

No. 705,003.

Patented July 15, 1902.

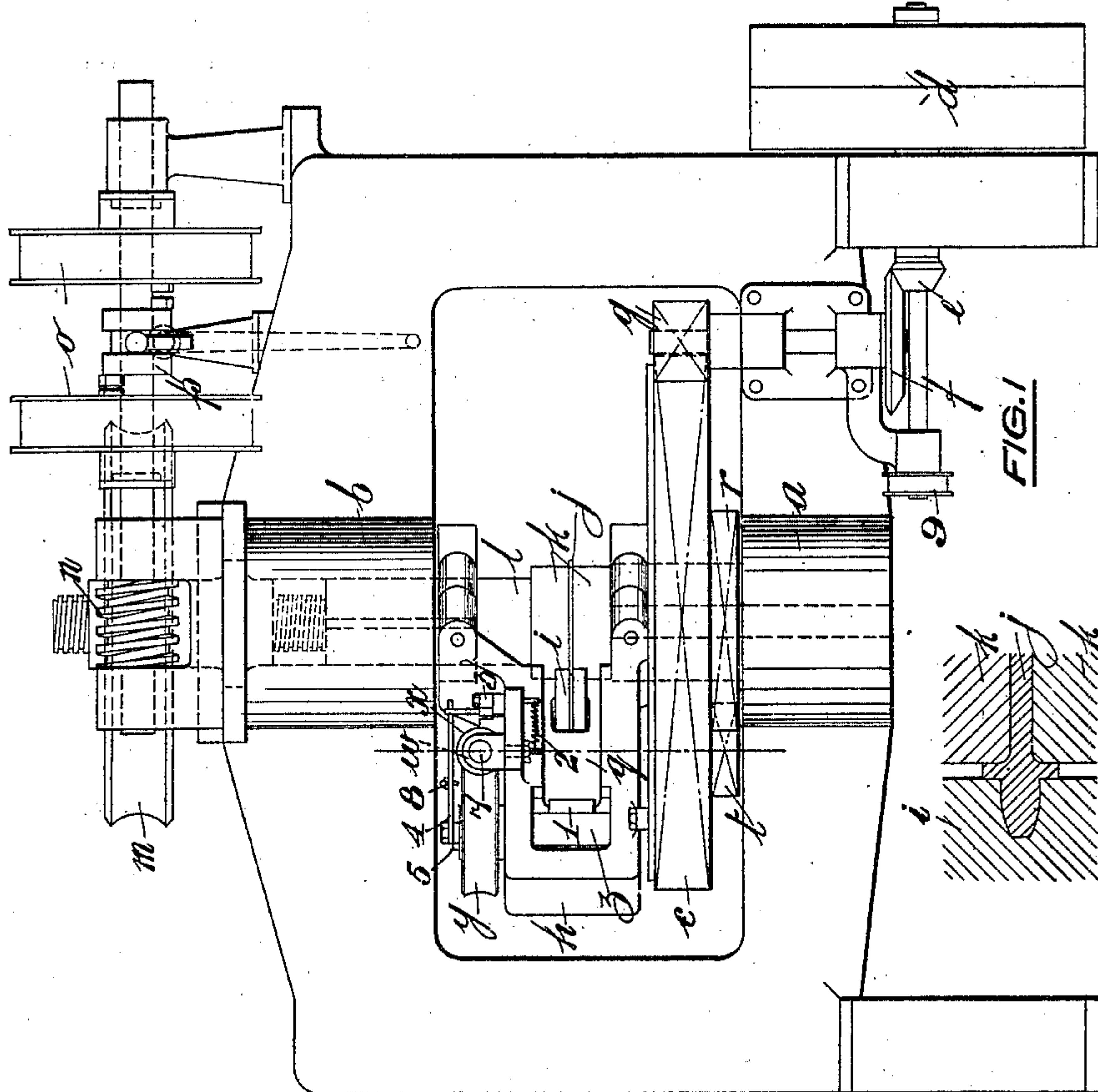
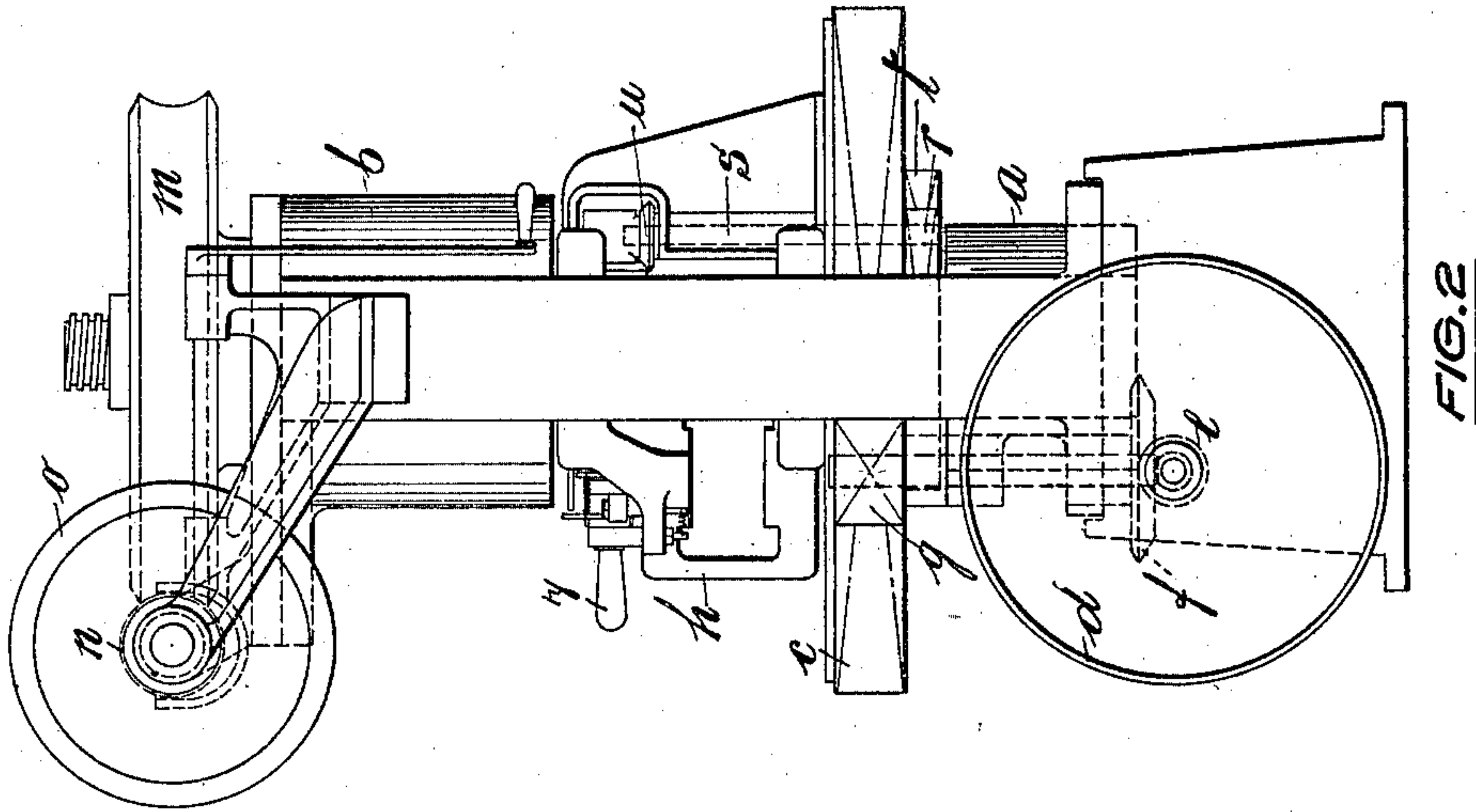
E. WILLIAMS.

MACHINERY FOR THE MANUFACTURE OF RIMMED WHEELS AND DISKS.

(Application filed Dec. 27, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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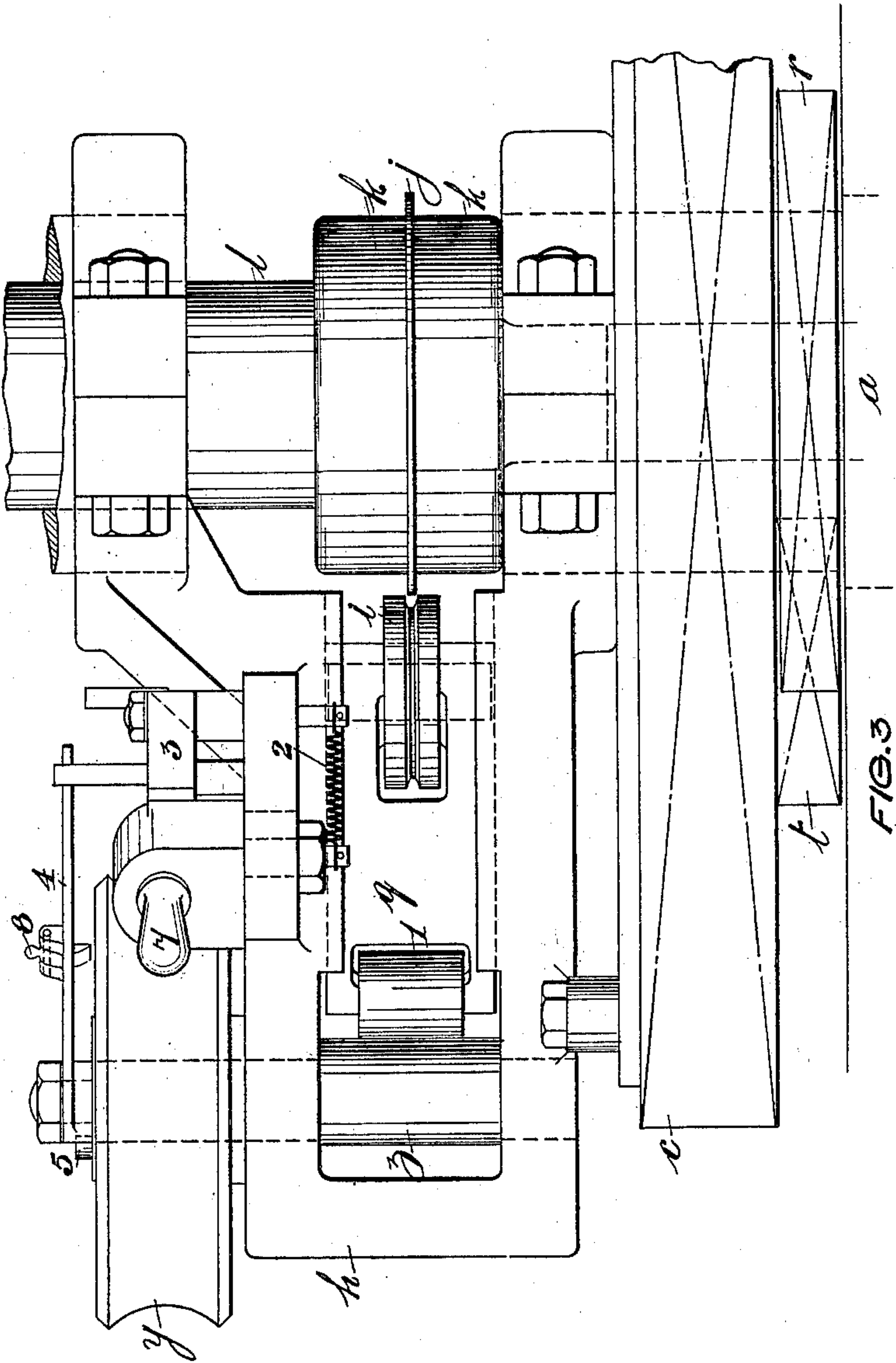
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MACHINERY FOR THE MANUFACTURE OF RIMMED WHEELS AND DISKS.

(Application filed Dec. 27, 1901.)

(No Model.)

4 Sheets—Sheet 2.



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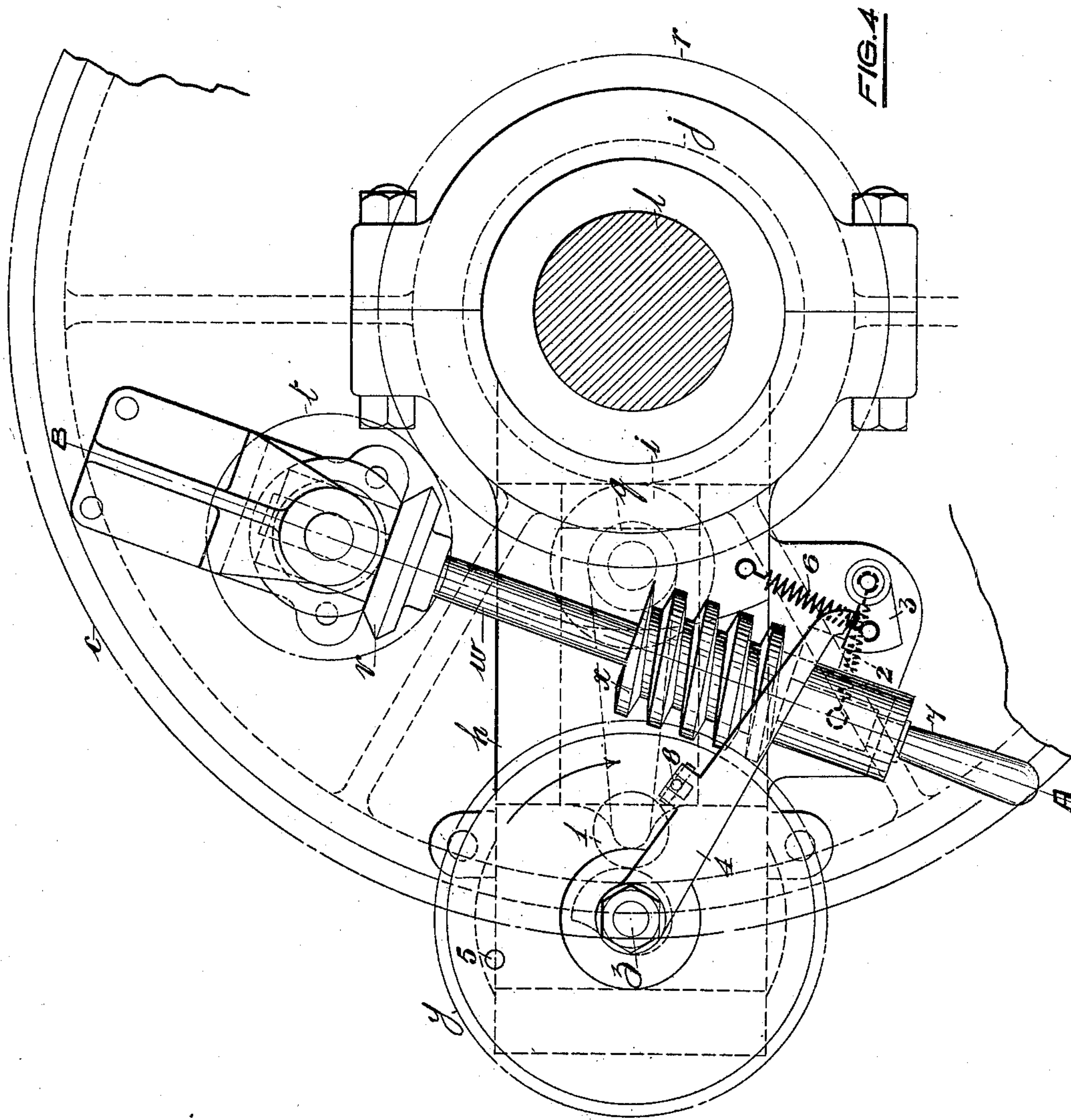
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**MACHINERY FOR THE MANUFACTURE OF RIMMED WHEELS AND DISKS.**

(Application filed Dec. 27, 1901.)

(No Model.)

**4 Sheets—Sheet 3.**



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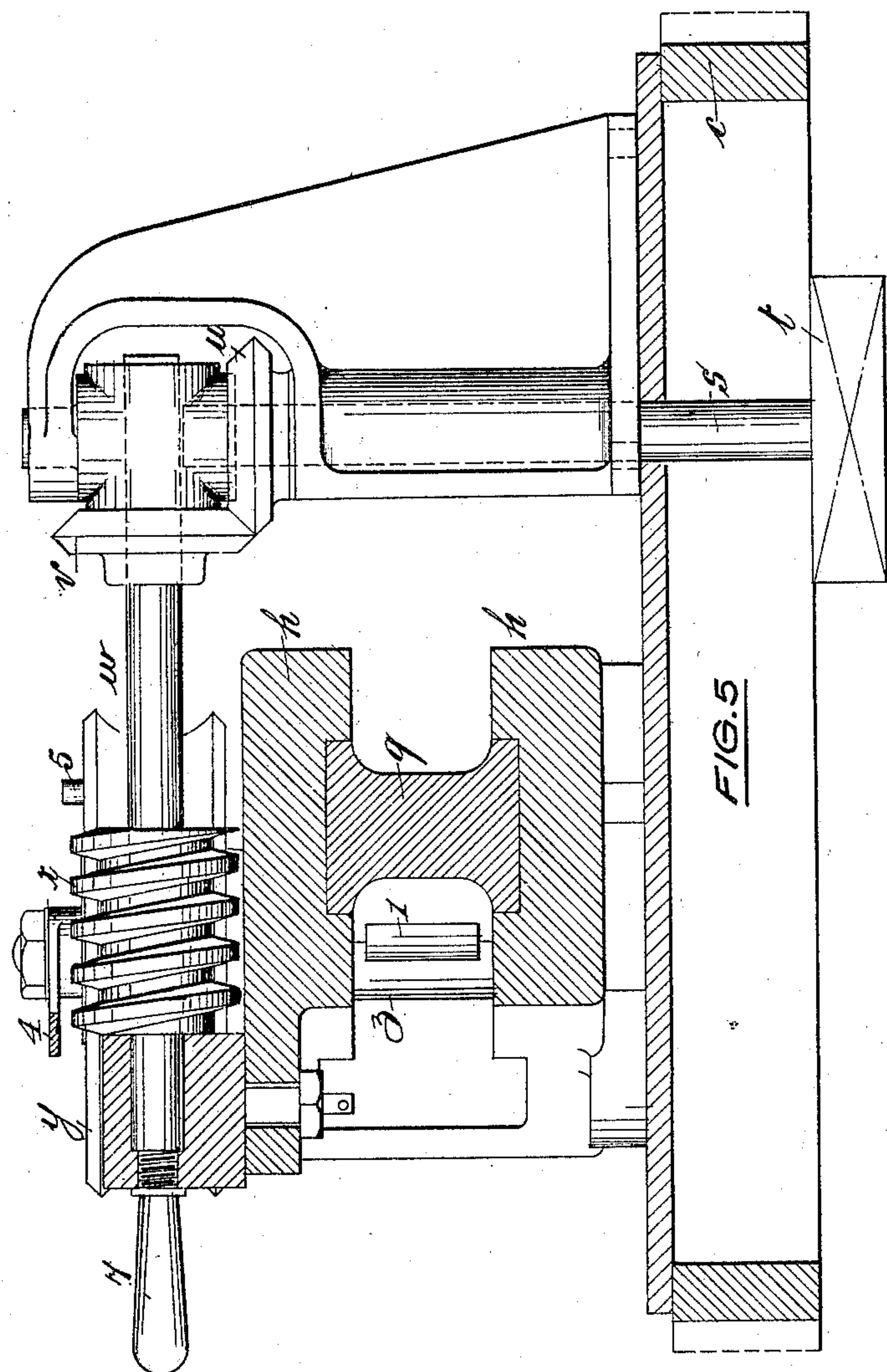
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(Application filed Dec. 27, 1901.)

(No Model.)

4 Sheets—Sheet 4.



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# UNITED STATES PATENT OFFICE.

EDWARD WILLIAMS, OF BIRMINGHAM, ENGLAND.

MACHINERY FOR THE MANUFACTURE OF RIMMED WHEELS AND DISKS.

SPECIFICATION forming part of Letters Patent No. 705,003, dated July 15, 1902.

Application filed December 27, 1901. Serial No. 87,443. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD WILLIAMS, a subject of the King of Great Britain and Ireland, and a resident of 48 Benson road, in the city of Birmingham, England, have invented certain new and useful Improvements in Machinery for the Manufacture of Rimmed Wheels and Disks, (for which I have filed an application in Great Britain, No. 12,489, bearing date June 19, 1901,) of which the following is a specification.

This invention consists of improvements in machines for the manufacture of rimmed wheels and disks from plain sheet-metal blanks of uniform thickness, my object being to provide simple means whereby disks of varying sizes can be very conveniently and securely fixed in the machine and the peripheries of such fixed disks expeditiously formed into rims of the required section.

Referring to the four accompanying sheets of explanatory drawings, Figure 1 is a front elevation, and Fig. 2 an end elevation, of a machine constructed in accordance with my invention. Figs. 3 to 5 are illustrations to a larger scale than Figs. 1 and 2, showing the rim-forming mechanism of the said machine, Fig. 3 being a front elevation, Fig. 4 a plan, and Fig. 5 an end section on the line A B, Fig. 4. Fig. 6 is a sectional view to a still larger scale, showing a portion of a chain-wheel rim as formed in the said machine, together with portions of the roll and the die-plates which constitute the rim-forming tool. The same reference characters in the different views indicate the same parts.

I preferably make the cast-iron or other framing of the machine somewhat in the form of a hydraulic or other press, as illustrated at Fig. 1, providing it with a bed *a* and a head *b*. Upon a fixed stem projecting centrally from the said bed *a* (which stem is preferably formed as a part of the bed) is freely mounted a spur-wheel *c*, which is rotated through the medium of the belt-pulleys *d* and gear-wheels *e*, *f*, and *g*, arranged in the manner shown. In rigid attachment with the spur-wheel *c* is a carrier *h*, having a pair of arms which take a bearing, respectively, upon the upper end of the aforesaid fixed stem projecting from the bed *a* and the lower projecting part of the holding-down

ram, to be hereinafter referred to. The said fixed stem and holding-down ram thus serve as the axis about which the carrier can be rotated by the motion of the wheel *c*. The rim-forming roll *i* and other allied parts, to be hereinafter referred to, are arranged between the arms of the carrier *h*.

The circular blank or disk of metal *j*, from which the rimmed wheel or rimmed disk is to be formed, is secured between a pair of die-plates or clamping-plates *k k*, disposed and held fast between the aforesaid fixed stem projecting from the bed of the machine and the holding-down ram *l*. The said ram is operated in any suitable manner for the purpose of imposing the necessary pressure upon the die-plates to securely fix them during the rim-forming operation. The means I preferably employ for the operation of ram *l* comprise a power-driven or mechanically-operated screw-and-nut device, as shown in the drawings. A screw-thread is cut around the upper portion of the ram, which passes through a nut formed in the center of the worm-wheel *m*. The rotation of the worm-wheel is effected through the worm *n*, fixed to or formed upon a shaft, on which are freely mounted the belt-driven pulleys *o o*. The said pulleys are driven in opposite directions, and one or the other can be connected with the worm-shaft, as may be required, respectively, for the ascent and descent of the ram *l* by means of the clutch *p*. On the descent of the ram the movement continues until the resistance set up by its abutment upon the die-plates *k k* exceeds the driving power of the belt. The belt will then slip, and thus further movement of the ram will be prevented; but the parts are so proportioned or designed that slipping of the belt will not occur until the pressure imposed upon the die-plates is sufficient to securely fix the blank or disk *j*. The roll-carrier *h*, attached to the spur-wheel *c*, is caused by the movement of such wheel to rotate around the fixed blank or disk *j*, on which a rim is to be formed. During such rotation the slide *q*, in which the roll is mounted, is fed toward the periphery of the disk at a varying rate of speed by the following mechanism: Beneath the loose or free spur or gear wheel *c*, hereinbefore referred to, I fix upon the same central stem



projecting from the bed *a* the spur-wheel *r*. Upon the top of the spur-wheel *c* is fixed a bracket carrying a vertical spindle *s*, and upon the lower end of such spindle is fixed  
 5 a small spur wheel or pinion *t*, which gears with the aforesaid fixed wheel *r*, so that as the spindle *s* is carried around or about the vertical axis of the whole machine by reason of its being mounted in a bracket fixed to the rotating gear-wheel *c* it is also revolved on its  
 10 own axis, because it gears or engages with the fixed wheel *r*. The rotation of the spindle *s* is transmitted through the bevel-wheels *u* and *v* to the spindle *w* and from thence through the medium of the worm *x* and the worm-wheel *y* to a cam-spindle *z*. The cam on such spindle abuts against the roller *l*, carried on the outer end of the slide *q*. The slide, with the rim-forming roll *i* mounted at  
 20 its opposite end, is thereby advanced or fed onto the periphery of the disk or blank *j* until the said periphery is pressed or caused to flow to the form illustrated at Fig. 6 or to such other form or section as may be required.  
 25 The slide *q* and other parts are omitted from the end elevation, Fig. 2, to permit of the more clear illustration of the complete machine.

Upon the conclusion of the rim-forming operation the small radius of the cam on the spindle *z* will be brought adjacent to the roller *l*, and in order that the worm-wheel *y* may then be rapidly moved by hand through a sufficient arc to enable the slide *q* to be moved  
 30 back for the disengagement of the roll *i* from the rimmed disk, and also for the subsequent rapid advance of the slide until the roll is in contact with the periphery of a newly-inserted disk, I provide the following mechanism for effecting the automatic disengagement of the worm *x* from the worm-wheel *y*.

The end of the spindle *w*, which carries the bevel-wheel *v*, has a swiveling bearing, as illustrated at Fig. 5. To the bearing at the  
 45 other end of the spindle is connected a spiral spring 2, the tension of which tends to draw the worm *x* out of engagement with the worm-wheel *y*; but such disengagement is prevented by the pawl or pivoted stop-piece 3, which  
 50 abuts against the spindle-bearing, and so prevents it from moving under the action of the spring until at the completion of the rim-forming operation the knock-out lever 4 will be so moved by the peg 5 (projecting from and rotating with the worm-wheel *y* in the  
 55 direction indicated by the arrow at Fig. 4) as to draw back the said pawl or pivoted stop-piece 3, (against the action of its own spring 6,) and thus allow the aforesaid spring 2 to effect the disengagement of the worm *x* from  
 60 the worm-wheel *y*.

After the completed disk has been removed from the machine and another blank or disk inserted the roll-feed gear is operated by  
 65 hand until the roll *i* is brought into contact with the periphery of the blank, when by means of the handle 7 the worm *x* is put into

gear with the worm-wheel *y* for the automatic continuance of the roll-feed motion.

To permit the peg 5 to pass under the knock-out lever 4 after moving the same, as aforesaid, I provide a pawl-like or pivoted abutment-piece 8 on the lever, so that such piece may be raised clear of the peg 5 when required.

The small wheel 9 on the spindle carrying the belt-pulleys *d d* and the bevel wheel or pinion *e* is a brake-wheel to serve for the quick stoppage of the roll-feeding mechanism, any ordinary brake-band or like friction device being arranged with the wheel for absorbing the momentum of the moving parts.

I sometimes arrange ordinary cutting-tools upon the rotatable carrier *h* for the purpose of automatically trimming the edges of the disk-rim immediately after its formation by the action of the roll *i*. Instead of imparting a continuous pressure to the periphery of the disk or blank *j* by means of a roll, as aforesaid, I sometimes mount a reciprocatory hammer or plunger upon the rotatable carrier *h* or upon a similar carrier to impart an intermittent pressure, and thus serve as the tool, whereby the metal at the disk periphery is caused to flow to or assume the required rim shape.

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

1. In machines for the manufacture of rimmed wheels and disks from plain sheet-metal blanks of uniform thickness, the combination consisting of a fixed bed, a holding-down ram, a stem projecting above the said bed, a spur-wheel freely mounted on the said stem and engaging with a rotating pinion, a carrier in rigid attachment with the said spur-wheel, a slide mounted on the said carrier, a rim-forming roll rotatable upon the said slide, and slide-advancing mechanism operated from a spur-wheel fixed to the said bed projecting stem, substantially as set forth.

2. In machines for the manufacture of rimmed wheels and disks from plain sheet-metal blanks of uniform thickness, the combination with a carrier rotatable about the blank fixed to the machine, and a tool-slide mounted on the same carrier, of a cam engaging the outer end of the said slide, a worm-wheel fixed to the spindle of the said cam, a driving-worm mounted upon a spindle provided with a swiveling bearing at one end and a sliding bearing at the opposite end, a withdrawing-spring in attachment with the said sliding bearing, a pivoted stop-piece, a stop-piece knock-out lever, and a knock-out-lever-operating peg fixed upon and rotating with the said worm-wheel, substantially as set forth.

3. In machines for the manufacture of rimmed wheels and disks from plain sheet-metal blanks of uniform thickness, the combination with rim-forming mechanism rotat-



ing around a stem constituting a part of the  
fixed bed of the machine, of a holding-down  
ram having a screw-thread cut around its  
upper portion, a worm-wheel having an in-  
ternally-threaded center mounted upon the  
5 said screwed portion of the ram, a worm en-  
gaging the said worm-wheel, a pair of belt-  
pulleys mounted freely upon the shaft of the

said worm, and a clutch arranged between  
the said pulleys, substantially as set forth. 10

In witness whereof I have hereunto set my  
hand in presence of two witnesses.

EDWARD WILLIAMS.

Witnesses:

EDWARD MARKS,

HERBERT BOWKETT.