No. 786,232. PATENTED MAR. 28, 1905.

A. J. O'REILLY.

SHUTTLE BOX ACTUATING MECHANISM.

APPLICATION FILED NOV. 14, 1904.

FIG. 1

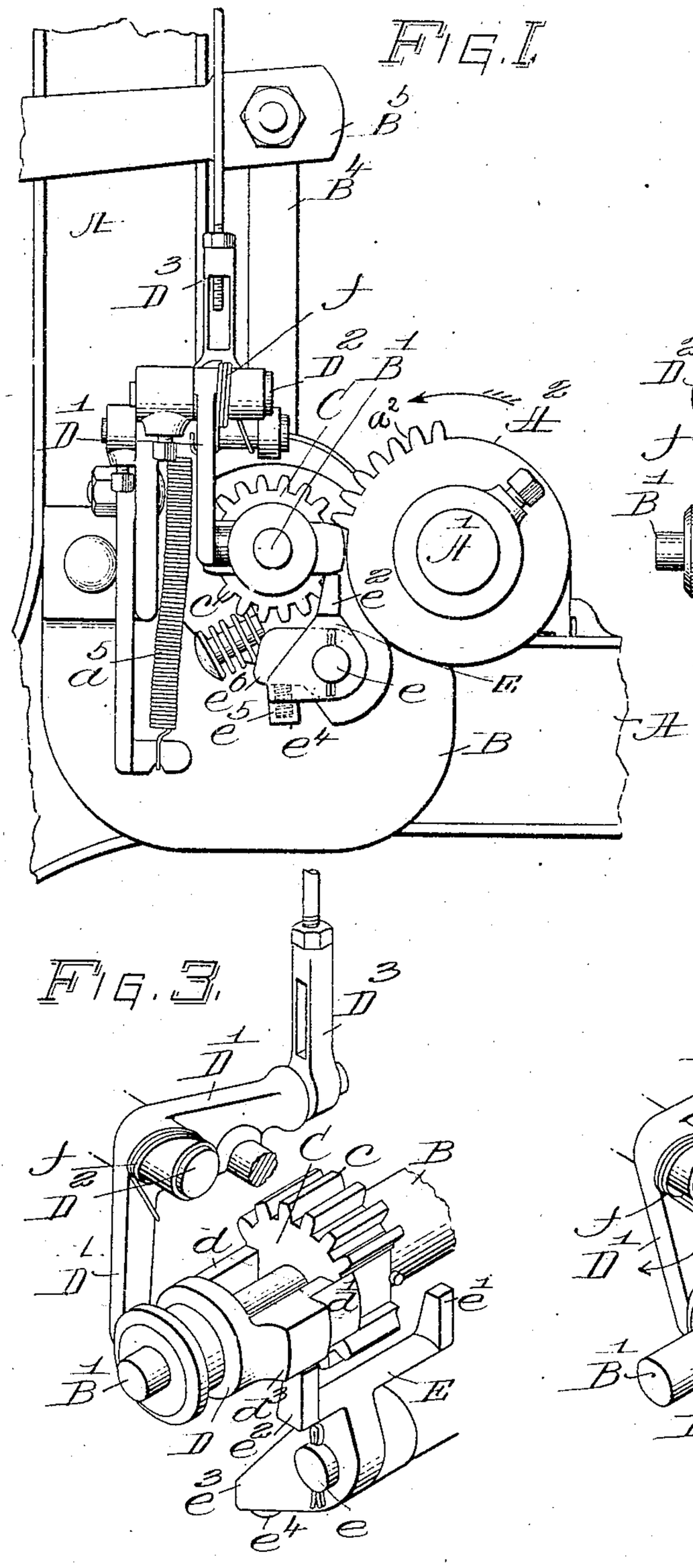


FIG. 2.

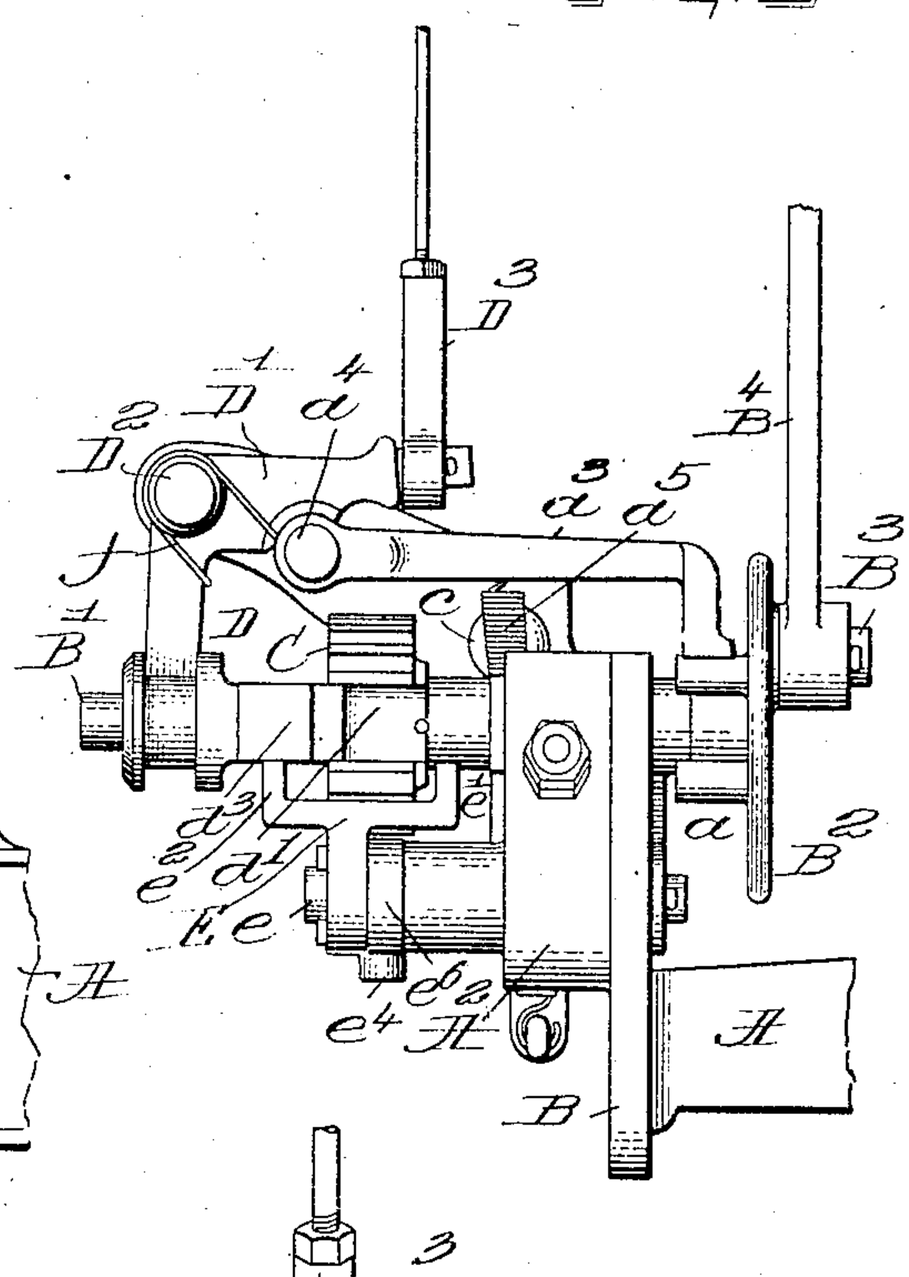
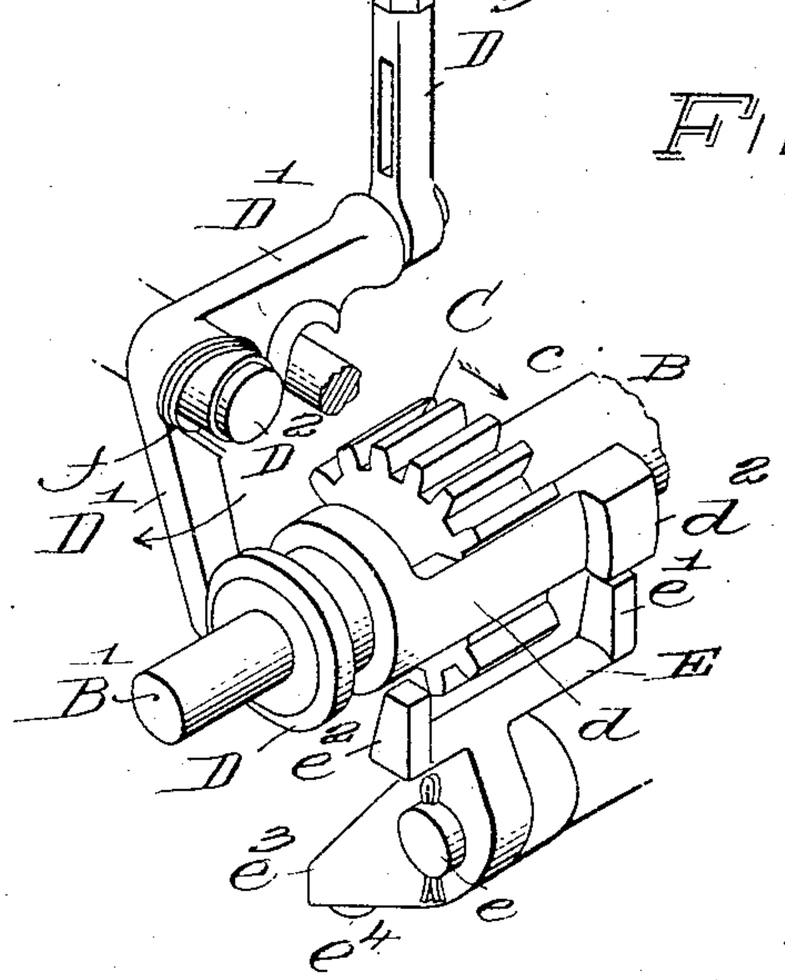


FIG. 3.

FIG. 4.



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No. 786,232. Patented March 28, 1905.

UNITED STATES PATENT OFFICE.

ANTHONY J. O'REILLY, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO RANDOLPH CROMPTON, GEORGE CROMPTON, EDWARD D. THAYER, AND WILLIAM B. SCOFIELD, OF WORCESTER, MASSACHUSETTS, DOING BUSINESS UNDER THE FIRM-NAME OF CROMPTON-THAYER LOOM COMPANY, OF WORCESTER, MASSACHUSETTS.

SHUTTLE-BOX-ACTUATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 786,232, dated March 28, 1905.

Application filed November 14, 1904. Serial No. 232,595.

To all whom it may concern:

Be it known that I, ANTHONY J. O'REILLY, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented an Improvement in Shuttle-Box-Actuating Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve and simplify the actuating mechanism for shuttle-boxes in looms.

The improvements herein to be described and claimed are directed toward the class of shuttle-box-actuating mechanism wherein a constantly-moving partial gear engages a tooth on one or another leg of a forked gear that is slid automatically in a mutilated pinion to place one or the other of said teeth in line with the teeth of said pinion that the teeth of the partial gear in its rotation may meet the tooth of the forked gear then in its operative position and impart a semirotation to that pinion and the shaft carrying the same to move the shuttle-box lever up or down. The partial gear having engaged a tooth of the forked gear moves the latter and the mutilated gear and imparts to the shaft a semirotation.

In accordance with my invention I have provided novel means for arresting the mutilated gear and its shaft at the completion of each semirotation, thus causing the locking of the gear and the shuttle-box moved by it in its correct relation to the race of the lay.

My improved stop is so constructed as to be met by that tooth of the forked gear which is in its inoperative position or out of line with relation to the teeth of the mutilated gear.

The stop is yieldingly sustained.

Figure 1 in end view shows a shuttle-box-actuating mechanism embodying my invention. Fig. 2 is a front side view of most of the parts shown in Fig. 1, and Figs. 3 and 4 show details in perspective illustrating the forked gear in its two extreme posit ons.

Referring to the drawings, A represents part of the end frame of a loom provided with suitable bearings for sustaining a cross or cam shaft A′, provided with a partial gear A^2. The end frame of the loom sustains a stand B, having bearings for a shaft B′, provided at its inner end with a disk B^2, having a crank-pin B^3, that receives the hollow hub at the end of a link B^4, that is jointed at its upper end, as shown only in Fig. 1, to the rear end of a shuttle-box lever B^5. The disk has inwardly-directed pins *a*, and said shaft has keyed thereon outside the bearings a mutilated gear C, said gear having some of its teeth cut away oppositely and being grooved to receive the legs *d d′* of a forked gear D, the leg *d* having a tooth d^2, while the leg *d′* has a tooth d^3. The outer end of the forked gear is shown as grooved to receive a stud at the lower end of an actuating device, shown as an elbow-lever D′, pivoted on a stud D^2 and having slipped over its opposite end part of a connecting-rod D^3, that is extended upwardly to a finger coacting with usual pattern mechanism to move the rod, turn the lever, and slide the fork, according to which one of two boxes carried by the shuttle-box lever B^5 is to be put into operative position with relation to the raceway of the lay. The parts so far described are common to looms for moving shuttle-boxes.

In accordance with the invention to be herein claimed I have provided the framework with a stud *e*, on which I have mounted a stop E, said stop, as herein represented, having two arms e' e^2, the part e^3 of the stop extended to the left, viewing Figs. 1 and 3, having a projection e^4, on which rests the

lower end of a spiral spring e^5, (shown by dotted lines in Fig. 1,) the upper end of said spring resting against a fixed ear e^6, forming part of the loom-frame, the spring referred to acting normally to hold the stop yieldingly in its operative position—the position shown in the drawings.

The spring f, shown as carried by the hub of the lever D′, acts normally to place the forked gear in the position shown in Fig. 3, with the tooth d^2 of the leg d in line with the teeth c of the mutilated gear C. Whenever the protuberance of the usual pattern-surface (not shown) raises the connection D^3 from the position Fig. 3 into the position Fig. 4, the elbow-lever D′ slides the forked gear into the position Fig. 4, putting the tooth d^3 in line with the teeth c of the mutilated gear. Let it be supposed that the mutilated gear C is at rest, with the tooth d^3 of the forked gear arrested by the arm e^2 of the stop E, and that it is desired to shift or put into position opposite the race of the lay the lowermost box of a series of two boxes. Now a protuberance of the pattern-surface will, acting through the connection D^3 and lever D′, turn the lever and slide the forked gear inwardly toward the loom side, placing the tooth d^3 of the leg d' in such position that as soon as the teeth a^2 of the partial gear meets said tooth it will start in rotation the mutilated gear and its shaft B′, turning the disk and crank-pin and depressing the rear end of the shuttle-box lever B^5, thus lifting its opposite end and putting the lowermost box of the two opposite the race of the lay. The partial gear has sufficient teeth a^2 to coact with one of the series of teeth of the mutilated gear to turn the latter and the shaft B′ a half-rotation, at which time the gear will come opposite the leg d, having the tooth d^2 then in its inoperative position, and consequently the partial gear will run out of engagement with the mutilated gear and the tooth d^2 of the leg d will meet the arm e' of the stop E, stopping the further rotation of the shaft B′ and positioning accurately the shuttle-box lever carrying the shuttle-box as to place the lowermost shuttle-box cell at the race of the lay. Now to start the lever again and bring the uppermost box-cell of the two opposite the race of the lay the lever D′ will be turned in the direction of the arrow on it, Fig. 4, by the spring f, a space of the pattern-surface permitting, and the tooth d^2 of the leg d will be put in line with the teeth c of the mutilated gear, and the partial gear in its rotation will engage the tooth d^2 and turn the mutilated gear and its shaft B′ until the tooth d^3 of the leg d' in the rotation of the forked gear meets the arm e^2 of the stop E, as shown in Fig. 3. In this way it will be seen that first one and then the other tooth of the two arms d and d' meet first the arm e' and then the arm e^2 of the stop E, so that the stop acts positively to prevent any overrunning or wrong positioning of the shuttle-box lever and shuttles. In case of any accidental backward movement of the mutilated gear a tooth of the forked gear will contact with the inclined rear or left-hand side of the arms e' e^2, and the stop may give a little under the spring e^5 and obviate breaking of the parts.

Herein the pins a are acted upon by the usual foot a^3, pivoted at a^4 and normally held down by a spring a^5.

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

1. In a shuttle-box-moving apparatus for looms, the combination with a shaft having a mutilated gear, a coacting forked gear having teeth out of line one with the other, and means for moving the forked gear to place either tooth thereof in line with the teeth of the mutilated gear, of a stop adapted to be struck by that one of the teeth of the forked gear which occupies its inoperative position with relation to the mutilated gear.

2. In a shuttle-box-moving apparatus for looms, the combination with a shaft having a mutilated gear, a forked gear having teeth at different distances from the hub of said gear, and means to slide the forked gear with relation to the mutilated gear to place either tooth of the forked gear in its operative position with relation to the teeth of the mutilated gear, of a stop having two arms and adapted to stop said mutilated gear and shaft at each semirotation by acting directly against one or the other of the teeth of the mutilated gear.

3. A shuttle-box-moving apparatus, a rotatable shaft having a partial gear, a shuttle-box lever, a shaft, means between said shaft and shuttle-box lever to move the latter, a mutilated gear fast on the latter shaft, a forked gear having legs engaged loosely with said mutilated gear, each leg having a tooth, said teeth occupying positions in different vertical planes, means to put either tooth of the forked gear in line with the series of teeth of the mutilated gear to be engaged by the teeth of the partial gear to rotate the mutilated gear and its shaft for a distance of one hundred and eighty degrees, and a stop having two arms, one or the other arm being interposed in the path of movement of one or the other of the teeth of the forked gear then in its inoperative position to stop said gear at the end of each semirotation thus insuring the absolute alinement of the shuttle-box with the race of the lay.

4. In a shuttle-box-operating mechanism for looms, the following instrumentalities,

viz: a crank-wheel, a shuttle-box lever, an intermediate connector between said crank and lever, a stop device at rest during the operation of the box motion, and acting to arrest said crank-wheel, as the latter completes its full movement.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANTHONY J. O'REILLY.

Witnesses:
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