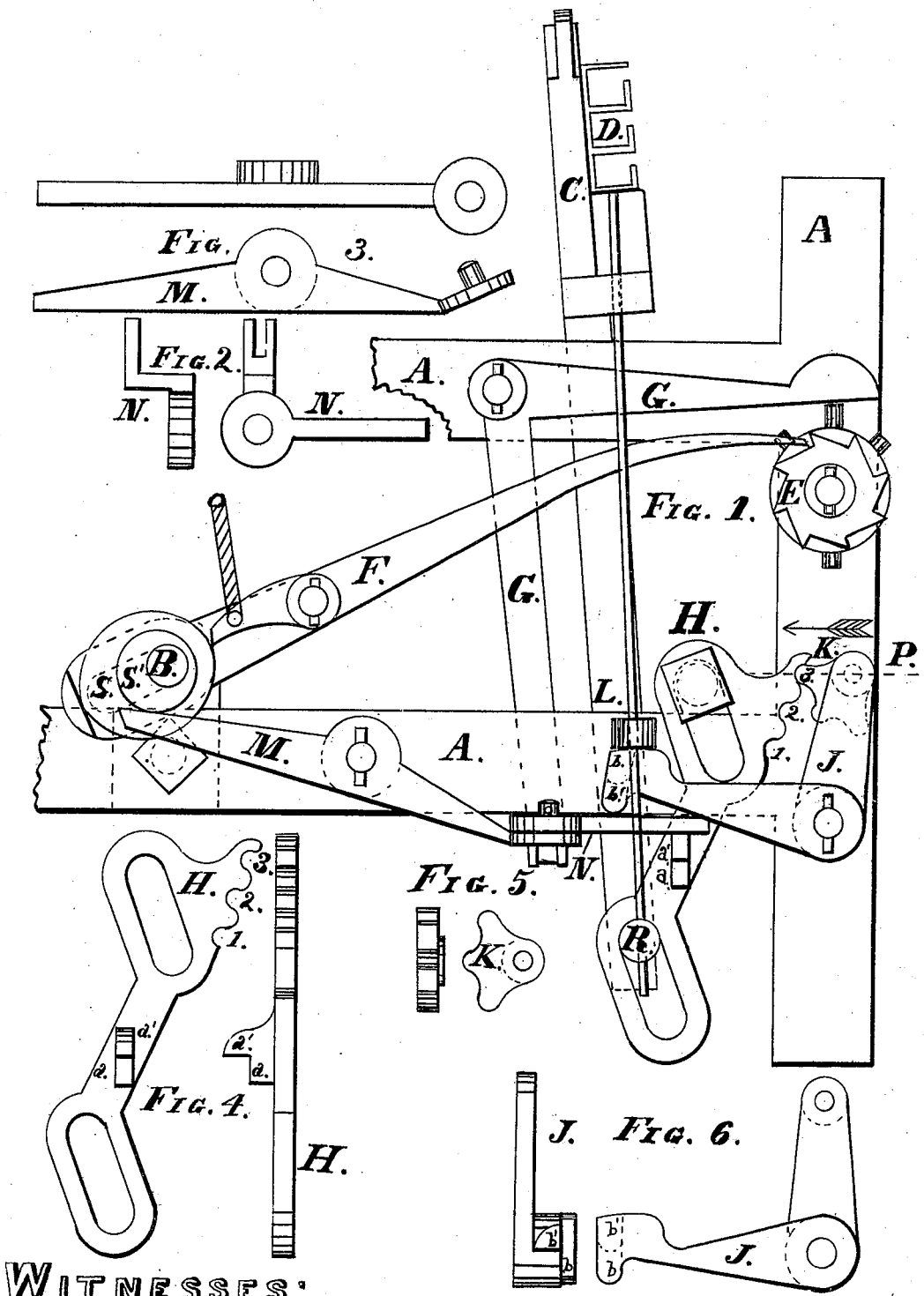
R. B. GOODYEAR.

Shuttle-Box Motion for Looms.

No. 205,794. Patented July 9, 1878.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ROBERT B. GOODYEAR, OF PHILADELPHIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO WOLFENDEN, SHORE & CO., OF CARDINGTON, PA.

IMPROVEMENT IN SHUTTLE-BOX MOTIONS FOR LOOMS.

Specification forming part of Letters Patent No. **205,794**, dated July 9, 1878; application filed November 14, 1877.

To all whom it may concern:

Be it known that I, ROBERT BURNS GOODYEAR, of the city of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Shuttle-Box Motions for Looms, of which the following is a specification:

The invention relates to lift and drop box motions for looms; and has for its object the construction of a simple, cheap, and effective shuttle-box motion for looms, which shall be capable of being operated at a high speed.

The invention consists in the combination and arrangement of a double-slotted sliding plate fitted to work on two fixed studs, so that the slots will form an angle with a perpendicular line, said plate being provided with fixed steps, and having on one of its upper edges a series of notches, one for each shuttle-box to be operated, with a right-angled lever, to one of the arms of which are fixed steps, there being secured to the other arm a stud, on which is a segment having teeth formed in the edge to correspond with the notches on the aforesaid sliding plate, all as will be hereinafter described.

Referring to the drawings, Figure 1 shows an end view of portions of a loom-frame with my improvement applied. Fig. 2 shows views of the lifting-finger; Fig. 3, views of the lifting-lever; Fig. 4, views of the double-slotted sliding plate; Fig. 5, views of the toothed segment; and Fig. 6, views of the right-angle lever.

Similar letters of reference in the drawings refer to like parts.

The construction and operation of my improved shuttle-box motion are as follows: A represents the end of a loom-frame; B, the cam-shaft; C, the lay; D, the shuttle-box; E, the pattern-wheel; F, the pawl for operating the pattern-wheel; G, the lever for operating the lifting-finger, and adapted to be controlled by the short and long pins in the pattern-wheel. These parts are all constructed and operated as is well known to those who are familiar with the well-known anchor-box motion, in which short and long pins are used to control the movements of the shuttle-boxes.

H is the double-slotted sliding plate, which is provided with steps *a a'*, and on one of its upper edges with three notches, 1 2 3. This sliding plate is guided at its upper end by a stud fixed to the loom-frame, and working in the upper slot of said plate, while by means of the lower slot the said plate is guided by and slides on the lay-rocker stud R. J is a right-angle lever, on the end of the horizontal arm of which are two steps, *b b'*, and on the vertical arm of which is pivoted loosely, by means of a stud, the segment K. This segment has three teeth, 1, 2, and 3, and the said lever is hung on a stud fixed to the loom-frame. L is a shoe fitted or sleeved on the lifting-rod of the shuttle-box. M is the lifting-lever, to which is pivoted the lifting-finger N. On the end of the cam-shaft B are fixed two eccentric-shaped cams, S S', one to operate the pattern-wheel, and the other to operate the lifting lever and finger. Extending from the hub of the lifting-finger N, and at right angles to said finger-arm, is an arm, at the end of which is a slot. (See Fig. 2.) In the slot engages the lower end of lever G, and through it the short and long pins in the pattern-wheel control the finger N, and by it in turn the sliding plate H, lever J, and shuttle-box D.

When adjusting the parts care must be taken to set the sector K and sliding plate H so that the center of the tooth and the center of the stud on which the sector is pivoted are in a direct horizontal line, as is shown by the dotted line P, Fig. 1.

The weight of the box D and the other parts of the lifting motion will exert a pressure in the direction indicated by the arrow. When operated by the finger N acting on steps *a a'* the box D may be readily lowered; but the weight of the box or any pressure brought to act directly on the box will be exerted on the sector K in a line indicated by the arrow, and it is impossible for the box to fall or be forced down when pressure is applied from the top of the box D, and the boxes will not move from the position placed by the finger N and shoes *a a'* and *b b'*.

The operation is as follows: The drawing shows the lever G resting on a long pin in the

pattern-wheel. This will cause the finger N to catch under the step *b'* on the horizontal arm of lever J, and the finger N will elevate the shuttle-box to operate the shuttle from the bottom box, and the segment K will insert its upper tooth into the notch 3 of sliding plate H. The next move of the pattern-wheel presents a short pin, which will shift the finger N, so that it will catch under the step *a'* on plate H, thereby elevating the sliding plate H and causing the middle tooth on segment K to mesh with notch 2 of the sliding plate H. This will draw back the vertical arm of the lever J and depress the arm on which rests the shoe L, thereby lowering the boxes to operate the middle shuttle. The next move of pattern-wheel will present a blank in the wheel and cause the finger N to catch under step *a* on plate H, thereby elevating plate H and causing the bottom tooth of segment K to engage in notch 1 of plate H. This will further draw back the vertical arm of lever J, and lower still farther the arm on which rests shoe L, thereby dropping the boxes so as to use the shuttle in the top box. The next move is a blank, and the top shuttle will be used, while the next move of pattern-wheel will present a short pin, and this time the finger N will catch under the step *b* on lever J, thus elevating the box to use the middle shuttle. The next move is a blank. This will cause, as before, the finger N to act on step *a* on plate H, which, as before, will drop the boxes to use from the top box; the next move, a blank, and the boxes will not be moved; the next move, a short pin, which, as before, will call the middle box; the next move, a long pin, which will call the lower box.

Therefore, it will be seen that a long pin calls the bottom box, a short pin the middle box, a blank the top box, and each box is controlled by its pin or blank as long as desired by repeating that pin or blank, the arm N invariably engaging with the steps on the lever J when it is desired to raise the boxes, and with the steps on the plate H when it is desired to lower them.

It is understood that in practice I shall use a pin-chain instead of a pin-wheel.

It is also to be understood that by increasing the number of steps on the lever and plate and the number of notches in the plate, and the number of teeth in the segment, also by correspondingly varying the number and length of the pins in the chain, a greater number of boxes may be worked, all of which will be readily understood by those skilled in the construction and operation of lift and drop box looms.

I claim—

The right-angle lever J, one arm having a series of steps, *b b'*, the other arm having a pivoted segment provided with a series of teeth, in combination with the double-slotted sliding plate H, provided with a series of steps, *a a'*, and notches 1 2 3, the finger N, and mechanism for operating said finger, as shown and described, and for the purpose specified.

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Witnesses:
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