

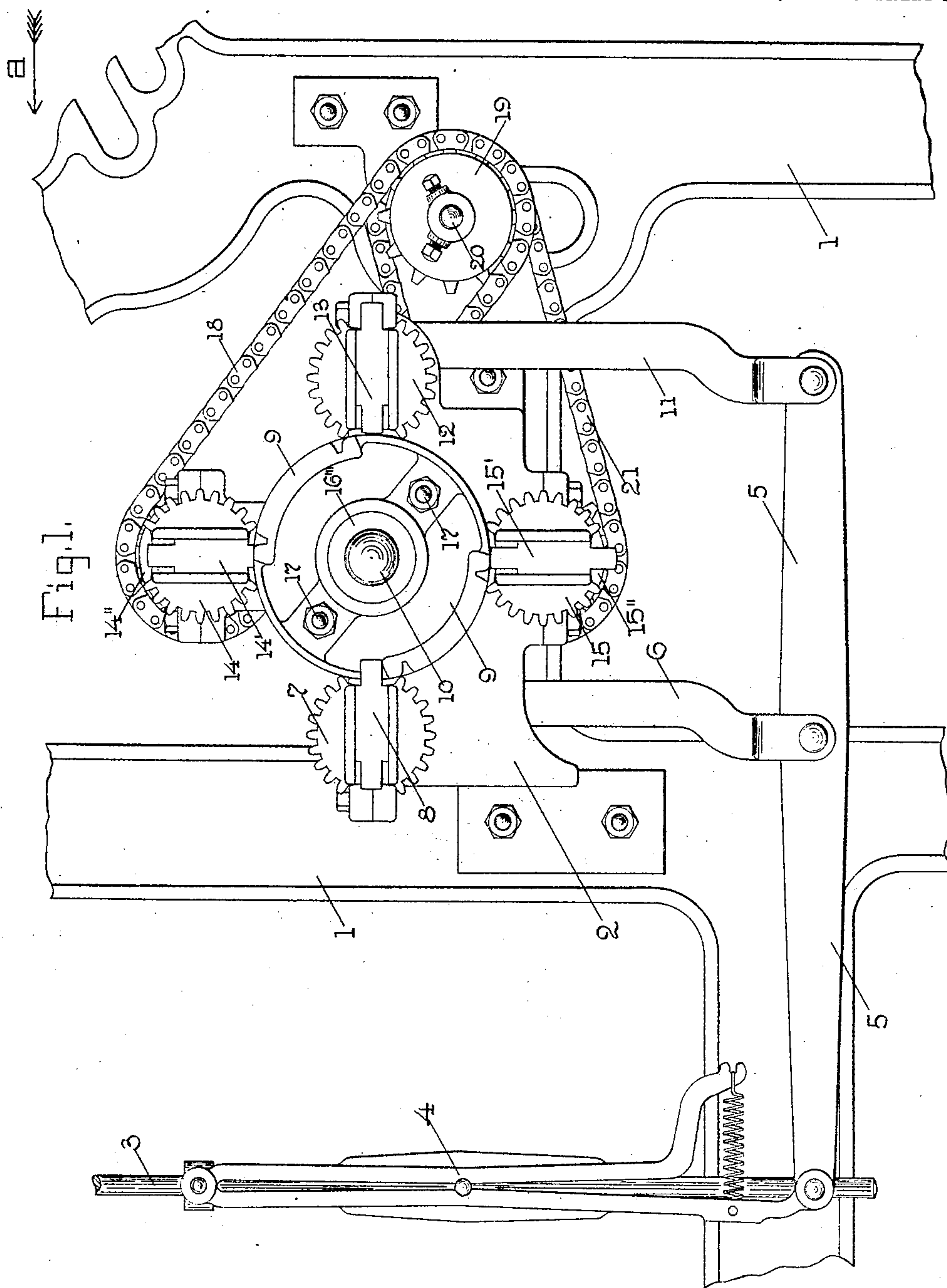
No. 803,869.

PATENTED NOV. 7, 1905.

H. BARDSLEY.  
SHUTTLE BOX MOTION FOR LOOMS.

APPLICATION FILED DEC. 10, 1904.

5 SHEETS—SHEET 1.



Witnesses.

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*M. Heas.*

By

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Inventor,  
*Henry Bardsley*

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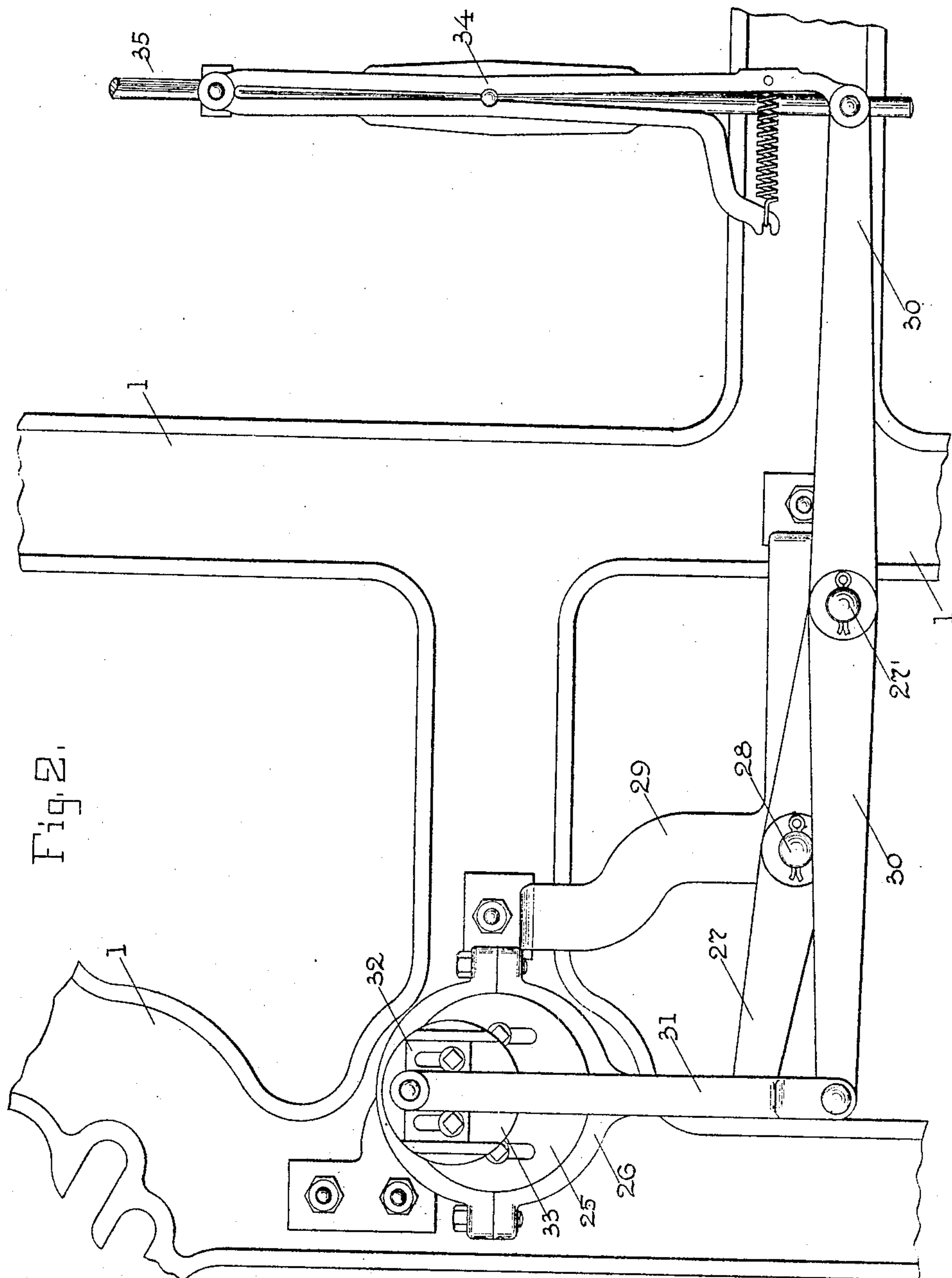


Fig. 2.

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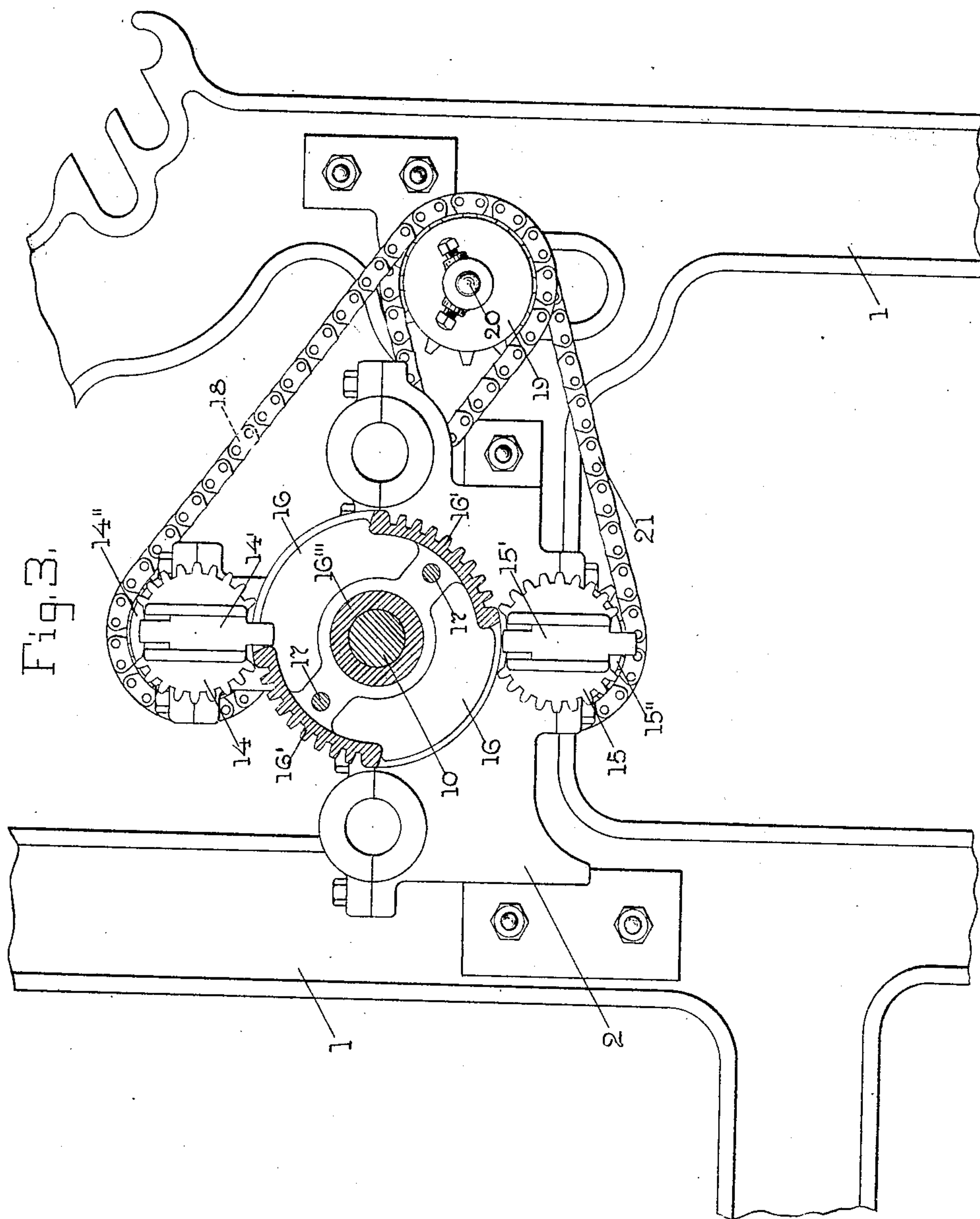
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5 SHEETS—SHEET 3.



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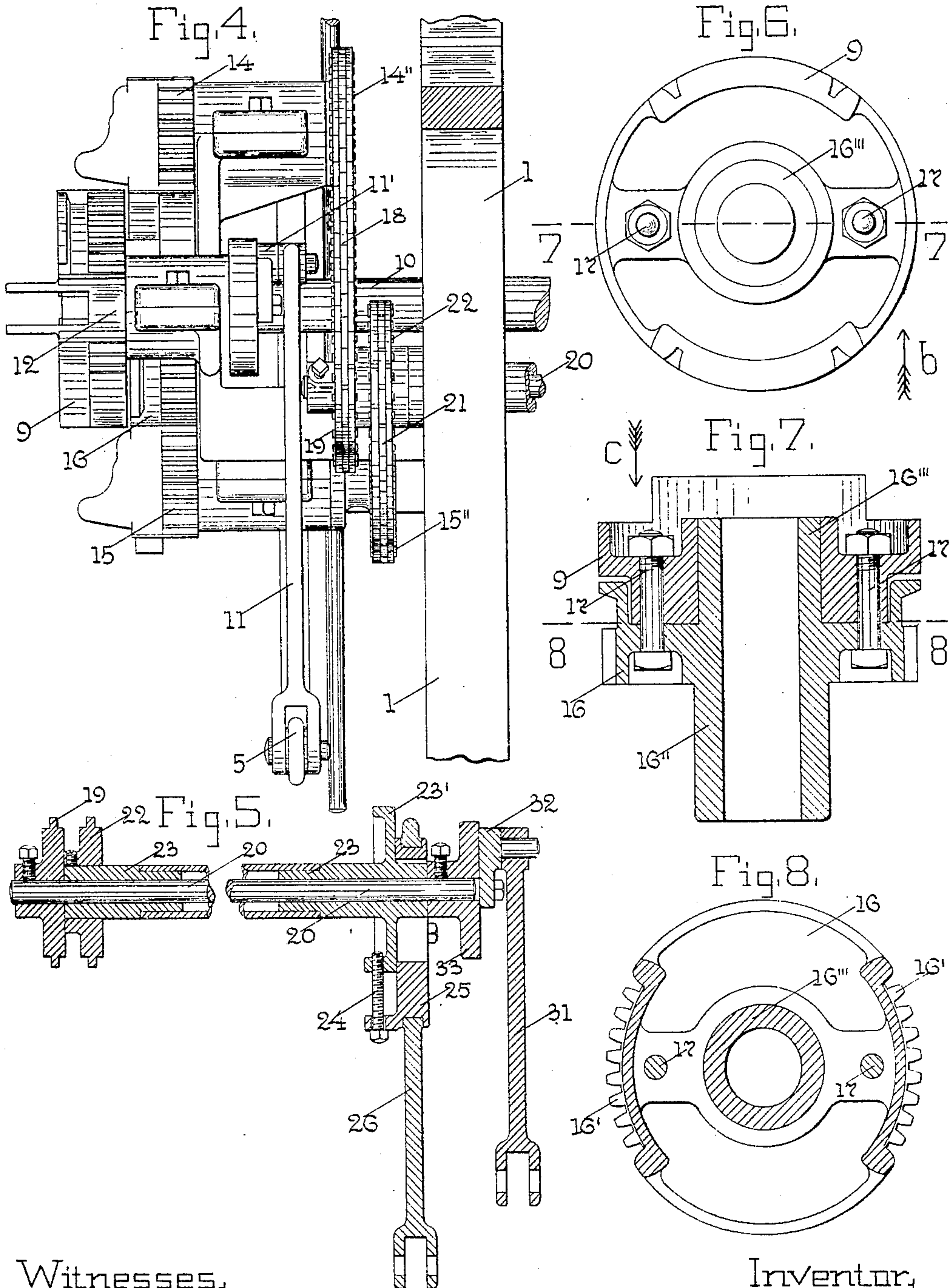
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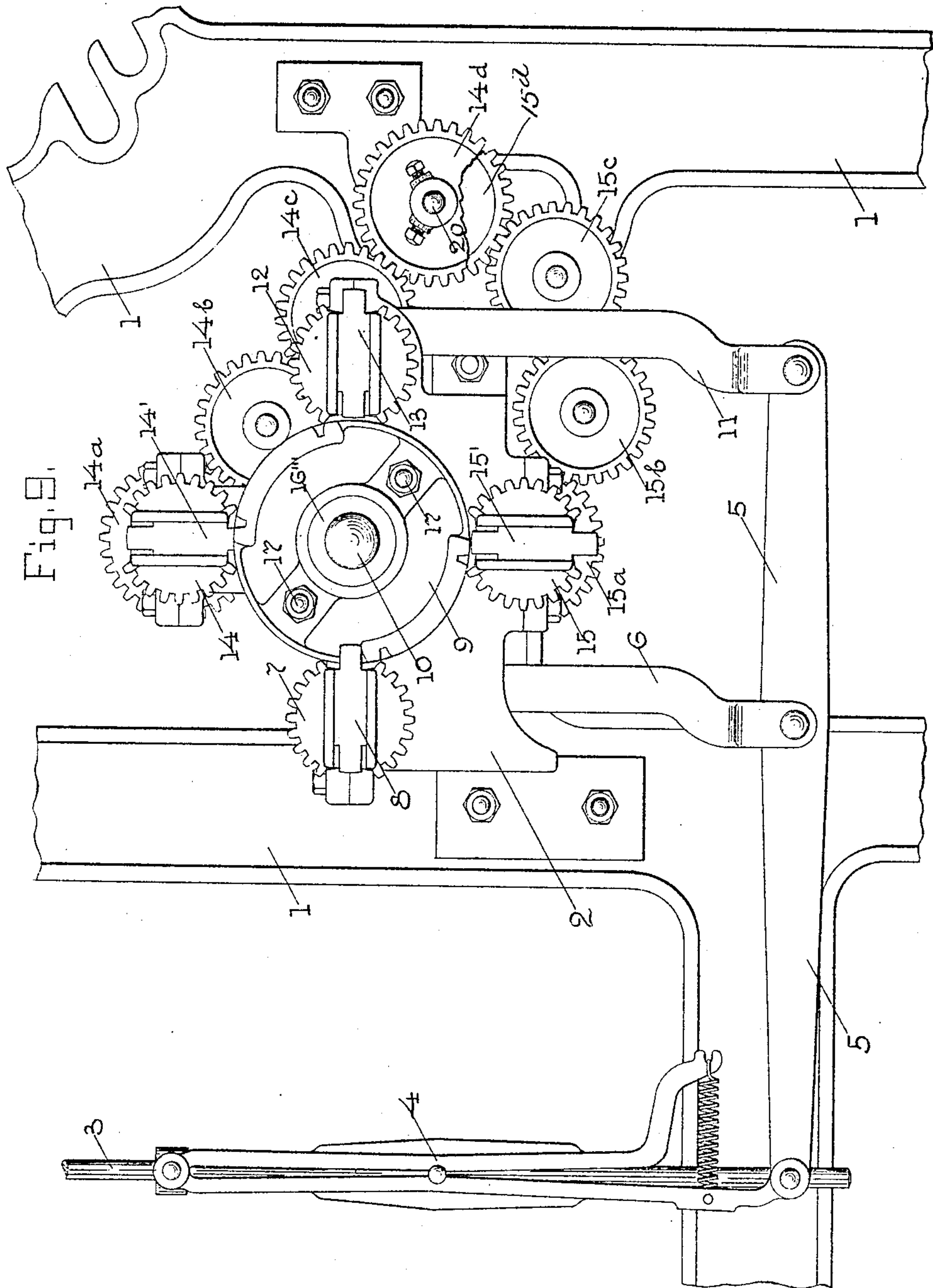
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5 SHEETS—SHEET 5.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

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## SHUTTLE-BOX MOTION FOR LOOMS.

No. 803,869.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed December 10, 1904. Serial No. 236,275.

*To all whom it may concern:*

Be it known that I, HENRY BARDSLEY, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Shuttle-Box Motions for Looms, of which the following is a specification.

My invention relates to shuttle-box motion for looms, and particularly to that class of shuttle-box motions shown and described in my United States Letters Patents Nos. 626,960 and 681,648.

The object of my invention is to improve upon the class of shuttle-box motions referred to as now ordinarily made.

In my improvements I preferably provide two master-gears instead of the ordinary single master-gear, and in place of the crank-plate on the inner end of the shaft of the mutilated pinions I provide a chain sprocket-wheel or a gear on the inner end of the shaft of one or more of the mutilated pinions to transmit from said mutilated pinions through a sprocket-chain or a train of gears motion to operate the movable shuttle-boxes on the opposite end of the loom.

My invention consists in certain novel features of construction of my improvements, as will be hereinafter fully described.

I have only shown in the drawings a detached portion of a shuttle-box motion of the class referred to sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings, Figure 1 is an end view of a portion of a loom-frame detached and portions of a shuttle-box motion of the class referred to embodying my improvements for four shuttle-boxes at each end of the loom. Fig. 2 shows the opposite end of a loom from that shown in Fig. 1 and the shuttle-box mechanism thereon. Fig. 3 corresponds to Fig. 1 with some of the parts shown in Fig. 1 removed. Fig. 4 is a front view of the parts shown in Fig. 1 looking in the direction of arrow *a*, same figure. Fig. 5 is a detached sectional view of the chain sprockets and the shafts extending through the loom and the shuttle-box-operating mechanism shown in Fig. 2. Fig. 6 is, on an enlarged scale, a front view of the master-gear shown in Fig. 1 detached. Fig. 7 is a section on

line 7 7, Fig. 6, looking in the direction of arrow *b*, same figure. Fig. 8 is a section on line 8 8, Fig. 7, looking in the direction of arrow *c*, same figure; and Fig. 9 corresponds to Fig. 1, but shows a train of gears substituted for the chain shown in Fig. 1.

I have shown in the drawings a shuttle-box-operating mechanism of the type shown and described in said Letters Patent above referred to for four movable shuttle-boxes at each end of the loom. I have not shown in the drawings the pattern mechanism and intermediate connections for moving the diametrical levers or bolts generally denominated "starting tooth-carriers," carried on the mutilated pinions, as the construction and operation of the same are well known and are fully shown and described in the patents above referred to.

In the accompanying drawings, 1 is the loom-frame. 2 is a stand secured thereto, which supports the several parts of the box-operating mechanism.

3 is a vertically-moving rod having the boxes (not shown) attached to its upper end.

4 is a give-way mechanism of usual and well-known construction, connecting the box-rod 3 with the box-lever 5. The box-lever 5 is attached, through a connector 6, pivoted on said lever near its central part to a crank on the inner end of the shaft of the mutilated pinion 7, carrying the diametrical lever or bolt 8, which is adapted to be moved into the path of and engaged by the driven master-gear 9. A second connector 11 is pivotally attached to the end of the box-lever 5 and to a crank 11' on the inner end of the shaft, (see Fig. 4,) of the mutilated pinion 12, carrying the diametrical lever or bolt 13, adapted to be engaged by the master-gear 9.

All of the above-mentioned parts may be of the usual and well-known construction and operation in a four-shuttle-box motion of the type referred to to communicate movement to shuttle-boxes operated by the rod 3 in the usual way. I will now describe my improvements.

There are two mutilated pinions 14 and 15, located in this instance, one above and one below the master-gear 9. Each mutilated pinion 14 and 15 has a diametrical lever or bolt 14' 15'. Said mutilated pinions are operated in this instance by a second master-



gear 16, having two tooth-segments 16' thereon, (see Fig. 3,) adapted to engage the diametrical levers or bolts 14' and 15'. The second master-gear 16 has a hub 16'' secured on the bottom shaft 10 and also an annular projection 16''' on which is mounted the hub of the master-gear 9, which in this instance is secured to the master-gear 16 by two bolts 17, passing through arms or webs on the two gears.

On the inner end of the supporting-shaft of the mutilated pinion 14 is fast a chain sprocket-wheel 14'', and fast on the inner end of the shaft of the mutilated pinion 15 is a chain sprocket-wheel 15''. (See Figs. 1, 3, and 4.) Each of these sprocket-wheels takes the place of the ordinary crank, fast on the inner end of the shaft of the mutilated pinions. The sprocket-wheel 14'' is connected by an endless chain 18 to a sprocket-wheel 19, fast on a shaft 20, which extends transversely through the loom and is mounted in suitable bearings thereon. The sprocket-wheel 15'' is connected by an endless chain 21 to a sprocket-wheel 22, (see Fig. 5,) fast on the end of a rotatable sleeve or shaft 23, loosely mounted on the shaft 20. (See Fig. 5.) On the opposite end of the sleeve or shaft 23 is a disk 23', to which is adjustably secured, by a screw 24, an eccentric 25, carrying the upper end of a connector 26. The lower end of the connector 26 is pivotally connected to one end of a lever 27 of the box-motion, (see Fig. 2,) centrally pivoted on a stud 28 on a stand 29, secured to the loom-frame. The other end of the lever 27 carries a stud 27', on which is pivotally and centrally mounted a lever 30, one end of which is pivotally connected to the lower end of a connector 31. The upper end of the connector 31 is pivotally connected to a crank-plate 32, adjustably secured to a disk 33, fast on the end of the shaft 20. (See Figs. 2 and 5.) The opposite end of the lever 30 is pivotally connected to a give-way mechanism 34, which connects the vertically-moving shuttle-box rod 35, carrying the shuttles (not shown) with the lever 30.

In Fig. 9 is shown a modified construction of the mechanism shown in Fig. 1. I substitute for the endless chains 18 and 21 trains of gears intermediate the upper and lower mutilated pinions 14 and 15 and the shafts 20 and 23. In case of the mutilated pinion 14 a gear 14<sup>a</sup> is substituted for the chain-sprocket 14'', fast on the inner end of the shaft of said mutilated pinion. Said gear 14<sup>a</sup> meshes with a gear 14<sup>b</sup>, which in turn meshes with a gear 14<sup>c</sup>, which in turn meshes with the gear 14<sup>d</sup>, fast on the shaft 20, to communicate motion on the rotation of the mutilated pinion 14 to the shaft 20 and the crank 32 on the opposite end thereof, as above described in connection with the chain 18. In case of the lower mutilated pinion 15 a gear 15<sup>a</sup> is substituted for the chain sprocket-wheel 15''. Said gear 15<sup>a</sup>

meshes with a gear 15<sup>b</sup>, which in turn meshes with a gear 15<sup>c</sup>, which in turn meshes with a gear 15<sup>d</sup> (see Fig. 9) at the rear of the gear 14<sup>d</sup>, corresponding to the sprocket-wheel 22, (see Fig. 5,) and fast on the shaft or sleeve 23 to communicate on the rotary motion of the mutilated pinion 15 movement to the eccentric 25.

From the above description, in connection with the drawings, the operation of my improvements will be readily understood by those skilled in the art.

I have shown in the drawings my improvements combined with a four-shuttle-box motion at each end of the loom; but it will be understood that they may be equally well used in a two-box motion by dispensing with one of the mutilated pinions of each pair and their connections to the shuttle-boxes and may be also used in connection with a six-shuttle-box motion by adding an additional mutilated pinion to each pair and connections to the shuttle-box rod.

The advantages of my improvements will be readily appreciated by those skilled in the art.

Through the operation of the box-operating mechanism at one end of the loom I am enabled to transmit motion to two or more boxes on the opposite end of the loom to operate the same according to the indications of the pattern mechanism. I prefer to have two separate master-gears, each having one or more tooth-segments thereon to control the operation of two or more shuttle-boxes on one or both ends of the loom; but instead of two separate master-gears one master-gear having the requisite number of tooth-segments thereon may be used.

It will be understood that the details of construction of my improvements may be varied, if desired.

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

1. In a shuttle-box motion, the combination with a driven master-gear, having two or more tooth-segments, of mutilated pinions operated by said gear, connections from some of said pinions to shuttle-box levers on one end of the loom, and said box-levers, and connections from some of said pinions to a rotary shaft, and said rotary shaft, and connections therefrom to shuttle-box levers on the other end of the loom, and said box-levers substantially as shown and described.

2. The combination with a shuttle-box motion at one end of a loom, of a shaft to transmit motion to the shuttle-boxes at the opposite end of the loom, an adjustable eccentric connected with said shaft, and connections therefrom to the operating-lever of the shuttle-boxes, substantially as shown and described.

3. The combination with a shuttle-box motion at one end of a loom, and connections



therefrom to rotary shafts, of said shafts, to transmit motion to the shuttle-boxes at the opposite end of the loom, said shafts placed one within the other, and connections from  
5 said shafts to the operating-levers of the shuttle-boxes, substantially as shown and described.

4. In a shuttle-box motion, a plurality of master-gears, with one or more tooth-segments  
10 thereon, mutilated pinions operated by said gears, some of said pinions having a sprocket-wheel connected therewith, two shafts placed one within the other, chains intermediate said sprocket-wheels and shafts, an adjustable ec-  
15 centric connected with one of said shafts, and connections therefrom to the operating-levers of the shuttle-boxes and said levers, a crank connected with the other shaft, and connections therefrom to the operating-levers of the  
20 shuttle-boxes, and said levers, substantially as shown and described.

5. In a shuttle-box motion, a plurality of master-gears, with one or more tooth-segments thereon, mutilated pinions operated by said  
25 gears, two shafts, one within the other, connections intermediate said shafts and said

pinions, an adjustable eccentric connected with one of said shafts, and connections therefrom to the operating-levers of the shuttle-boxes and said levers, a crank connected with  
30 the other shaft, and connections therefrom to the operating-levers of the shuttle-boxes and said levers, substantially as shown and described.

6. In a box-motion of the class described, 35 two mutilated pinions, connections therefrom to two rotary shafts, to rotate the shafts, and said shafts and connections from said shafts to the levers of the box-motion on the opposite end of the loom and said levers, substan-  
40 tially as shown and described.

7. In a shuttle-box motion, the combination with a supporting-shaft of a mutilated pinion, and a rotary shaft to transmit motion to the shuttle-boxes at the opposite end of the  
45 loom, of connections intermediate said mutilated pinion and said shaft, substantially as shown and described.

HENRY BARDSLEY.

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