding sleeve or bush E has a travel of about half the length of the shuttle peg or tongue B.

On the outer side of the shuttle a spring arm or lever G, carrying a stud *g*, is fitted, the stud *g* projecting through a hole *a* in the shuttle side. A notch *g'* is cut in the edge of the arm or spring G.

The hook or catch *e* of the sliding bush E engages the arm G when the cop D is full, as in Figs. 1 to 3, holding it back and the stud *g* from projecting through the shuttle side. When the cop is nearly exhausted, as in Figs. 4 to 6, the hook *e* encounters the notch *g'*, releasing the arm G and causing the stud *g* to spring out and project through the shuttle side.

In a modification (see Figs. 8, 9, and 10) a slide G' may be placed upon the spring-arm G, which may be moved to and fro over the notch *g'* to regulate or adjust the time at which the hook *e* will encounter the notch *g'* and release the pin *g*. The slide G' is clamped sufficiently tightly on the spring G to maintain its position by friction.

On the shuttle-box K on the weft-fork side of the loom is pivoted a lever M, one end *n* of

which projects through the front of the shuttle-box to engage the stud *g* of the shuttle when it projects. The other or free end of the lever M is constructed with an inclined face or wedge-shaped end *m'*. To the loom-frame or breast-beam L is pivoted a second oscillating or rocking lever N, the end *n* of which, also preferably wedge-shaped, engages with the end *m'* of the shuttle-box lever M, and the other end *n'* extends over the weft-fork P. When the first lever M is tilted by the shuttle-stud *g*, the end *m'* engages the end *n* of second lever N and lifts it, thereby depressing the end *n'*, and by it the weft-fork, which then operates to engage the weft-hammer R and stop the loom or to change the shuttle or weft-filling. The end *n* of the lever N is supported in normal position by a pin n^2 inside the breast-beam of the loom.

The second lever N may operate any other stop mechanism, electrical or otherwise, or any other shuttle or weft replenishing mechanism; but it is preferred to connect it with the weft-fork P or hammer R, which will then carry out its function in the ordinary way.

In operation the full cop D is placed in position in the shuttle A upon the shuttle-tongue B and the bush or sleeve E pushed back, compressing the spring F. At the same time the pin or stud *g* on the spring-arm G is pressed inward, and the hook *e* holds it back in working position. As the cop D is reduced in length and its grip upon the shuttle-tongue B decreases it is gradually moved toward the end of the tongue, the hook *e* following it and sliding along the spring-arm G until it reaches the notch *g'*, thereby disengaging and releasing the spring-arm G, which then springs back, projecting the pin or stud *g* through the side of the shuttle. At the next shot of the shuttle the pin *g* passes under the end *m* of the pivoted lever M on the shuttle-box, raising it and depressing the wedge-shaped end *m'*, and at the next forward beat up of the slay the wedge-shaped end *m* passes beneath the inclined end *n* of the lever N, raising it (see Figs. 14 and 15) and depressing the end *n'*, which in turn depresses the weft-fork P, bringing it into engagement with the weft-hammer R.

What we claim as our invention, and desire to protect by Letters Patent, is—

1. A loom-shuttle, constructed with a sleeve and hook, placed upon the shuttle-tongue to slide forward as the weft-cop decreases in length, a notched spring-arm along which the hook slides attached to the shuttle, and a pin which is projected through the shuttle side when the weft is nearly exhausted.

2. In a loom, the combination with the shuttle and shuttle-tongue, of a sleeve and hook placed upon the shuttle-tongue behind the weft-cop, a spring-arm and pin attached to the shuttle with which the sliding hook engages, and means to engage the pin and actuate a functional part of the loom, substantially as described.

3. In a loom, the combination with the shuttle and shuttle-tongue, of a sleeve placed upon the shuttle-tongue behind the cop, a hook affixed to the sleeve to engage a spring-arm, a spring placed behind the hook to force it along the shuttle-tongue, a notched arm attached to the inside of the shuttle with which the sliding hook engages, and a pin projecting from the arm and through the side of the shuttle, substantially as described.

4. In a loom the combination with the shuttle and shuttle-tongue, a sleeve placed upon the shuttle-tongue, a spring attached to the shuttle-body in contact with the sleeve on the shuttle-tongue, a pin projecting through the shuttle affixed to the spring attached to the shuttle-body by which it is held back out of operation until the weft is exhausted, of a lever M pivoted to the shuttle-box with which the pin projecting through the shuttle engages, the said lever having a wedge-shaped end, a second lever N pivoted to the breast-beam provided with an inclined end to engage the lever M, and a free end to engage the weft-fork substantially as and for the purpose described.

5. In a loom the combination with the shuttle-box, the shuttle, the shuttle-tongue, a sleeve placed upon the shuttle-tongue behind the cop, a hook affixed to the sleeve, a spring-arm engaged by the hook, a spring placed behind the hook to force it along the shuttle-tongue, a notched arm attached to the inside of the shuttle with which the sliding hook engages, a pin projecting from the arm and through the side of the shuttle, of a lever pivoted to the side of the shuttle-box, with which the pin engages, the said lever having a wedge-shaped end, a second lever pivoted on the breast-beam of the loom-frame, the said lever having a wedge-shaped end with which the end of the first pivoted lever engages, and a weft-fork with which the tail of the lever engages, substantially as described.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

WILLIAM WILLIAMSON.
JOHN COLLINSON.

Witnesses:
J. OWDEN O'BRIEN,
B. TABHAM WOODHEAD.