

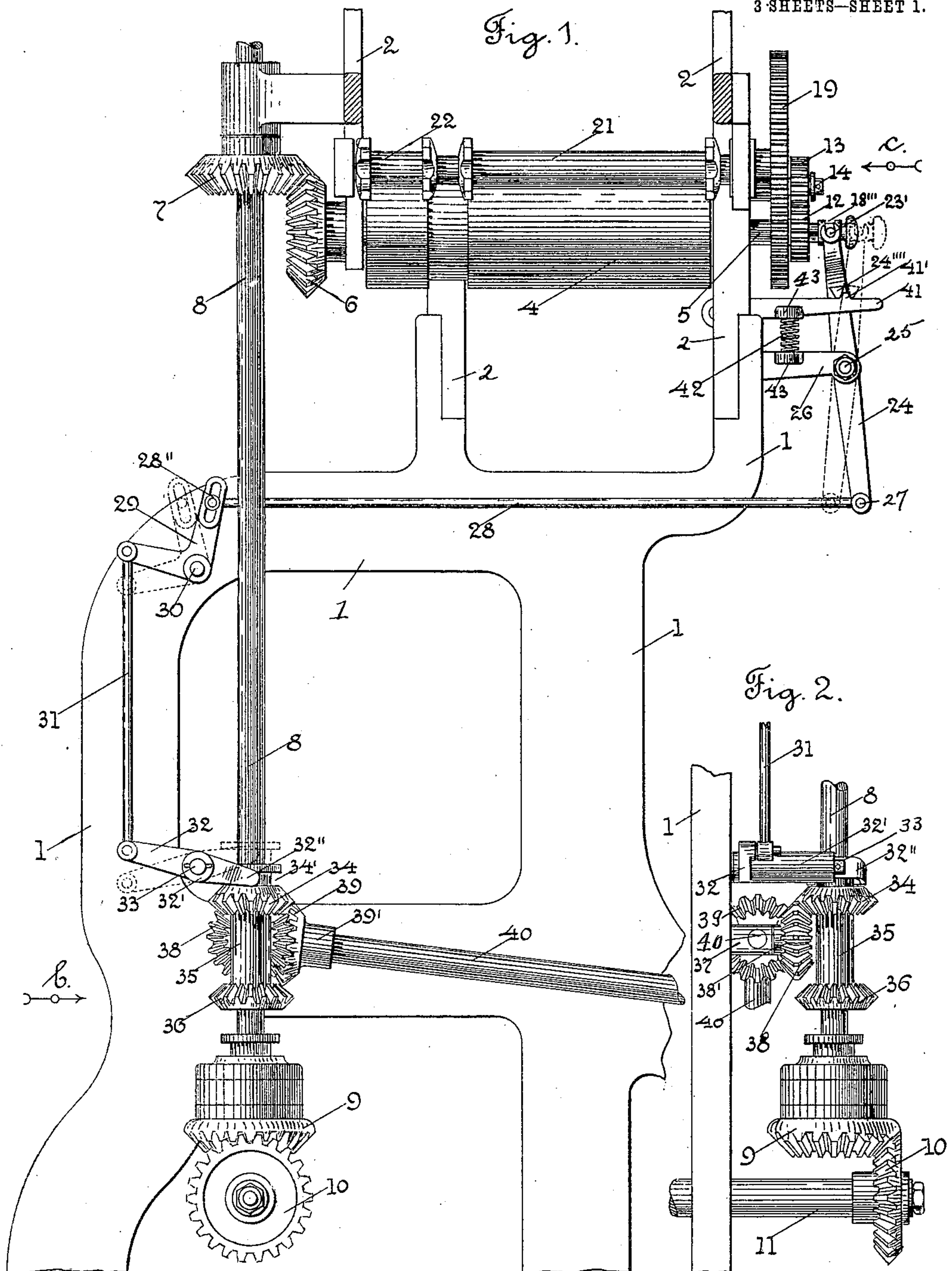
No. 810,680.

PATENTED JAN. 23, 1906.

E. H. RYON.  
LOOM REVERSING MECHANISM.

APPLICATION FILED APR. 24, 1905.

3 SHEETS—SHEET 1.



Witnesses  
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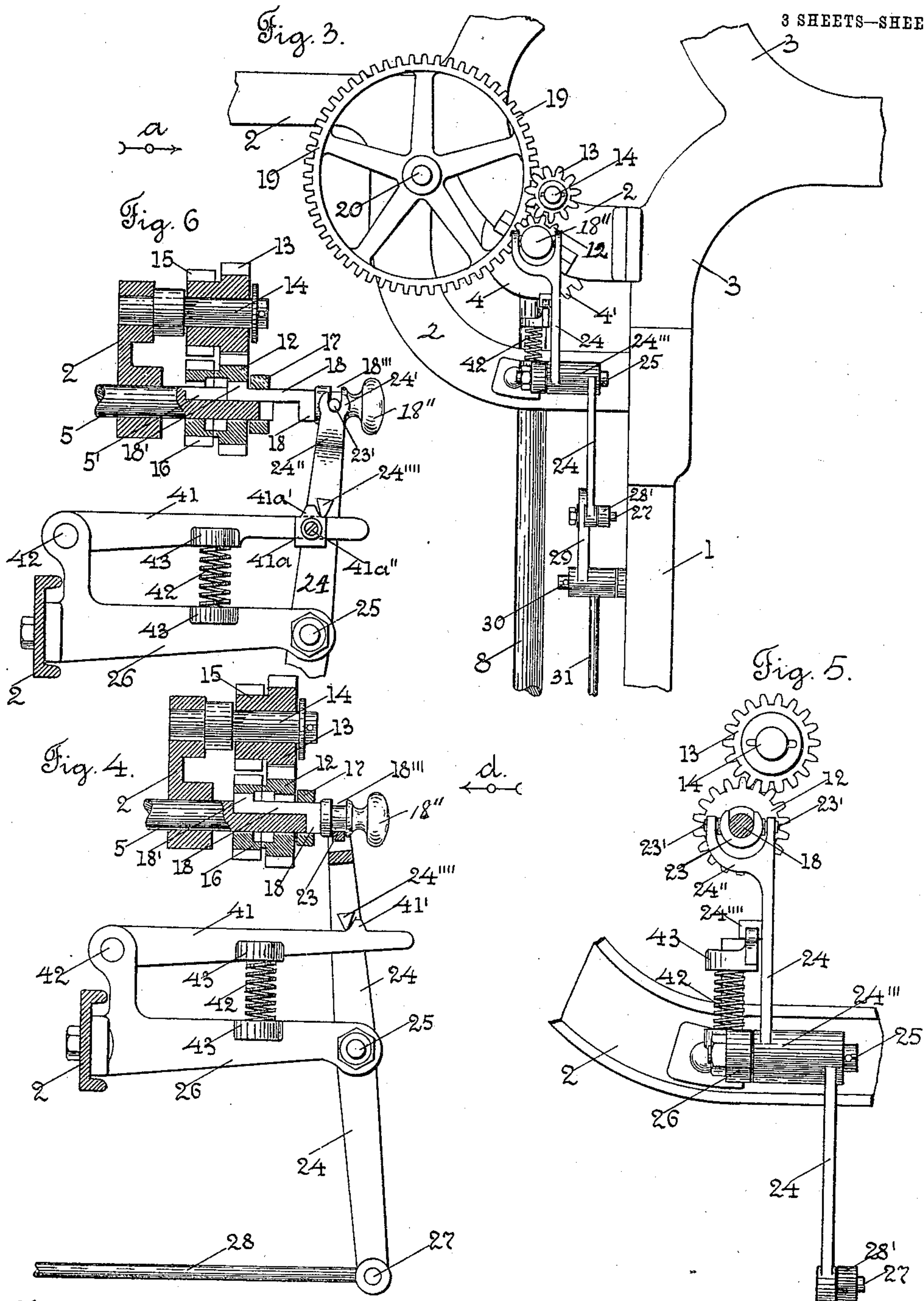
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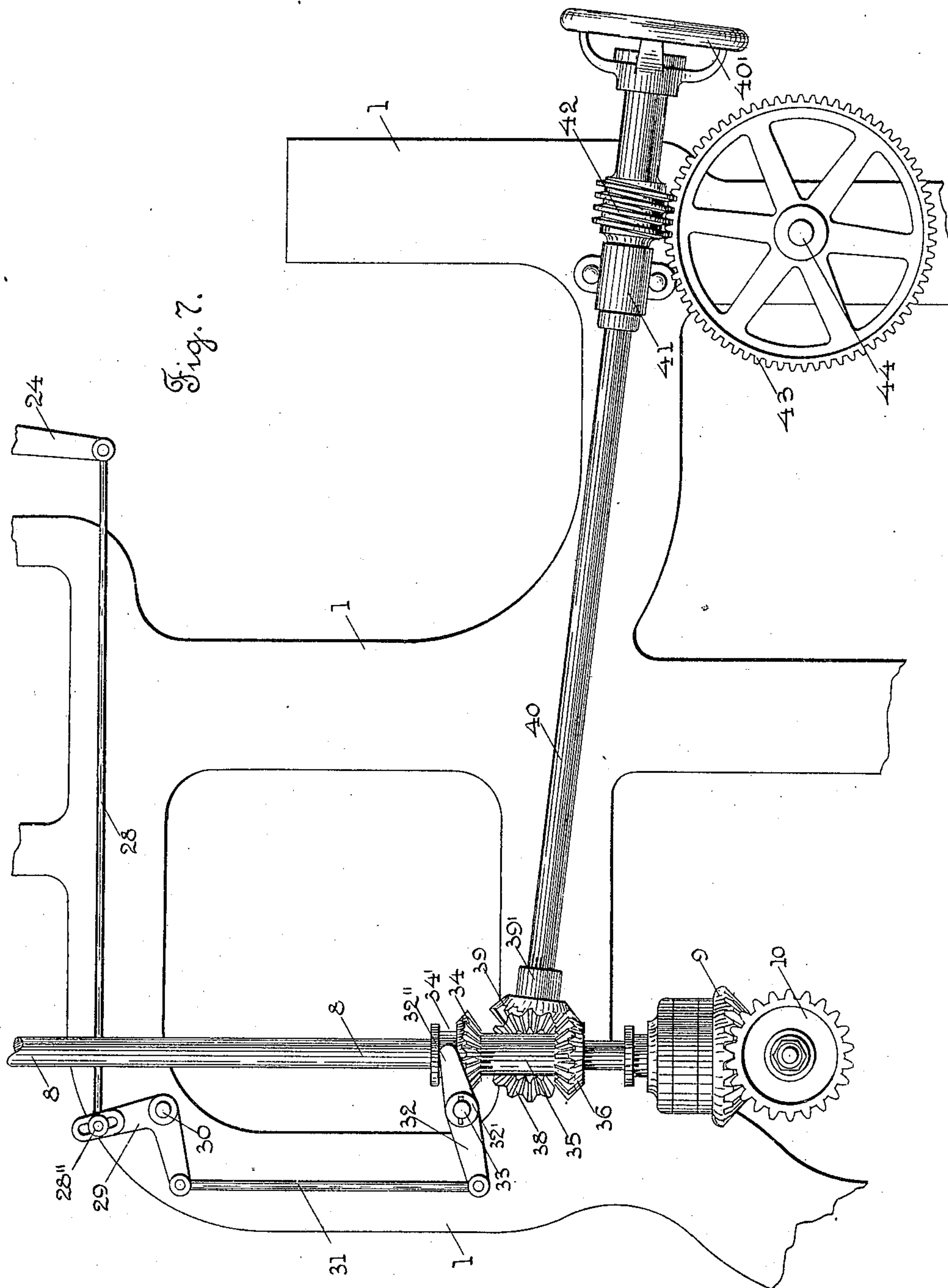


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# UNITED STATES PATENT OFFICE.

EPPA H. RYON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, A CORPORATION OF MASSACHUSETTS.

## LOOM REVERSING MECHANISM.

No. 810,680.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed April 24, 1905. Serial No. 257,057.

*To all whom it may concern:*

Be it known that I, EPPA H. RYON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Loom Reversing Mechanism, of which the following is a specification.

My invention relates to looms, and more particularly to a reversing-motion for the take-up adapted to be used in connection with the well-known Knowles head-motion shown and described in Reissue Letters Patent No. 7,784 and with the system of reverse-gears shown and described in United States Letters Patent No. 398,328.

The object of my invention is to provide a mechanism adapted to be combined with and used in connection with said Knowles head-motion and said reverse-gear mechanism and with the take-up motion to reverse or move backward the take-up roll at the same time that the pattern-cylinders are reversed or moved back by said reverse-gear mechanism.

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 detached parts of the said Knowles head-motion and of said reverse-gear mechanism and of the driving-shaft of the take-up roll and my improvements combined therewith sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings, Figure 1 shows a detached part of said Knowles head-motion and said reverse-gear mechanism looking in the direction of arrow *a*, Fig. 3, and the upright driving-shaft and the shaft to the take-up roll and my improvements combined therewith. Fig. 2 shows a rear view of the gears and other parts shown at the lower part in Fig. 1 looking in the direction of arrow *b*, same figure. Fig. 3 is a front end view of the parts shown in the upper part of Fig. 1 looking in the direction of arrow *c*, same figure. Fig. 4 is, on an enlarged scale, a detached view of the operating-lever of the reverse-gear mechanism shown at the right in Fig. 1 and showing the reverse-gears in section. Fig. 5 is an end view of the parts shown in Fig. 4 looking in the direction of arrow *d*, same figure, and showing the gears

in full lines and the sliding key in section. Fig. 6 corresponds to Fig. 4, but shows the key and operating-lever in their opposite positions and also shows a modified construction of the locking-lever; and Fig. 7 corresponds to the lower part of Fig. 1, but shows a gear on the take-up-roll shaft meshing with a worm on the take-up-driving shaft.

In the accompanying drawings, 1 is a portion of the loom side or frame, 2 the stands secured upon the upper part thereof and supporting the several parts of the head-motion, and 3 the end of the arch. 4 is the lower cylinder-gear of the well-known Knowles head-motion, (fully shown and described in Reissue Letters Patent No. 7,784,) fast on the shaft 5 and having teeth 4' on a portion only of its periphery. (See Fig. 3.)

On the inner end of the cylinder-gear shaft 5 is fast a bevel-gear 6, which meshes with and is driven by a bevel-gear 7, fast on the upright shaft 8. The upright shaft 8 has at its lower end a clutch mechanism of ordinary and well-known construction and forming a part of which is a bevel-gear 9, which meshes with and is driven by a bevel-gear 10, fast on a driven shaft 11, in the usual and well-known way. (See Fig. 2.)

I will now describe the reverse-gear mechanism, which is of the same construction and operation as the reverse-gear mechanism shown and described in Letters Patent No. 398,328, above referred to.

Loose on the end of the cylinder-gear shaft 5 is a gear 12, which meshes with a gear 13 of the same size loose on the stud 14, fast in the frame 2. Secured to the gear 13, in this instance integral therewith, is a smaller gear 15 in line with a fourth gear 16 of the same size as the gear 15 and loose on the shaft 5 and adjoining the first-mentioned gear 12. Gears 15 and 16 are smaller than gears 12 and 13, so that when the gears 12 and 13 are in mesh the teeth of the gears 15 and 16 will clear each other. (See Figs. 4 and 6.) Gears 12 and 16 are retained on the end of the shaft 5 by a collar 17 and are slotted internally to receive the projecting end 18' on the key 18, which is adapted to slide freely in a slot or recess 5' in the outer end of the shaft 5 (see Fig. 6) and is provided with an engaging end or knob 18'' and also an annular groove 18''' for the purpose to be hereinafter described. The two gears 15 and 16 in this instance mesh



with the gear 19, fast on the end of the shaft 20, on which is fast the harness-pattern-chain cylinder 21 and the box-pattern-chain cylinder 22.

5 When the loom is running normally, the key 18 is in its inner position to attach the gear 16 to the shaft 5, (see Fig. 4,) and the revolution of the shaft 5 through gear 16 rotates the gear 19 and the shaft 20 and the  
10 pattern-chain cylinders 21 and 22 thereon in a forward direction, the gears 15, 13, and 12 running loose. When the key 18 is in its outer position, (see Fig. 6,) the gear 12 is attached to the shaft 5 and turns the gear 13  
15 and the gear 15, which in turn turns the gear 19 and shaft 20 and cylinders 21 and 22 in a reverse or backward direction, the gear 16 running loose, all in the usual and well-known way.

20 I will now describe my improvements combined with the reverse-gear mechanism above described.

The key 18 has an annular groove 18''' at its outer end, as above stated, to receive an  
25 open-end collar 23, having studs 23' projecting from opposite sides thereof to enter the open-end slots 24' in the upper forked end 24'' on the upper end of the centrally-pivoted lever 24, having a hub 24''' loosely mounted  
30 on a stud 25, fast in the end of a stand 26, bolted to the frame 2. The lower end of the lever 24 has a stud 27 thereon to receive the hub 28' (see Fig. 5) on one end of a connector 28. The other end of the connector 28 has a  
35 stud 28'' thereon adjustably secured in the upper slotted end of one arm of an angle-lever 29, pivotally mounted on a stud 30 on the loom-frame. The other arm of the angle-lever 29 is connected by a link 31 with one end  
40 of a lever 32, having a hub 32' pivotally mounted on a stud 33 on the loom-frame. (See Fig. 2.)

The lever 32 has a forked arm 32'', having inwardly-extending pins thereon which extend into an annular groove 34' in the hub of  
45 the bevel-gear 34. The bevel-gear 34 is fast on the upper end of sleeve 35, splined on the upright shaft 8 to revolve therewith and to move longitudinally thereon. On the lower  
50 end of the sleeve 35 is fast a second bevel-gear 36 of the same size as the bevel-gear 34.

A stud 37 is fast at its inner end to the loom-frame and extends out therefrom. (See Fig. 2.) The outer end of the stud 37 is  
55 turned down to receive the hub 38' of a double bevel-gear 38, which is adapted to mesh with the upper bevel-gear 34, as shown, when the loom is running normally or with the lower bevel-gear 36 when the sleeve 35 is  
60 raised and the parts are reversing or running backward. The double bevel-gear 38 is also in mesh with a bevel-gear 39, the hub 39' of which is fast on the shaft 40, leading to the take-up mechanism. One end of the shaft  
65 40 has a bearing in the stud 37. (See Fig. 2.)

The other end of the shaft 40 has a bearing in a box 41, secured to the loom-frame, and the extreme end of the shaft is provided with a hand-wheel 40'. On the shaft 40 is fast a  
70 worm 42, which meshes with and drives a gear 43, fast on the shaft 44 of the take-up roll in the usual way.

In connection with the lever 24, attached to the sliding key 18, I preferably use a locking-lever 41, pivotally mounted at one end on  
75 a stud 42 on the stand 26 and having a projection 41' on its upper edge, preferably of wedge shape and preferably made integral with the lever 41, as shown in Fig. 3, which is adapted to be engaged by a projection 24''''  
80 on the lever 24, said projection being preferably of wedge shape. The projection 41' on the lever 41 is held in yielding engagement with the projection 24'''' on the lever 24 on one side or the other side thereof to yieldingly  
85 lock the lever 24 in its opposite positions, in this instance by a spiral expansion-spring 42, having its ends seated in bosses 43 on the stand 26 and the lever 41.

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

When the sliding key 18 is drawn out to reverse the direction of movement of the pat-  
95 tern-chain cylinders 21 and 22 through the reverse system of gears 12, 13, 15, and 16 in the ordinary way, the lever 24 will be moved out at its upper end and through connector 28, angle-lever 29, link 31, and lever 32 the  
100 sleeve 35 will be raised, as indicated by broken lines in Fig. 1, to disengage the bevel-gear 34 from the bevel-gear 38 and bring the bevel-gear 36 into mesh with the bevel-gear 38 to turn said gear in the reverse direction,  
105 and through said gear 38 the gear 39 and the shaft 40 to the take-up mechanism to reverse or turn backward the take-up mechanism, as will be readily understood by those skilled in  
110 the art. When the sliding key 18 is in its inward position in the normal operation of the loom, the lever 32 acts to lock and hold it in its inward position to prevent any accidental movement thereof. When the sliding key  
115 18 is in its outward position, the lever 41 acts to lock and hold it, through the lever 24, in said position and prevent any accidental movement thereof. At the same time the lever 24 acts to support the sliding key 18  
120 and hold it in its proper position.

In Fig. 5 is shown a modified construction of the locking-lever 41. In said figure instead of having the locking projection 41' made integral with the lever 41 said projection 41'<sup>a</sup> is made separate therefrom on a col-  
125 lar 41<sup>a</sup>, adjustably secured on the lever 41 by a screw 41<sup>a''</sup> or otherwise.

It will be understood that the details of construction of my improvements may be varied, if desired, and they may be adapted  
130



to be applied to any ordinary construction of head-motion and combined with the reverse-gear mechanism thereof.

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

1. In a loom take-up reversing mechanism, a sliding key for reversing through a system of gears the pattern-cylinder shaft, and said gears and said cylinder-shaft, and the driving-shaft of the take-up mechanism, and connections intermediate said sliding key and said driving-shaft.
2. In a loom take-up reversing mechanism, a sliding key for reversing through a system of gears the pattern-cylinder shaft, and said gears and pattern-cylinder shaft, and the driving-shaft of the take-up mechanism, and connections intermediate said sliding key and said driving-shaft, said connections comprising a pivoted lever, and connections intermediate said lever and a sleeve on a shaft, and said sleeve revolving with and movable on said shaft and having two bevel-gears thereon, either one adapted to be moved into engagement with a third bevel-gear, and said third bevel-gear in engagement with the bevel-gear fast on the driving-shaft of the take-up mechanism, and said bevel-gear.
3. In a loom take-up reversing mechanism, a sliding key for reversing through a system of gears the pattern-cylinder shaft, and said gears and pattern-cylinder shaft, and the driving-shaft of the take-up mechanism, and connection intermediate said sliding key and said driving-shaft, said connections comprising

ing a pivoted lever, and a locking-lever, and connections intermediate said pivoted lever and a sleeve on a shaft, and said sleeve revolving with and movable on said shaft, and having two bevel-gears thereon, either one adapted to be moved into engagement with a third bevel-gear, and said third bevel-gear in engagement with the bevel-gear fast on the driving-shaft of the take-up mechanism, and said bevel-gear and driving-shaft.

4. In a loom reversing mechanism for the pattern-cylinder shaft, a shaft for a take-up, gears for driving said take-up shaft, either in a forward or backward direction, and connections between said gears and said reversing mechanism.

5. In a loom reversing mechanism for the pattern-cylinder shaft, the combination with a sliding key for reversing, through a system of gears, the pattern-cylinder shaft, of a pivoted lever, engaging said key in its inner and outer position and acting to support said key, and hold it in its proper position.

6. In a loom reversing mechanism for the pattern-cylinder shaft, the combination with a sliding key for reversing, through a system of gears, the pattern-cylinder shaft, of a pivoted lever engaging said key in its inner and outer position, and acting to support said key, and hold it in its proper position, and a second lever for locking or holding said pivoted lever.

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