No. 756,164. PATENTED MAR. 29, 1904.

B. & P. GROSSLAUB.

LOOM SHUTTLE.

APPLICATION FILED AUG. 19, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

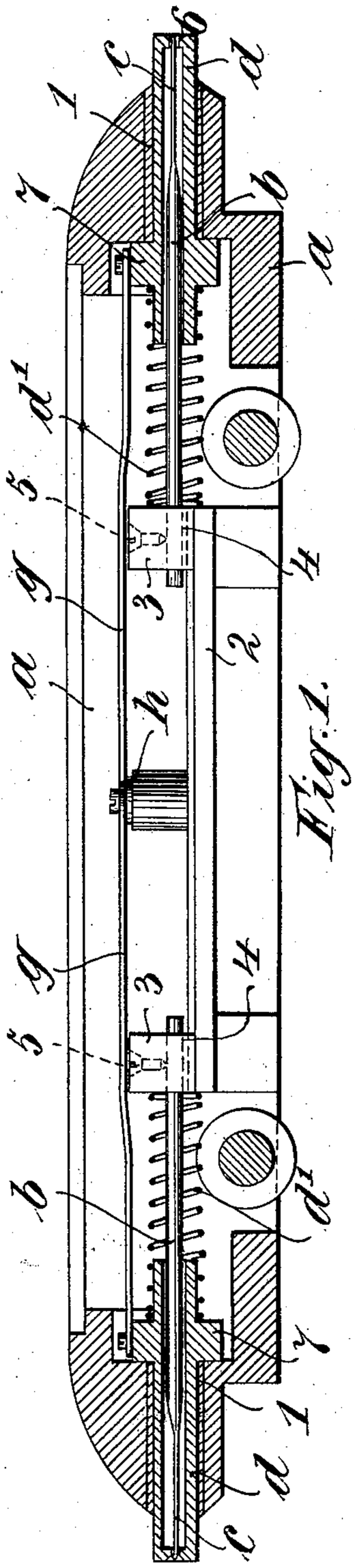


Fig. 1.

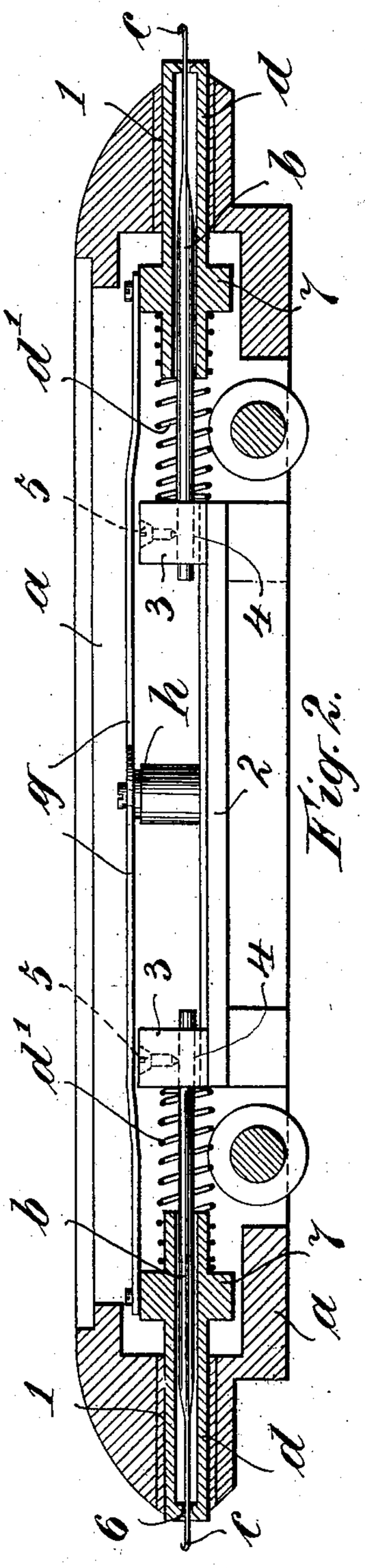


Fig. 2.

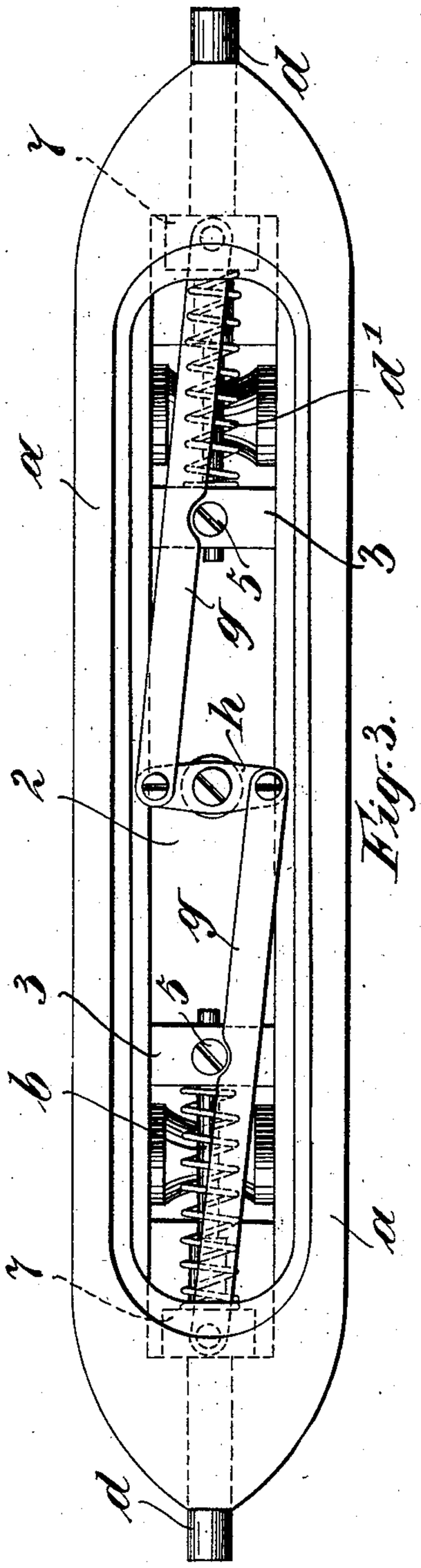


Fig. 3.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4

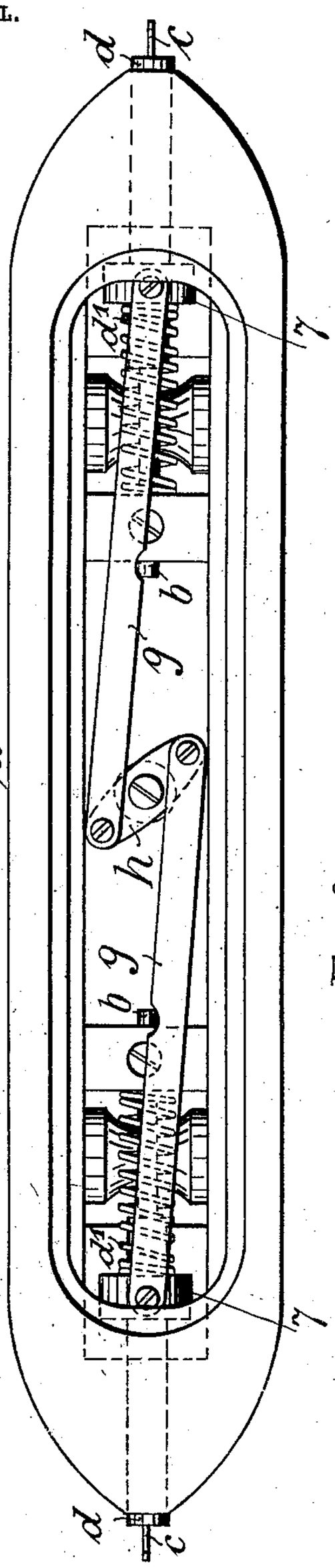



Fig. 5

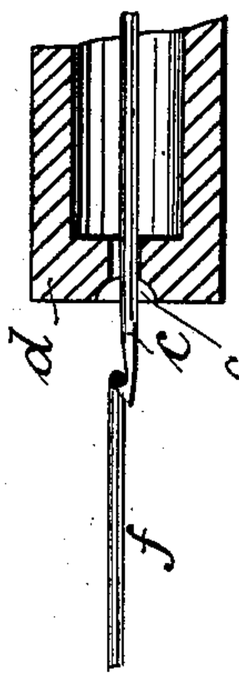



Fig. 6

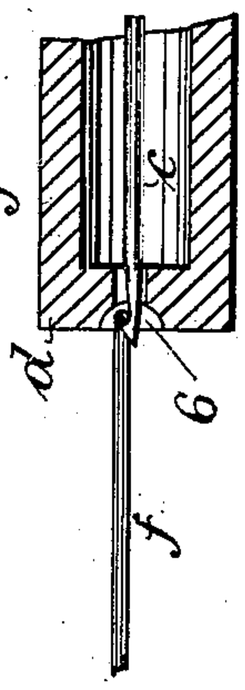



Fig. 7

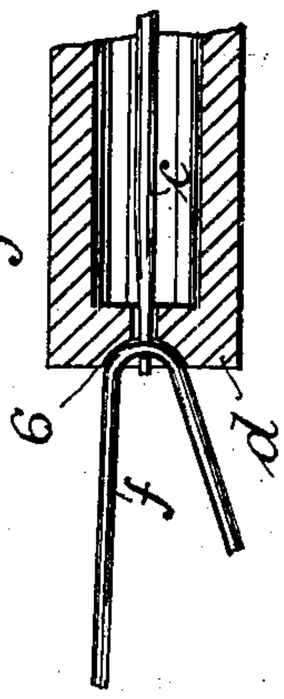
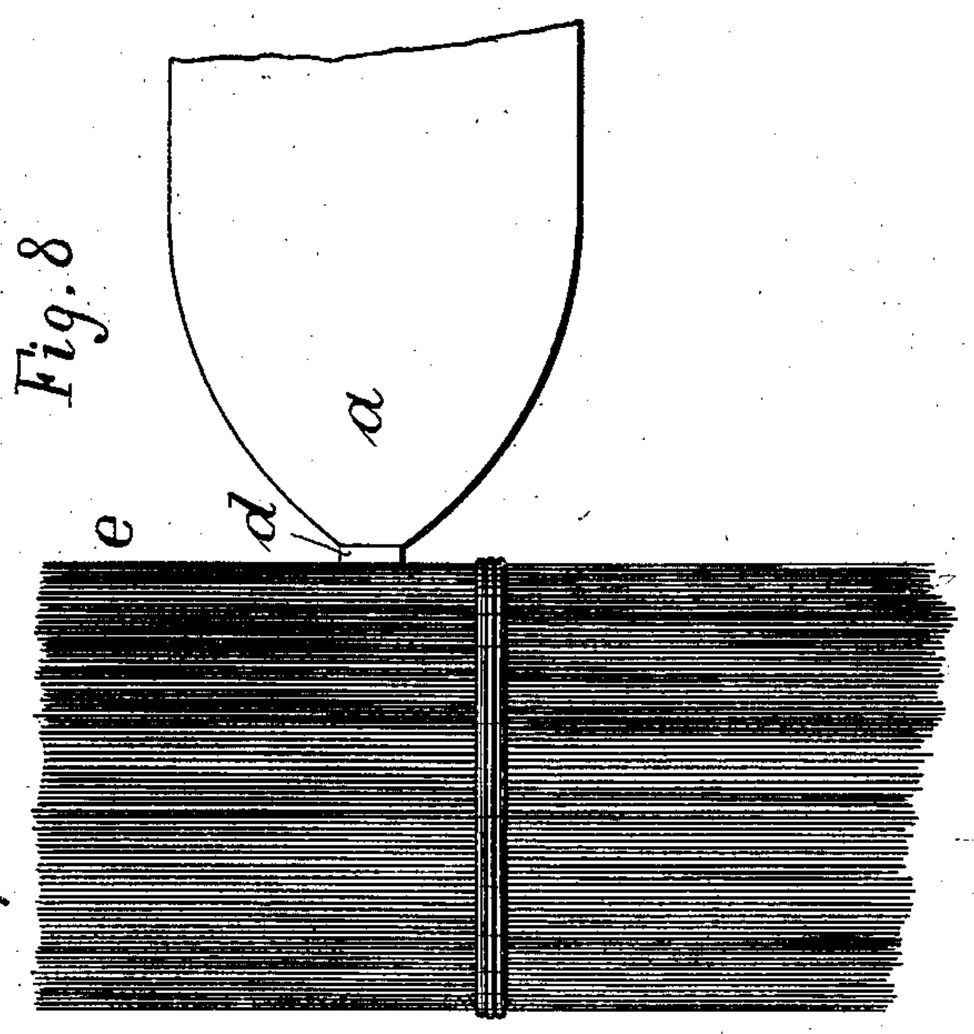



Fig. 8

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No. 756,164. Patented March 29, 1904.

# UNITED STATES PATENT OFFICE.

BRUNO GROSSLAUB AND PAUL GROSSLAUB, OF HAINICHEN, GERMANY.

## LOOM-SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 756,164, dated March 29, 1904.

Application filed August 19, 1901. Serial No. 72,524. (No model.)

*To all whom it may concern:*

Be it known that we, BRUNO GROSSLAUB and PAUL GROSSLAUB, citizens of the Kingdom of Saxony, residing at Hainichen, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in Loom-Shuttles for Production of Fabrics or Stuffs with Horsehair Insertions; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

The production of fabrics with horsehair as weft has hitherto been accomplished by shooting the hair from one side only of the web, whereby not only a loss of time is caused, but also the fabric made more expensive.

The object of this invention is to remove this disadvantage by means of a shuttle adapted to weave from both sides of the web. For this purpose the shuttle is provided at each end with a spring-catch mechanism and is designed to strike a bundle of horsehair and to pick therefrom, according to the size of the catch-hook, one or more hairs, so that in its passage it can carry the hair or hairs into the shed.

One form of construction of the shuttle of the invention is shown in the accompanying drawings, Figures 1, 2 being longitudinal sections, Figs. 3, 4 plan views, Figs. 5, 6, 7 details, and Fig. 8 a view of a shuttle end striking the horsehair bundle.

The shuttle consists of a shell or casing *a*, formed with a central chamber from which extend longitudinal openings or channels 1 at the opposite sides thereof. Within the shell or casing *a* is arranged a platform or baseplate 2, upon the opposite ends of which are arranged and secured studs or brackets 3 3, formed with sockets 4 4, in which are adjustably seated the rear ends of rods *b b*, which are held in position by means of set-screws 5 5, substantially as shown in the drawings. These rods *b b* extend through the openings 1 and project beyond the ends of the shuttle-case, where the ends of the said rods terminate in thread-hooks *c c*.

Slidably mounted upon the rods *b b* are sleeves *d d*, which are recessed at their outer ends, as at 6 6, and are provided with annular flanges 7 7, said sleeves being thrust outwardly by means of springs *d' d'* in order that their recessed portions will cover the thread-hooks to securely bind a thread therein. The springs *d' d'* are coiled about the rods *b b* and are so arranged that their opposite ends abut against the brackets 3 3 and the collars or flanges 7 7, substantially as shown. It will be seen that the annular flanges 7 7 serve a double purpose—namely, to afford an abutment for the springs *d' d'* and to limit the outward movement of the sleeves *d d*. It will also be seen that by recessing the outer ends of the sleeves the hair or thread when caught by the hook will be embedded in the said recess and clamped between the said sleeve and the hook and the liability of the escape of the thread or hair be lessened.

The seizure of the horsehair takes place mechanically by means of the hooked pins *c* in the manner that when the shuttle is shot against the horsehair bundle *e*, Fig. 8, the spring-sleeve *d* is pushed backward, whereupon the hooked pin enters between the horsehairs, seizing, say, in this case one, *f*, Fig. 5, which then by reason of the sleeve *d* pressing steadily forward is clamped between this latter and the hook of pin *c*, Figs. 6, 7. To attain this end, the spring *d'*, placed over and influencing the sleeve *d*, is designed of such a strength that only upon the shuttle striking against the horsehair bundle does it permit the sleeve to move backward to leave the hook free. The spring *d'* then again pressing forward, the sleeve *d* going with it pushes away the superfluous hairs from the hook, while the hair caught in the hook is clamped fast. The hair thus seized is then in the return throw of the shuttle passed into the warp-shed like an ordinary shuttle-thread. At the opposite end of the loom the shuttle in a like way strikes a bundle of horsehair, seizes a hair with the other hooked pin, and moving in the opposite direction carries the hair through the

shed. The alternating striking of the shuttle against the horsehair bundle and seizure of the hairs is simultaneously utilized for the release from the shuttle of the clamped hair passed through the shed. To this end the two clamping-sleeves *d* are so connected by rods *g* and a lever *h* that when one sleeve is pressed back upon striking the corresponding horsehair bundle to seize a fresh hair the other sleeve is drawn back to the same extent through its rod *g*, thereby releasing the hair held by it and permitting it to be struck off and bound into the formed shed. In a like way the operation is kept up repeatedly, the shuttle at each end of its throw picking a hair from the hair bundle, at the same time releasing at its opposite end the hair previously seized by it and drawn in the direction of its axis through the shed.

The horsehairs may be placed to lie horizontally or stand vertically in a box fixed to and taking part in the travel of the lathe of the loom, only to insure their proper seizure they must occupy a position at right angles to the hooks. For holding the hairs together they may be bound up in several—say six—places. This does not at all impede their withdrawal, as the clamping of the hairs by hook and sleeve is firm enough to overcome a stronger resistance.

The shuttle is shot by means of drivers which engage it under the sleeves *d*.

The shuttle works as quickly and surely as other kinds of shuttle which carry a thread in them, as no stoppage of movement is required in the carriage of the hair, only at the end of its throw it must be slightly detained or slowed down, and then it seizes a fresh hair.

If it be desired to seize several hairs together, it is simply necessary to make the hook of such a size that the required number of hairs can find room in it.

What we claim, and desire to secure by Letters Patent of the United States, is—

1. In a loom-shuttle, the combination with a shell, of oppositely-arranged thread-hooks projecting therefrom, spring-actuated sleeves slidably mounted on and covering the said hooks, levers connecting the spring-actuated sleeves and means to limit the outward movement of the said sleeves.

2. In a loom-shuttle, the combination with a hollow shell, of brackets mounted therein, thread-hooks secured to the brackets and projecting beyond the ends of the shuttle-shell, spring-actuated sleeves slidably mounted upon the thread-hooks, and having annular flanges thereon, and levers connecting the said sleeves.

3. In a loom-shuttle, the combination with a hollow shell having a platform therein, of brackets mounted on the said platform, thread-hooks secured to the brackets and projecting beyond the ends of the shuttle, sleeves slidably mounted on the said hooks and having annular flanges thereon, coil-springs on the shanks of the needle-hooks, the ends of said springs being lodged against the brackets and the annular flanges on the sleeves respectively and levers connecting the said sleeves.

4. In a loom-shuttle, the combination with a hollow shell, of brackets having apertures formed therein, adjustable thread-hooks seated in the said brackets, sleeves movably mounted on said hooks, springs around the shanks of said thread-hooks and bearing against said brackets, and means to hold the said hooks in adjusted position.

5. In a loom-shuttle, the combination with a hollow shell, of brackets having apertures formed therein, adjustable thread-hooks seated in the said apertures, set-screws to hold the hooks in adjusted position, spring-actuated sleeves having recessed outer ends, slidably mounted on the thread-hooks, means on said sleeves forming an abutment for the springs thereof and stops for the outward movement of the sleeves and levers connecting the flanges of said sleeves.

6. In a loom-shuttle, the combination with a hollow shell having a platform therein, of apertured brackets on said platform, thread-hooks adjustably seated within the brackets, and projecting beyond the ends of the shuttle, sleeves slidably mounted thereon and having annular flanges and recessed outer ends, expansive spiral springs on the shanks of the needle-hooks, the ends of the said springs being lodged against the annular flanges on the sleeves and the brackets, and levers connecting the said sleeves.

In testimony whereof we affix our signatures.

BRUNO GROSSLAUB.
PAUL GROSSLAUB.

In presence of—
EMIL REICHELT,
HERNANDO DE SOTO.