

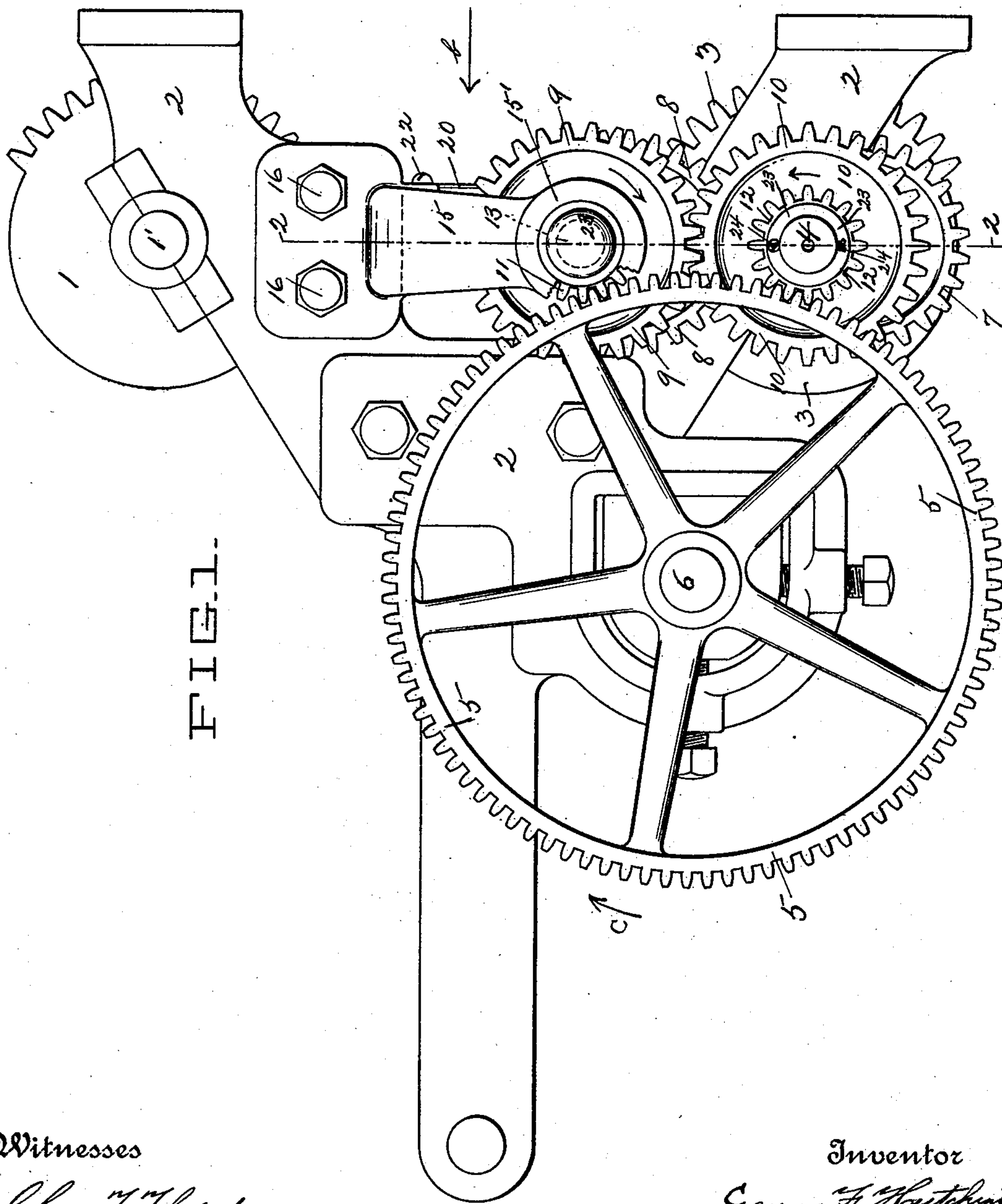
(No Model.)

2 Sheets—Sheet 1.

G. F. HUTCHINS.
PATTERN MECHANISM FOR LOOMS.

No. 506,818.

Patented Oct. 17, 1893.



Witnesses

Chas. T. Fletcher
Wm. L. Chase

Inventor

George F. Hutchinson

Attorney

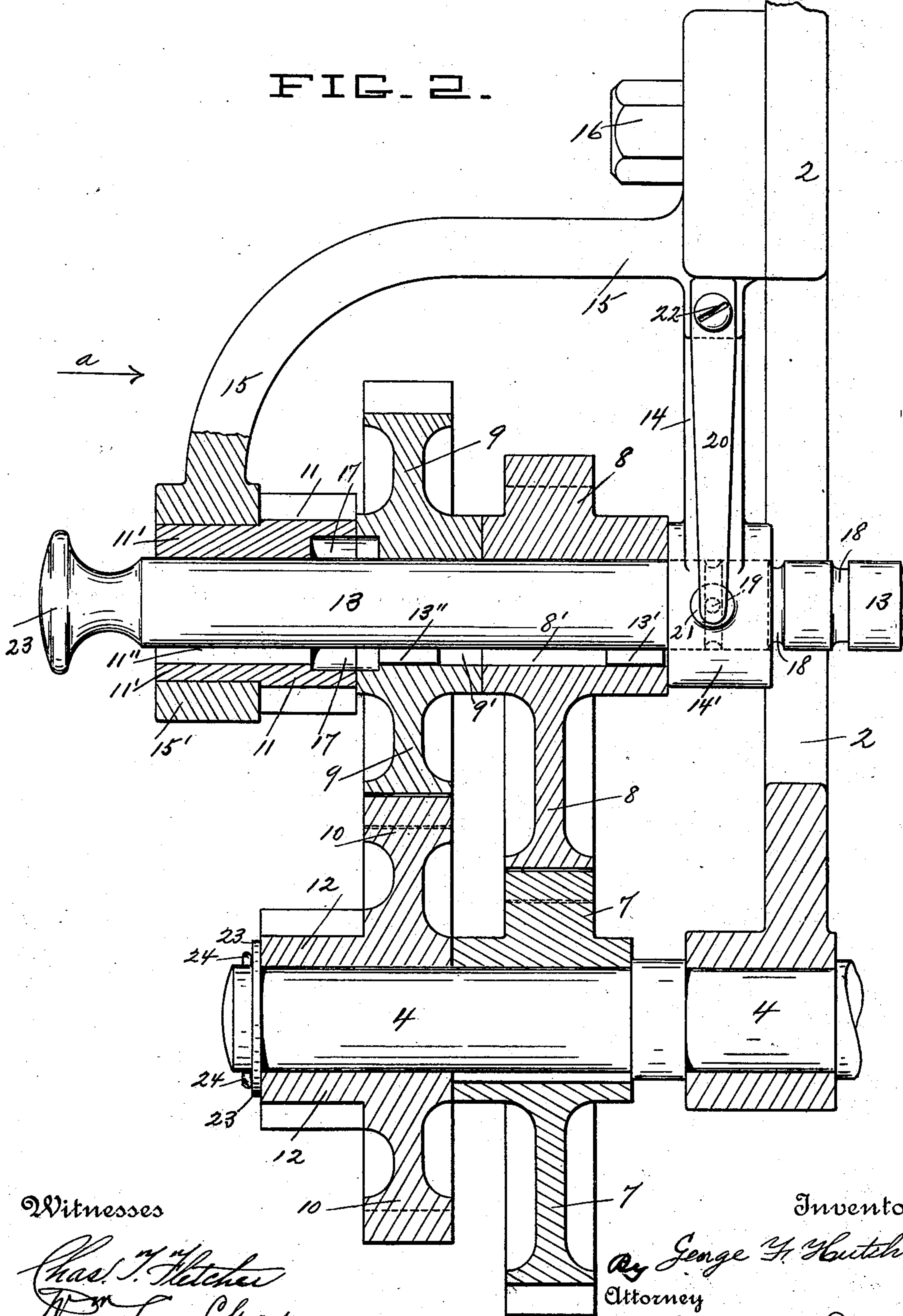
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FIG. 2.



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UNITED STATES PATENT OFFICE.

GEORGE F. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
KNOWLES LOOM WORKS, OF SAME PLACE.

PATTERN MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 506,818, dated October 17, 1893.

Application filed May 11, 1893. Serial No. 473,786. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. HUTCHINS, 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 Pattern Mechanism for Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to looms, and more particularly to the harness and drop box mechanism of the well known Knowles loom, shown and described in the United States Reissue Letters Patent No. 7,784, of July 3, 1877.

I am familiar with the pattern mechanism shown and described in the United States Letters Patent No. 495,453, of April 11, 1893, and the object of my present invention is to improve upon the construction of the pattern mechanism shown and described in said patent, and more particularly to simplify the construction and combination of gears, intermediate the upper or lower cylinder gear and the pattern cylinder gear, for communicating a continuous fast and slow motion to the pattern cylinder, for the same purposes as fully set forth in said patent.

My invention consists in certain novel features of construction and combination of parts of the pattern mechanism for looms, of the class referred to, as will be hereinafter fully described, and the nature thereof indicated by the claims.

I have shown in the drawings a detached portion of the head of the Knowles loom, above referred to, sufficient to illustrate the nature of my improvements applied thereto.

Referring to the drawings:—Figure 1 is a front elevation of a portion of the head of said Knowles loom, with my improvements applied thereto, looking in the direction of arrow *a*, Fig. 2. Fig. 2 is, on an enlarged scale, a partial vertical section through the system of gears, intermediate the lower cylinder gear and the pattern cylinder gear, taken on line 2, 2, Fig. 1, looking in the direction of arrow *b*, same figure. Some of the

parts shown in Fig. 1 are left off in this figure.

In the accompanying drawings 1 is the upper cylinder gear, the shaft 1' of which is journaled in the upper portion of the head frame 2. 55

3 is the lower cylinder gear, the shaft 4 of which is journaled in the lower portion of the head frame 2.

5 is the pattern cylinder driving gear, fast on the pattern cylinder shaft 6, journaled in the frame 2, all in the usual way. Intermediate the pattern cylinder driving gear 5, and the upper or lower cylinder gear, in this instance the lower cylinder gear 3, is arranged a system of gears for communicating a continuous fast and slow motion to the driving gear 5 on the pattern cylinder shaft 6, and to the pattern cylinder, not shown, both in a forward and in a backward direction. 60 65 70

The system of gears, intermediate the lower cylinder gear and the pattern cylinder gear, for communicating a continuous fast and slow motion, either in a forward or in a backward direction to the pattern cylinder shaft, consists of a pair of elliptical gears 7 and 8, in mesh with each other, a pair of circular gears 9 and 10 in mesh with each other, and a second pair of circular gears 11 and 12 in mesh with the pattern cylinder gear 5. The lower elliptical gear 7 is splined on the projecting end of the lower cylinder gear shaft 4, and meshes with and drives the elliptical gear 8, mounted on the longitudinally movable shaft 13, and preferably connected with said shaft by a fin or projection 13' thereon. extending into a slot 8' in the hub of said gear 8. 75 80 85

The shaft 13 is supported at its inner end in the lower end 14' of an arm 14, and at its outer end in the hub 11' of the gear 11, which gear is loosely mounted on said shaft, and the hub 11' of said gear is supported and adapted to revolve in the lower end 15' of the bracket or arm 15, secured to the loom frame 2, in this instance by bolts 16. See Fig. 1. Also mounted loosely on the shaft 13 is a circular gear 9; said gear 9 and the gear 11 are provided with slots 9' and 11'' in their hubs, to receive the fin or projection 13'' on the shaft 13, to couple the gear 9, or the gear 11 to said shaft, and cause the same to revolve 90 95 100

with the elliptical gear 8. The gears 9 and 11 are also provided with a circular groove 17, within the hubs of said gear at their adjoining ends, as shown in Fig. 2, into which the fin or projection 13'' on the shaft 13 will extend, by moving the shaft 13 longitudinally, when it is desired to uncouple said gears from said shaft and from the elliptical gear 8; both of said gears are then free to turn on the shaft 13, independently of said shaft and the elliptical gear 8, and the pattern cylinder gear 5 may be turned in either direction by hand.

The circular gear 10 is mounted loosely on the shaft 4, and the gear 12, is attached thereto, and preferably made integral therewith, as shown in Fig. 2, so that both gears revolve together on said shaft 4. The gears 10 and 12, and the elliptical gear are retained on the shaft 4, in this instance by a collar 23, and pin 24. As before stated, both of the gears 11 and 12 mesh with the driving gear 5 on the pattern cylinder shaft 6, as shown in Fig. 1.

The longitudinally movable shaft 13, which acts as a sliding key to couple one of the circular gears 9, or 11, to said shaft, and to the elliptical gear 8, or to uncouple said gears therefrom, is provided with circumferential grooves 18 therein, at its inner end, into which a pin 19, on the end of a spring arm 20, and extending through a hole 21 in the end 14' of the arm 14, is adapted to extend, to hold the shaft 13 in its adjusted position. The upper end of the spring arm 20 is in this instance secured by a screw 22 to the bracket 15. The outer end of the shaft 13 is provided with a head 23, by means of which said shaft may be moved longitudinally.

From the above description, in connection with the drawings, the operation of the system of gears, for communicating a continuous fast and slow motion to the gear 5 on the pattern cylinder shaft 6, either in a forward or in a backward direction, will be readily understood by those skilled in the art.

When it is desired to drive the pattern shaft 6 in a forward direction, as indicated by the arrow in Fig. 1, the shaft 13 is in the position shown in Fig. 2, having the fin or projection 13'' thereon, engaging the slot 9' in the circular gear 9, to couple said gear to said shaft, and to the elliptical gear 8 fast thereon. The revolution of the lower cylinder gear shaft 4, which acts as the driver, communicates motion to the elliptical gear 7, fast thereon, and through said gear 7 to the gear 8 coupled to the shaft 13, and through the circular gear 9, coupled to the shaft 13, to the circular gear 10 loose on the shaft 4, and the gear 12 fast to said gear 10, and through said gear 12, to the driving gear 5; the gear 11 meshing with the gear 5, runs loose on the shaft 13. When it is desired to drive the pattern cylinder shaft 6 in the reverse direction, the shaft 13 is drawn outwardly until the projection or fin 13'' thereon, engages with the slot 11' in the hub 11' of the gear 11. The spring actu-

ated pin 19, will then engage the last circumferential groove 18 in the end of the shaft 13. The gear 11 will now be coupled to the shaft 13 and to the elliptical gear 8, and will drive the cylinder gear 5 in the opposite direction, the circular gears 9, 10, and 12 running loose. When it is desired to turn the pattern cylinder gear 5 freely in either direction, independently of the gears 11 and 12, the shaft 13 is moved longitudinally, so that the projection or fin 13'' thereon will extend in the circular groove 17 in the gears 9 and 11; the spring actuated pin 19 will now extend into the middle circumferential groove 18 in the shaft 13, and the gears 9 and 11 will both be loose on the shaft 13, as also the gears 10 and 12 on the shaft 4, and free to turn in either direction independently of the elliptical gears 7 and 8, and the shaft 13.

The advantages of my improvements, over the construction and combination of the gears shown in said Patent No. 495,453, above referred to, will be readily appreciated by those skilled in the art.

I do away with one pair of elliptical gears, and arrange one set of gears on the shaft of the upper or lower cylinder gear, and the other set of gears on a movable shaft, which shaft not only acts to support the gears, but also acts as a key to couple the circular gears thereto, or to uncouple them therefrom.

By my improved construction I obtain the results sought for in said Patent No. 495,453, and by a much simpler and less expensive combination of gears.

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

1. In a loom, the combination with the head motion cylinder gear, and the pattern cylinder gear, of gearing intermediate said gears, for communicating a continuous fast and slow motion to the pattern cylinder gear, such gearing consisting of a pair of elliptical gears meshing with each other, one of said elliptical gears being fast on the shaft of the said head motion cylinder gear, and the other being fast on a longitudinally movable shaft, a pair of circular gears meshing with each other, one of said circular gears being loose on the shaft of the said head motion cylinder gear, and the other being loose on said longitudinally movable shaft, and adapted to be coupled thereto, this latter gear having a circular recess in its hub, and a second pair of circular gears, both of said circular gears meshing with the pattern cylinder gear, one of said gears being attached to the first mentioned circular gear, loose on the shaft of said head motion cylinder gear, and the other being loose on said longitudinally movable shaft, and adapted to be coupled thereto, this latter gear having a circular recess in its hub adjacent the recess in the hub of the other gear, and said longitudinally movable shaft, the same being provided with fins or projections thereon adapted to extend in slots in

the hubs of the circular gears mounted thereon, to couple either one of said gears thereto, and also to extend in the circular recesses in the hubs of said gears, to allow the circular gears to turn loosely thereon, for the purpose stated, substantially as set forth.

2. In a loom, the combination with the head motion cylinder gear, and the pattern cylinder gear, of gearing intermediate said gears, for communicating a continuous fast and slow motion to the pattern cylinder gear, such gearing consisting of a pair of elliptical gears meshing with each other, one of said elliptical gears being fast on the shaft of said head motion cylinder gear, and the other being fast on a longitudinally movable shaft, a pair of circular gears meshing with each other, one of said circular gears being loose on the shaft of the said head motion cylinder gear, and the other being loose on said longitudinally movable shaft, and adapted to be coupled thereto, this latter gear having a circular recess in its hub, and a second pair of circular gears, both of said circular gears meshing with the pattern cylinder gear, one of said gears being attached to the first mentioned circular gear, loose on the shaft of the said head motion cylinder gear, and the other be-

ing loose on said longitudinally movable shaft, and adapted to be coupled thereto, this latter gear having a circular recess in its hub, adjacent the recess in the hub of the other gear, and said longitudinally movable shaft supported at its inner end in an arm attached to the loom frame, and provided with circumferential grooves therein, into which a pin on a spring arm extends, to hold said shaft in its adjusted position, and said spring arm and pin, and said longitudinally movable shaft supported at its outer end in the hub of the circular gear meshing with the pattern cylinder gear, said hub supported in the end of an arm or bracket secured to the loom frame, and said arm or bracket, and said longitudinally movable shaft provided with fins or projections thereon adapted to extend in slots in the hubs of the circular gears mounted thereon, to couple either one of said gears thereto, and also to extend in the circular recesses in the hubs of said gears to allow the circular gears to turn loosely thereon, for the purpose stated, substantially as set forth.

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