

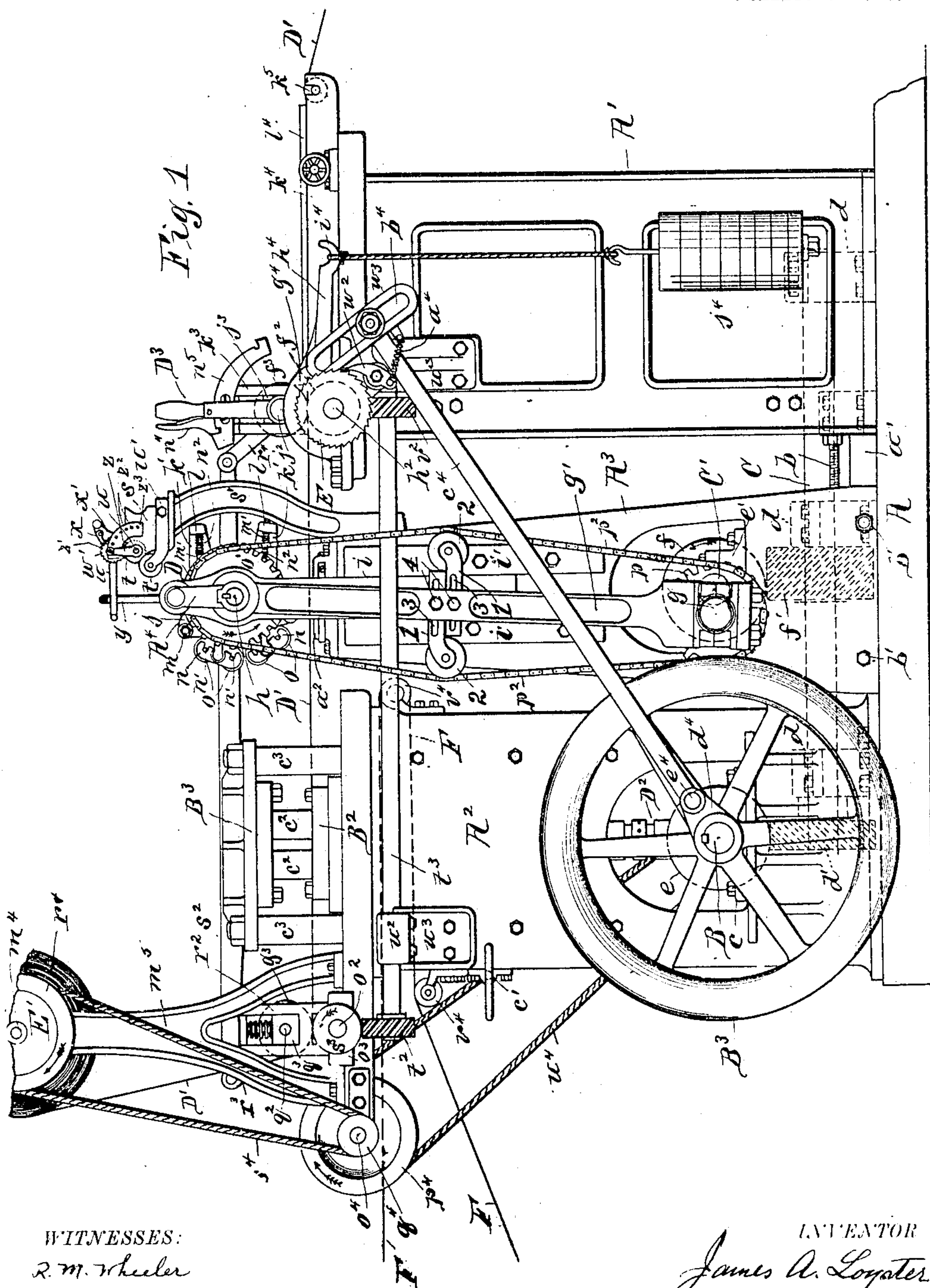
No. 818,699.

PATENTED APR. 24, 1906.

J. A. LOYSTER.
COMBINED PRINTING AND CUTTING MACHINE.

APPLICATION FILED AUG. 4, 1904.

7 SHEETS—SHEET 1.



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No. 818,699.

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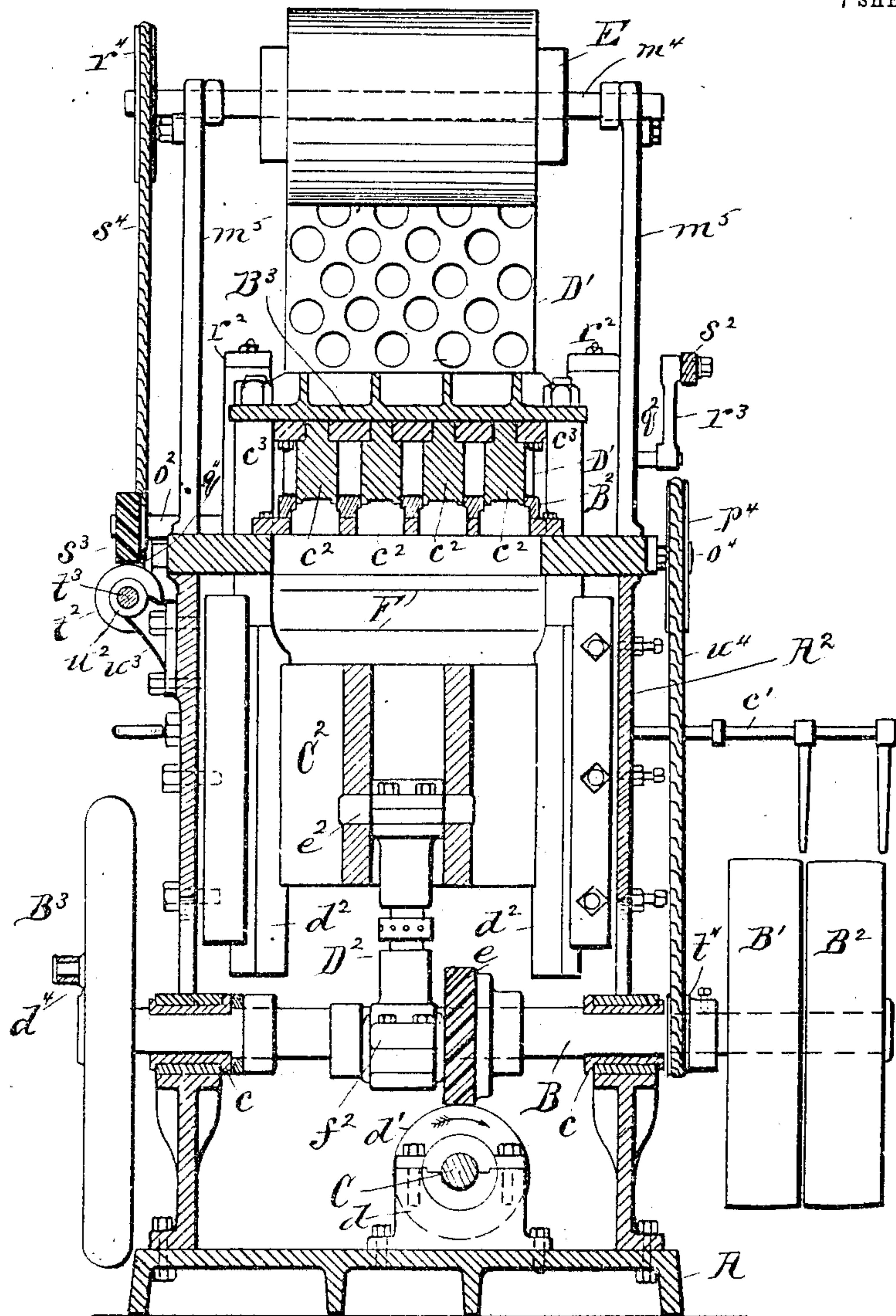


Fig. 2

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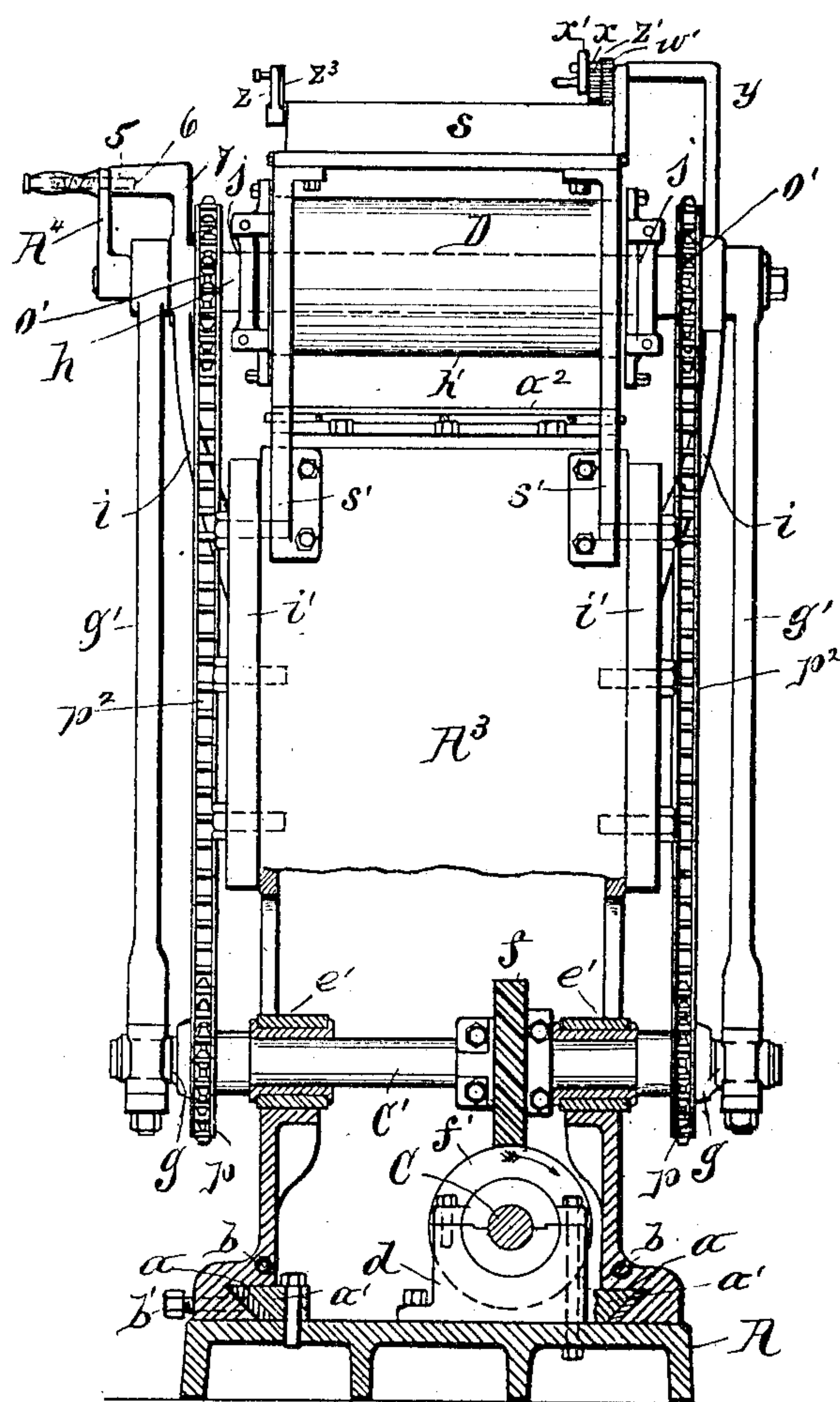


Fig. 3

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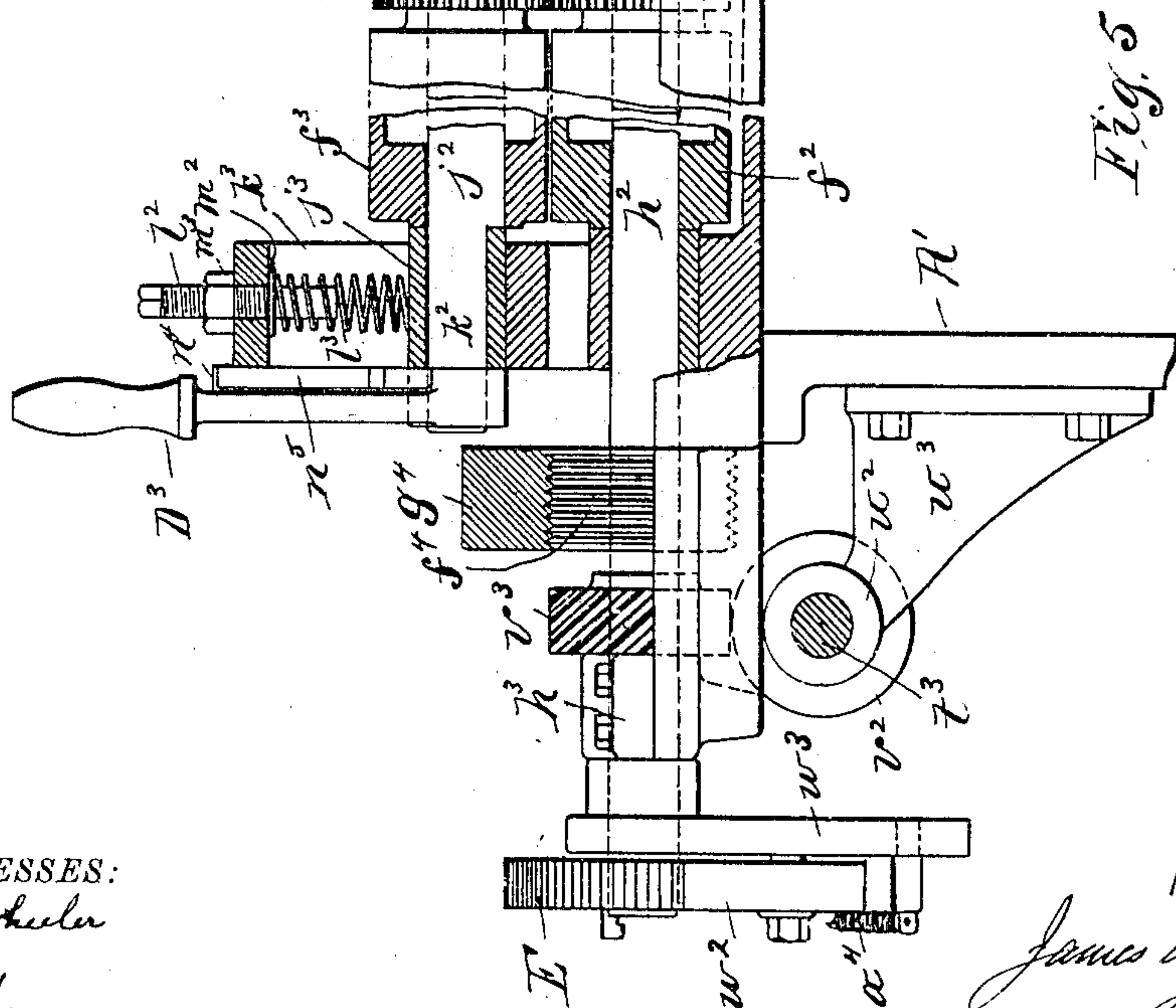
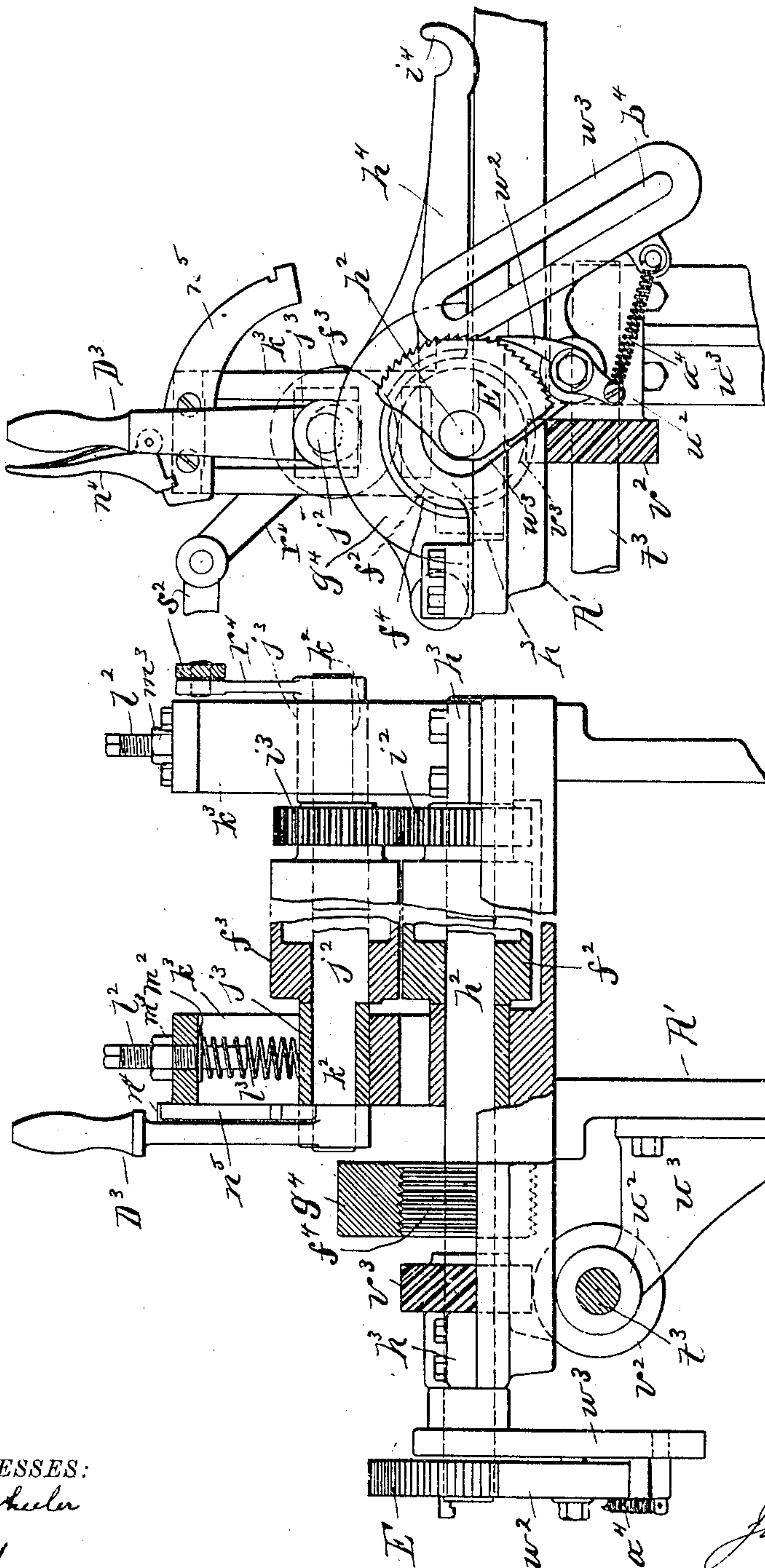
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7 SHEETS--SHEET 4.



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7 SHEETS—SHEET 5.

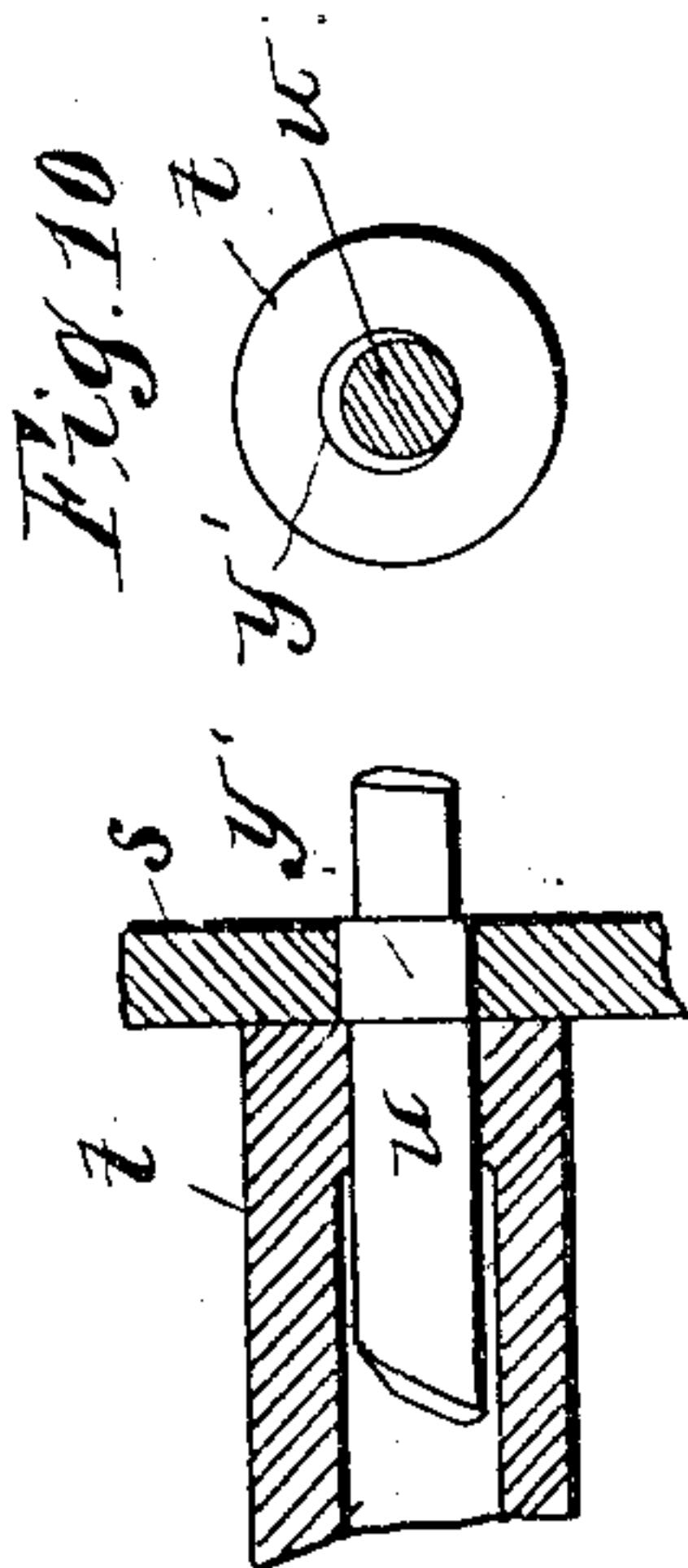


Fig. 9

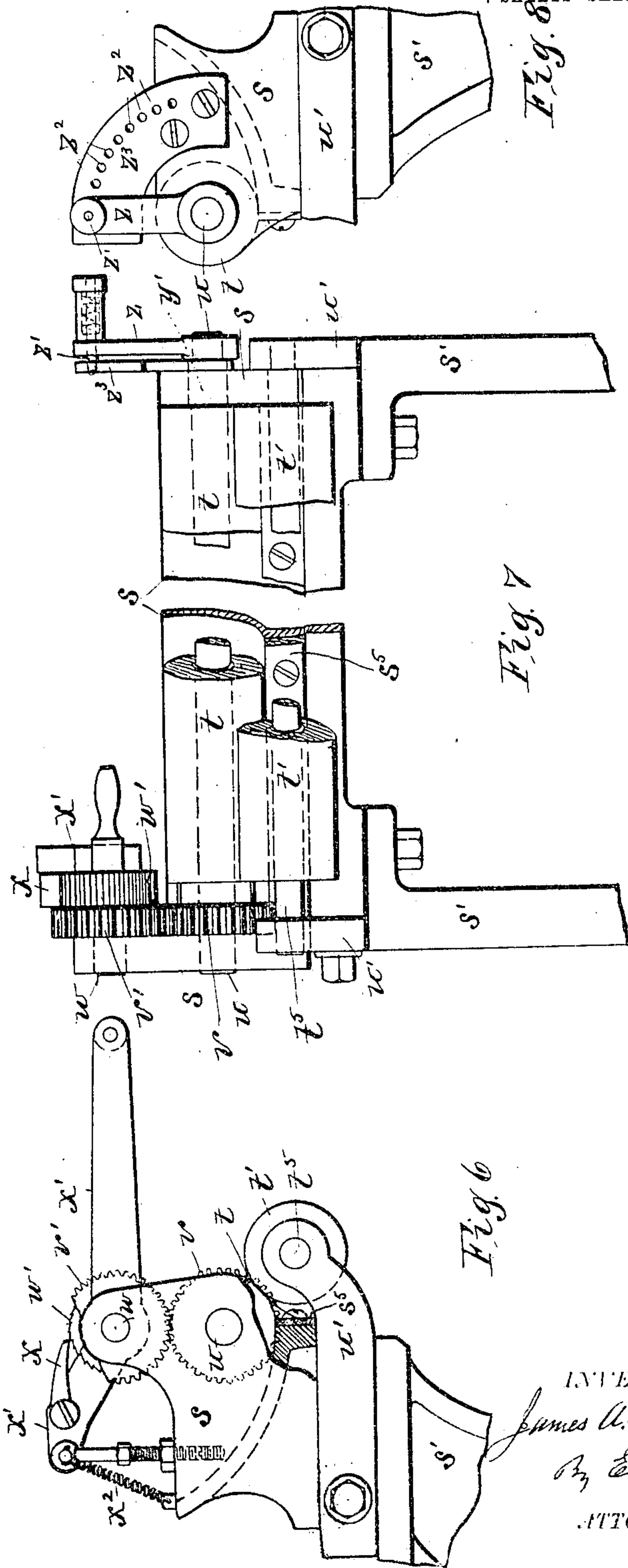


Fig. 7

Fig. 6

Fig. 8

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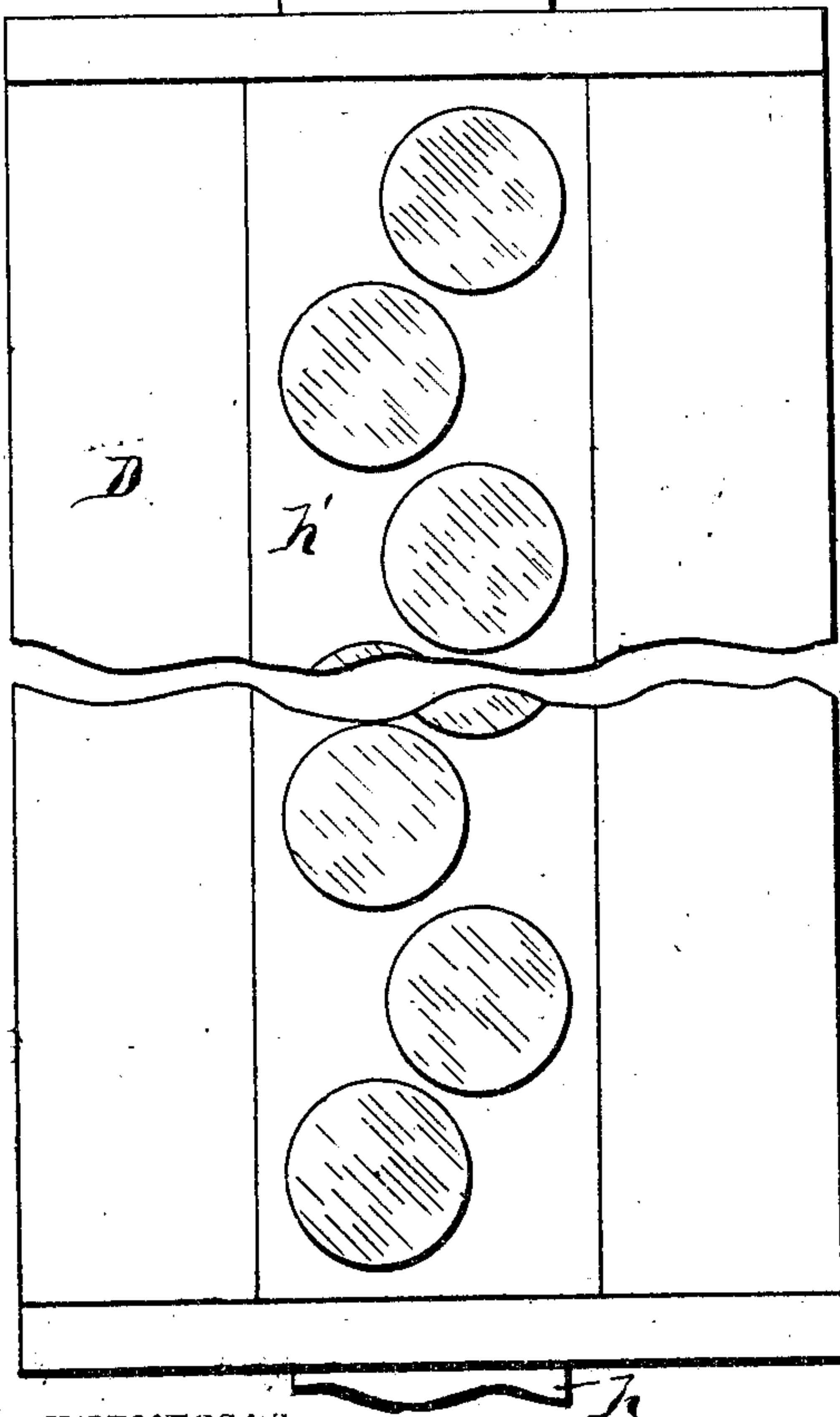
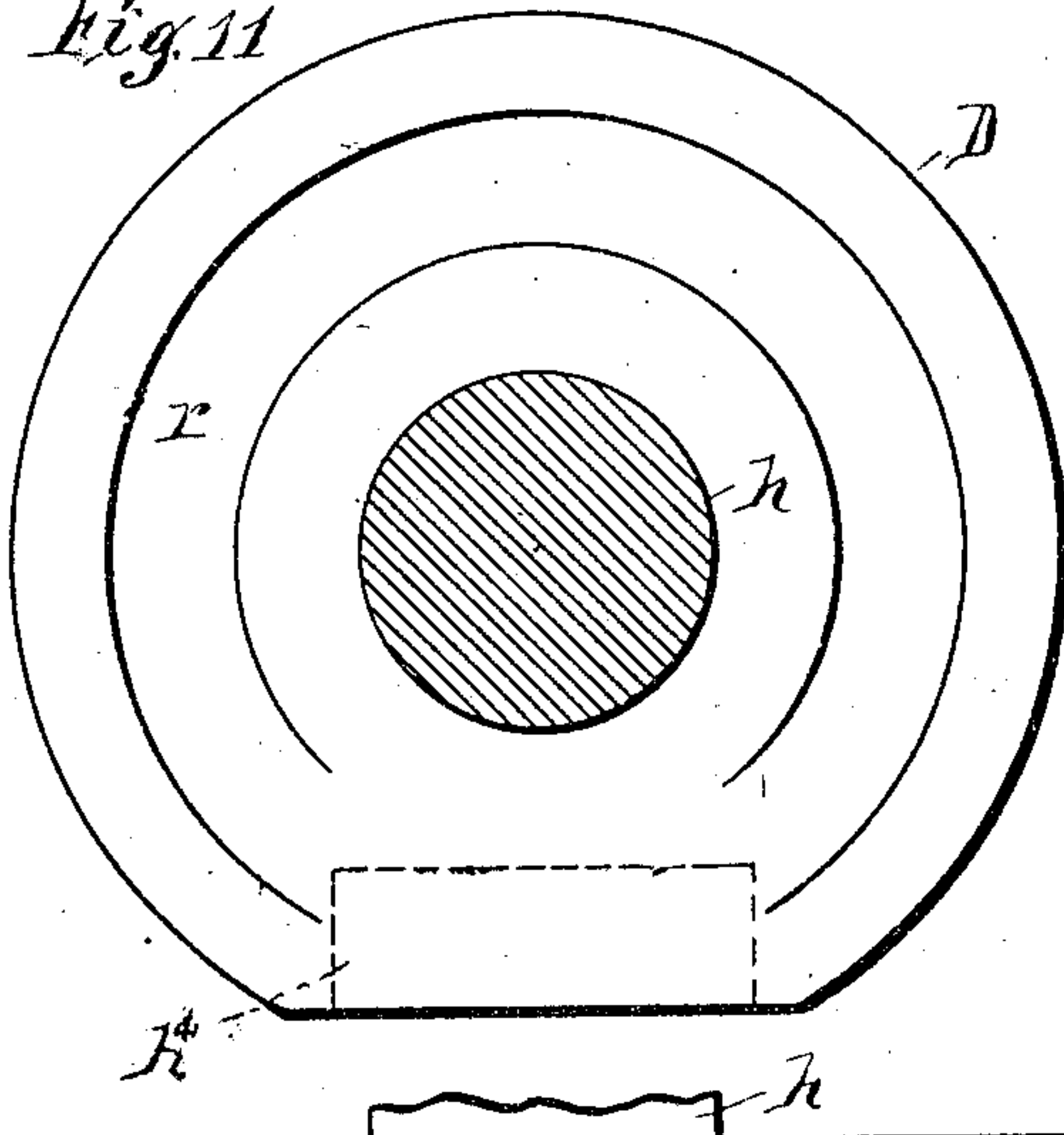
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APPLICATION FILED AUG. 4, 1904.

7 SHEETS—SHEET 6.

Fig. 11



WITNESSES:

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Fig. 12

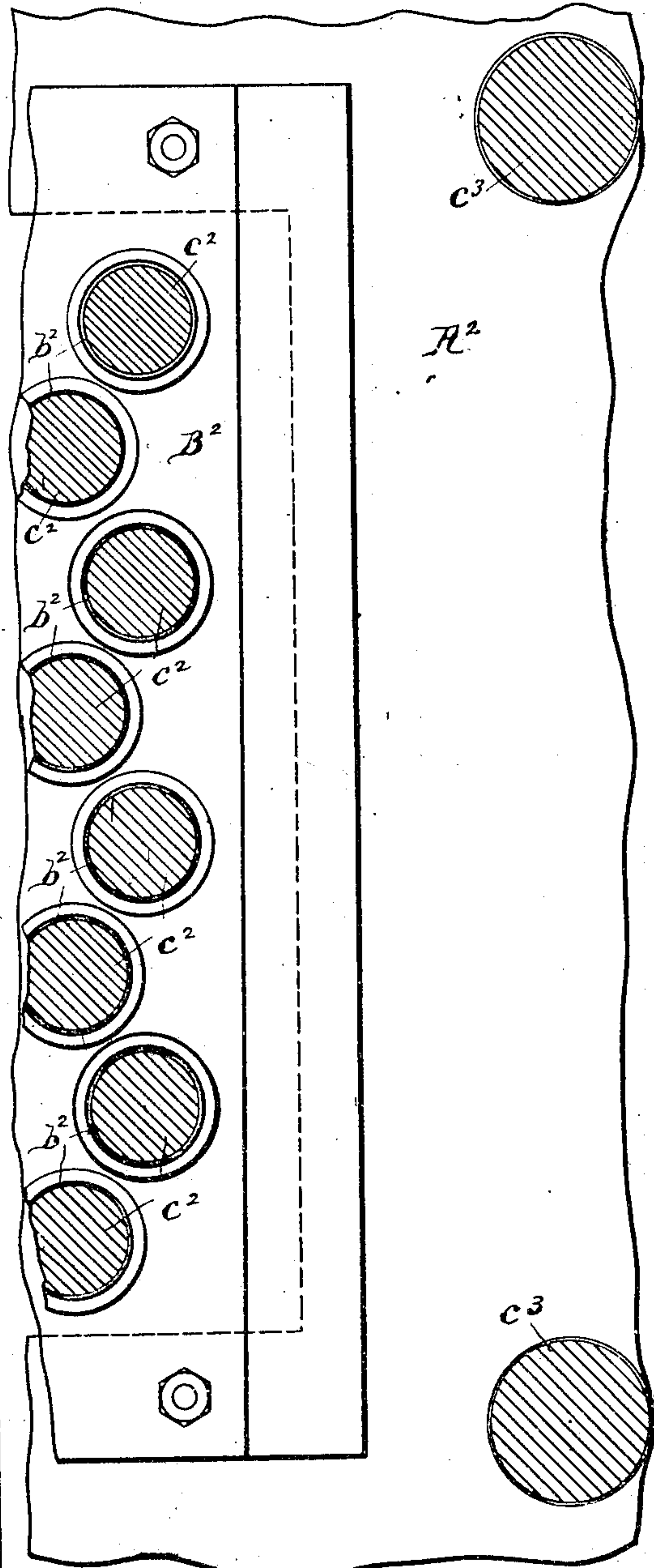


Fig. 13

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7 SHEETS—SHEET 7.

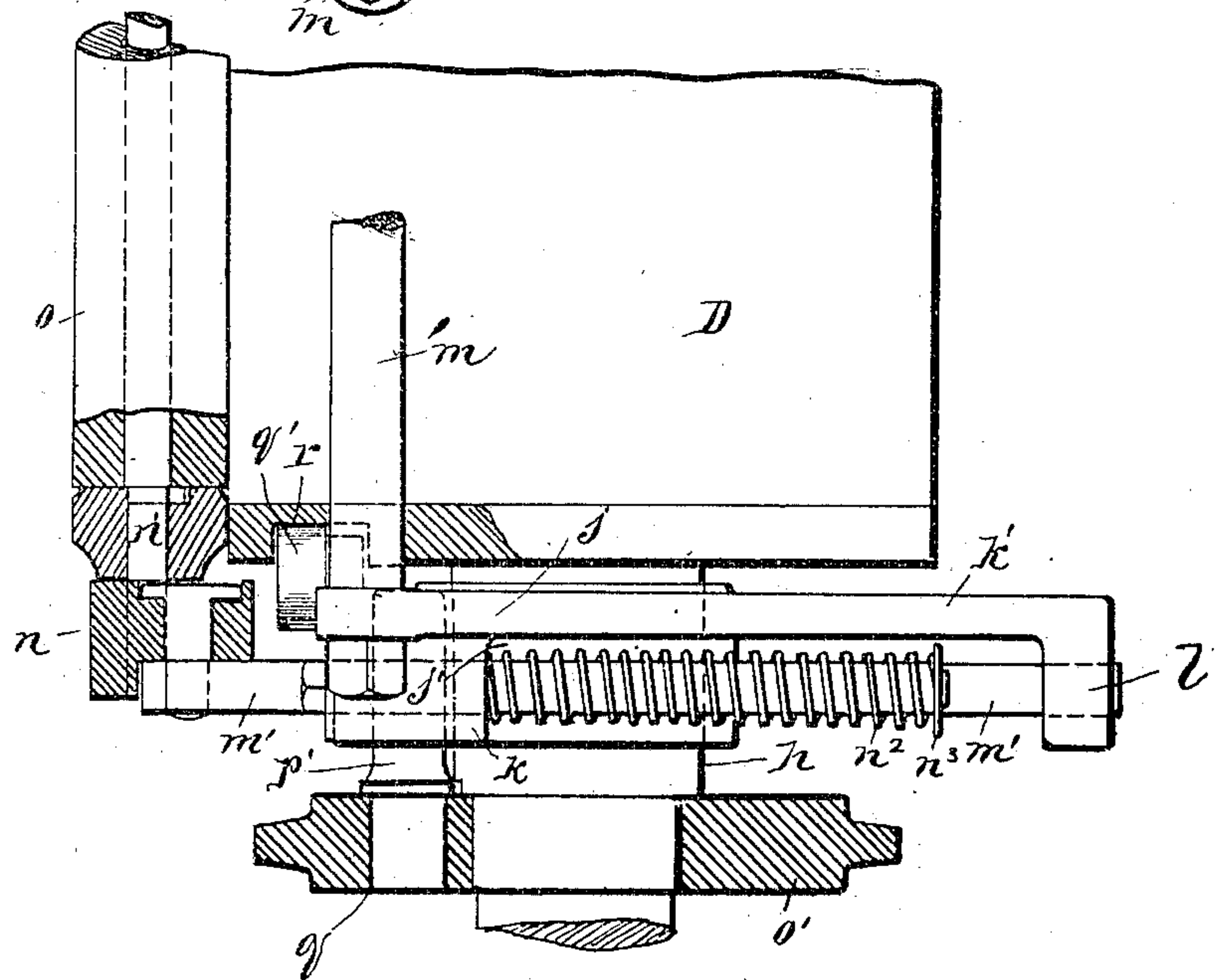
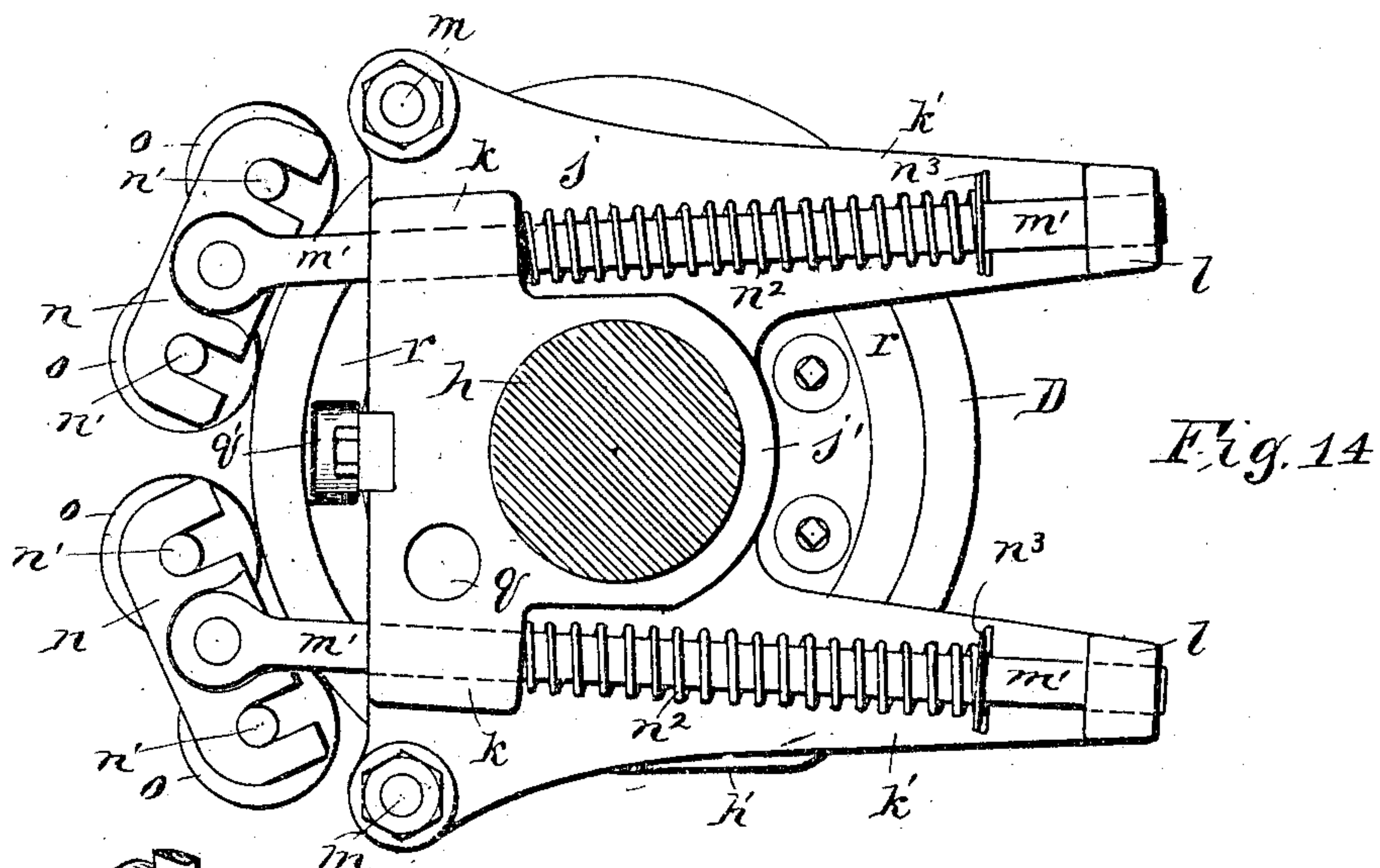


Fig. 15

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UNITED STATES PATENT OFFICE.

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COMBINED PRINTING AND CUTTING MACHINE.

No. 818,699.

Specification of Letters Patent.

Patented April 24, 1906.

Application filed August 4, 1904. Serial No. 219,439.

To all whom it may concern:

Be it known that I, JAMES A. LOYSTER, of Cazenovia, in the county of Madison, in the State of New York, have invented new and useful Improvements in a Combined Printing and Cutting Machine, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention relates to the class of machines in which a web or strip of paper or cardboard is fed therethrough and primarily subjected to the action of printing devices and secondarily to the action of cutting or
15 punching means, serving to form therefrom disks or plates bearing the impressions produced by the said printing devices, which cut-out portions may be used for various purposes.

20 The object of the invention is to produce a combined printing and cutting machine for the aforesaid purpose which shall be strong, durable, and compact in its construction, very efficient and reliable in its operation,
25 and also readily and conveniently controlled and at the same time shall permit of quick and easy manipulation of the parts for the purpose of adjusting the same when required.

30 To that end the invention consists in the novel arrangement and combination of the component parts of the machine, as hereinafter described, and set forth in the claims; and the invention also consists in the novel
35 details of construction of the various mechanisms embodied in the machine.

In the accompanying drawings, Figure 1 is a side elevation of a combined printing and cutting machine embodying my invention.
40 Fig. 2 is partly a side elevation and partly a vertical section of the standard on which the printing-cylinder and inking devices are supported and showing more clearly the mechanisms operating said parts. Fig. 3 is a ver-
45 tical section of the rear standard and illustrating more clearly the cutting devices and the mechanism operating the same. Fig. 4 is an enlarged detail side view of the pawl-and-ratchet mechanism which actuates the
50 front web-feeding rollers. Fig. 5 is a front view of the same, the said feed-rollers being broken away and shown partly in section. Fig. 6 is an enlarged end view of the ink-fountain. Fig. 7 is a rear view of the same. Fig.
55 8 is an enlarged detail view of the opposite end of the ink-fountain and showing the

means for adjusting one of the feed-rollers thereof. Fig. 9 is a longitudinal sectional view of one end of the upper ink-feeding roller and a portion of the reservoir and illustrating one of the eccentrics of the adjusting means. Fig. 10 is an end view of the said roller, the shaft thereof being shown in cross-section. Fig. 11 is an enlarged detail end view of the printing-cylinder, showing the
65 cam-groove by which the inking-rollers are shifted longitudinally. Fig. 12 is an inverted plan view of said printing-cylinder. Fig. 13 is an enlarged longitudinal section of a portion of the die-press, taken above the female
70 die-plate. Fig. 14 is a face view of one of the plates by which the inking-rollers are driven; and Fig. 15 is a plan view of the same with the driving sprocket-wheel and showing the means for shifting said rollers, partly in sec-
75 tion.

Referring to the drawings, A represents the usual bed-plate of the machine-frame, which frame is composed of front and rear end standards A' A², permanently fixed to
80 the bed-plate, and an intermediate standard A³, mounted longitudinally movable thereon, whereby the latter can be shifted toward and from the standard A² for the purpose hereinafter described. The bottom portion of the
85 standard A³ is provided with longitudinal grooves or guides *a a* at opposite sides, which grooves may be of any suitable form and engage correspondingly-shaped tracks *a' a'*, se-
90 cured to or formed integral with the bed-plate, as clearly shown in Fig. 3. The adjustment or shifting of the said standard A³ is preferably obtained by means of screws *b b*, extending from the front standard A' and working into the lower portion of the former.
95 To firmly retain the adjustable standard in its required position, I provide set-screws or bolts *b' b'*, which pass through the lower portion thereof and engage the aforesaid tracks *a' a'*.

100 B denotes the main shaft, which is journaled in suitable boxes *c c*, secured to opposite sides of the rear end standard A², and on said shaft are mounted the usual driving and loose pulleys B' B² and fly-wheel B³ in the
105 well-known manner.

c' is a belt-shifting rod which is supported longitudinally movable on the standard A².

C is a counter-shaft which is disposed longitudinally in relation to the bed-plate A and
110 is journaled in suitable boxes *d d*, secured thereto. Said counter-shaft receives its mo-

tion from the main shaft B by means of worm-gears $d' e$, secured to the respective shafts.

C' denotes a supplemental shaft which is disposed parallel to the main shaft and is
 5 journaled in boxes $e' e'$, mounted on the frame-standard A^3 . Said supplemental shaft receives its motion from the counter-shaft C by means of worm-gears $f f'$, secured to the respective shafts. This latter worm-gear f' is
 10 provided with a widened engaging face in order to maintain the other gear in mesh therewith when the standard A^3 is shifted toward and from the standard A^2 , as aforesaid. The ends of the supplemental shaft C' are pro-
 15 vided with cranks $g g$, preferably formed integral therewith, to which cranks are pivotally connected upright connecting-rods $g' g'$, which receive vertically-reciprocating movement therefrom. These connecting-rods are
 20 disposed at opposite sides of the frame-standard A^3 , and to the upper ends of said connecting-rods is secured a transverse shaft h , which is normally irrevolvable and on which is rigidly mounted a printing-cylinder D, provided
 25 with a flat lower face, the function of said printing-cylinder being to furnish with its cylindrical portion an inking-surface and to carry upon its flat side a suitable type, electrotype, or other printing form h' and to produce therefrom a printed impression upon
 30 the paper or cardboard web D' , fed intermittently beneath it in the manner hereinafter described. The said type or electrotype form may be secured to the printing-cylinder in any
 35 suitable manner.

$i i$ denote two upright arms which are pivotally fastened at their upper ends to the shaft h of the printing-cylinder and have their lower end portions sliding between vertical
 40 guides $i' i'$, fastened to opposite sides of the standard A^3 , whereby during rotation of the shaft C' the connecting-rods $g' g'$ are caused to impart vertically-reciprocating movement to the printing-cylinder D.

45 To the printing-cylinder shaft h is secured a hand-lever A^4 , provided with a spring-pressed pin 5, engaging a socket 6, formed in an extension 7, projecting upwardly from one of the guide-arms i . By withdrawing said
 50 pin the hand-lever can be operated to turn the shaft, and thereby invert the printing-cylinder to afford access to the "form" carried thereon or for the purpose of attaching the same to or removing it from the printing-
 55 cylinder. On the said shaft h of the printing-cylinder at opposite ends thereof are arranged a pair of rotating plates $j j$, formed with hubs $j' j'$, by which they are journaled on said shaft, which hubs are provided with perfor-
 60 rated lugs $k k$. Said plates are also formed with arms $k' k'$, which extend slightly divergent therefrom and are provided with perforated lugs $l l$ on their free ends. These plates
 65 $j j$ are rigidly connected by means of suitable tie-rods $m m$, so as to revolve in unison.

Through the aforesaid lugs $k k l l$ extend longitudinally-movable rods $m' m'$, to one end of which are pivotally connected carriers $n n$, on which are pivotally supported the shafts n'
 70 n' of the inking-rollers $o o$. Said inking-rollers are held in contact with the printing-cylinder by means of spiral springs $n^2 n^2$, surrounding the rods $m' m'$ and bearing at one end against the aforesaid lugs $k k$ of the
 75 plates $j j$ and at their opposite ends against collars $n^3 n^3$, fastened to said rods. By this arrangement of parts the said inking-rollers are caused to travel around the print-
 80 ing-cylinder and across the face of the form thereof when the aforesaid plates $j j$ are rotated on the shaft h . This rotary movement of the plates $j j$ is derived from sprocket-
 85 wheels $o' o'$, journaled on the shaft h of the printing-cylinder adjacent to said plates, which sprocket-wheels are connected to like sprocket-wheels $p p$, fastened to the aforesaid
 90 cranks $g g$ on the shaft C' by means of the usual chains $p^2 p^2$. Said sprocket-wheels $o' o'$ are each provided on the inner face with a pin p' , engaging an aperture or socket q , pro-
 95 vided in the hub of the plate j , whereby the plates are rotated with said sprocket-wheels. The said pins $p' p'$ loosely engage said apertures q , and thus permit the plates j to be shifted longitudinally on the shaft h , which
 100 movement of the plates imparts like movement to the inking-rollers $o o$ for the purpose of more effectually distributing the ink, thereby obtaining a uniformity in the im-
 105 pressions produced by the form upon the web fed thereto. This shifting movement of the inking-rollers is effected by means of small rollers $q' q'$, pivoted to the inner faces of the plates $j j$ and traveling in cam-grooves
 110 $r r$, provided in the ends of the printing-cylinder D. The ink is supplied to the printing-cylinder from a fountain disposed above the said rollers. Said fountain comprises an ink-
 115 storing reservoir s , mounted upon the top of an auxiliary frame s' , fastened to the top of the standard A^3 , a metal ink-feeding roller t , and a coöperating feed-roller t' , composed of rubber or other suitable material.

The metal roller t is journaled on a shaft
 115 u , supported in the end walls of the reservoir, and frictionally engages the composition roller t' to rotate the same. This roller t' is disposed to be engaged by the printing-cylinder D when the latter is moved upward and has its shaft t^5 journaled on arms $u' u'$, project-
 120 ing from the bottom of the reservoir. The ink-feeding roller t is rotated by means of a gear v , secured thereto and meshing with a like gear v' , journaled on an arbor w , project-
 125 ing from the reservoir s , to which latter gear is fastened a ratchet-wheel w' , which is actuated by a pawl x , carried on a rock-arm x' , pivoted to said arbor. This rock-arm is operated intermittently by another arm y , fastened rigidly to one of the vertically-recipro-
 130

feeding guide-arms i , movable with the printing-cylinder shaft, as hereinbefore described and clearly shown in Figs 3, 6, and 7 of the drawings. A spiral spring x^2 retracts the
5 said rock-arm.

The end portions y' y' of the shaft u , by which the shaft is supported in the end walls of the reservoir, are formed eccentric to the main portion upon which the roller t revolves
10 and to the said shaft u is fastened a hand-lever z . The turning of the said lever z causes the eccentric main portion of the shaft u to move the metal roller t toward and from the lip or scraper s^5 , fastened to the reservoir
15 S , causing the roller t to retain a thinner or thicker film of ink, and thus regulate the ink-supply. To retain the roller t in its adjusted position, I provide the hand-lever z with a spring-pressed pin z' , which is adapted to en-
20 gage perforations z^2 z^2 , provided in a plate z^3 and arranged in a line concentric to the shaft of the roller. This plate z^3 is preferably secured to one end of the ink-reservoir s , as clearly shown in Figs. 7 and 8 of the draw-
25 ings.

a^2 denotes a stationary platen upon which the printing impression is made and which may be of any suitable form and material and is fastened on top of the frame-standard
30 A^3 in any convenient manner, over which platen the web D' travels. Back of the described printing mechanism is disposed a die-press which operates upon the printed web. This die-press comprises a female die-plate
35 B^2 , provided with cutting-apertures b^2 b^2 . Said die-press also comprises a like number of male dies or punches c^2 c^2 , carried on the under side of a head B^3 . These apertures of the die-plate and coöperating male dies may
40 be of any desired shape and size. The said female die-plate B^2 is rigidly fastened on top of the frame-standard A^2 in any suitable manner. The aforesaid head B^3 , which carries the male dies, is firmly fastened on the
45 upper ends of vertically-reciprocating rods or posts c^3 c^3 , which are connected to and receive motion from a plunger C^2 , sliding on vertical guides d^2 d^2 , fastened within the standard A^2 . Said plunger is operated by
50 means of a pitman D^2 , pivotally connected thereto, as indicated at e^2 , which pitman is connected at its lower end to a crank f^5 , secured to or formed integral with the main shaft B , as clearly shown in Fig. 2 of the
55 drawings. The aforesaid die-plate B^2 is disposed in plane with the platen a^2 of the described printing devices, over which plate the printed web is fed. It will be understood that the said web is fed from a roll
60 which may be supported in any suitable and convenient manner. (Not necessary to be shown.)

The web-feeding mechanism comprises a pair of rollers f^2 f^3 , disposed in front of the
65 printing devices, and a similar pair of rollers

g^2 g^3 , disposed back of the die-press, which pairs are supported on the top of the frame-standards A' A^2 , respectively. The shaft h^2 of the lower feed-roller f^2 of the front pair is journaled in suitable boxes h^3 h^3 , fastened to
70 the said standard A' , and to one end of said shaft is fastened a gear i^2 , meshing with a gear i^3 , fastened to the corresponding end of the companion roller f^3 , which latter roller is journaled on a shaft j^2 , formed at its end por-
75 tions with eccentrics k^2 k^2 , by which it is supported in suitable boxes j^3 j^3 , disposed vertically movable in brackets k^3 k^3 , fastened to the standard A' . Extending through the tops of said brackets are vertical screw-rods
80 l^2 l^2 , and surrounding said rods are spiral springs l^3 l^3 , bearing on the said boxes j^3 j^3 , and collars m^2 m^2 , fastened to the screw-rods, which springs serve to press the roller f^3 upon the other roller f^2 . By turning these screw-
85 rods the tension of the said springs can be regulated, and each of the rods is provided with a set-nut m^3 , bearing on top of the bracket and serving to retain the screw in its
90 adjusted position. To one of the eccentrics k^2 of the shaft j^2 is fastened an upright hand-lever D^3 for turning the shaft to raise the roller f^3 for the purpose of inserting or removing the web. Said lever is provided with
95 a spring-pressed dog n^4 , which is disposed to engage a rack n^5 , secured to the adjacent bracket k^3 , which engagement of the dog locks the said roller either in its normal or
100 raised position. The shaft o^2 of the lower web-feeding roller g^2 of the rear pair is journaled in suitable boxes o^3 o^3 , fastened to the top of the frame-standard A^2 , and is journaled on a shaft q^2 , supported in boxes q^3 q^3 ,
105 disposed vertically movable in brackets r^2 r^2 , fastened to the top of said standard A^2 . The ends of said shaft q^2 are formed with eccentrics. (Not necessary to be shown.) These
eccentrics are formed like the aforesaid eccentrics k^2 k^2 , and to the shaft q^2 is fastened an upright lever r^3 , which is connected by a
110 rod s^2 to a similar lever r^4 , fastened to the shaft j^2 of the upper roller of the front pair, whereby the feed-roller g^3 is raised and lowered simultaneously with the said roller f^3 when the aforesaid hand-lever D^3 is operated.
115 To the shaft o^2 of the web-feeding roller g^2 is fastened a worm-gear s^3 , which meshes with a like gear t^2 , fastened to one end of a longitudinal shaft t^3 , journaled in suitable
120 boxes u^2 u^2 , formed on brackets u^3 u^3 , secured to the sides of the frame-standard A' A^2 , respectively, as clearly shown in Figs. 1, 2, 4, and 5 of the drawings. To the opposite end of the shaft t^3 is secured a worm-gear v^2 ,
125 which meshes with a worm-gear v^3 , fastened to the shaft h^2 of the web-feeding roller f^2 , whereby all of said feed-rollers are rotated in unison. The said pairs of rollers are rotated intermittently to impart step-by-step move-
ment to the web, which is properly timed 13

with the raising and lowering of the aforesaid printing-cylinder and male dies of the die-press. To produce this intermittent movement to the rollers and resultant movement of the web, I prefer to employ a ratchet-wheel E, which is secured to the shaft h^2 of the feed-roller f^2 and is actuated by a pawl w^2 , pivoted to an oscillatory arm w^3 , pivotally supported on said shaft, said pawl being held in its engagement by means of a spiral spring a^4 , as more clearly is shown in Figs. 4 and 5 of the drawings. The said oscillatory arm w^3 is provided with a longitudinal slot b^4 , in which is adjustably secured one end of a rod c^4 , which is connected at its opposite end to a crank d^4 , fastened to the main shaft B, as indicated at e^4 and clearly shown in Fig. 1.

To the shaft h^2 of the web-feeding roller f^2 is rigidly secured a collar f^4 , provided with grooves in its periphery, which collar is frictionally engaged by an interiorly-grooved segmental brake-shoe g^4 , pivoted to the top of the standard A' . Said brake-shoe is formed with a horizontal arm h^4 , terminating with a hook i^4 , from which is suspended a weight j^4 , which draws said shoe firmly onto the collar. Said collar and shoe serve as a detent to prevent rotation of the feed-rollers and resultant shifting of the web during the retrograde movement of the aforesaid actuating-pawl w^2 . The rear pair of web-feeding rollers g^2 g^3 are preferably of slightly larger diameter than the front pair of feed-rollers f^2 f^3 in order to exert a tension on the web during the operation of feeding, and thus prevent the web from buckling. On top of the standard A' is provided a suitable bed k^4 , over which the web is drawn by the feed-rollers, and at the outer end of said bed is provided a roller k^5 , over which the web travels. This bed is also provided at opposite sides with suitable guides l^4 l^4 for the web. (Not necessary to be shown in detail.)

E' represents a roller or drum which has its shaft m^4 journaled upon two upright bracket-arms m^5 m^5 , fastened to the top of the frame-standard A^2 upon which roller the remnant portion of the web is wound after the latter has been operated on by the die-press. On the standard A^2 is journaled a transverse shaft o^4 , to the ends of which are respectively fastened large and small grooved pulleys p^4 q^4 . To the shaft of the roller or drum E' is fastened a like pulley r^4 of a diameter equal to the pulley p^4 , which pulleys r^4 q^4 are connected by a belt s^4 . To the main shaft B is secured a pulley t^4 , equal to the diameter of the pulley q^4 . This pulley t^4 , being connected to the larger pulley p^4 on the shaft o^4 by a belt u^4 , rotary movement is transmitted from said main shaft to the roller or drum E'. It will be understood that the tension of said belts is so adjusted as to allow said belts to slip on their pulleys to a degree, and thus not

effect the intermittent movement imparted to the web, as described.

F represents a conveyer or apron which travels below the die-press and receives the disks or plates cut from the web. Said conveyer is supported on rollers v^4 v^4 , supported on the standard A^2 , and may be operated by any suitable means. (Not necessary to be shown.)

In reference to the printing devices hereinbefore described the connecting-rods g' g' thereof are each provided with a pair of horizontal plates 1 1, which are secured thereto longitudinally adjustable. These plates are provided with rollers 2 2, on which the aforesaid sprocket-chains p^2 p^2 ride, and the adjustability thereof serves to regulate the tension of said chains. This adjustment is obtained by providing the plates with longitudinal slots 3 3, through which slots and bars pass bolts 4 4. By loosening said bolts the plates can be shifted in opposite directions to cause their rollers to exert greater or less pressure against the chains.

What I claim is—

1. In a machine of the character described, the combination of an irrevolvable printing-cylinder, means imparting vertically-reciprocating movement thereto, means supplying the cylinder with ink and controlled by the movement thereof, ink-distributing rollers movable on the printing-cylinder, means operating said ink-distributing rollers, a platen supported below the printing-cylinder, and mechanism intermittently feeding a web over the platen as set forth.

2. In a machine of the character described, the combination of an irrevolvable printing-cylinder, means imparting vertically-reciprocating movement thereto, an ink-storing receptacle, rollers feeding the ink to the printing-cylinder, mechanism intermittently rotating the rollers, means carried with the cylinder for actuating said mechanism, ink-distributing rollers traveling around the printing-cylinder, means operating said ink-distributing rollers, and intermittently-operated web-feeding means as set forth.

3. In a machine of the character described, the combination of an irrevolvable printing-cylinder, means imparting vertically-reciprocating movement thereto, an ink-fountain comprising a reservoir and intermittently-rotated rollers feeding the ink to the printing-cylinder, one of said rollers being arranged to be engaged by the cylinder in its upward movement, suitably-supported ink-distributing rollers traveling around the cylinder, means operating said ink-distributing rollers, means actuated during the downward movement of the cylinder for rotating the ink-feeding rollers, and means intermittently feeding the web under the said printing-cylinder as set forth.

4. In a machine of the character described,

the combination of an irrevolvable printing-cylinder, means imparting vertically-reciprocating movement thereto, an ink-fountain supported above the cylinder and comprising
 5 a reservoir, rollers feeding the ink therefrom to the cylinder, and pawl-and-ratchet mechanism rotating said rollers intermittently, means carried with the cylinder for actuating said pawl-and-ratchet mechanism, ink-distributing rollers carried on and adapted to
 10 travel around the printing-cylinder, means operating the latter rollers, a stationary platen disposed below the cylinder, and mechanism for intermittently feeding the web between said printing-cylinder and
 15 platen as set forth.

5. In the machine herein described, the combination with the frame, of an irrevolvable horizontal shaft, vertically-reciprocating supports for the ends of said shaft, means operating said supports, a printing-cylinder rigidly mounted on said shaft, a platen below
 20 the cylinder, an ink-fountain comprising a reservoir, rollers feeding the ink from the reservoir to the cylinder, and mechanism intermittently rotating said rollers, means carried on one of the shaft-supports for actuating said mechanism, ink-distributing rollers
 25 permanently in contact with the printing-cylinder, carriers for the latter rollers supported revolubly on the aforesaid shaft and causing the rollers to travel around the cylinder, means operating said carriers, and intermittently-operated web-feeding means as set
 30 forth.

6. In a machine of the character described, the combination of a normally irrevolvable printing-cylinder, mechanism imparting vertically-reciprocating movement thereto, ink-
 40 ing-rollers movable with and traveling around said printing-cylinder, an ink-fountain comprising a reservoir and rollers feeding the ink therefrom to the printing-cylinder, means rotating said ink-feeding rollers, and mechanism intermittently feeding the web to the
 45 printing-cylinder as set forth.

7. In a machine of the character described, the combination of a normally irrevolvable printing-cylinder, mechanism imparting vertically-reciprocating movement thereto, suitably-supported inking-rollers traveling
 50 around the printing-cylinder, means imparting longitudinally-reciprocating movement to said inking-rollers, an ink-fountain comprising a reservoir and feed-rollers supplying ink to the printing-cylinder, and means intermittently rotating said ink-feeding rollers as set
 55 forth.

8. In a machine of the character described, the combination of a normally irrevolvable printing-cylinder, suitably-operated longitudinally-reciprocating ink-distributing rollers traveling around the printing-cylinder, ink-supplying means, means imparting vertically-
 60 reciprocating movement to said printing-

cylinder, geared web-feeding rollers disposed in front and back of the cylinder, and suitably-actuated pawl-and-ratchet mechanism intermittently rotating said web-feeding
 70 rollers as set forth.

9. In the herein-described machine, the combination with a suitable supporting-frame, of a normally irrevolvable transverse shaft, a printing-cylinder mounted on said
 75 shaft, mechanism imparting vertically-reciprocating movement to said shaft, a pair of rigidly-connected plates journaled on the shaft at opposite ends of the printing-cylinder, inking-rollers driven by said plates and lying on the printing-cylinder, and means rotating said
 80 plates to cause said inking-rollers to travel around the printing-cylinder as set forth.

10. In the herein-described machine, the combination with a suitable supporting-frame of a normally irrevolvable shaft, a printing-cylinder rigidly mounted on said shaft, mechanism imparting vertically-reciprocating movement to said shaft, inking-roller carriers, supports mounted revolubly and longitudinally shiftable on said shaft and driving
 85 said carriers, and means imparting shifting movement to said supports for the purpose set forth.

11. In the herein-described machine, the combination with a normally irrevolvable horizontal shaft, a printing-cylinder secured to said shaft, mechanism imparting vertically-reciprocating movement to said shaft, a pair of upright plates journaled on said shaft at opposite ends of the printing-cylinder, means rotating said plates, longitudinally-movable spring-pressed rods supported on said plates, carriers pivotally connected to said rods, and inking-rollers pivotally supported on said carriers, as set forth.
 100

12. In the herein-described machine, the combination of a normally irrevolvable horizontal shaft, a printing-cylinder rigidly fastened to said shaft, mechanism imparting vertically-reciprocating movement to said shaft, a pair of plates journaled on the shaft at opposite ends of the printing-cylinder, means for rotating said plates, inking-rollers driven by the plates and held in contact with said printing-cylinder, annular cam-grooves provided in the ends of the printing-cylinder, and means on said plates engaging said cam-grooves for reciprocally shifting said plates for the purpose set forth.
 115

13. In the herein-described machine, the combination with the irrevolvable printing-cylinder and means imparting vertically-reciprocating movement thereto, of inking-rollers, rotary inking-roller supports movable with the cylinder and carrying the rollers around the cylinder, and suitably-operated sprocket wheels and chains imparting movement to said inking-roller supports as set forth.
 120

14. In the herein-described machine, the
 125

combination of a main shaft, a normally ir-
 revoluble printing-cylinder, means transmit-
 ting vertically-reciprocating motion from the
 main shaft to said cylinder, inking-rollers
 5 traveling around the printing-cylinder and
 revoluble supports therefor, web - feeding
 rollers geared together, pawl - and - ratchet
 mechanism intermittently rotating said feed-
 10 rollers, sprocket wheels and chains rotating
 said inking-roller supports, and means trans-
 mitting motion from the main shaft to said
 sprocket wheels and chains and to the pawl-
 and-ratchet mechanism as set forth.

15 15. In the herein-described machine, the
 combination with the main frame and main
 shaft, of a suitably-journaled crank-shaft ro-
 tated by said main shaft, upright rods pivot-
 ally connected at their lower ends to said
 20 crank-shaft, a normally irrevoluble shaft car-
 ried on the upper ends of said rods and receiv-
 ing vertically-reciprocating motion there-
 from, a printing-cylinder mounted on said
 shaft, and vertically-movable guide-arms
 connected to said latter shaft as set forth.

25 16. In the herein-described machine, the
 combination with the frame and main shaft,
 of a shaft receiving rotation from the main
 shaft, cranks on the second shaft, a pair of
 upright rods disposed at opposite sides of the
 30 frame and pivotally connected at their lower
 ends to said cranks, a normally irrevoluble
 transverse shaft carried on the upper ends of
 said rods, a printing-cylinder rigidly secured
 to the latter shaft and receiving vertically-
 35 reciprocating motion therefrom, vertical
 guides on the frame, and arms pivotally con-
 nected to said shaft and sliding in said guides
 as set forth.

40 17. In the herein-described machine, the
 combination with the main frame, of a trans-
 verse main shaft, a longitudinal counter-
 shaft rotated thereby, a shaft supported par-
 45 allel to the main shaft and provided with a
 pair of cranks at its ends, means transmitting
 motion from the counter-shaft to said crank-
 shaft, a pair of upright rods disposed at op-
 posite sides of the frame and pivotally con-
 50 nected at their lower ends to the respective
 cranks, a normally irrevoluble transverse
 shaft carried on the upper ends of said rods
 and thereby receiving vertically-reciprocating
 motion, a printing-cylinder rigidly secured
 to the latter shaft, vertically-movable guide-
 55 arms for said rods and shaft, inking-roller
 supports mounted revolvably on said print-
 ing-cylinder shaft at opposite ends of the
 roller, sprocket-wheels journaled on said lat-
 ter shaft and on the aforesaid cranks, chains
 60 connecting said sprocket-wheels, and means
 connecting the upper sprocket-wheels to the
 inking-roller supports as set forth.

18. In the herein-described machine, the
 combination with the main frame and main
 shaft, of a longitudinal counter-shaft, a shaft
 65 parallel to the main shaft and provided with

cranks, gears transmitting motion from the
 main shaft to the counter-shaft and from the
 latter shaft to said crank-shaft, a pair of up-
 right rods pivotally connected at their lower
 ends to said cranks, a normally irrevoluble 70
 shaft carried on the upper ends of said rods, a
 printing-cylinder rigidly secured on the upper
 shaft, vertically-movable guide-arms con-
 nected to the printing-cylinder shaft and
 sliding on the frame, a pair of upright plates 75
 journaled on the latter shaft at opposite ends
 of the printing-cylinder, inking-rollers driven
 by said plates and traveling around the print-
 ing-cylinder, and sprocket wheels and chains
 transmitting rotary motion from said cranks 80
 to the plates as set forth.

19. In the herein-described machine, the
 combination with the main frame and trans-
 verse main shaft, of a longitudinal counter-
 shaft, another shaft parallel to the main shaft 85
 and provided with cranks, worm-gears trans-
 mitting motion from the main shaft to the
 counter-shaft and from the latter shaft to the
 other shaft, a pair of upright rods pivotally
 connected at their lower ends to said cranks, 90
 upright arms connected to the upper end of
 said rods, vertical guides on the frame for
 said arms, a transverse shaft supported nor-
 mally irrevolvably on the upper ends of the
 rods, a printing-cylinder rigidly mounted on 95
 the latter shaft, a pair of upright plates
 mounted revolvably on the printing-cylinder
 shaft at opposite ends of the cylinder, spring-
 pressed carriers pivotally supported on said
 plates, inking-rollers on said carriers and trav- 100
 eling around the printing-cylinder, a pair of
 sprocket-wheels journaled on the printing-
 cylinder shaft and imparting rotary motion
 to said plates, a pair of sprocket-wheels se- 105
 cured to the aforesaid cranks, and chains con-
 necting the latter sprocket-wheels with the
 former as set forth.

20. In the herein-described machine, the
 combination with the frame and main shaft,
 a pair of vertically-movable upright rods, a 110
 crank-shaft actuating said rods, means trans-
 mitting motion from the main shaft to said
 crank-shaft, a transverse shaft supported nor-
 mally irrevolvably on the upper ends of said
 rods, and receiving vertically-reciprocating 115
 movement therefrom, a printing-cylinder rig-
 idly mounted on the latter shaft, a pair of up-
 right plates journaled on said shaft at oppo-
 site ends of the printing-cylinder, inking-
 roller carriers driven by said plates, each of 120
 said plates provided with an aperture,
 sprocket-wheels journaled on said shaft and
 provided with horizontal pins loosely engag-
 ing said apertures and thereby imparting ro-
 tary movement to said plates and permitting 125
 the plates to be shifted longitudinally on the
 shaft, cam mechanism disposed between the
 ends of the printing-cylinder and plates for
 reciprocally shifting the latter, sprocket-
 wheels secured to the aforesaid cranks, and 130

chains connecting the latter sprocket-wheels with the former as set forth.

21. In the herein-described machine, the combination with the frame, a suitably-journaled crank-shaft, means for rotating the same, a pair of upright rods pivotally connected at their lower ends to said shaft, a normally irrevolvable shaft carried on the upper ends of said rods and reciprocated vertically thereby, a printing-cylinder rigidly mounted on the latter shaft, vertical guide-for said rods, inking-roller supports mounted revolvably on said printing-cylinder shaft, sprocket-wheels journaled on said shaft and connected to the respective inking-roller supports, sprocket-wheels fastened to the aforesaid cranks, chains connecting the latter sprocket-wheels with the former, horizontal arms secured longitudinally adjustable on the said rods, and rollers pivoted to said arms and engaging the said chains for the purpose set forth.

22. In the herein-described machine, the combination with the main frame, a platen thereon, a vertically-reciprocating printing-cylinder supported normally irrevolvably over the platen, suitably-supported ink-distributing rollers traveling around the printing-cylinder, of an ink-storing reservoir, geared ink-feeding rollers, a ratchet-wheel connected to one of said ink-feeding rollers, a rock-arm, a pawl carried on said rock-arm and actuating the ratchet-wheel, and means movable with the cylinder for operating said rock-arm as set forth.

23. In the herein-described machine, the combination of a pair of suitably-supported vertically-movable upright rods, a normally irrevolvable shaft carried on the upper end of said rods, a printing-cylinder rigidly mounted on said shaft, means actuating said rods and thereby imparting vertically-reciprocating movement to the printing-cylinder, guide-arms for said rods, one of said guide-arms provided with an upward extension having a horizontal socket, a hand-crank fastened to the shaft and operative for inverting the printing-cylinder, and a spring-pressed pin supported on said hand-crank and engaging said socket as set forth.

24. In the herein-described machine, the combination with a vertically-reciprocating normally irrevolvable printing-cylinder and suitably-operated ink-distributing rollers traveling around the cylinder, of an ink-fountain comprising a reservoir, a pair frictionally-engaged ink-feeding rollers, one feed-roller being arranged to supply ink to the printing-cylinder when the latter is moved upward, a gear fastened to the other feed-roller, a gear supported on the reservoir and meshing with the other gear, a ratchet-wheel connected to said second gear, a suitably-pivoted rock-arm, a pawl carried on said rock-arm and actuating said ratchet-wheel, and an

arm movable with the printing-cylinder and adapted to actuate the rock-arm when the cylinder is moved downward as set forth.

25. In the herein-described machine, the combination of a normally irrevolvable printing-cylinder, means supporting said cylinder and imparting vertically-reciprocating movement thereto, means intermittently feeding a web to the printing-cylinder, suitably-operated die-press adapted to cut out printed portions of the web, a remnant or waste receiving drum or roller, and means for rotating the latter as set forth.

26. In the herein-described machine, the combination of a suitably-operated vertically-reciprocating printing-cylinder, inking-rollers adapted to travel around said cylinder, means operating said inking-rollers, a die-press, means operating said die-press independent of the printing-cylinder, and means intermittently feeding the web to said printing-cylinder and die-press as set forth.

27. In the herein-described machine, the combination of a vertically-reciprocating printing-cylinder adapted to produce a plurality of like impressions, web-cutting means comprising vertically-reciprocating dies for forming disks bearing said impressions, independently-operated mechanisms imparting movements to said cylinder and cutting means, two sets of web-feeding rollers disposed respectively in front of the printing-cylinder and back of the cutting means, and mechanism intermittently rotating said web-feeding rollers as set forth.

28. In the herein-described machine, the combination of a suitably-supported normally irrevolvable printing-cylinder, means imparting vertically-reciprocating movement thereto, ink-feeding means, ink-distributing rollers adapted to travel around said cylinder, mechanism operating the ink-feeding means and ink-distributing rollers, a die-press, means operating said die-press, rollers feeding the web to the printing-cylinder and die-press, and suitably-actuated pawl-and-ratchet mechanism intermittently rotating said web-feeding rollers as set forth.

29. In the herein-described machine, the combination of a suitably-supported irrevolvable web-printing cylinder adapted to produce a plurality of like impressions, inking-rollers disposed permanently in contact with the printing-cylinder, means operative for carrying the inking-rollers around the cylinder, web-cutting means adapted to cut from the web disks bearing the said impressions, intermittently-operated rollers feeding the web to said printing-cylinder and cutting means, and a suitably-operated conveyer disposed under the cutting means for receiving the printed disks as set forth.

30. In the herein-described machine, the combination of printing mechanism, cutting mechanism, means for feeding a web to said

mechanisms, a suitably-operated conveyer traveling below said cutting mechanism, a drum or roller receiving web remnant or waste, and means for operating the said printing and cutting mechanisms and drum as set forth.

31. In the herein-described machine, the combination of a vertically-reciprocating web-printing cylinder adapted to produce a plurality of like impressions, suitably-operated ink-distributing rollers adapted to travel around said cylinder, ink-feeding means, a die-press operative for cutting disks or plates from the web bearing the impressions produced by the printing-cylinder, independent mechanisms simultaneously operating the printing-cylinder and die-press, suitably-rotated rollers intermittently feeding the web to said printing-cylinder and die-press, and a suitably-operated conveyer receiving the printed disks or plates formed by the die-press as set forth.

32. In the herein-described machine, the combination of a suitably-supported normally irrevolvable printing-cylinder, means imparting vertically-reciprocating movement thereto, a die-press comprising vertically-reciprocating male dies and a stationary female die-plate, suitably-operated web-feeding means, a conveyer receiving the cuttings from the die-press, and a suitably-operated drum or roller receiving the web remnant or waste as set forth.

33. In the herein-described machine, the combination with the frame and main shaft, of a pair of suitably-supported upright vertically-movable rods, a normally irrevolvable horizontal shaft carried on the upper ends of said rods, a printing-cylinder rigidly mounted on said shaft and reciprocated vertically by the rods, a crank-shaft operated by the main shaft and actuating said rods, a web-cutting device comprising vertically-reciprocating rods, a head mounted on said rods, and dies carried on said head, mechanism operated by the main shaft and operating said rods, and intermittently-actuated web-feeding means as set forth.

34. In the herein-described machine, the combination with the main frame, main shaft, and counter-shaft, a supplemental shaft parallel to the main shaft, cranks on the supplemental shaft, means transmitting motion from the counter-shaft to said supplemental shaft, a pair of vertically-movable upright rods and vertical guides therefor, said rods actuated by the cranks, a printing-cylinder carried on the upper ends of said rods and reciprocated vertically thereby, a crank connected to the main shaft, a vertically-movable plunger connected to said crank, a head moved by said plunger, male dies carried on said head, a stationary female die-plate on the frame, and suitably-actuated web-feeding means as set forth.

35. In the herein-described machine, the combination with the main frame and main shaft, of a counter-shaft, a supplemental shaft parallel to the main shaft, worm-gears transmitting motion from the main shaft to the counter-shaft and from the latter shaft to the supplemental shaft, a suitably-supported normally irrevolvable vertically-reciprocating printing-cylinder, means imparting motion from the supplemental shaft to said printing-cylinder, a die-press comprising a female die-plate and vertically-reciprocating male dies, means imparting movement from the main shaft to said male dies, web-feeding rollers, mechanism actuated by the main shaft and imparting intermittently rotary movement to said web-feeding rollers, and means for receiving the cuttings from the web produced by the said die-press as set forth.

36. In the herein-described machine, the combination with the main frame and main shaft, of a counter-shaft, a supplemental shaft disposed horizontally, worm-gears, connecting said shafts, cranks connected to the supplemental shaft, vertically-movable upright rods connected to said cranks, a normally irrevolvable printing-cylinder carried on said rods and reciprocated vertically thereby, guide-arms attached to said rods inking devices for the printing-cylinder, a crank connected to the main shaft, a die-press comprising a vertically-movable plunger operated by the latter crank, a head carried by the plunger, male dies fastened to said head, and a female die-plate supported on the frame, web-feeding rollers, pawl-and-ratchet mechanism imparting intermittent rotary motion to said web-feeding rollers, and a rod connected to the main shaft and pawl-and-ratchet mechanism as set forth.

37. In the herein-described machine, the combination of web-cutting mechanism, web-feeding mechanism, printing devices comprising a suitably-supported irrevolvable cylinder for producing impressions on the web, inking-rollers traveling around said printing-cylinder, means imparting vertically-reciprocating movement to the printing-cylinder, a platen under said printing-cylinder, and chain-and-sprocket mechanism operating the inking-rollers and means for shifting the printing devices toward and from the cutting mechanism as set forth.

38. In the herein-described machine, the combination with the main frame comprising a fixed standard and an adjustable standard shiftable toward and from the fixed standard of printing mechanism supported on said adjustable standard and comprising a pair of vertically-movable upright rods, a printing-cylinder carried on said rods and reciprocated vertically thereby, inking-rollers supported on the latter standard and traveling around the printing-cylinder sprocket-wheels and chains actuating said inking-rollers, and a

suitably-rotated crank-shaft operating said rods, a web-cutting mechanism supported on the fixed standard, means operating the cutting mechanism, and suitably-operated web-feeding rollers as set forth.

39. In the herein-described machine, the combination with the main frame comprising a bed-plate, a fixed standard thereon, and an adjustable standard, a transverse main shaft journaled on the fixed standard, a suitably-journaled longitudinal counter-shaft, a supplemental shaft journaled on the adjustable standard and disposed parallel to the main shaft and provided with a pair of cranks, worm-gears transmitting motion from the main shaft to the counter-shaft, and from the latter shaft to the supplemental shaft, a pair of vertically-movable upright rods on the adjustable standard and connected to the respective cranks, an irrevoluble shaft carried

on the upper ends of said rods, a printing-cylinder fixed to said latter shaft, a pair of rigidly-connected plates mounted revolubly on said printing-cylinder shaft, inking-rollers carried on said plates and traveling around the printing-cylinder, sprocket-wheels journaled on the printing-cylinder shaft and connected to the respective plates, sprocket-wheels fastened to said cranks, chains connecting said sprocket-wheels, a vertically-movable plunger supported on the aforesaid fixed standard, a crank on the main shaft, a pitman connecting said crank and plunger, male dies carried on the plunger, a female die-plate mounted on the latter standard, and suitably-operated web-feeding rollers as set forth.

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