No. 775,169. PATENTED NOV. 15, 1904.

R. B. GOODYEAR, DEC'D.

A. L. GOODYEAR, ADMINISTRATOR.

SHUTTLE BOX ACTUATING MECHANISM.

APPLICATION FILED JULY 29, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

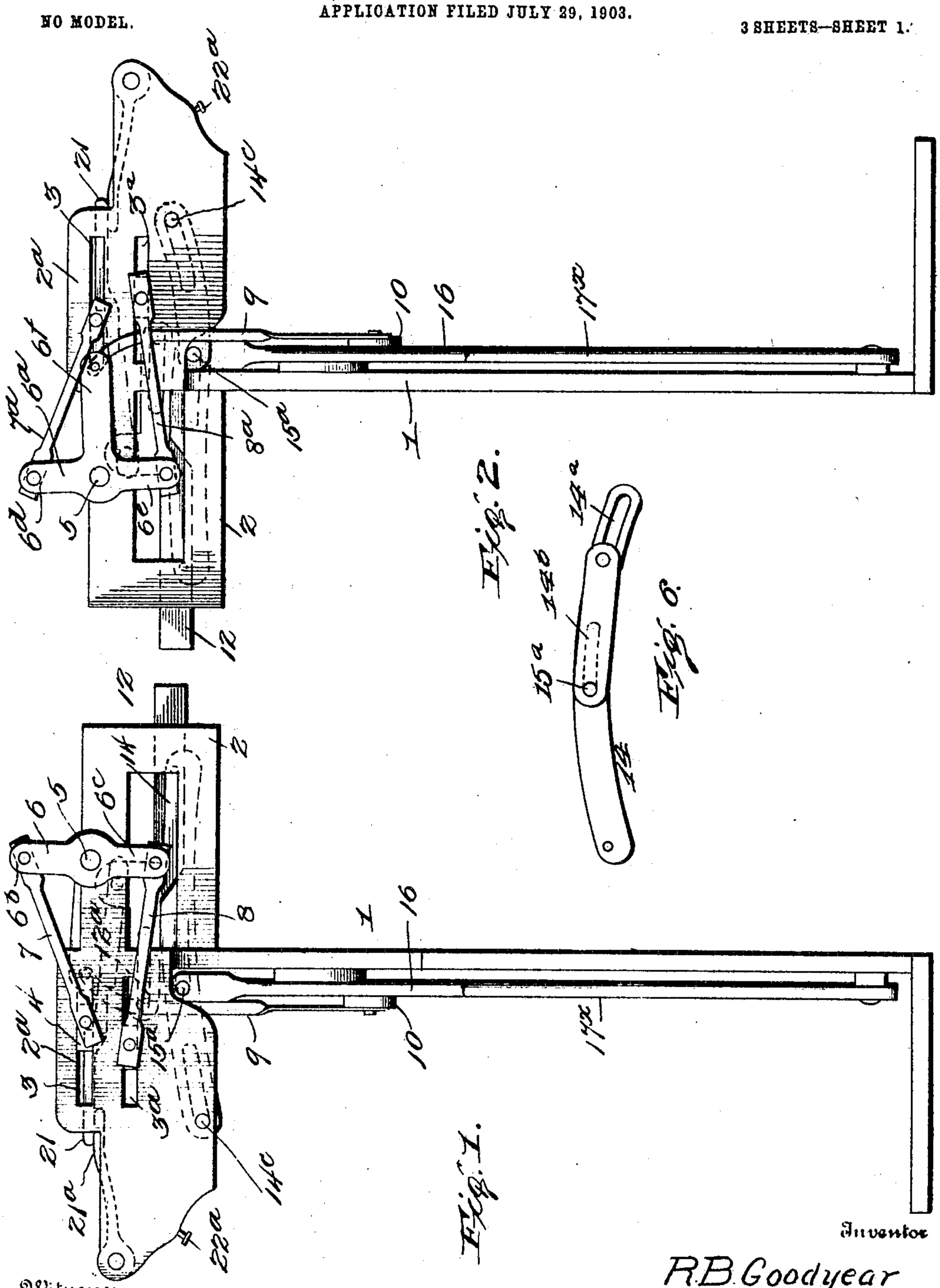

Fig. 1.

Fig. 2.

Fig. 3.

Witnesses

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NO MODEL. 3 SHEETS—SHEET 2.

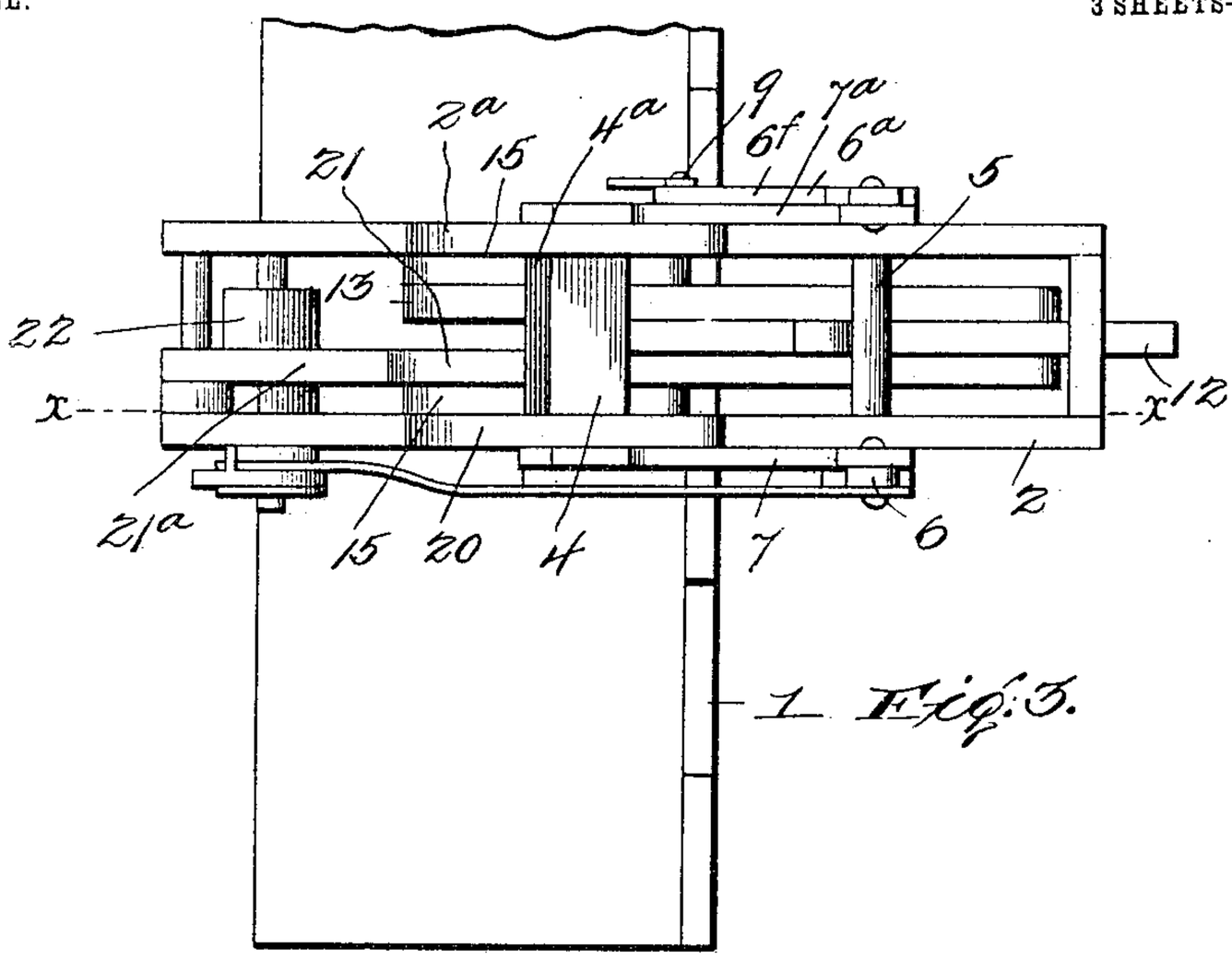
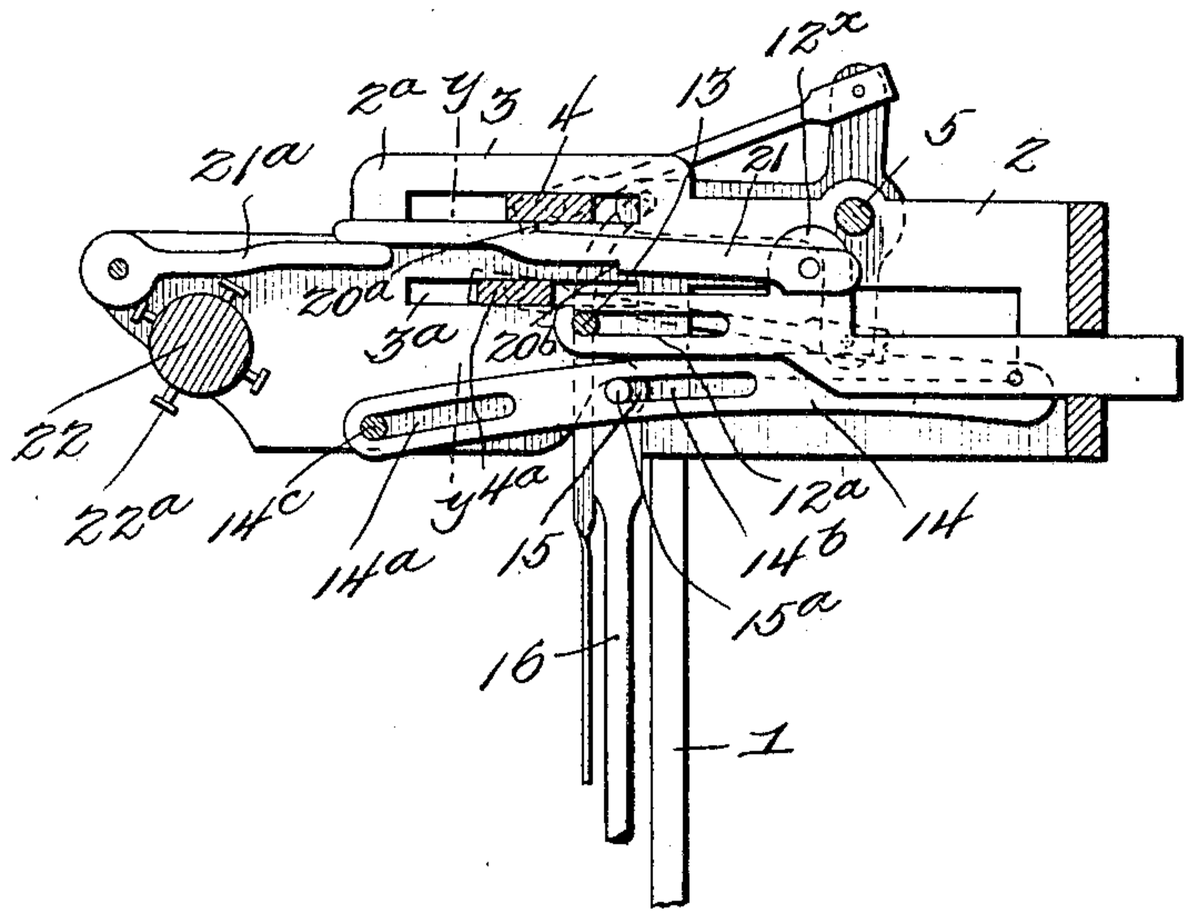


Fig. 3.

Fig. 4.



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SHUTTLE BOX ACTUATING MECHANISM.

NO MODEL. APPLICATION FILED JULY 29, 1903. 3 SHEETS—SHEET 3.

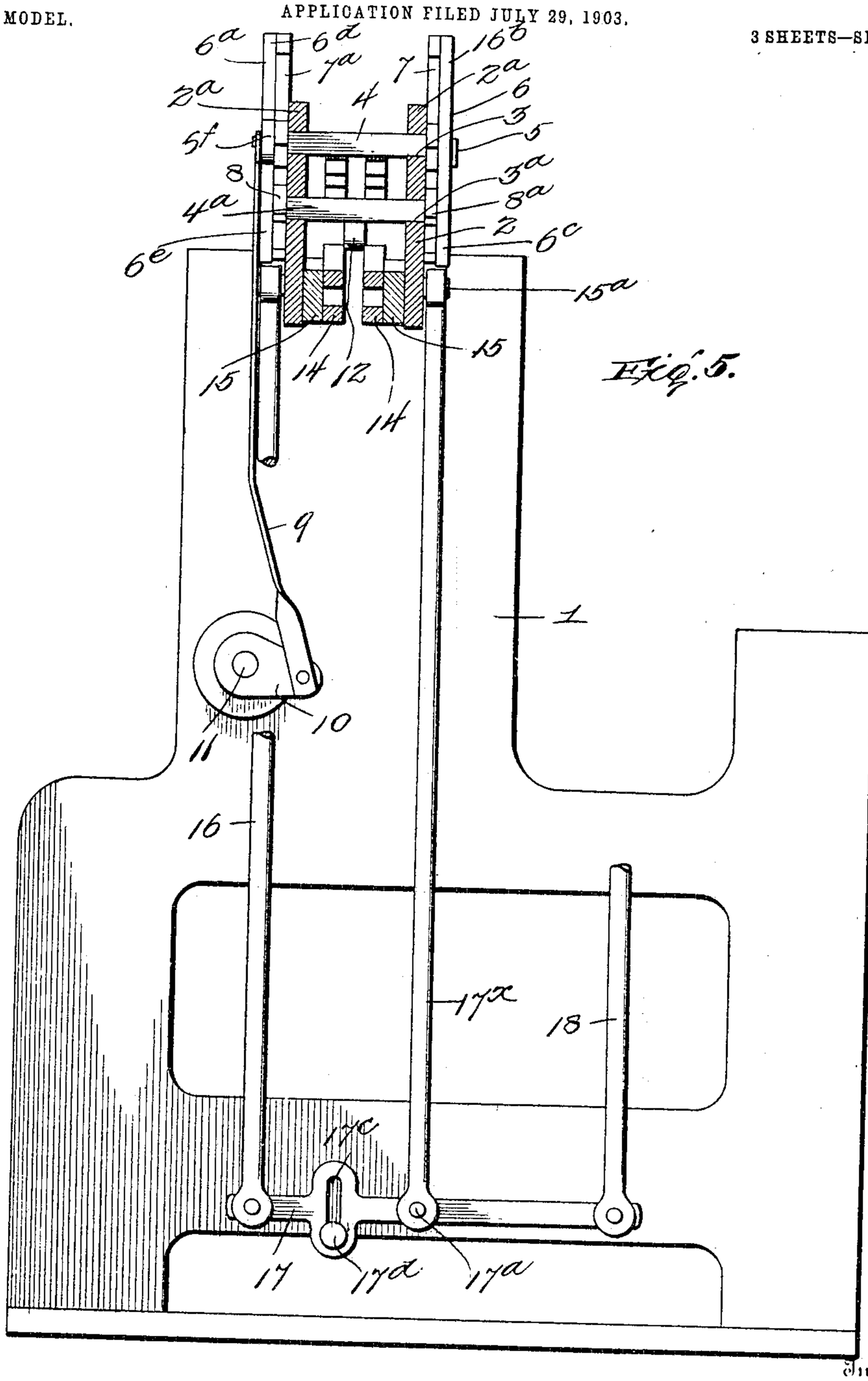

Fig. 5.

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UNITED STATES PATENT OFFICE.

ROBERT B. GOODYEAR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO THOMAS M. LORD, OF GARRETTFORD, PENNSYLVANIA; A. LINCOLN GOODYEAR ADMINISTRATOR OF SAID ROBERT B. GOODYEAR, DECEASED.

SHUTTLE-BOX-ACTUATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 775,169, dated November 15, 1904.

Application filed July 29, 1903. Serial No. 167,472. (No model.)

To all whom it may concern:

Be it known that I, ROBERT BURNS GOODYEAR, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Shuttle-Box-Actuating Mechanism; and I do hereby 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.

My invention relates to certain improvements in mechanism for actuating shuttle-boxes for pick-and-pick shuttle-motions for looms.

It has for its object to simplify the construction and arrangement of the parts and otherwise improve the same; and the nature thereof consists of the combination of said parts, substantially as hereinafter more fully disclosed, and specifically pointed out by the claims.

In the accompanying drawings, illustrating the preferred embodiment of my invention, Figure 1 is a side elevation. Fig. 2 is an opposite side elevation. Fig. 3 is a plan view. Fig. 4 is a longitudinal section taken on the line *x x* of Fig. 3, and Fig. 5 is a transverse section taken on the line *y y* of Fig. 4. Fig. 6 is a detail view of one of the links 15 and cams 14.

It will be understood that I do not limit myself as to details as herein disclosed, as the same may be changed as circumstances suggest without departing from the spirit of my invention and the same remain intact and be protected.

In carrying out my invention I employ the usual framework 1 for supporting the operative parts of the shuttle mechanism and the other parts of the loom. Suitably supported in position in said frame at each side is a supplemental frame 2, comprising lateral portions 2^a, having produced in each of said lateral portions parallel longitudinal slots 3 3^a, the upper and lower ones of said slots being arranged in horizontal alinement with each other. In the upper slots 3 is fitted a sliding transverse impelling-bar 4, and in the lower slots 3^a is similarly arranged a like impelling-bar 4^a, these bars being actuated to move simultaneously in opposite directions. A transverse rock-shaft 5 is journaled in suitable bearings in said side or lateral portions 2^a, to the ends of which shaft are secured levers 6 6^a, one of which levers has two arms 6^b 6^c, the opposite lever 6^a having three arms 6^d 6^e 6^f, the purpose of which will presently appear. The arm 6^b of the lever 6 and the arm 6^d of the lever 6^a are connected by pitmen 7 7^a to the ends of the sliding or impelling bar 4, and the arm 6^c of the lever 6 and the arm 6^e of the lever 6^a are likewise connected by pitmen 8 8^a to the ends of the second sliding or impelling bar 4^a. As said rock-shaft is actuated to throw the arms 6^b 6^d in one direction and the arms 6^c 6^e in the reverse direction said pitmen move the two sliding or impelling bars in reverse direction simultaneously, said bars being guided within their respective slots to move horizontally in planes one above the other. The arm 6^f of the lever 6^a projects centrally from said lever at right angles to the arms 6^d 6^e, and to one end of said arm 6^f is pivoted the upper end of a link 9, the lower end of which link is connected or pivoted to a cam 10, said cam being carried by a rotary shaft 11, suitably journaled in the loom-frame and driven in any suitable manner. At each side of the heddle-harness are arranged certain parts comprising a draw or latch bar 12, with one end guided in an apertured end bar of the frame 2^a, said latch or draw bar having near one end a longitudinal slot 12^a, adapted to receive a cross-rod 13, secured in the lateral pieces of said frame 2^a. Pivoted or connected up with said latch or draw bar are slides or cams 14, each having two inclined slots 14^a 14^b, one of said slots receiving a cross-rod 14^c, also secured in the lateral portions of the frame 2^a, the slot 14^a of said slides or cams having opposite inclina-

tions, the object of which will presently appear. A lever 15 has one end pivoted upon the cross-rod 14^c and has projecting from opposite sides thereof a cross-pin 15^a, fixed to said lever 15, with one end engaging the slot 14^b of the slide 14 and its opposite end having connected thereto a pitman or rod 16, connected to a second lever 17 at one end, in turn suitably connected to the shuttle-box-actuating rod 18. Said lever 17 has connected thereto, as at 17^a, a second pitman or rod $17^\times$, connected at its upper end to similar parts as said first-named pitman. Intermediately of the points of connection of said pitmen with said lever 17 said lever is provided with an elongated vertical slot 17^c, receiving a stud or projection 17^d from the loom-frame, thus permitting said lever to have a sliding vertical movement upon said projection as said lever is actuated by said pitmen. It will be observed that by the downward stroke of the pitman 16 the pitman or rod $17^\times$ will be raised and the shuttle-box-actuating rod will be lifted, so as to dispose one of its shuttles for removal therefrom upon the race, while upon the downward stroke of said pitman 16 the operation will be reversed. It is obvious that the inclination of the slots 14^a of the slides 14 will govern the length of the strokes of the pitmen 16 and 17 and that the inclination of the slot 14^a of one slide 14 upward should correspond to that of the slot 14^a of the other slide 14 downward. Connected to a shoulder or elevation $12^\times$ of said latch-bar 12 is a jack 21, arranged to have endwise movement and supported intermediately of the impelling-bars 4 4^a, with its free end resting upon a finger 21^a, pivoted at one end in the frame 2^a directly above the pattern-cylinder 22, suitably journaled and actuated in said frame. Said jack has oppositely-facing shoulders 20^a 20^b upon its upper and lower surfaces, respectively, adapted to be engaged by the oppositely-moving impelling-bars 4 4^a. It will be observed that when the pattern-cylinder provided with suitably spaced-apart tappets or studs 22^a is in operation said tappets or studs will engage the finger 21, imparting a vibratory movement thereto, which in turn will similarly actuate the jack 21, said movement being timed with the reciprocating movement of the impelling-bars 4 4^a, so as to permit said bars to engage the oppositely-facing shoulders of said jack at the required intervals as said impelling-bars are themselves actuated, thus imparting a longitudinally-reciprocating movement to the draw or latch bar 12. Said draw or latch bar will accordingly actuate the slide or cam 14 and transmit, through the lever 15 and its pin 15^a, a vertical reciprocating motion to the pitman or rod 16, and by means of similar parts, as just described, a like movement will be imparted to the pitman $17^\times$. Said movements of said pitmen alternate with each other, thus actuating the shuttle-box, as and for the purpose above described.

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

1. In a device of the character described, the combination of a shuttle-box-actuating lever, means effecting connection between said lever and the shuttle-box, mechanism having a reciprocated motion, and pitmen effecting connection between said reciprocated mechanism and said lever, said lever having intermediately of the points of connection therebetween and said pitmen an elongated slot receiving a stud or projection from a fixture.

2. In a device of the character described, the combination of a shuttle-box-actuating lever, means effecting connection between the shuttle-box and said lever, mechanism having a reciprocated motion, pitmen having connection with said lever, said lever having a vertical sliding movement, said mechanism comprising cams, slides having inclined slots therein, and levers adapted to engage said inclined slots at one end of each of said levers, respectively, the opposite end slots of said levers receiving fixed cross-rods in the supporting-frame of said mechanism, said pitmen having connection with the last-referred-to levers.

3. In a device of the character described, the combination of a shuttle-box-actuating lever having a vertical sliding movement, means for effecting connection between the shuttle-box and said lever, pitmen connected with said lever, mechanism for imparting movement to said pitmen, comprising slides, cams having inclined slots and pivoted to said slides, and levers having pin connections with the slots toward one end of said cams and with said pitmen.

4. In a device of the character described, the combination of a shuttle-box-actuating lever, means for effecting connection between said lever and the shuttle-box, said lever having a vertical sliding movement, pitmen connecting with said lever, slides, cams pivoted to said slides, levers having slot-and-pin connections with said cams and with said pitmen, jacks connected with said slides, impelling-bars engaging said jacks, and means for actuating said jacks in effecting the engagement of said impelling-bars with said jacks.

5. In a device of the character described, the combination of a shuttle-box-actuating lever, said lever having a vertical sliding movement, means effecting connection between said lever and the shuttle-box, pitmen connected to said lever, slides suitably supported in position, cams pivoted to said slides, additional levers having pin-and-slot connections with said cams and with said pitmen, jacks connected with said slides having oppositely-facing shoulders, oppositely-reciprocating impelling-bars adapted to engage said shoulders, pivoted fin-

gers having engagement with said jacks, and a pattern-cylinder adapted to actuate said fingers.

6. In a device of the character described, the combination of a shuttle-box, a lever, means for effecting connection between said shuttle-box and said lever, reciprocating mechanism, pitmen effecting connection between said reciprocating mechanism and said lever, the points of connection of said pitmen with said lever being arranged laterally of the means effecting connection between said lever and said shuttle-box, said lever having intermediately of the points of connection therebetween and said pitmen an elongated slot receiving a stud or projection from the loom-frame.

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

ROBT. B. GOODYEAR.

Witnesses:

CHARLES S. CLOSE,

MAME R. CLOSE.