

(No Model.)

3 Sheets—Sheet 1.

H. WYMAN & A. A. GORDON.

SHUTTLE OPERATING MECHANISM FOR NARROW WARE LOOMS.

No. 438,214.

Patented Oct. 14, 1890.

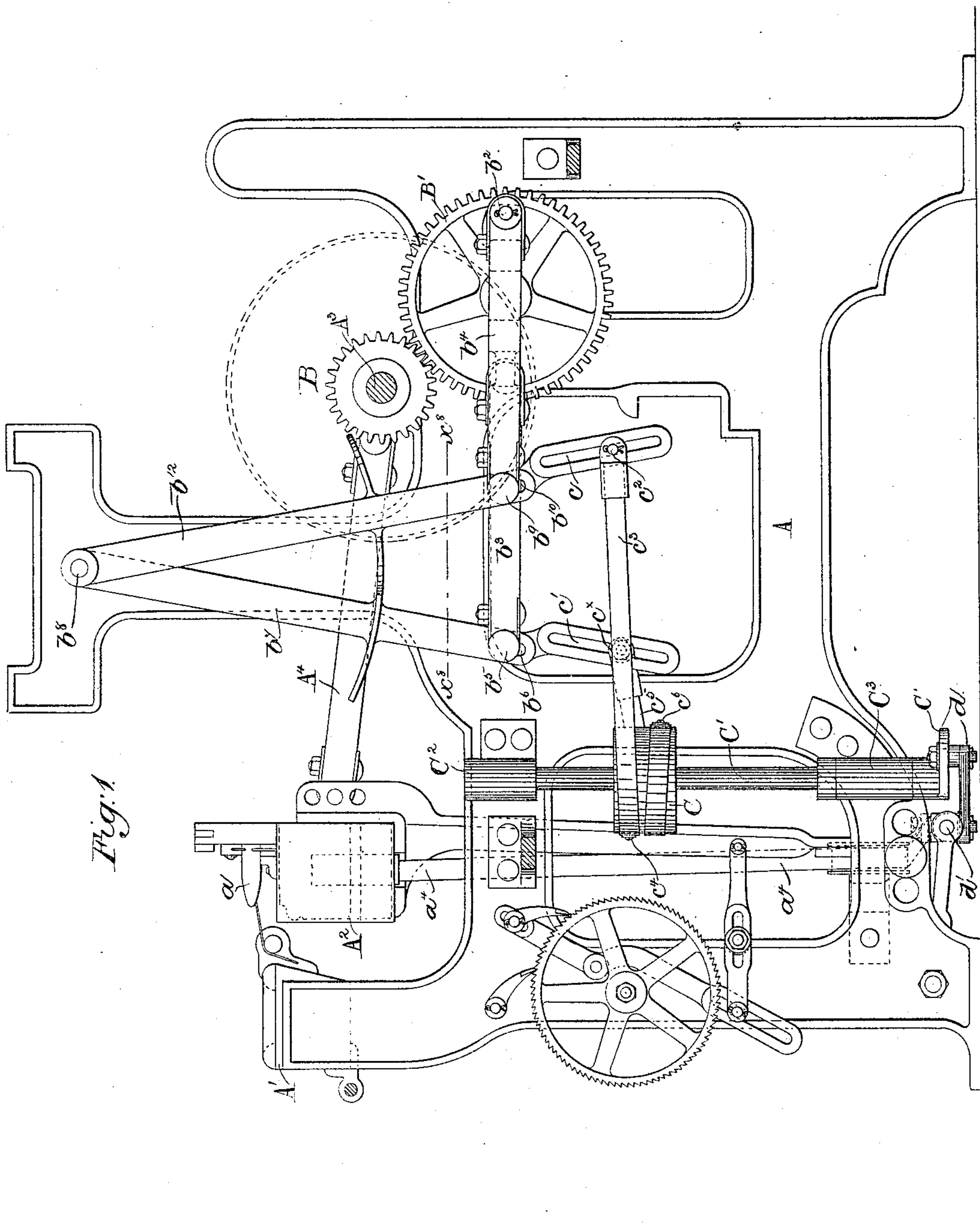


Fig. 1

Witnesses.

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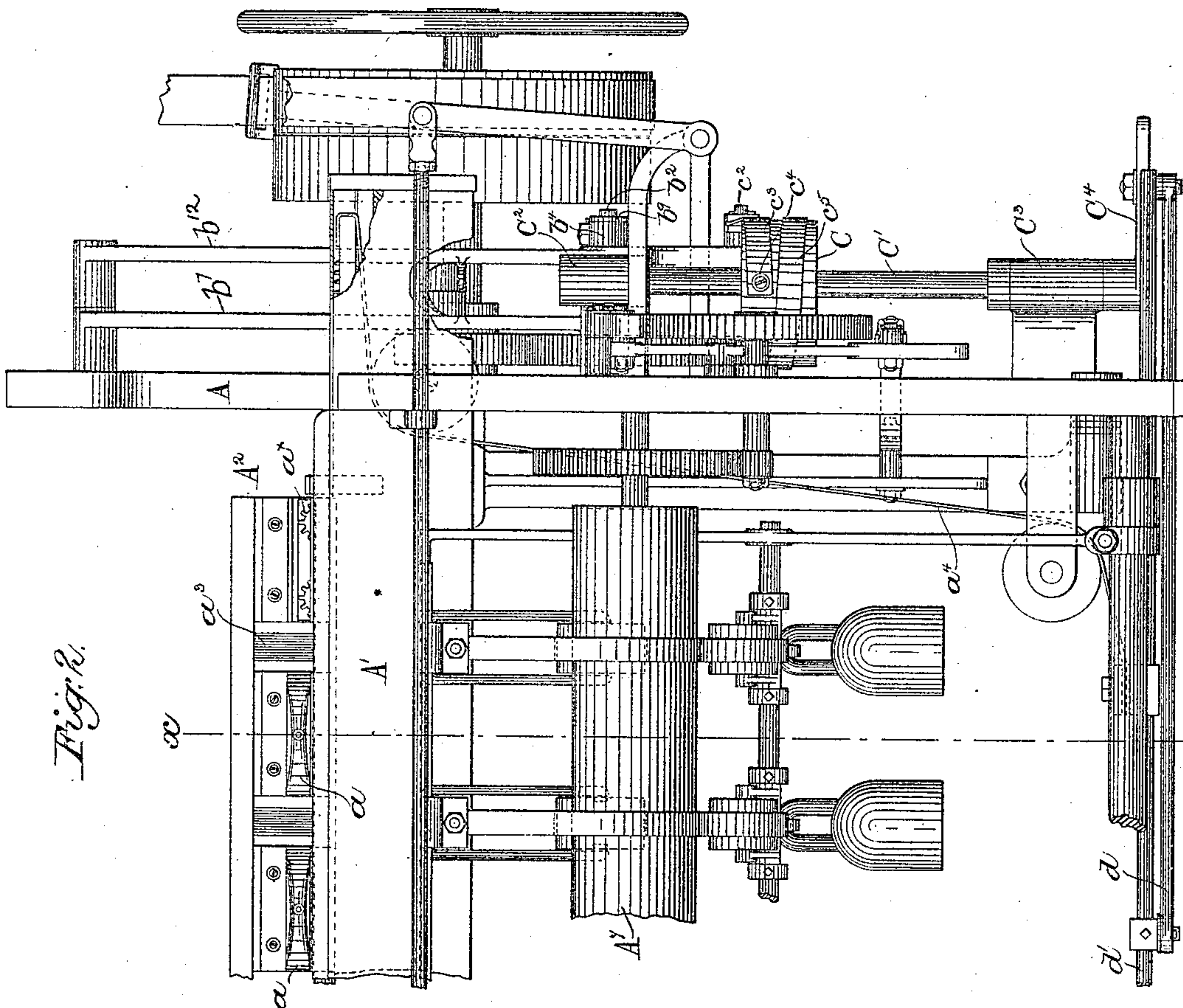


Fig. 2.

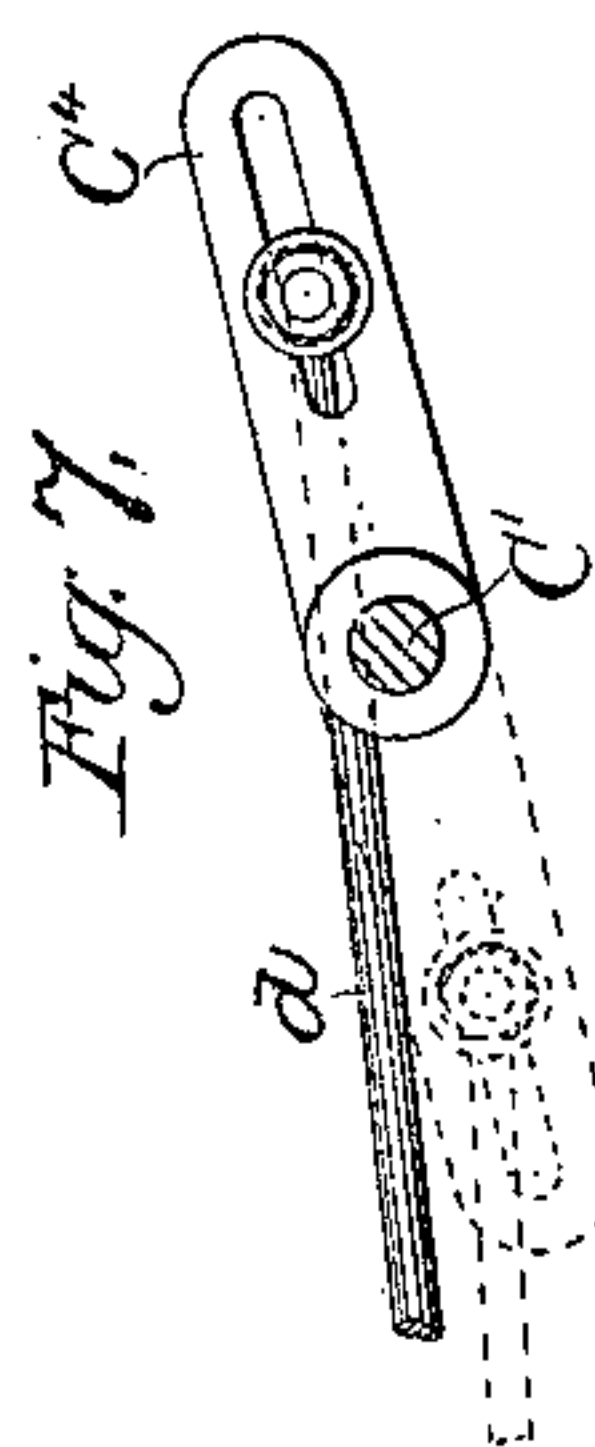


Fig. 7.

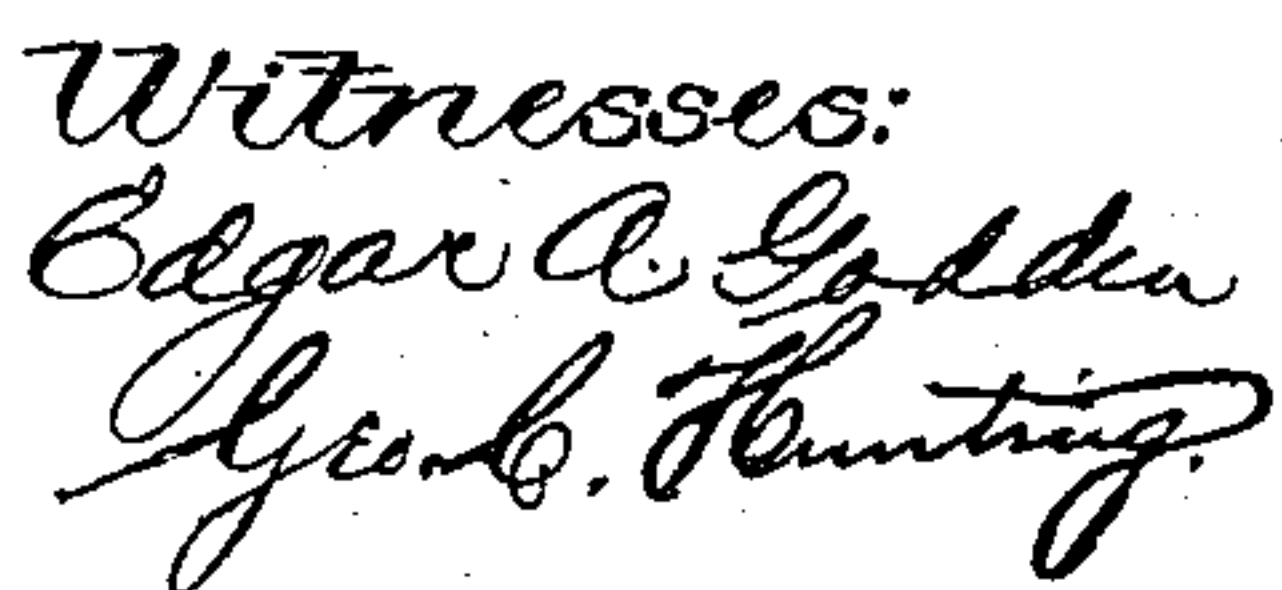
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3 Sheets—Sheet 3.

SHUTTLE OPERATING MECHANISM FOR NARROW WARE LOOMS.

Patented Oct. 14, 1890.



Inventors.
Horace Wyman
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UNITED STATES PATENT OFFICE.

HORACE WYMAN AND ALBERT A. GORDON, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO THE CROMPTON LOOM WORKS, OF SAME PLACE.

SHUTTLE-OPERATING MECHANISM FOR NARROW-WARE LOOMS.

SPECIFICATION forming part of Letters Patent No. 438,214, dated October 14, 1890.

Application filed January 16, 1890. Serial No. 337,092. (No model.)

To all whom it may concern:

Be it known that we, HORACE WYMAN and ALBERT A. GORDON, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Shuttle-Operating Mechanism for Narrow-Ware Looms, 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 that class of looms known as "narrow ware."

In the invention to be herein described the shuttles derive their movement from a vertical shaft having an oscillatory movement, and, as herein shown, the devices for oscillating the said shaft are so constructed as to admit of such adjustment that the speed of movement of the shuttles derived from the said shaft and usual intermediate connections between it and the usual shuttle-actuating rack-bar may be varied according to the class of work being done and the material used in the web being woven, such material as silk or wool requiring a faster speed for the shuttle, or to have the shuttle pass through the shed in quicker time than when cotton is used.

In accordance with our invention the vertical oscillating shaft referred to is provided with a drum or collar having attached to it straps which go from opposite sides thereof to vibrating levers, the latter deriving their motion from a double crank actuated by some moving gear of the loom, the said double crank, as herein shown, deriving its motion from a gear fast on the crank-shaft of the loom, the said double crank having one rotation to two of the crank-shaft, the connections of the straps referred to with the said levers and also the connections of the double crank or the pitmen with said levers being adjustable in order to provide for greater or less oscillation of the vertical shaft within a certain definite period of time, thus varying the speed of the same, first one and then the other of the said straps being pulled upon to produce a movement of the vertical shaft in first one and then in an opposite direction.

Figure 1 of the drawings is a right-hand end elevation of a sufficient portion of a loom

embodying our invention to enable the same to be understood. Fig. 2 is a partial front elevation of the loom near its right-hand end. Fig. 3 is a partial section of the loom in the line xx of Fig. 2. Fig. 4 is a partial section below the line x^8 , Fig. 1, chiefly to show the double crank for moving the levers to which are connected the straps for oscillating the vertical shuttle-actuating shaft. Fig. 5 is a sectional detail of part of the double crank. Fig. 6 is a top or plan view of the drum or collar of the vertical oscillating shuttle-actuating shaft; Fig. 7, a detail to be referred to.

The loom-frame A, the breast-beam A', the lay A², the crank-shaft A³, the lay-connecting rods A⁴, the cross-girths A⁵ A⁶, extended between the loom sides at the rear end of the frame, the narrow-ware shuttles a , the rack-bar a' , laid in a groove in the lay to actuate the gears a^x and effect the reciprocations of the shuttles across the narrow reeds a^3 , the straps a^4 , connected to the said rack-bar, and the sand-roll a^7 and the actuating devices therefor are and may be all as usual in narrow-ware looms.

We have herein shown the crank-shaft A³ as provided with fast and loose pulleys; but we desire it to be understood that the said crank-shaft may be driven by power in any usual manner.

The crank-shaft has fast upon it a gear B, which is herein represented as engaging a gear B' of twice its size, mounted upon a suitable stud secured at or to the loom-side. The said gear B' constitutes a wheel, to which is secured, as herein represented, by suitable screws b , part b^x of a double crank, (best shown in Fig. 6,) the said double crank having two crank-pins, as b' b^2 , the former of which is embraced by one end of a connecting-rod b^3 , while the latter crank b^2 is embraced by one end of a connecting-rod b^4 . The forward end of the connecting-rod b^3 embraces or engages a suitable stud or bolt b^5 , made adjustable in a slot b^6 of a lever b^7 , pivoted at b^8 , while the forward end of the connecting-rod b^4 embraces a stud b^9 , made adjustable in a slot b^{10} of a lever b^{12} , also pivoted, as herein shown, at b^8 . These levers b^7 b^{12} , substantially alike, are slotted, respectively, at c' c , near their lower ends, the

slot c receiving in it an adjustable stud c^2 , to which is connected one end of a strap or actuator c^3 , wrapped partially about and attached at c^4 to the drum or collar C, the slot c' receiving in it a smaller stud c^x , to which is connected one end of a strap or actuator c^5 , extended partially about the said drum or collar in an opposite direction and attached to the said drum or collar by a screw c^6 . The drum or collar C is fast upon the shuttle-actuating shaft C', it being a vertically-placed shaft having bearings C² C³ and provided at its lower end with a crank C⁴, the said shaft deriving an oscillating motion by or through the said levers $b^7 b^{12}$ and the said straps. By adjusting the connecting-rod toward the pivot b^8 of the levers $b^7 b^{12}$ the said levers may have given to their lower ends greater throw, and by adjusting the studs $c^2 c^x$ in the slots cc' a greater or less movement of oscillation may be given to the vertical shaft C' during each rotation of the double crank referred to. The greater the extent of oscillation during a given time the faster the speed of movement of the shuttles from one to the other end of their stroke.

In practice we have found that when the warp and weft are either all of silk or of wool the web produced is better if the speed of the shuttle is materially increased, whereas when cotton warp is used the speed of movement of the shuttle may be less, and so, also, according to the various classes of material and width of webs, it is desirable in the mill to at times give to the shuttles a faster or a slower speed, different manufacturers having different views as to the speed at which they prefer to reciprocate the shuttles. The adjustment provided for enables such manufacturers to give to the shuttles any desired speed.

The crank C⁴ at the lower end of the vertical shaft C' is attached to a link d , which is herein shown as attached to a shaft or rod d' , mounted in suitable bearings d^2 , in which the said shaft is free to slide.

The straps a^4 referred to, which are attached to the opposite ends of the usual rack-bar a' , are represented as connected to the opposite ends of this rod or shaft d' ; but we desire it to be understood that our invention would not be departed from if the said rod had substituted for it a strap which might be in continuation of the straps a' , the link being connected directly to the said strap, such a strap, for instance, as is shown in United States Patent No. 60,388; but we prefer the said rod as a stronger and more durable means of connecting the straps which give motion to the rack.

In the use of the double crank it will be obvious that the two levers $b^7 b^{12}$, actuated by it, are not always moved at exactly the same speed one with the other during the entire stroke of the cranks actuating them, and that the distance from the stud c^x to and around the center of the shaft carrying the drum C

back to C² will be varied accordingly as the double cranks are in a horizontal or in vertical position, thus varying the tension of the straps $c^3 c^5$. So to compensate for this and keep the straps $c^3 c^5$ in contact with the drum or collar C we have made the latter of cam shape (see Fig. 8) rather than truly circular.

We claim—

1. A loom containing the following instrumentalities, viz: a lay, a rack-bar for actuating shuttles, straps connected to the said rack-bar, an oscillating shaft, connections between it and the said straps, a crank on the said shaft, and devices to oscillate the said shaft, substantially as described.

2. A loom containing the following instrumentalities, viz: a shuttle-actuating shaft C', having a crank, a drum thereon, levers $b^7 b^{12}$, a rotating double crank and connecting-rods between it and the said levers, and straps between the said levers and the drum on the said shaft, to operate substantially as described.

3. A loom containing the following instrumentalities, viz: a shuttle-actuating shaft C', having a crank, a drum thereon, levers $b^7 b^{12}$, a rotating double crank, connecting-rods adjustably attached to the said levers, and straps between the said levers and the drum on the said shaft, whereby the extent of oscillation of the said shaft C' may be varied, to operate substantially as described.

4. A loom containing the following instrumentalities, viz: a shuttle-actuating shaft C', having a crank, a drum thereon, levers $b^7 b^{12}$, a rotating double crank, connecting-rods between it and the said levers, and straps adjustably connected to the said levers and attached to the said drum, whereby the speed at which the said shaft is oscillated during each stroke in a given time may be varied or increased or diminished, as desired, for the purposes set forth.

5. The lay, the rack-bar thereon, the straps connected thereto, the rod d' , to which the said straps are joined, and the link d , combined with the vertical shaft having a crank at its lower end, and with devices to oscillate the said shaft, substantially as described.

6. The combination of the lay, the rack-bar thereon, the straps connected thereto, the rod d' , to which the said straps are joined, and means to move the said rod, substantially as described.

7. The shuttle-actuating shaft C' and its attached cam-shaped drum, and the connected straps $c^3 c^5$, combined with the levers $b^7 b^{12}$, and means to actuate them, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HORACE WYMAN.
ALBERT A. GORDON.

Witnesses:

JUSTIN A. WARE,
SAMUEL B. SCHOFIELD.