



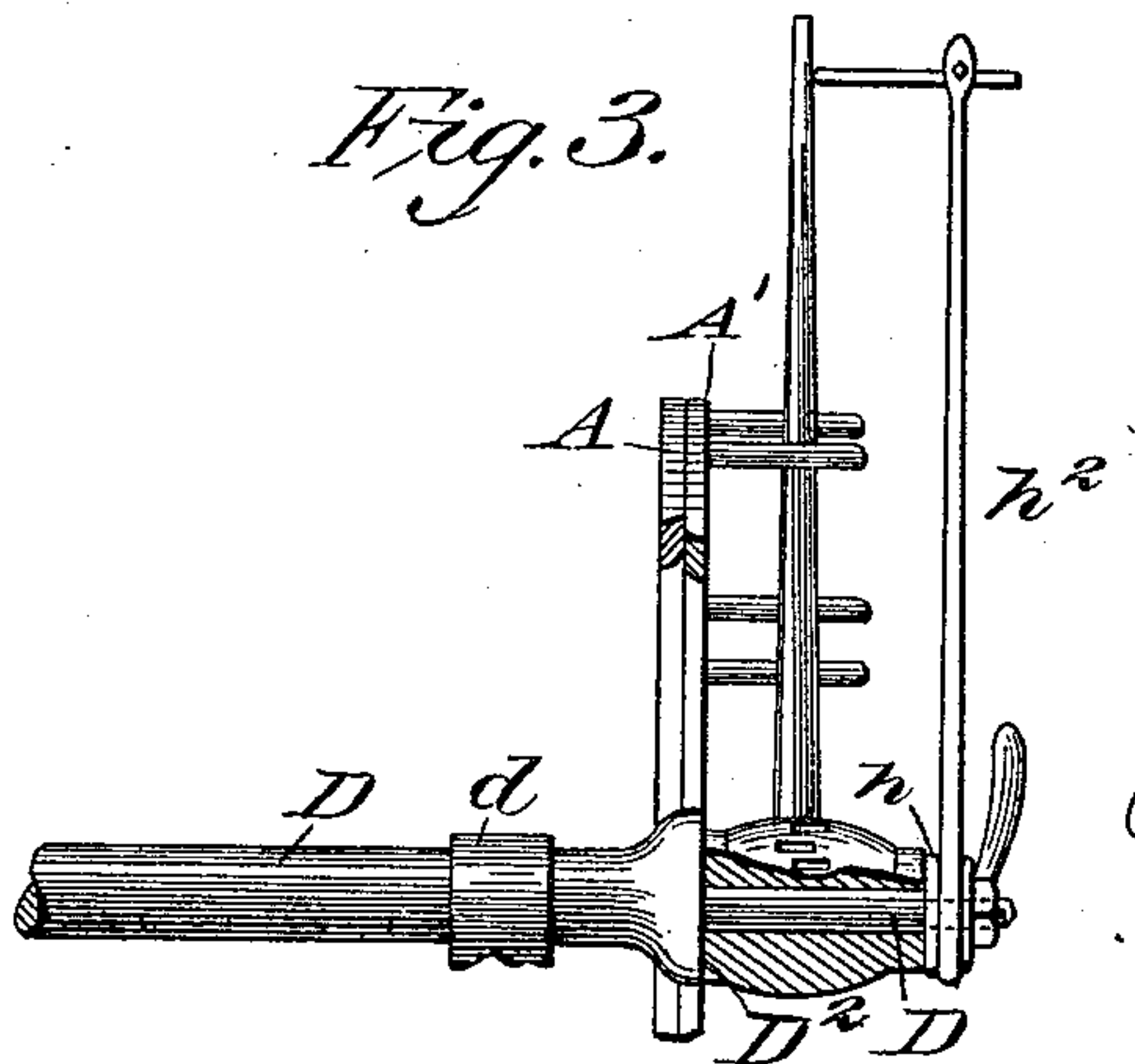
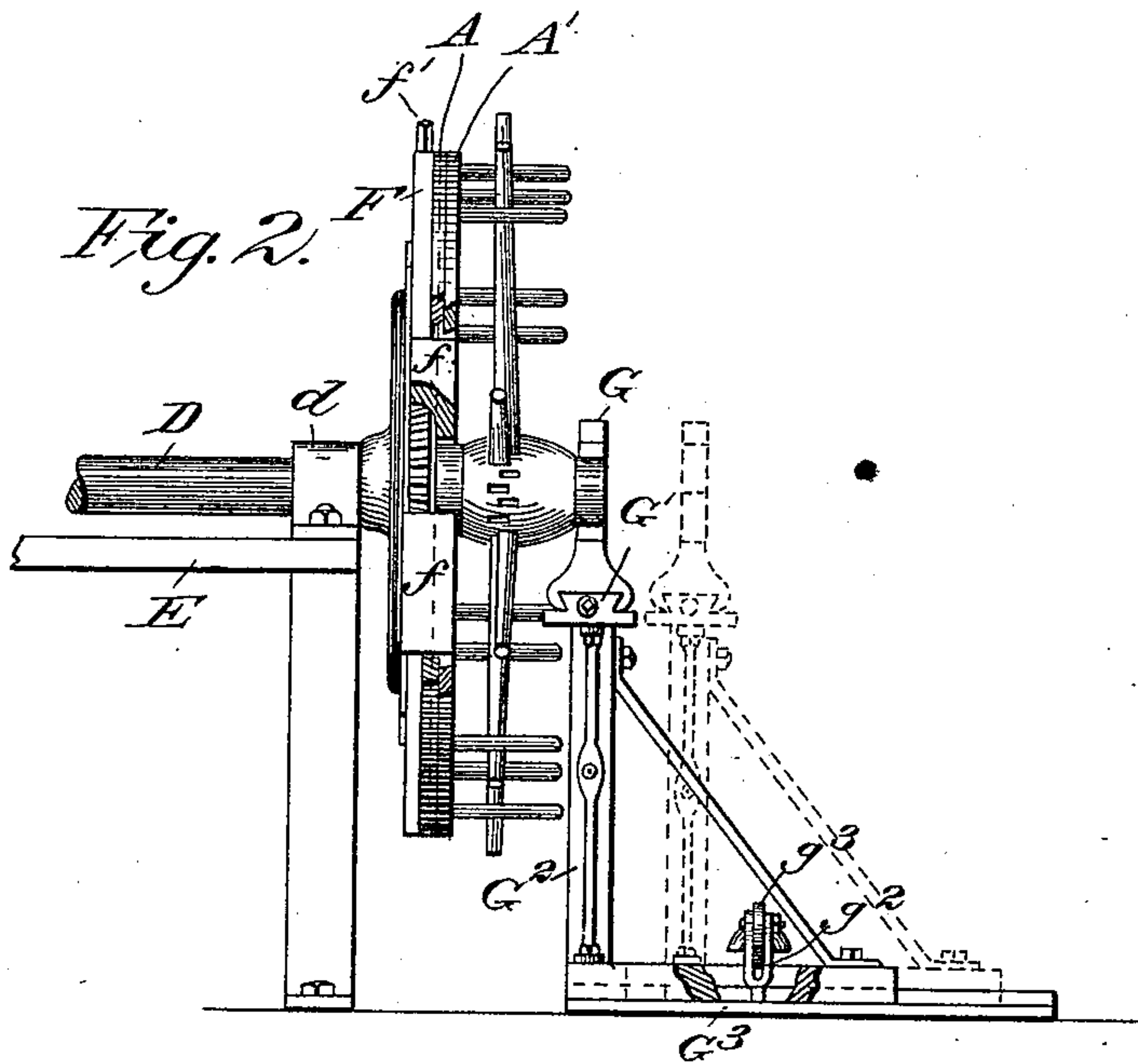
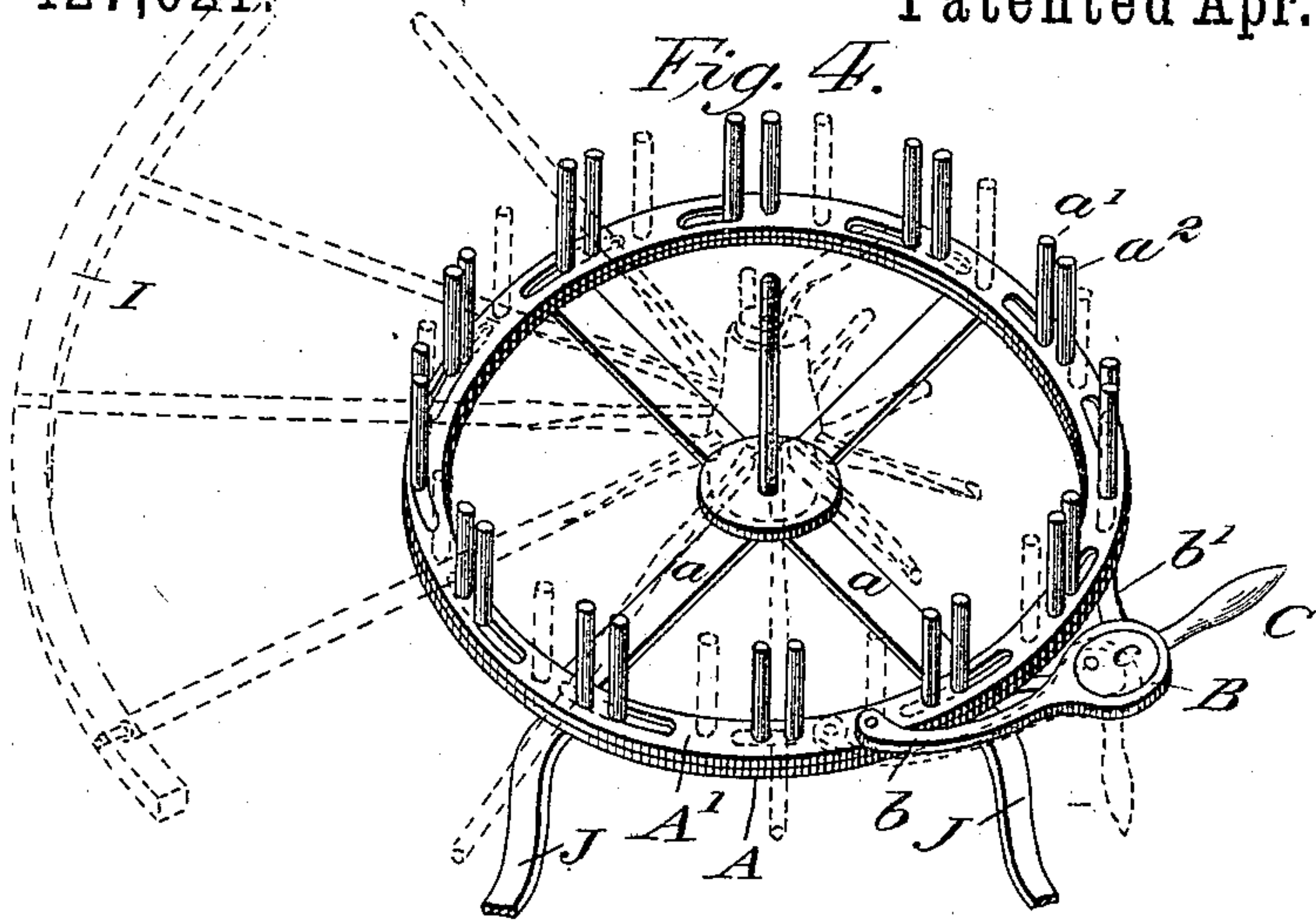
(No Model.)

2 Sheets—Sheet 2.

J. M. SWEET.  
WHEEL MANUFACTURING MACHINE.

No. 427,021.

Patented Apr. 29, 1890.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JOHN M. SWEET, OF BATAVIA, NEW YORK, ASSIGNOR TO THE BATAVIA  
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## WHEEL-MANUFACTURING MACHINE.

SPECIFICATION forming part of Letters Patent No. 427,021, dated April 29, 1890.

Application filed October 22, 1889. Serial No. 327,870. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN M. SWEET, a citizen of the United States, residing at Batavia, in the county of Genesee and State of New York, have invented a new and useful Machine for Manufacturing Wheels, of which the following is a specification.

My invention relates to improvements in wheel-making machines in which the spokes are held automatically in a true position radially while being driven into the hub, as well as while the felly is being fitted to the spokes; and the objects of my improvements are, first, to provide a mechanism whereby the hub may in spoke-driving be secured to a wheel having upon the peripheral face laterally-projecting spacing-pins, by which the spokes are held in a radial line with the spoke-mortise, so that after being driven the spokes will stand with their outer ends equidistantly apart, and, second, to arrange for clamping the spokes in an equidistant position and holding the same in such position while the felly or rim is being placed thereupon. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the machine having the hub secured thereto and in position for driving the spokes into the hub. Fig. 2 is a side view of same with portions broken away for showing the several parts. Fig. 3 is a modification of Fig. 1, wherein the hub-clamping jaws are removed and a lateral pin substituted in place of the jaws for holding the hub in position while driving the spokes. Fig. 4 is a perspective view of the spacing-wheel shown in Fig. 1, arranged for holding the hub-driven spokes in an equidistant position until the rim may be secured thereto; and Fig. 5 is a top plan view of Fig. 4 and face view of the rim-spoke holder shown in Fig. 1 detached.

Similar letters refer to similar parts throughout the several views.

To those conversant with the art of wheel-making it is known that when the spokes are driven into the hub by hand great skill must be displayed by the operator, in order that the completed wheel may have the outer ends of the spokes equidistantly spaced when left

in their normal condition, as the least variation in the sides of the mortise or bending the spoke when driving will cause a greatly-increased deflection at the outer end thereof, which defect can only be remedied (after the spoke is seated in the hub) by a side bending of the spoke, causing it to remain bent even after the rim is in place, which greatly detracts from the beauty as well as usefulness of the wheel.

To quickly and truly secure the spoke to the hub and apply the rim thereto, so that the spokes will be equidistantly spaced upon the completion of the wheel, I employ two rings A A', the one A having the cross-supporting bars *a* securely attached thereunto and provided with lateral pins *a'* of a number corresponding with the spokes of the wheel, which pins are evenly spaced and secured at one end to the face of the ring. The corresponding rim A' is also provided with like pins, (designated *a''*), which are secured to the ring in close proximity to the slot *a''*, made centrally of the width of the ring, and with the pins equidistantly spaced, which pins are of dimensions corresponding with the width of the slot and of pins *a'*, through which slot the said pins *a* pass, and in such manner that the ring A' is made to turn upon the ring A to a degree corresponding to the length of the slot for the purpose of causing the impingement of a pin against either side of the spoke, thereby forming a guide to the spoke in the act of driving into the hub, also producing a clamp for securing the driven spokes in an equidistant position while the rim is being placed thereupon. For the convenience of turning this movable ring an eccentric bar B is used, the end *b* being secured to the ring A', while the leg *b'* is attached to ring A, the operating-lever C, having the disk *c* eccentrically attached thereto, being pivoted at its inner end to the ring A, so that as the free end of the lever is moved to the right or left the ring A' will by the eccentric connection be correspondingly moved thereby, adjusting the space between the pins so as to accommodate large or small sized spokes, or tightly clamp the same, as may be desired. When these spacing-rings are to be used in



spoke-driving, an arbor D may be secured to the cross-bars  $a$ , extending rearwardly therefrom, which arbor is made to turn (and with it the rings) in bearing-boxes  $d$ , secured to the table E, the legs of which may be bolted to the floor of the shop. Upon the face side of the ring cross-bars reverse from the arbor is fastened a clutch-bar F, carrying the sliding heads  $f$ , which heads are operated by the screw-rod  $f'$ , one end of which is provided with a right-handed screw-thread, while the reverse end has a left-handed screw-thread, which is made to turn in corresponding screw-nuts attached to the inside of the sliding heads, and so arranged that as the screw-rod is turned to the right or left the sliding heads will be made to approach or recede from each other in equal proportions.

Upon the inner edges of the sliding heads are diamond-shaped notches  $f^2$ , within which notches rests the hub as the slides are by the screw-threaded mechanism drawn thereagainst, and in such manner that the hub will be accurately centered longitudinally in line with the arbor. It will be understood, of course, that the bar F and sliding heads  $f$  are provided with the usual dovetail edges or the common gibbed sides, so that the heads and bar will be held together and kept from lateral displacement.

G are other adjustable heads dovetailingly placed upon the plate  $G'$  and operated by a screw  $g$ , having right and left screw ends similar to the clutch mechanism hereinbefore described, by which the front end of the hub is held in true position while the spokes are being driven. This way-plate  $G'$  is secured to the upright post  $G^2$ , which rises from the slotted base  $G^3$ , the parts being securely braced each to the other, so that a firm support is given the forward end of the hub. This base may rest upon the floor or other suitable foundation, and is provided with a slot  $g'$ , through which rises the eared bolt  $g^2$ , between which ears is pivoted the cam foot-lever  $g^3$ . The bolt  $g^2$  is made fast at its lower end to the floor underneath the base  $G^3$  and in line with the slot in the same, so that the entire supporting mechanism may be drawn back or moved forward to permit the removal of the wheel or placing the hub in position for driving the spokes therein. When this support is to be moved, the cam-lever  $g^3$  may be raised by the foot of the operator, so as to loosen the hold of the cam upon the base, and when in position the lever can by the foot be again brought down, thereby locking the parts in a fixed position.

In the modification shown in Fig. 3 the entire back-clutch arrangement is dispensed with (the front support being used or not, as desired) and the hub is placed upon the spindle  $D'$ , the same being a continuation of the arbor D, and is thereupon so as to turn with the arbor by means of the impingement of the nut  $h$  upon the forward end of the hub,

which causes the rear end to adhere to the shoulder  $D^2$ , clamping the hub, so that the whole will revolve together while the spokes are driven, one at a time, in the mortise upon the upper side of the hub. The spoke-gage  $h^2$  may be attached to the spindle, as shown in Fig. 3, or in any other well-known manner.

In order that the spokes may (until the rim is placed thereupon) be held in the equidistant position attained in the driving, the spacing-ring arrangement hereinbefore described is placed upon the legs J, two of which are shown in Fig. 4, the legs being secured to the lower ring at their top ends, with the pins  $a'$   $a^2$  in an upright position, between which pins the driven spokes are again placed, (the hub being placed upon the center pin,) and after the wheel has been clamped in position by the clamp mechanism hereinbefore mentioned the workman proceeds to place thereupon the rim, (shown in dotted lines and designated I,) which retains the spokes in their true equidistant position, and thereby completing the wheel ready for ironing.

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

1. The combination of the fixed spacing-ring having a series of pins projecting from the face thereof, the movable spacing-ring, with its attached pins, coacting with the stationary ring and pins, the ring-supporting mechanism, and the hub centering and holding device attached to and co-operating with the rings for the purpose of equidistantly retaining the spokes while in the process of wheel-manufacturing, substantially as herein specified and set forth.

2. The combination, with the ring spoke-spacing mechanism, of the outer end hub-supporting device consisting of the adjustable clamping-jaws, the jaw-supporting bed, the jaw-adjusting screw, the upright jaw-supporting post, the adjustable slotted base secured thereto, and the base-locking device adapted for adjustingly securing the base, with its co-operating parts, in the desired position, substantially as described, and for the purpose herein set forth.

3. The combination, with the ring mechanism, consisting of one fixed ring and one movable ring, with the spoke-spacing pins projecting laterally from the face thereof, of the longitudinal arbor, the arbor-bearing boxes, and the arbor-supporting table arranged for permitting the rings, with the attached hub, to be revolved for the purpose of driving the spokes in the uppermost part of the hub, substantially as described and set forth.

4. The combination of the stationary spacing-ring secured to upright legs and provided with a series of pins projecting beyond the face of the ring, the movable spacing-ring having a series of slots, with a pin projecting from the ring contiguous to each slot and in



line with the pins in the stationary ring, one of which passes through each slot, the hub-centering pin, and the ring-operating cam adapted for use in operating the movable  
5 ring, so that each of the hub-driven spokes will be clamped between two of the pins for the purpose of holding the same in an equi-

distant position while the rim is being secured thereto, substantially as described and herein set forth.

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