

No. 637,587.

Patented Nov. 21, 1899.

E. HETT.

ROLLING UP OR DEVELOPING MACHINE.

(Application filed Jan. 31, 1898.)

(No Model.)

2 Sheets—Sheet 1.

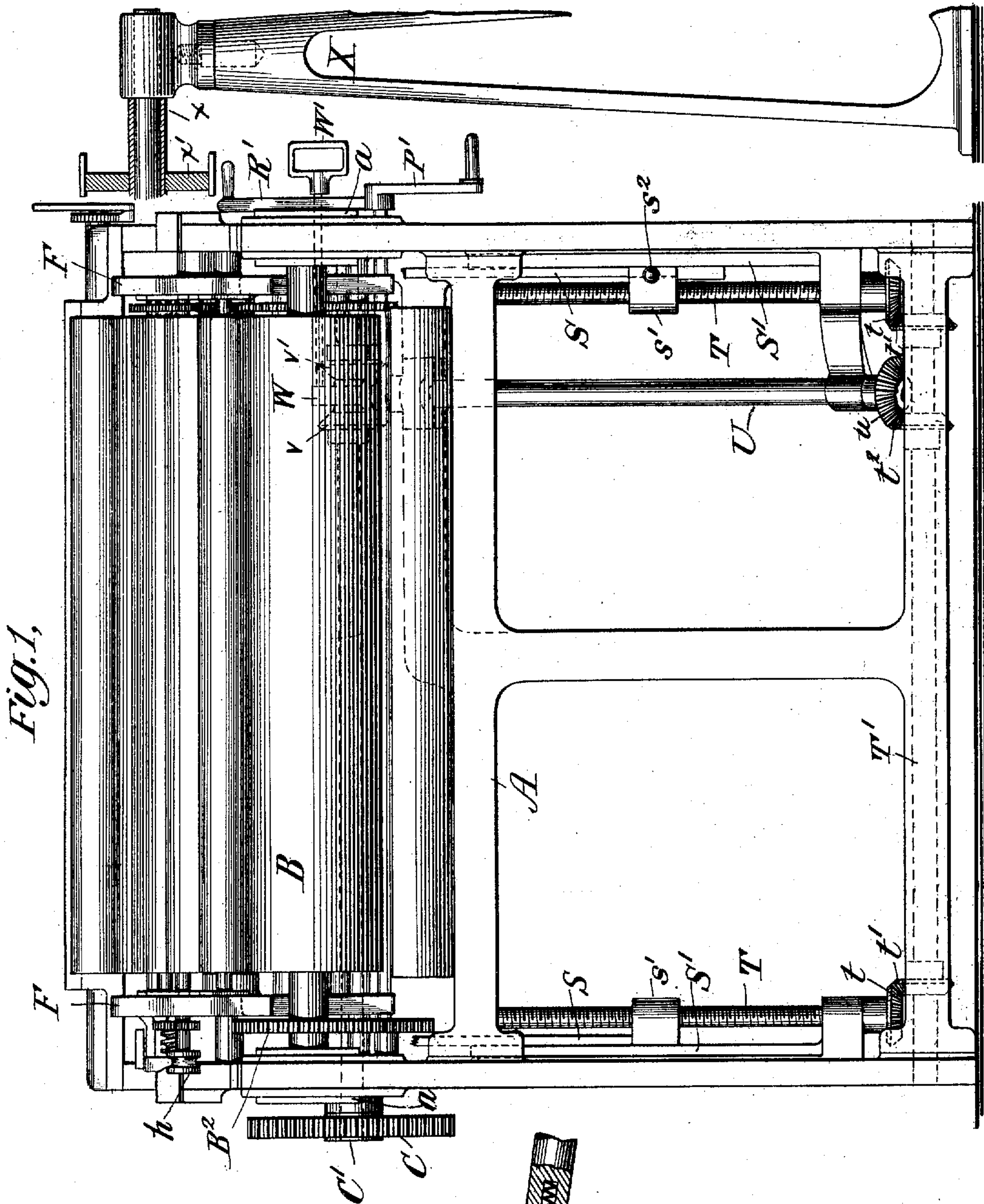
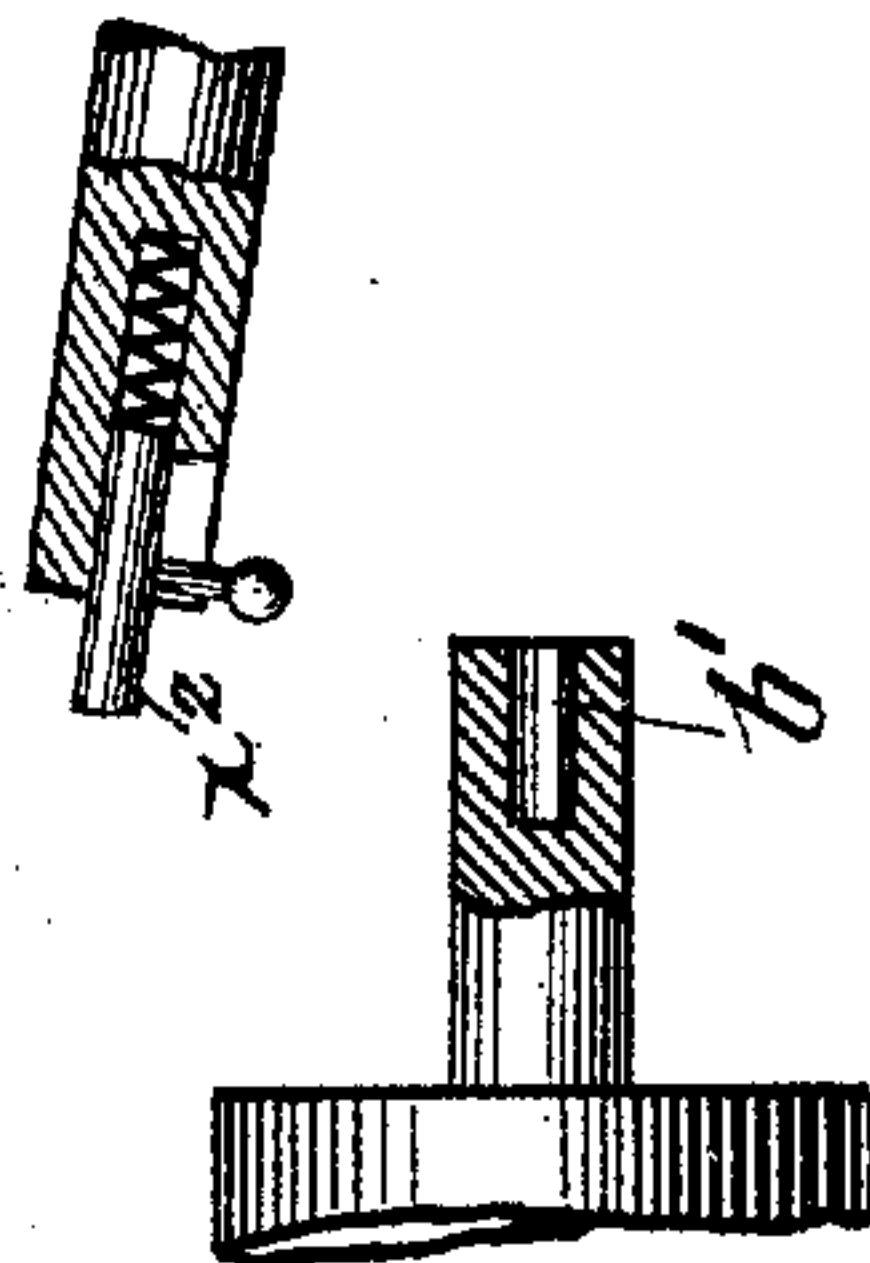


Fig. 1,

WITNESSES:

R. H. Raymond
Edw. Segar

Fig. 6,



INVENTOR

Edward Hett
BY
Walter + Kump
ATTORNEYS

No. 637,587.

Patented Nov. 21, 1899.

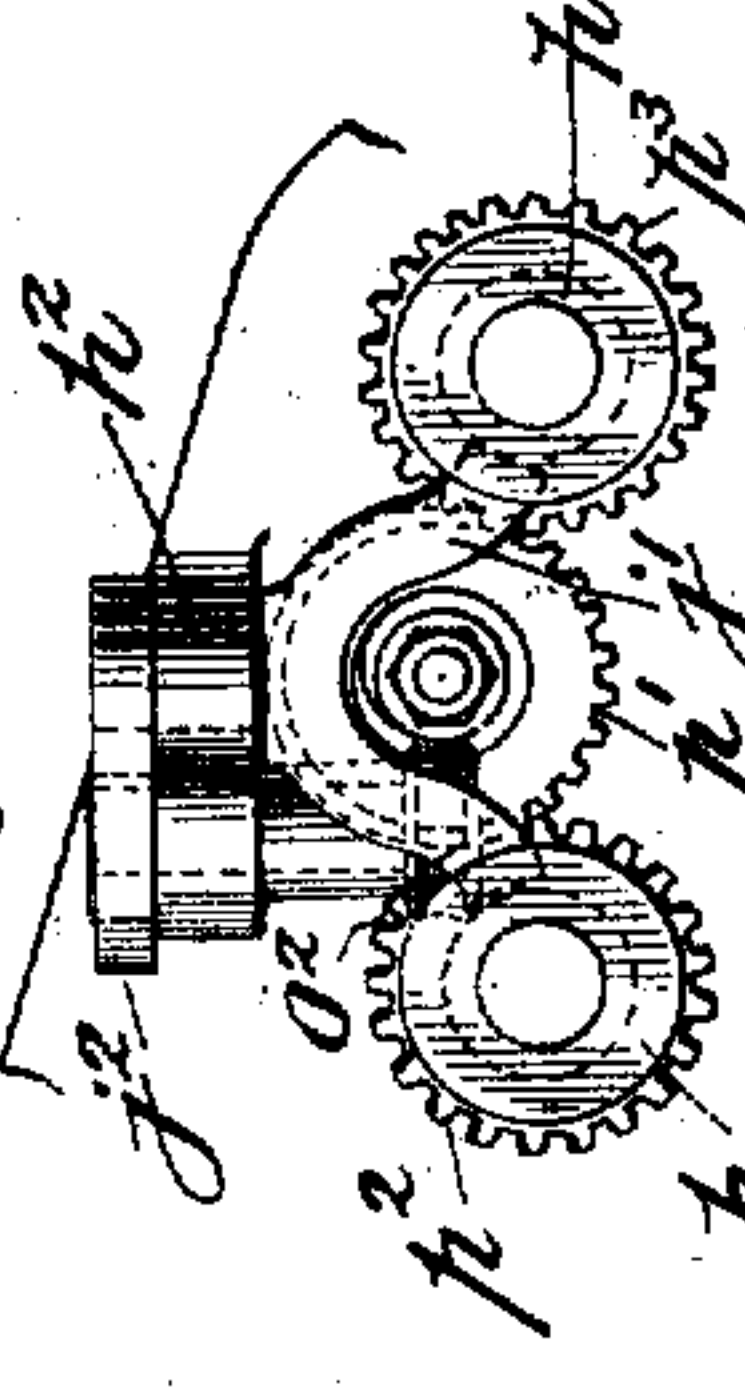
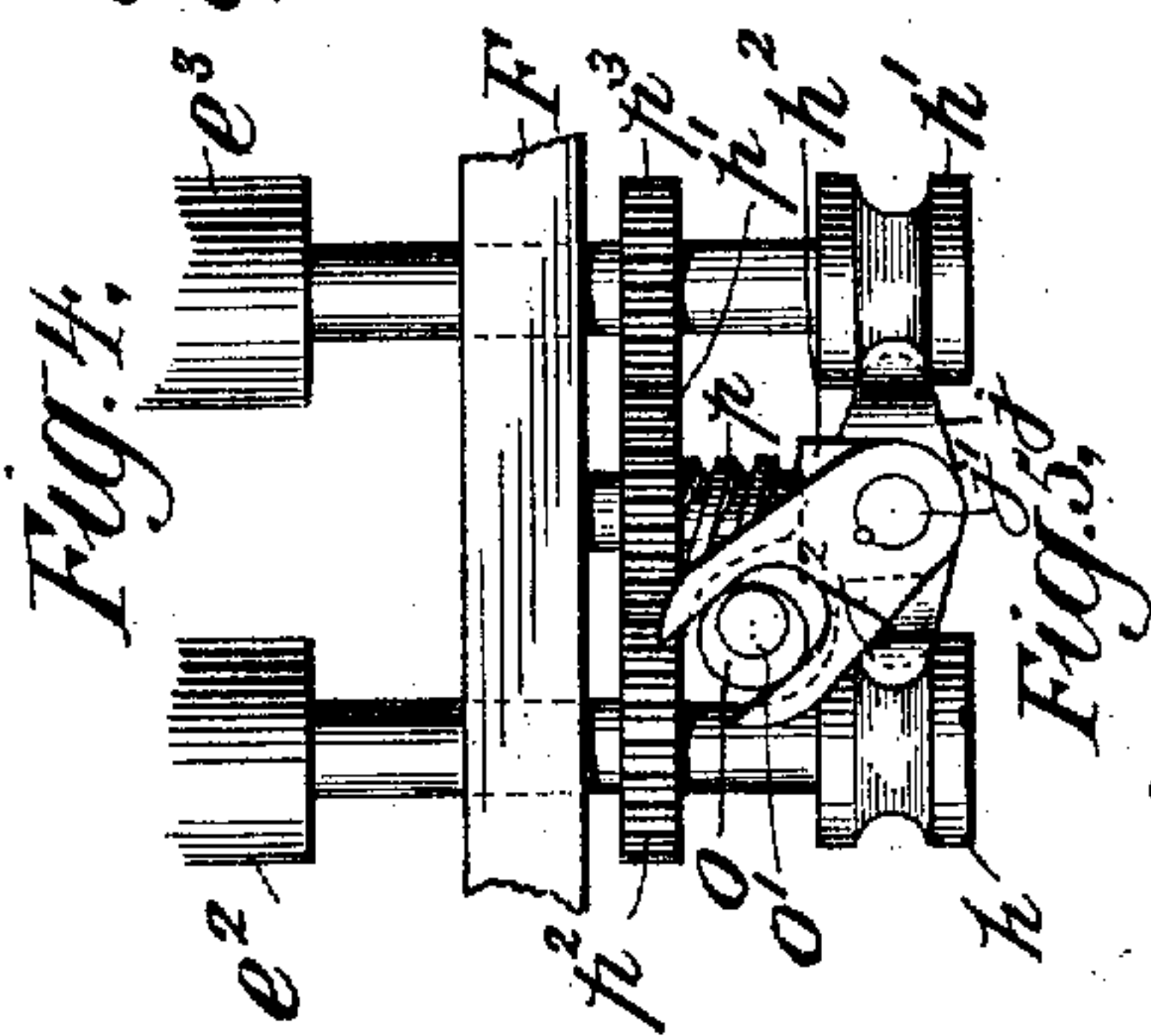
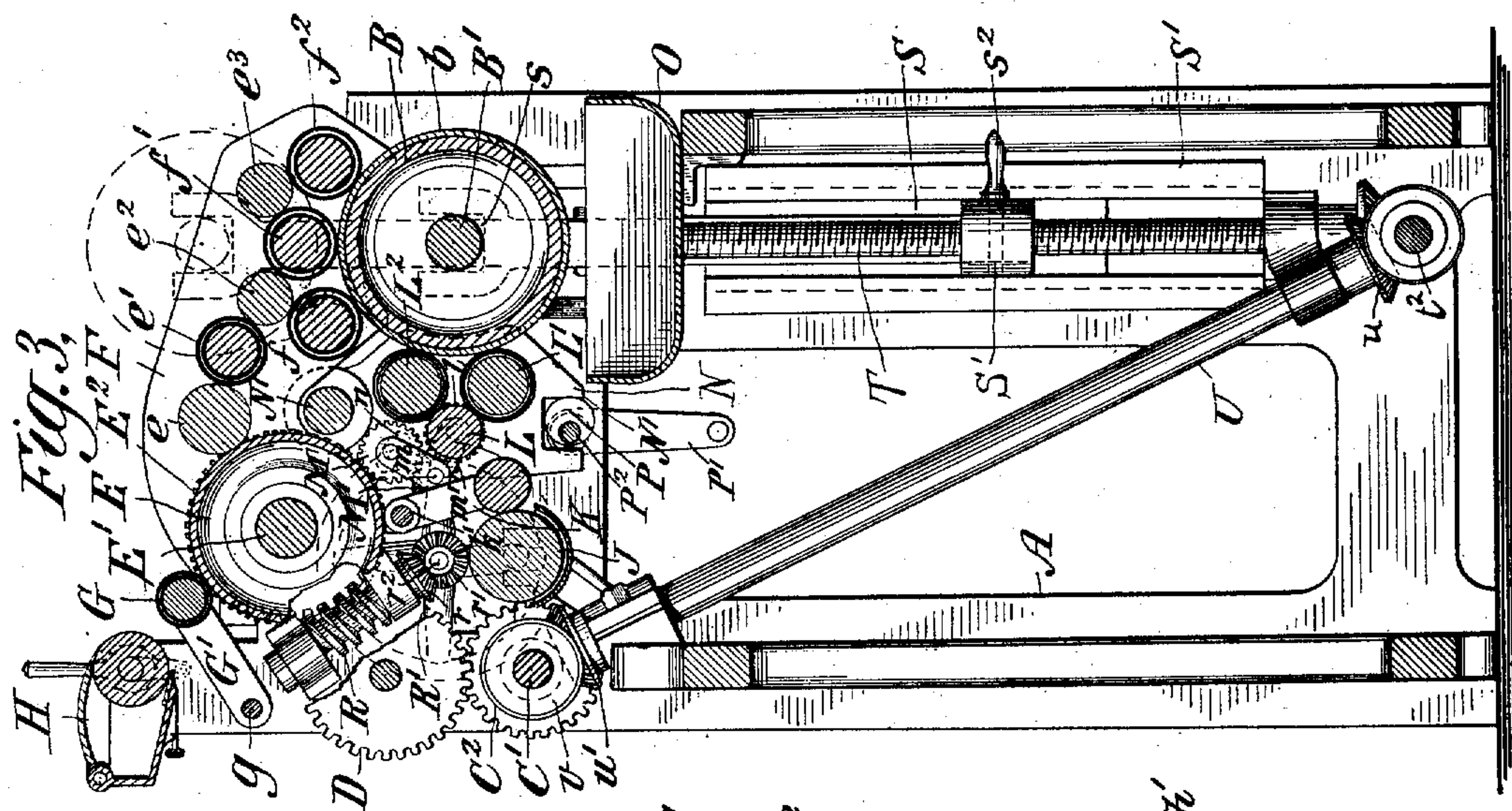
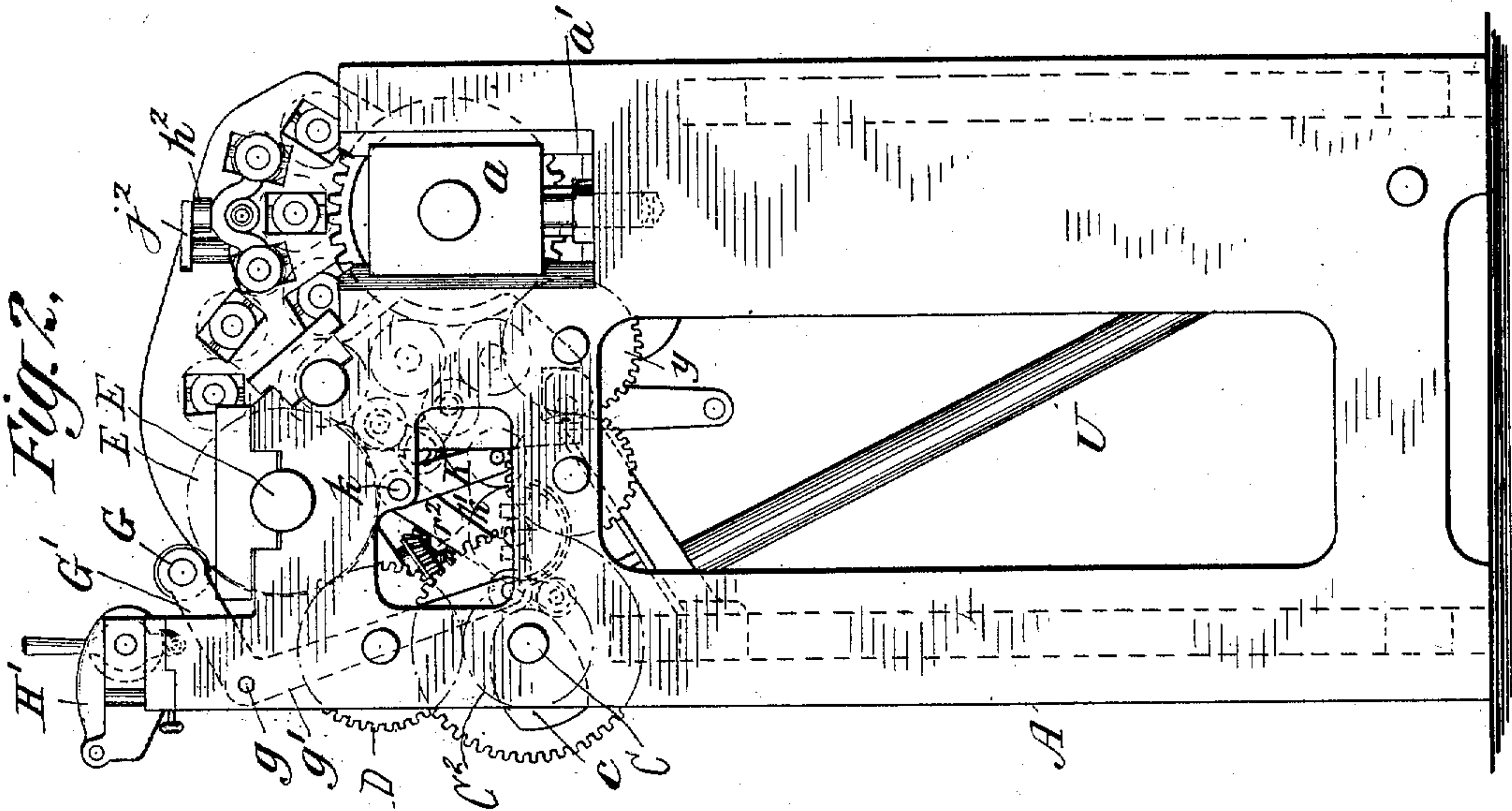
E. HETT.

ROLLING UP OR DEVELOPING MACHINE.

(Application filed Jan. 31, 1898.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

B. H. Maynard
Edwin Seger

INVENTOR

Edward Hett
by Witter & Kington

ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWARD HETT, OF NEW YORK, N. Y.

ROLLING-UP OR DEVELOPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 637,587, dated November 21, 1899.

Application filed January 31, 1898. Serial No. 668,587. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HETT, a citizen of the United States, and a resident of New York, (New Dorp,) in the county of Richmond, State of New York, have invented certain new and useful Improvements in Rolling-Up or Developing Machines, of which the following is a specification.

This invention relates to a rolling-up or developing machine designed to be employed in the lithographic or planographic art.

It also relates to certain hoisting mechanism associated with or forming part of such machine, but which may also be employed in other machines, such as turning-over machines, lithographic or planographic, or other printing-machines. The purpose of the hoisting mechanism is to facilitate the handling of the form or printing-surface in removing it from and depositing it into its place in such machine.

The invention consists of the structure and the various combinations of elements herein-after pointed out.

In the accompanying drawings, forming part of this specification, and in which like letters of reference designate similar parts throughout, Figure 1 is a front elevation of a rolling-up machine embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a central vertical section thereof. Figs. 4 and 5 are a plan and a side elevation, respectively, of a detail included within the invention; and Fig. 6 is a fragmental view of another detail.

A is the main frame of the machine, provided with boxes *a*, fitting in and movable in the recess *a'* in the main frame. The printing or form cylinder B has its shaft B' rotatably supported in the boxes *a* and is driven by the gear-wheel B², fixed on the shaft. The form or printing-surface *b* is in the form of a shell, which may be slipped on and off the cylinder B.

C is the main drive-wheel, carried on the shaft C', on which is also mounted the gear C², meshing with the gear D, which in turn meshes with the gear E² on the shaft E', which carries the main ink-distributing roller E. The ink-distributing rollers *e*, *e'*, *e*², and *e*³ carry the ink from the roller E to the form-inking rollers *f* *f'* *f*², which supply it to the

printing-surface *b*. The rollers E, *e*, *e'*, and *e*² are connected from one to the other by gears, (see Fig. 1;) and the roller *e*³ is connected with the roller *e*² by gears *p'*, *p*², and *p*³. (See Fig. 4.) The inking-rollers *e* *e'* *e*² *e*³, gear *p'*, and form-inking rollers *f* *f'* *f*² are mounted in a swinging frame F, fixed to the shaft E', on which turns the roller E, the frame being actuated by suitable mechanism, hereinafter described, whereby when the swinging frame is moved upward the inking-rollers are carried away from the form-cylinder to permit the form-cylinder to be lifted from place or deposited in place. For the purpose of moving the swinging frame F with its inking-rollers I mount a worm R on the side of the main frame, which meshes with a worm-gear on the rear of the frame F at one side. A hand-wheel R' on the shaft *r*² operates the worm through the beveled gears *r* *r'*. If desired, a worm R and worm-wheel could be arranged for both sides of the frame F. The worm and worm-gear operate to lock the frame at any position desired. The ink-roller E receives its ink-supply from the ductor G, which takes ink from the fountain H. The ductor G vibrates between the fountain and roller E, being carried by a pair of arms G', mounted on a rock-shaft *g*, which is operated by the arm *g'*, made fast on the shaft *g*, the arm being intermittently actuated by the cam *c*, carried by the main shaft C'. The water-fountain roller J supplies water to the printing-surface through the ductor K, rider L, and dampening-rollers L' and L², the ductor K being supported by arms K', carried by the rock-shaft *k*, which is operated by the arms *k'*, made fast on the shaft *k*. The arm *k'* is intermittently actuated by cam *c* on the shaft C' or cam similar thereto. The rider L is driven from the gear E² by the gear M, which meshes with the gear E² and with a pinion M', which is supported by links and is in engagement with the gear *l* on the shaft of the rider. The rider L and rollers L' and L² are supported by a swing-frame N, carried on a cross-rod N', so as to be capable of swinging on this rod as a center to and from the cylinder B. The gear M is carried on a pin which is secured to the main frame and extends through slot *n* in the frame N, this slot thus enabling the frame N to move freely

without obstruction from the pin. The frame N is moved back and forth by crank P' and cams P, carried on a shaft P² and working in recesses N' on the frame N.

5 The inking-rollers e^2 and e^3 are given the usual longitudinal reciprocating movement coincident with their rotary movement. This is accomplished by the following means, (shown clearly in Figs. 4 and 5:) On the ends
10 of the shafts of the rollers e^2 and e^3 at one side of the machine are the grooved hubs h and h' , the grooves of which are engaged by the ends of a yoke j . This yoke is rigidly connected at its middle with a spindle j' , which
15 passes through the bracket h^2 , projecting from the frame F, and is made fast to one end of a vibrating arm j^2 , the other end of which is engaged by an eccentric o , carried by a spindle o' , which is supported by the bracket h^2 .
20 The spindle o' is provided with a worm-wheel o^2 , meshing with the worm p , projecting from the frame F, and provided with a gear p' , which is in engagement with the pinions p^2 and p^3 on the shafts of the rollers e^2 and e^3 .
25 By this arrangement the roller e^2 not only drives the roller e^3 through the connecting-pinions p^2 , p' , and p^3 , but through the worm p , worm-wheel o^2 , and eccentric o also causes the arm j^2 to vibrate, thus giving a rocking
30 movement to the yoke j through the connecting-spindle j' . This movement of the yoke imparts the desired reciprocating movement to the rollers e^2 and e^3 .

Mounted on the main frame is a pair of
35 hoisting-arms S, provided with recesses s at their upper ends to receive the ends of the shaft B' of the form-cylinder B. These arms S are arranged to move up and down in slide-ways S' and are provided with actuating mechanism whereby the printing-cylinder when
40 the inking-rollers and dampening-rollers are moved away from the printing-cylinder, as above described, may be lifted from its normal working position up above the main frame
45 into the position shown in dotted lines, Fig. 3, for the purpose of removing from or fixing on the printing-cylinder B a printing surface or shell b . In the present embodiment of the invention this actuating mechanism is constructed as follows: Screws T, supported on
50 the sides of the main frame, work through threaded collars s' , fixed on the arms S. When the screws T are turned, the collars s' are carried up or down, as desired, and with them the arms S. The screws T are provided with
55 beveled gears t , which engage with the beveled gears t' on the shaft T', which is driven by the shaft U, whose gear u meshes with the gear t^2 on shaft T'. The shaft U has a beveled gear u' , which meshes with the reversed
60 beveled gears v or v' on the main shaft C'. These gears v and v' are loose on the shaft C', and between them is a clutch W, operated by the rod W', whereby either of the gears v or v' can be made fast on the shaft C'. Both
65 are in mesh with the gear u' , but only the one which is made fast on the shaft by the clutch

drives the shaft U for the time being. The shaft U may thus be turned in either direction by the shaft C', whereby the hoisting-arms S are
70 raised or lowered, as desired. One of the collars s' is detachable from its arm S, the attachment and detachment of these parts being effected by means of a removable pin s^2 , passing through apertures in the collar and arm,
75 as shown in Figs. 1 and 3.

X is a transporting-stand having a revoluble arm x provided with blocks x' and adapted to support a printing-surface in taking such surface from or putting it on the
80 form-cylinder.

O is a drip-pan supported underneath the form-cylinder to catch the drip when the printing-surface is being rolled up or developed.

Suppose now it is desired to fix a print-
85 ing-surface b in the rolling-up machine to develop it. The hand-wheel R' is first turned to swing the frame F upward and with it its inking-rollers, as above described. The crank P' is then turned to swing the frame N back
90 and with it the dampening-rollers. The form-cylinder B is then free from all obstructions to its upward movement. The main shaft is now turned slowly, the gear v on the main-shaft having been first made fast on this shaft.
95 This movement of the shaft C' operates through the train of gearing already described to lift the arms S, which in turn lift the form-cylinder B, together with its shaft and the bearing-boxes a , above the main frame and into
100 the position shown in dotted lines, Fig. 3. The stand X being in proper position beside the machine, its arm x , carrying the printing-surface, is brought into alinement with the
105 shaft B' of the form-cylinder, and the bearing-box a next the stand X having been removed the shaft B' and arms X are connected at their abutting ends, so as to form for the time being a straight rigid shaft.

In Fig. 6 is shown convenient means for
110 securing the abutting ends of the shaft B' and arm x together. b' is a socket in the end of the shaft, and x^2 is a sliding bolt, which may, as shown, be spring-pressed. The bolt slips into the socket and effects the connection desired. The collar s' and arm S are
115 now disconnected by drawing out the pin s^2 , and the arm S, which is the one on the side next the stand X, slips down out of the way of the printing-surface, which is then slipped
120 along the arm x and onto the form-cylinder B, where it is secured by suitable means. The arm is then brought up to support the end of the shaft B', the arm x is withdrawn, the bearing-box a is put on the shaft B', and
125 the shaft C' is rotated, the gear v' having been previously clutched on the shaft and the gear v unclutched. The screws T are in this way reversed and the arms S lowered to bring the form-cylinder B, with its printing-surface
130 b , into the proper place in the machine.

The machine shown in the drawings is a rolling-up or developing machine, and it is to be understood, of course, that the printing-

surface before being mounted in this machine has already received the transfers which are to be developed. In carrying out the developing operation the printing-surface is preliminarily etched by being gummed up and dried in the usual way, after which it is washed off with water to remove the gum and, as is usual, is again washed with water and turpentine to remove the ink. The dampening-rollers are then applied to the printing-surface by swinging forward the frame N and the printing-surface is slowly rotated. The frame F is then swung down to bring the inking-rollers into operation with the printing-surface, which is then inked, resined, and fully etched with dilute acid and washed off and reetched, if necessary. It is of course obvious that the etching may be prolonged until it becomes deep etching and the surface developed so as to become a relief or intaglio printing-surface. The printing-surface is in this way rolled up or developed in the machine shown in the drawings and is then ready to be taken from the form-cylinder and transported to a printing-press or a proper place of storage and used as a printing-surface. The operation of taking the printing-surface from the rolling-up machine need not be described, as it is the reverse of the operation of putting it in the machine and will be readily inferred from the foregoing description.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a planographic or other machine working with or upon a printing-surface, the combination of a suitable frame, a form-cylinder supported by the frame, a pair of hoisting-arms provided with threaded collars and adapted to slide up and down in the frame and lift the form-cylinder from its working position, a pair of screws passing through the threaded collars on the said arms, and mechanism for turning the screws to actuate the arms, one of the arms being detachable from its operating-screw, substantially as set forth.

2. In a planographic or other machine working with or upon a printing-surface, the combination of a suitable frame, a form-cylinder supported by the frame, a pair of hoisting-arms provided with threaded collars and adapted to slide up and down in the frame and lift the form-cylinder from its working position, a pair of screws passing through the threaded collars on the said arms, and mechanism for turning the screws to actuate the arms, one of the arms being detachably connected with its collar by means of a removable pin passing through the collar and arm, substantially as set forth.

3. In a planographic or other machine working with or upon a printing-surface, the combination of a suitable frame, a form-cylinder supported by the frame, a pair of hoisting-arms provided with threaded collars and adapted to slide up and down in the frame and lift the form-cylinder from its working

position, a pair of screws passing through the threaded collars on the said arms, said mechanism including a pair of reversed gears loose on a driving-shaft, a clutch to make either of said gears fast on the shaft, and a shaft in operative connection with the said screws and having a gear meshing with both of said reversed gears on the driving-shaft, substantially as set forth.

4. In a planographic or other machine working with or upon a printing-surface, the combination of a suitable frame, a form-cylinder supported by the frame, a pair of hoisting-arms provided with threaded collars and adapted to slide up and down in the frame and lift the form-cylinder from its working position, a pair of screws passing through the threaded collars on the said arms, one of the arms being detachable from its operating-screw, and mechanism for turning the screws to actuate the arms, said mechanism including a pair of reversed gears loose on a driving-shaft, a clutch to make either of said gears fast on the shaft, and a shaft in operative connection with the said screws and having a gear meshing with both of said reversed gears on the driving-shaft, substantially as set forth.

5. In a planographic or other machine working with or upon a printing-surface, the combination of a main frame, an ink-distributing roller mounted upon a shaft carried by the main frame, a swinging frame mounted concentrically with said distributing-roller carrying a set of inking-rollers adapted to be applied to the printing-surface in the normal operation of the machine, a train of gearing for actuating the swinging frame to carry the rollers to and from the printing-surface, said gearing including a worm-gear on the frame and a worm meshing directly therewith whereby the gearing locks the frame in any position, substantially as set forth.

6. In a planographic or other machine working with or upon a printing-surface, the combination of a main frame, an ink-distributing roller mounted upon a shaft carried by the main frame, a swinging frame mounted concentrically with said distributing-roller carrying a set of inking-rollers adapted to be applied to the printing-surface in the normal operation of the machine, hand-operated means for actuating the swinging frame, and gearing connecting said hand means with the swinging frame including a worm and worm-gear, whereby the gearing locks the frame in any position, substantially as set forth.

7. In a planographic or other machine working with or upon a printing-surface, the combination of a main frame, an ink-distributing roller mounted upon a shaft carried by the main frame, a swinging frame mounted concentrically with said distributing-roller carrying a set of inking-rollers adapted to be applied to the printing-surface in the normal operation of the machine, a train of gearing for actuating the swinging frame to carry the

rollers to and from the printing-surface, said gearing including worm-teeth on the swinging frame, a worm meshing with the worm-teeth, and a hand-operated shaft connected
5 with the worm by beveled gears, whereby the gearing locks the frame in any position, substantially as set forth.

8. In a planographic or other machine working with or upon a printing-surface, the combination with the main frame, of a swinging
10 frame, as N, carrying dampening-rollers, a train of gearing for driving said rollers comprising a gear-wheel mounted on a pin fixed to the main frame, and passing through a slot
15 in the frame N, an idle gear supported by pivoted links in mesh with said gear-wheel on the main frame and also with a gear on one of the dampening-rollers, whereby when the
20 the train of gearing is kept in operative connection, substantially as set forth.

9. In a planographic or other machine working with or upon a printing-surface, the combination of a main frame, a swinging frame
25 carrying a set of inking-rollers, a main ink-distributing roller, as E, on whose shaft the swinging frame is centered, a ductor-roller carried by oscillating arms mounted on a rock-shaft, provided with one or more rocking
30 arms, and one or more cams mounted on a shaft in the machine for actuating the rocking arms, a train of gearing for actuating the swinging frame to carry the inking-rollers to

and from the printing-surface, said gearing including a worm-gear on the swinging frame 35 and a worm meshing directly therewith, substantially as set forth.

10. In a planographic or other machine working with or upon a printing-surface, the combination of a main frame, a swinging
40 frame carrying a set of inking-rollers, a main ink-distributing roller, as E, on whose shaft the swinging frame is centered, a ductor-roller carried by oscillating arms mounted on a rock-shaft provided with one or more rocking arms, 45 a swinging frame carrying dampening-rollers, a water-ducter carried on a pair of oscillating arms mounted on a rock-shaft, and a shaft carrying cams for actuating the ink and water ductors, substantially as set forth. 50

11. In a planographic or other machine working with or upon a printing-surface, the combination with a pair of inking-rollers having grooved hubs, of a yoke engaging the
55 grooved hubs and means for oscillating the yoke to reciprocate the rollers, said means including the vibrating arms j^2 , cam o , worm-wheel o^2 , worm h and pinions p , p' and p^2 , substantially as set forth.

In testimony whereof I have signed my 60 name to this specification in the presence of two subscribing witnesses.

EDWARD HETT.

Witnesses:

SIDNEY MANN,
EDWIN SEGER.