

No. 744,683.

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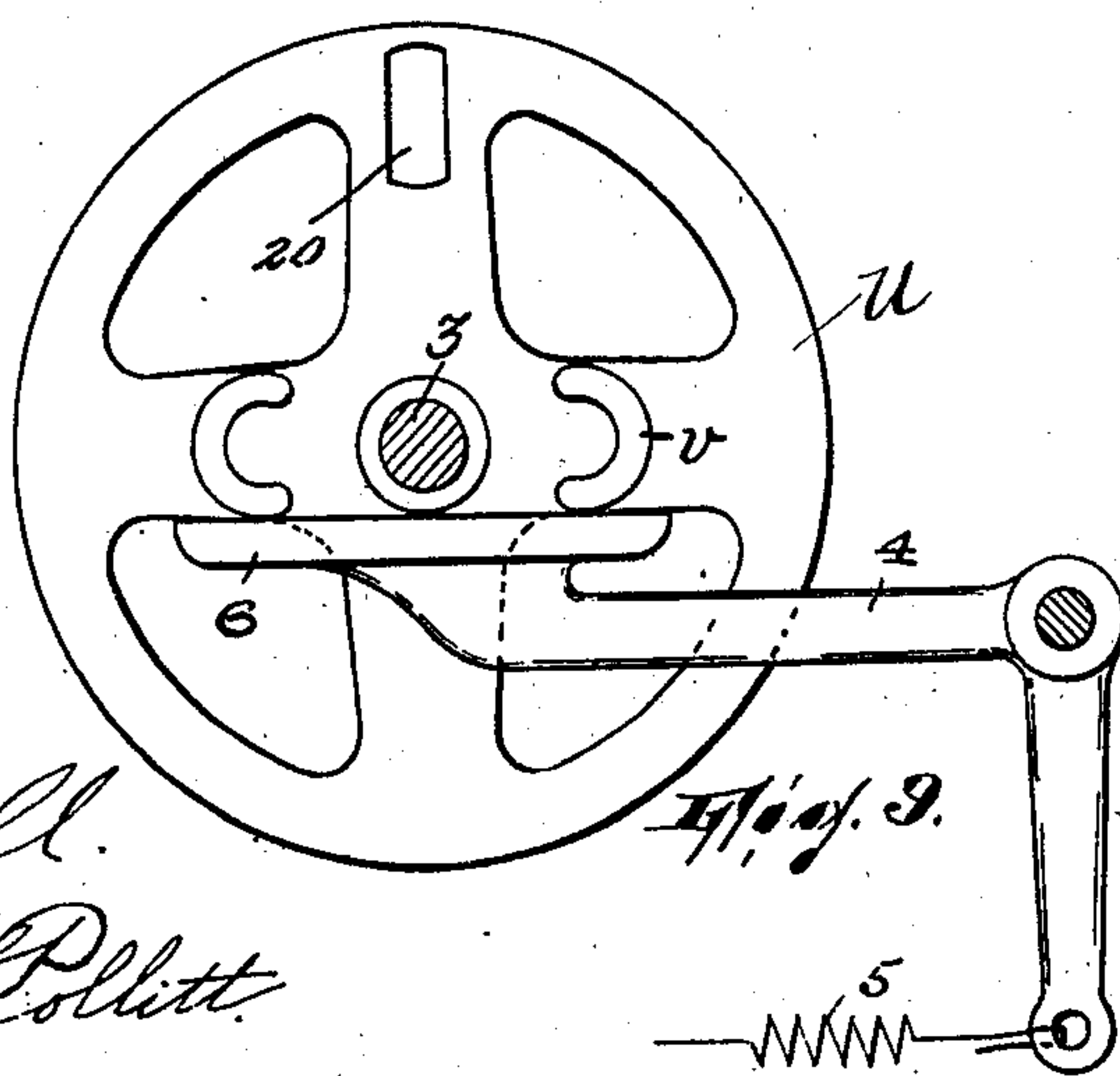
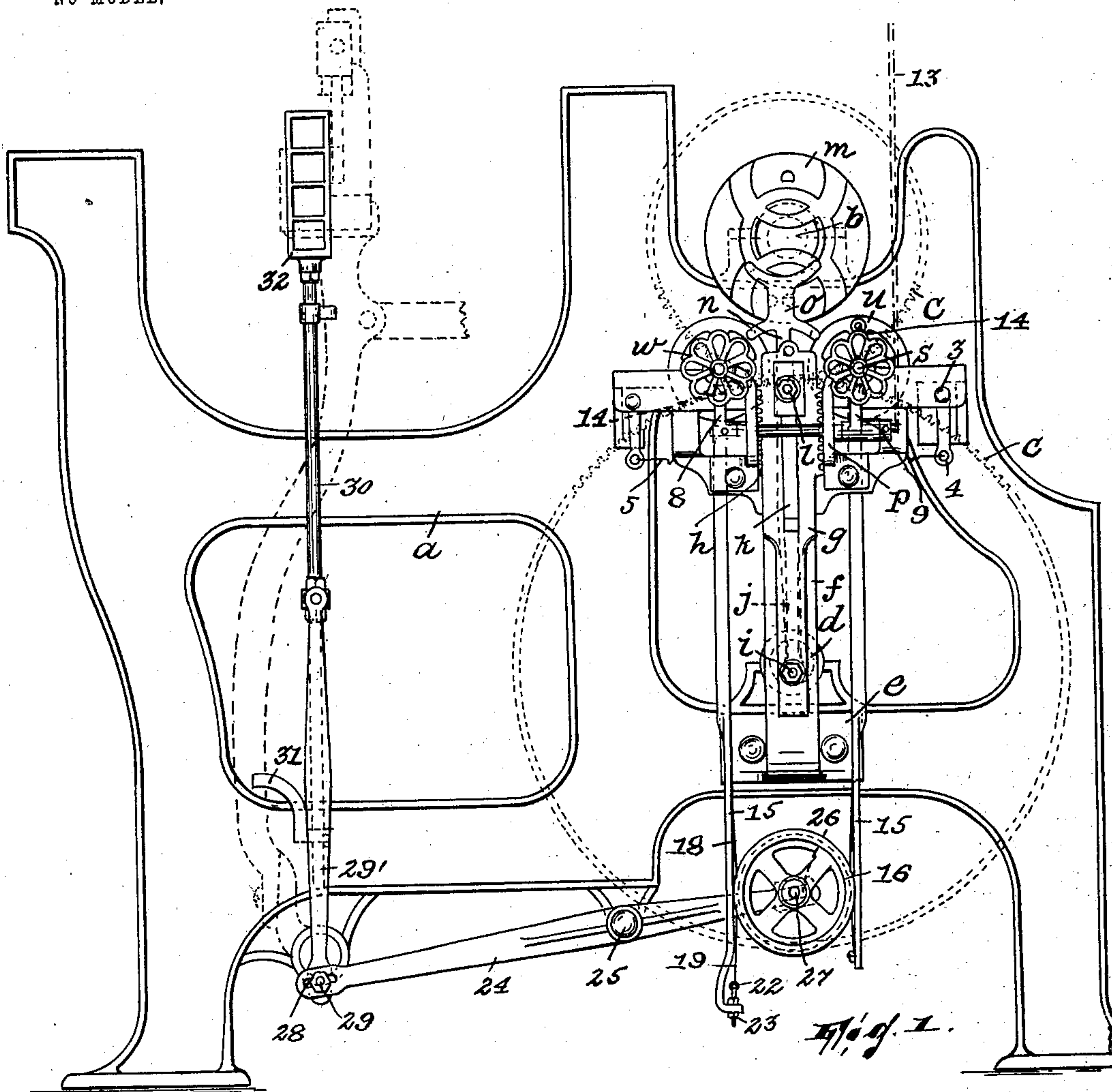
G. GOODLINE.

SHUTTLE BOX OPERATING MECHANISM FOR LOOMS.

APPLICATION FILED DEC. 17, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

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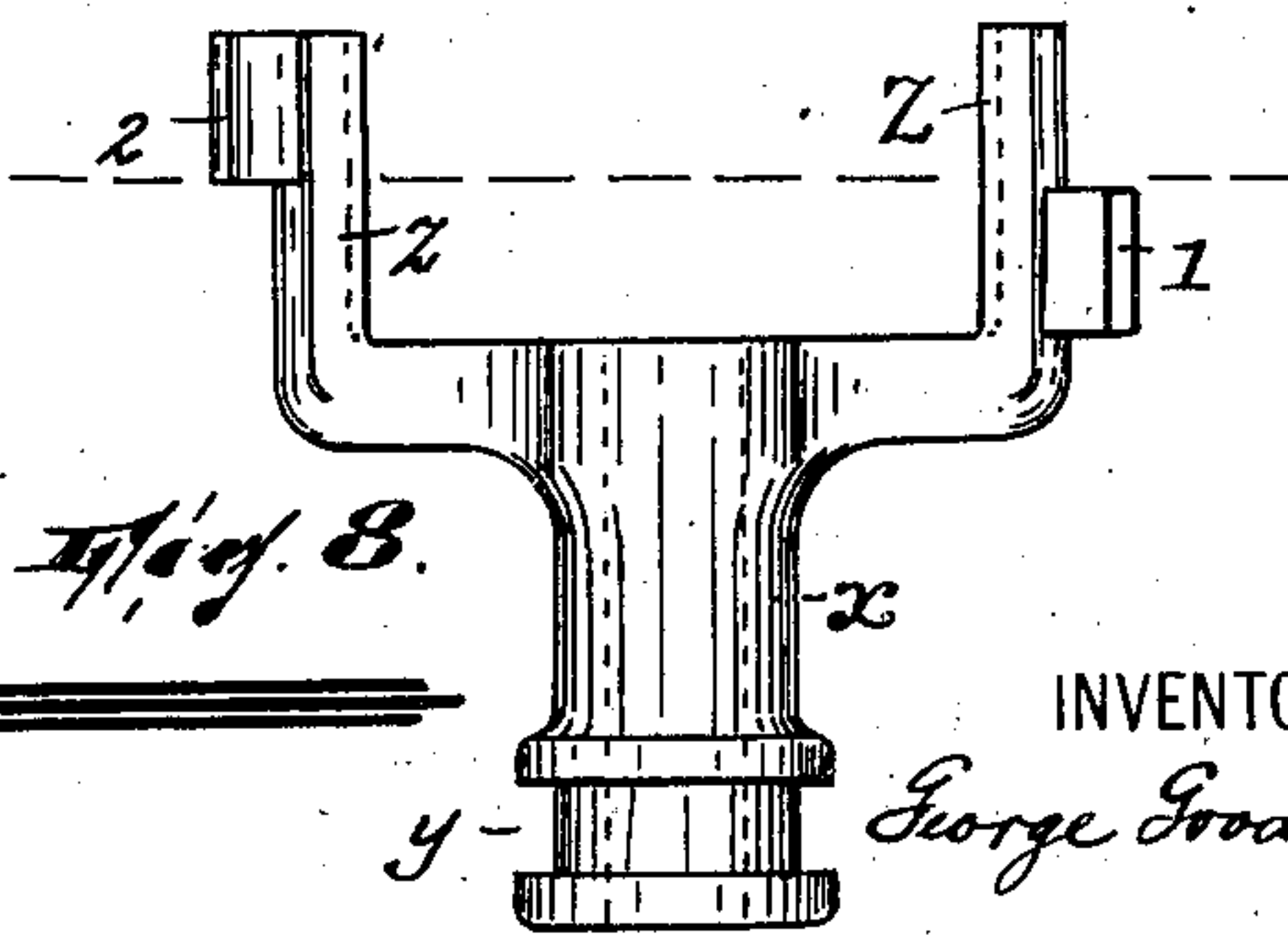
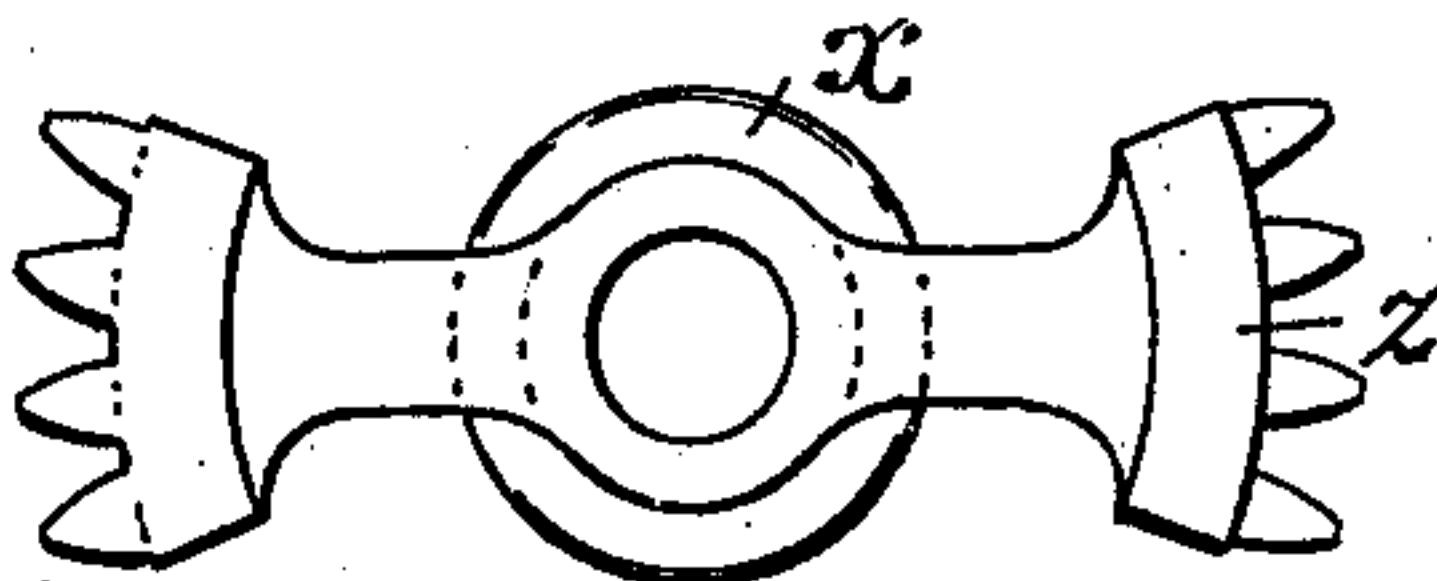
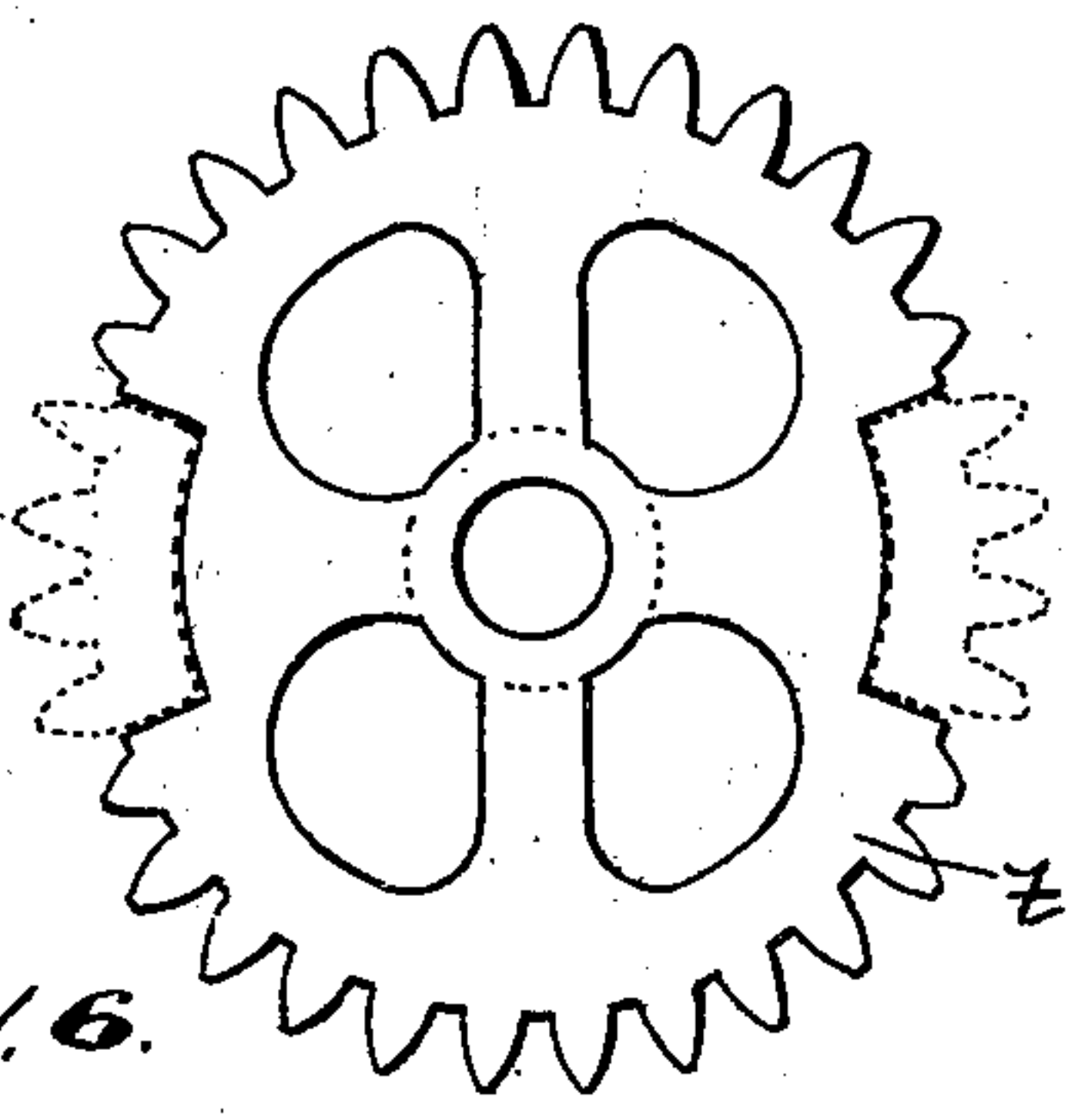
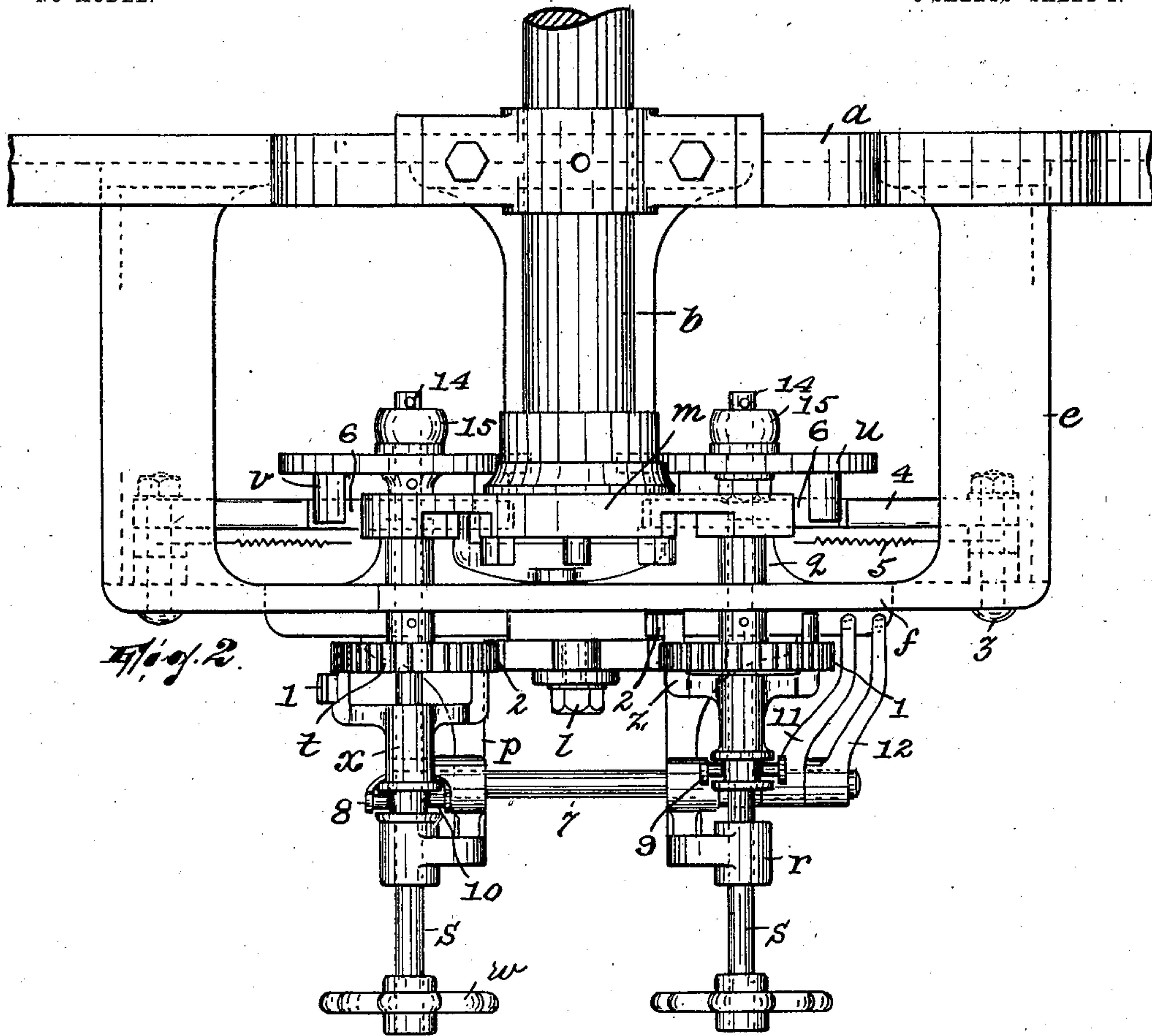
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3 SHEETS—SHEET 2.



WITNESSES:

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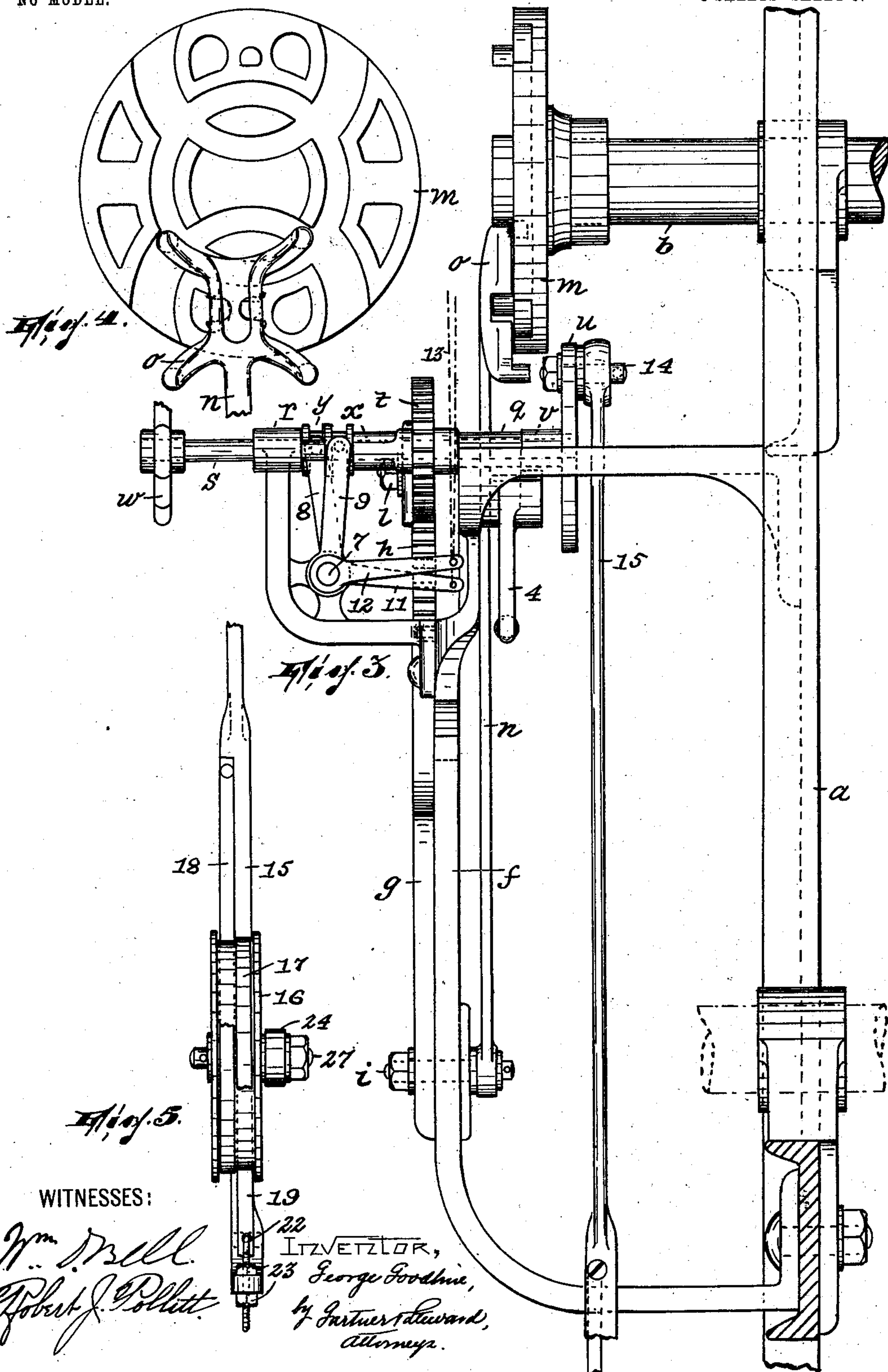
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APPLICATION FILED DEC. 17, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

GEORGE GOODLINE, OF PHILADELPHIA, PENNSYLVANIA.

SHUTTLE-BOX-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 744,683, dated November 17, 1903.

Original application filed December 10, 1901, Serial No. 85,306. Divided and this application filed December 17, 1902. Serial No. 135,516. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GOODLINE, a citizen of the United States, residing in Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Shuttle-Box-Operating Mechanism for Looms; 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, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention relates to the construction of looms, and it has reference particularly to box-loom, having especially to do with that portion of the mechanism of such looms whereby the operation of the shuttle-boxes so as to change the shuttles is effected.

In a copending application filed of even date herewith, Serial No. 135,515, I have set forth and claimed a novel "call" mechanism proper for box-motions for looms. In another copending application, filed December 10, 1901, Serial No. 85,306, (and of which this application is a division,) I have set forth and claimed a novel mechanism for transmitting the action of the call mechanism to the boxes.

The present invention therefore consists in certain combinations and arrangements of parts found in the said copending applications.

The present invention further consists in certain combinations and arrangements of parts of the said call mechanism and of a mechanism which may be used to actuate said call mechanism, and which I have fully set forth and claimed in United States Letters Patent No. 685,420, dated October 29, 1901.

In the accompanying drawings my invention will be found fully illustrated.

Figure 1 is a side view of a box-loom provided with my improved box-operating mechanism; Fig. 2, a top plan view of said box-operating mechanism with certain parts removed; Fig. 3, an enlarged side view of the mechanism, the lower portion thereof being removed; Fig. 4, a view in front elevation of certain parts from which an alternating reciprocating and dwell movement is secured;

Fig. 5, a view of the lower portion of the box-operating mechanism—i. e., that portion thereof which is removed from the mechanism shown in Fig. 3; Figs. 6, 7, and 8, detail views of one of the call-gears and its accessory parts, and Fig. 9 a view of a certain stop mechanism for the call-gears.

a is a loom side; *b*, the loom crank-shaft; *c*, gearing connecting the shaft *b* and the cam-shaft *d*, and *e* a bracket or stand which supports my improved box-operating mechanism.

Arranged to slide against the front face of a vertical part *f* of stand *e* is a vertically-movable part *g*, which in its upper portion has teeth *h* on its two side edges, thus forming a rack. The lower end of this rack carries a stud *i*, extending through a slot *j* in part *f*, while its upper portion has a vertical slot *k*, penetrated by a stationary bolt *l* on stand *e*. These bolts and slots act to guide the rack.

In my Letters Patent aforementioned I have described a mechanism whereby an alternating reciprocating and dwell motion may be imparted to the rack *g*. The parts of this mechanism are a peculiarly-grooved disk *m*, rigidly secured on so as to turn with shaft *b*, and a connecting-rod *n*, provided at one end with a peculiarly-shaped claw *o*, engaging the grooves of said disk and movable in the same and having its other end pivoted on stud *i*, according to a definite scheme. A full, clear, and exact description of the construction and operation of these parts is set forth in said patent, and so it is unnecessary herein. The motion derivable from said parts, being one which is positive and susceptible of variation, so as to secure different relative lengths of reciprocations and dwells, is one which is well adapted for actuating rack *g*.

p represents auxiliary brackets projecting outwardly from stand *e*. In aligned bearings *q* *r* in stand *e* and brackets *p* are journaled horizontal shafts *s*. On each shaft is secured rigidly a call-gear *t*, which call-gear, being mutilated by having diametrically-opposed portions thereof removed, abuts with its hub against stand *e*. On the inner end of each shaft *s* is rigidly secured a stop-disk *u*, each having two diametrically-opposed sectionally half-round lugs *v*. The outer end of each shaft *s* carries a hand-wheel *w*. Between the

bearing r and each call-gear t is arranged to slide on the shaft a sleeve x , having an annular groove y and carrying two arms z , formed so as to fit into the cut-out portions of the call-gears into which they extend. On arms z are mounted toothed segments 1 2, corresponding to the sections of teeth removed from the call-gears. Segments 1 2 are not directly opposed to each other, but are preferably arranged the one on one side and the other on the other side of a plane (indicated by a dotted line in Fig. 8) which is perpendicular to the shaft s . The assembled call-gear and segments form an endless engaging surface portions of which (the segments) are movable to form breaks or recesses in said surface. On studs 3, arranged in the upper portion of stand e , are fulcrumed bell-crank stop-levers 4, two of the corresponding arms of which are drawn toward each other by a spiral spring 5, while each of the other arms of said levers is formed with an integral shoe 6, taking against the lugs v of the stop-disks u and acting to hold the call-gears positively stationary. These coacting stop-levers and stop-disks keep the call-gears positively stationary and firm between actuations. In the brackets p is journaled a shaft 7, carrying forks 8 and 9, having diametrically-opposed pins 10, which engage the grooves y of the corresponding sleeves x . Fork 8 is rigidly secured on shaft 7, while fork 9 is arranged to turn thereon. To fork 9 is secured a lever 11, and to the adjoining end of shaft 7 is secured another and substantially similar lever 12. Thus in an obvious manner the levers are adapted through the forks to shift the sleeves. Wires, rods, or the like 13 may be used to actuate the levers so as to move them in the one direction, while gravity may be depended upon to move them in the other direction.

From eccentrically-disposed pivots 14 on the stop-disks u are suspended rods 15, one for each disk. Between the lower ends of these rods is a floating or bodily-movable wheel or pulley 16, peripherally grooved, as at 17. Said groove receives straps or bands 18 19, the latter extending over the pulley, while the former extends under it, their ends being secured to the rods, as shown in Fig. 1. In order to render the throw of one rod variable, the pivot 14 thereof is arranged in a slot 20 of the corresponding stop-disk. In order to adjust the bands, one end of, say, band 19 is connected to one of the rods 15 by a threaded hook 22, secured to said rod by nuts 23. The groove in the pulley also receives and guides each rod.

24 is the box-rod lever, fulcrumed at a stationary point 25 on the loom side and having one of its ends formed with a slot 26, receiving the stud 27 of the pulley. The other end of said lever has a slot 28, receiving a stud 29 on the lower end of a pitman 29', connected with the box-rod 30, which latter

is guided in brackets 31 and carries the shuttle-boxes 32.

The mechanism operates thus: Shaft b being rotated continuously, through parts m and n is transmitted an alternating reciprocating and dwell movement to rack g . It will be observed that the stop-levers and stop-disks normally hold the call-gears, with their cut-out portions, in the same horizontal plane, the arms z of sleeves x being received by said cut-out portions. The toothed segments are likewise held horizontal. If a previous actuation of fork 8 9 has moved the toothed segments on sleeve x so that the one which is next adjacent rack g is thrown completely out of the plane of the call-gear, rack g will reciprocate without actuating the call-gear; but if the pattern so moves the fork through the connecting means 13 that said segment is thrown back completely into the cut-out portion of the call-gear the rack will turn the call-gear a half-revolution. The rack will not turn the gear more than a half-revolution, because when one toothed segment comes into the plane of the gear the other is thrown out of said plane, thus producing a space in the call-gear, so that so long as the toothed segments are not again moved the rack will continue reciprocating without actuating the call-gear. Thus each rod can oscillate with alternating dwells variable at will. The action of the pattern mechanism in effecting the shifting of the segments occurs between the movements of the rack. Hence the importance of having the rack so work that between its movements dwells occur, giving the pattern mechanism opportunity to act. The up-and-down movement of either or both of rods 15 of course moves pulley 16. If the pivotal connection between one rod 15 and the corresponding stop-disk u is further removed from the center of rotation of said disk than that between the other rod and stop-disk, the mechanism will be susceptible of imparting four separate positions to pulley 16. The uppermost position is that where the two rods are in their extreme elevated positions. Another is where the right-hand rod is up while the left-hand rod is down. Still another is where the right-hand rod is down while the left-hand rod is up, the position which this movement imparts to the pulley being different from the previous one, because since the pivotal points of the rods are differently disposed in their respective stop-disks one has a greater throw than the other, and the last position is where both rods are down. Of course as the pulley is moved it imparts its movement to lever 24, which in turn transmits motion to the boxes.

It will be noticed that the segments 1 2 are not only arranged on opposite sides of a plane perpendicular to the axis of the sleeve x , but that they are close to said plane. Thus the pattern from which the segments are controlled may act to shift the segments so that

half of each is received by the corresponding cut-out portions of the call-gear. The object of this is to render it possible to make the boxes work pick and pick with reference to any two boxes without having to resort to the pattern mechanism as an initial means for setting the two boxes involved each time each comes into use—i. e., every alternate pick of the loom.

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

1. The combination of a support, shafts journaled in said support, a rack adapted to slide in said support, call-gears revoluble with said shafts and carried thereby and disposed the one on one side and the other on the other side of said rack, means for effecting engagement and disengagement between said rack and the gears, a rotary driving part, and operative connecting means between said rack and the rotary part, substantially as described.

2. In a box-motion mechanism for looms, the combination of a rotary part having an endless engaging surface, portions of which are movable to form recesses, an oscillatory part adapted to engage said surface of the rotary part to drive said rotary part, said movable portions being rotatable with the rotary part, movable as one, and being so arranged with reference to each other that when one is at one side of and close to one side line of the way of said rotary part the other will be on the other side of and close to said line, a rotary driving part, and a reciprocating part operatively connecting said driving part and the oscillatory part, substantially as described.

3. In a box-motion mechanism for looms, the combination of a rotary part having an endless engaging surface, portions of which are movable to form recesses, a reciprocating part adapted to engage said surface of the rotary part to drive said rotary part, said movable portions being rotatable with the rotary part, movable as one, and being so arranged with reference to each other that when one is at one side of and close to one side line of the way of said rotary part the other will be on the other side of and close to said line, a rotary driving part, and another reciprocating part operatively connecting said driving part and said first-named reciprocating part, substantially as described.

4. In a mechanism for shifting a part to any one of a plurality of positions between intervals of varying lengths, the combination, with a support, of a rotary part journaled in said support and having sections of its peripheral portion removed to form recesses, a driving part adapted to engage said peripheral portion of the rotary part to drive the same, segmental devices rotatable with said rotary part, corresponding to and alined with the recesses thereof and movable as one axially

thereof, said devices being arranged one at each side of and contiguous to a line perpendicular to the axis of said rotary part, rods, one of which is eccentrically connected to said rotary part, a pulley interposed between and having a rolling engagement with said rods, and operative connection between the part to be moved, and said pulley, substantially as described.

5. The combination of a support, shafts journaled in said support, a rack adapted to slide in said support, call-gears revoluble with said shafts and carried thereby and disposed the one on one side and the other on the other side of said rack, means for effecting engagement and disengagement between said rack and the gears, a rotary driving part, operative connecting means between said rack and the rotary part, rods, means for connecting said rods with the shafts at points eccentric of the latter, and a part to be moved operatively connected to both of said rods, substantially as described.

6. The combination of a support, shafts journaled in said support, a rack adapted to slide in said support, call-gears revoluble with said shafts and carried thereby and disposed the one on one side and the other on the other side of said rack, means for effecting engagement and disengagement between said rack and the gears, rods, means for connecting said rods with the shafts at points eccentric of the latter, and a part to be moved operatively connected to both of said rods, substantially as described.

7. The combination of a support, shafts journaled in said support, gears carried by said shafts and adapted to rotate therewith, a rack arranged to slide in said support between said gears, means for effecting engagement and disengagement between said rack and the gears, rods, means for connecting said rods with the shafts at points eccentric of the latter, a rotary part interposed between said rods, and a strap or band extending under and engaging the periphery of said rotary part and having its ends connected to said rods, substantially as described.

8. The combination of a support, shafts journaled in said support, gears carried by said shafts and adapted to rotate therewith, a rack arranged to slide in said support between said gears, means for effecting engagement and disengagement between said rack and the gears, rods, means for connecting said rods with the shafts at points eccentric of the latter, and a rotary part interposed between and having a rolling engagement with said rods, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of December, 1902.

GEORGE GOODLINE.

Witnesses:

ANDREW V. GROUPE,
RALPH H. GAMBLE.