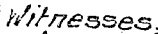


APPLICATION-FILED DEC. 29, 1911.

Patented Mar. 11, 1913.

Fig-1.



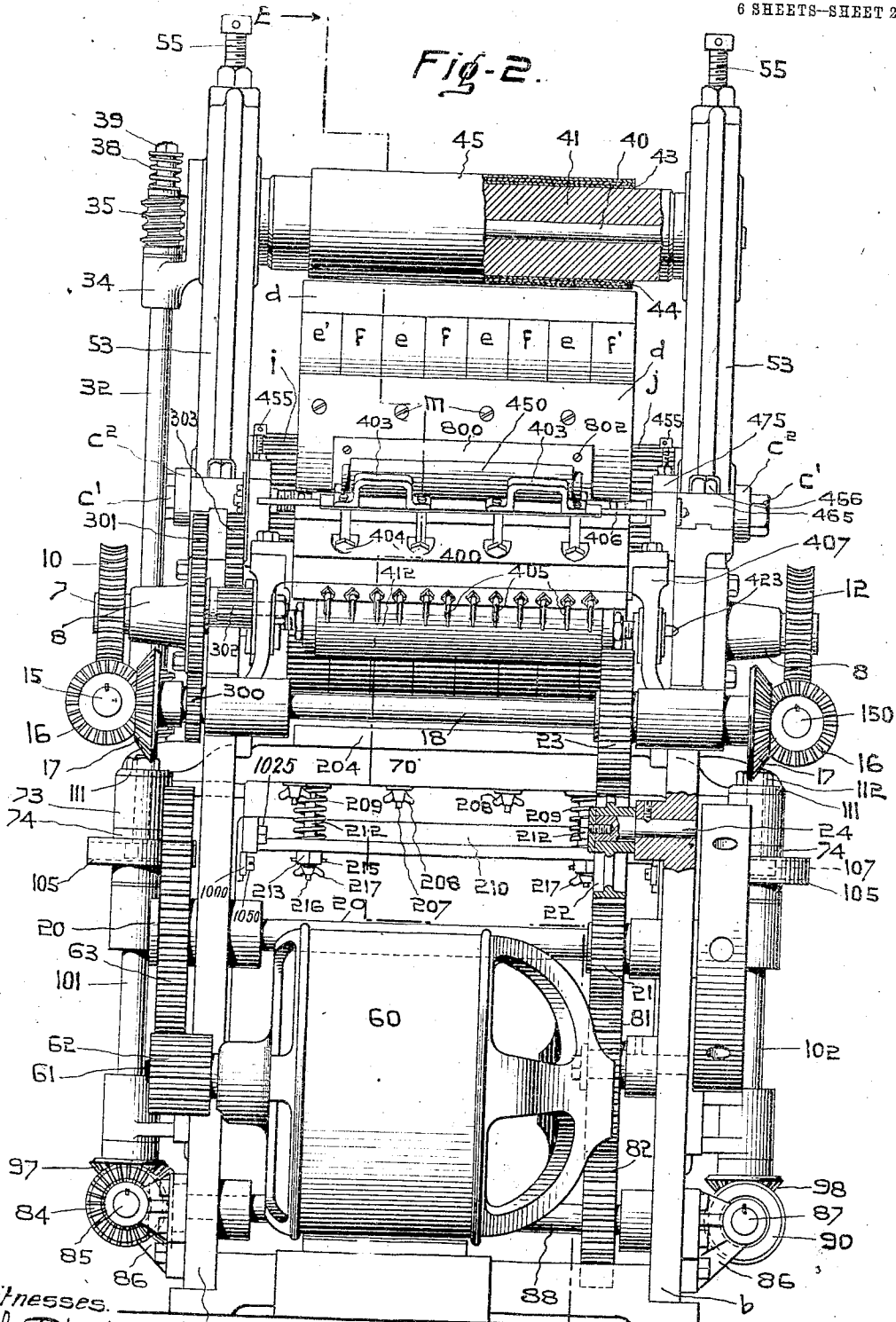
John F. Seufferheld
Gordon Cooke

Myron H. Lathey.
per Attorney. Inventor.
William P. Heath

1,055,335.

Patented Mar. 11, 1913.

6 SHEETS-SHEET 2.



Witnesses.
John F. Deufferling
Edward Hooker

Myron A. Lathey,
 per Attorney, Inventor.
William R. Lathey

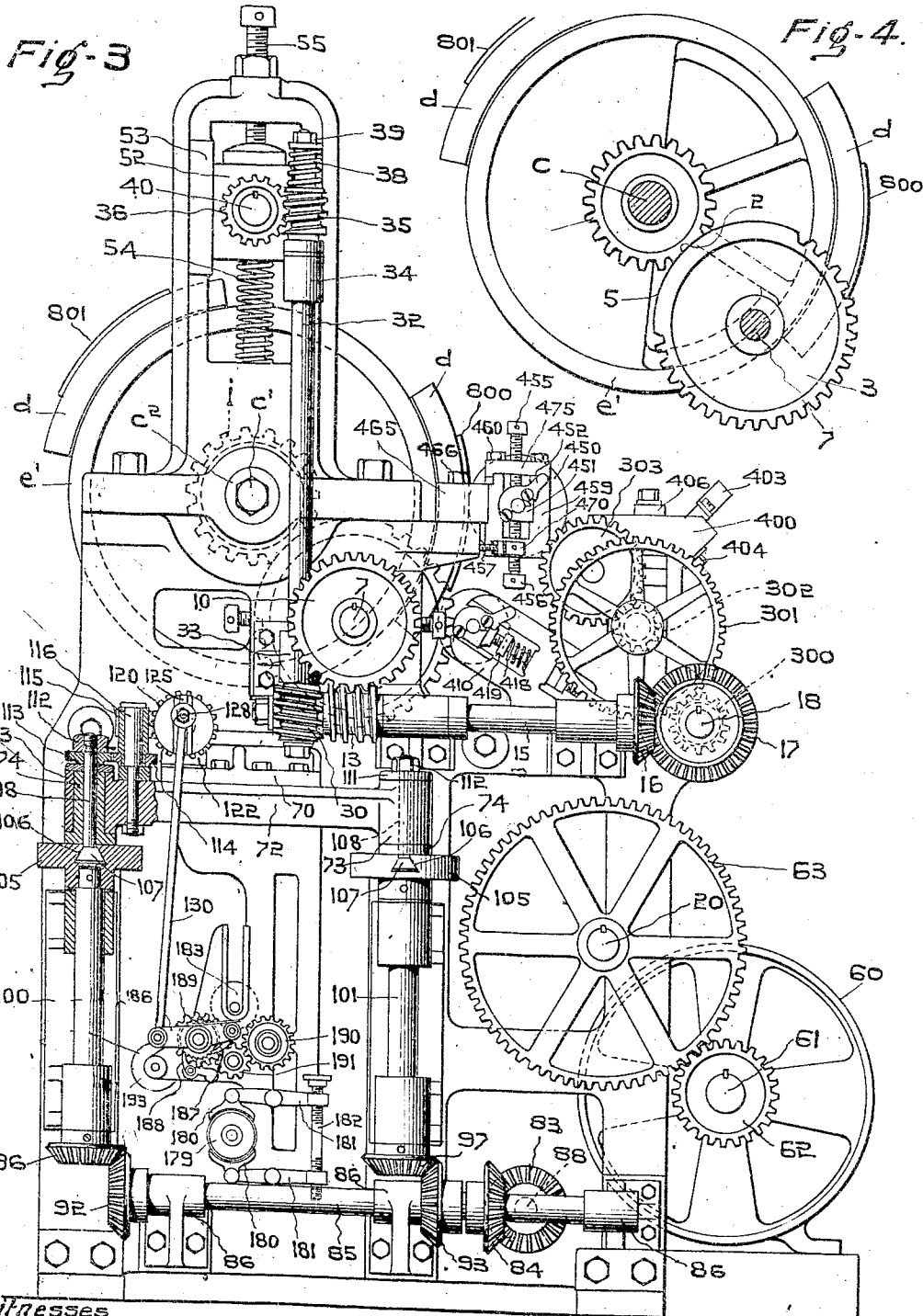
M. A. LATHEY.
PRINTING MACHINE.

APPLICATION FILED DEC. 29, 1911.

1,055,335.

Patented Mar. 11, 1913.

6 SHEETS-SHEET 3.



Witnesses.

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PRINTING MACHINE.

APPLICATION FILED DEC. 29, 1911.

Patented Mar. 11, 1913.

6 SHEETS-SHEET 4.

1,055,335.

Fig-5

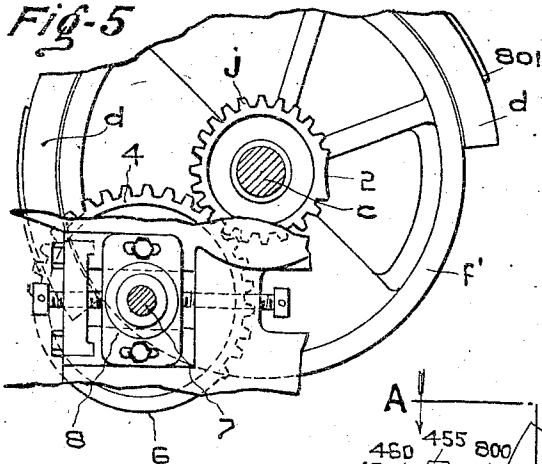
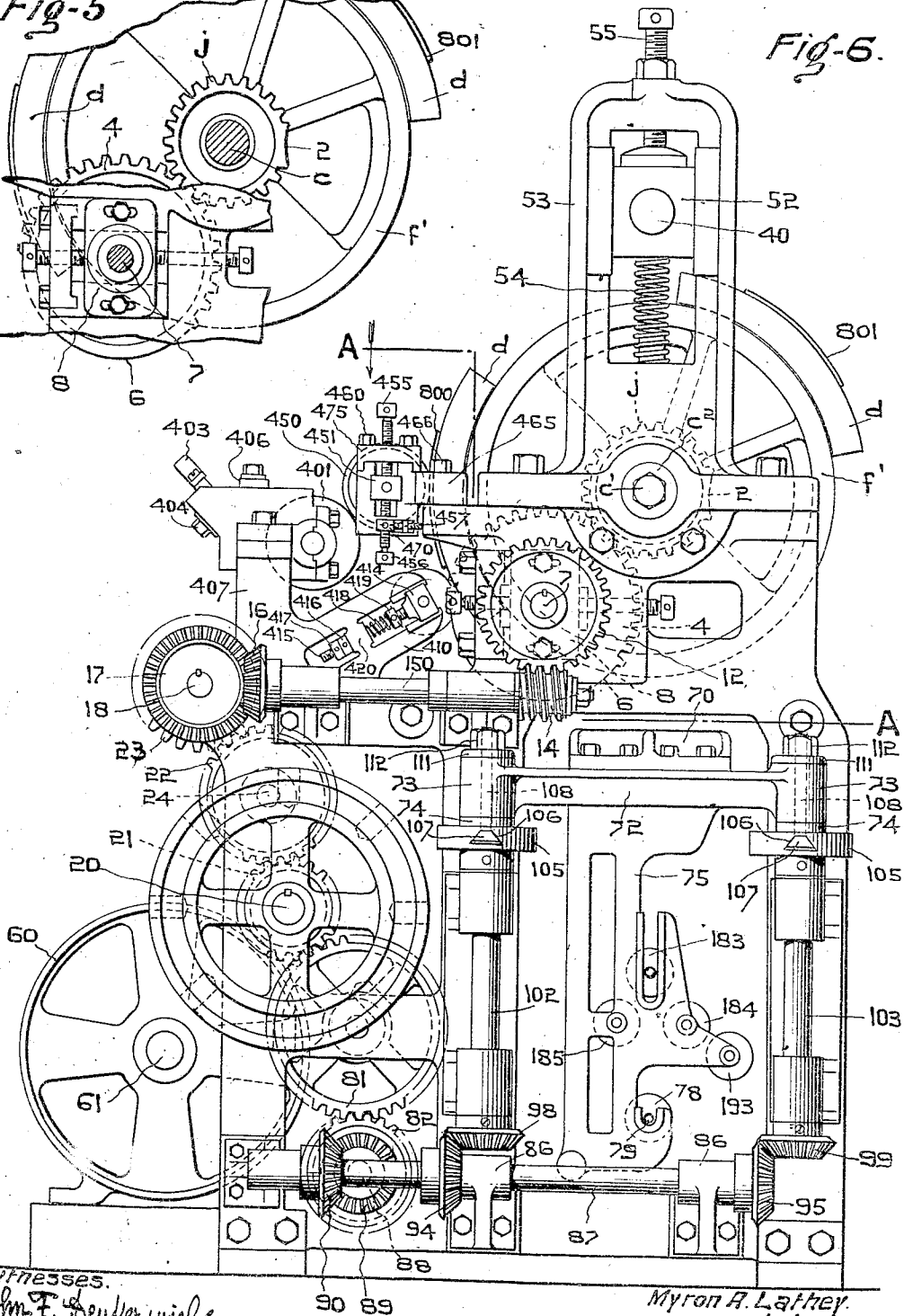


Fig-5.



Witnesses.

John F. Deuffermich
London, Ontario

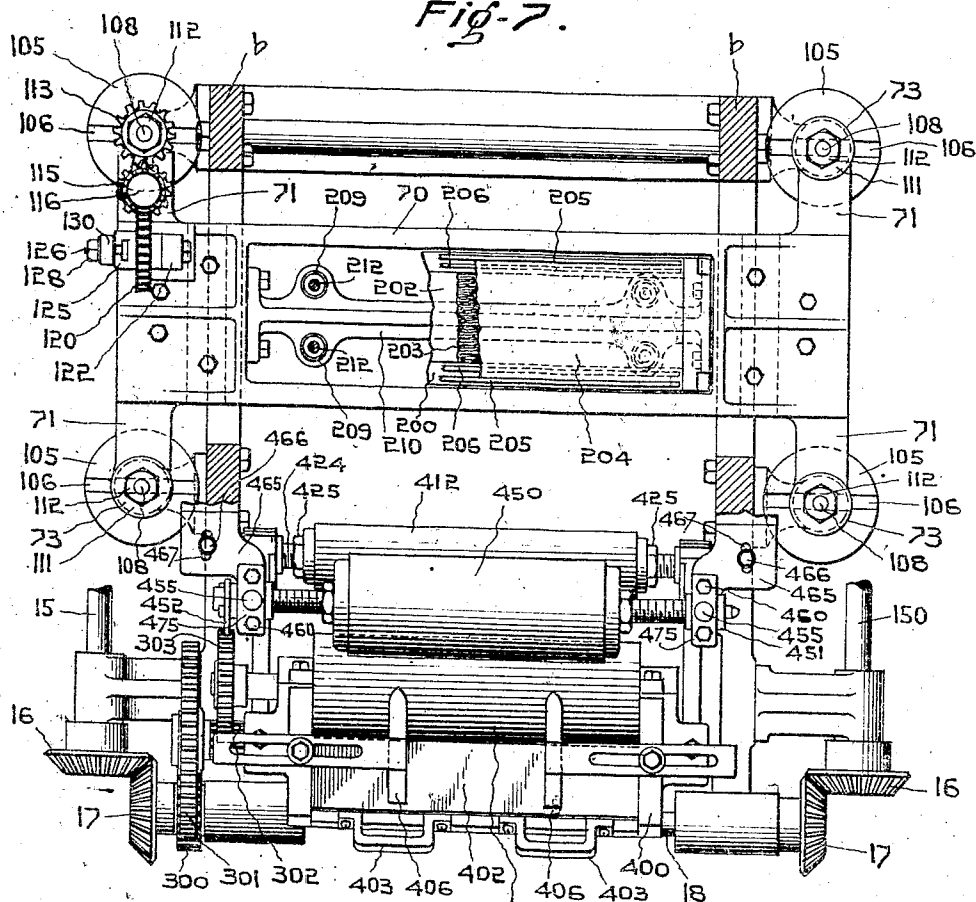
Myron A. Lathey,
per Attorney, Inventor.
William P. Lathey

PRINTING MACHINE.

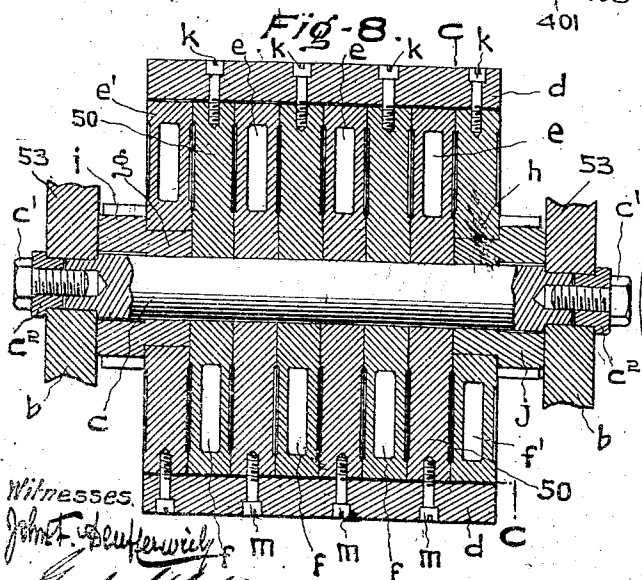
Patented Mar. 11, 1913.

6 SHEETS--SHEET 5.

Fig-7.



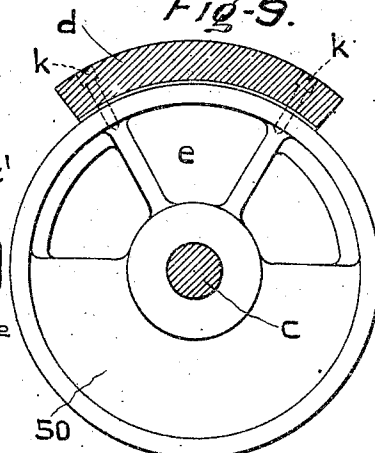
$FjQ-\varepsilon$



Witnesses

John F. Deffenwiel
London, Ohio

Fig-9.



Myron A. Lathey.
Inventor

per Attorney,

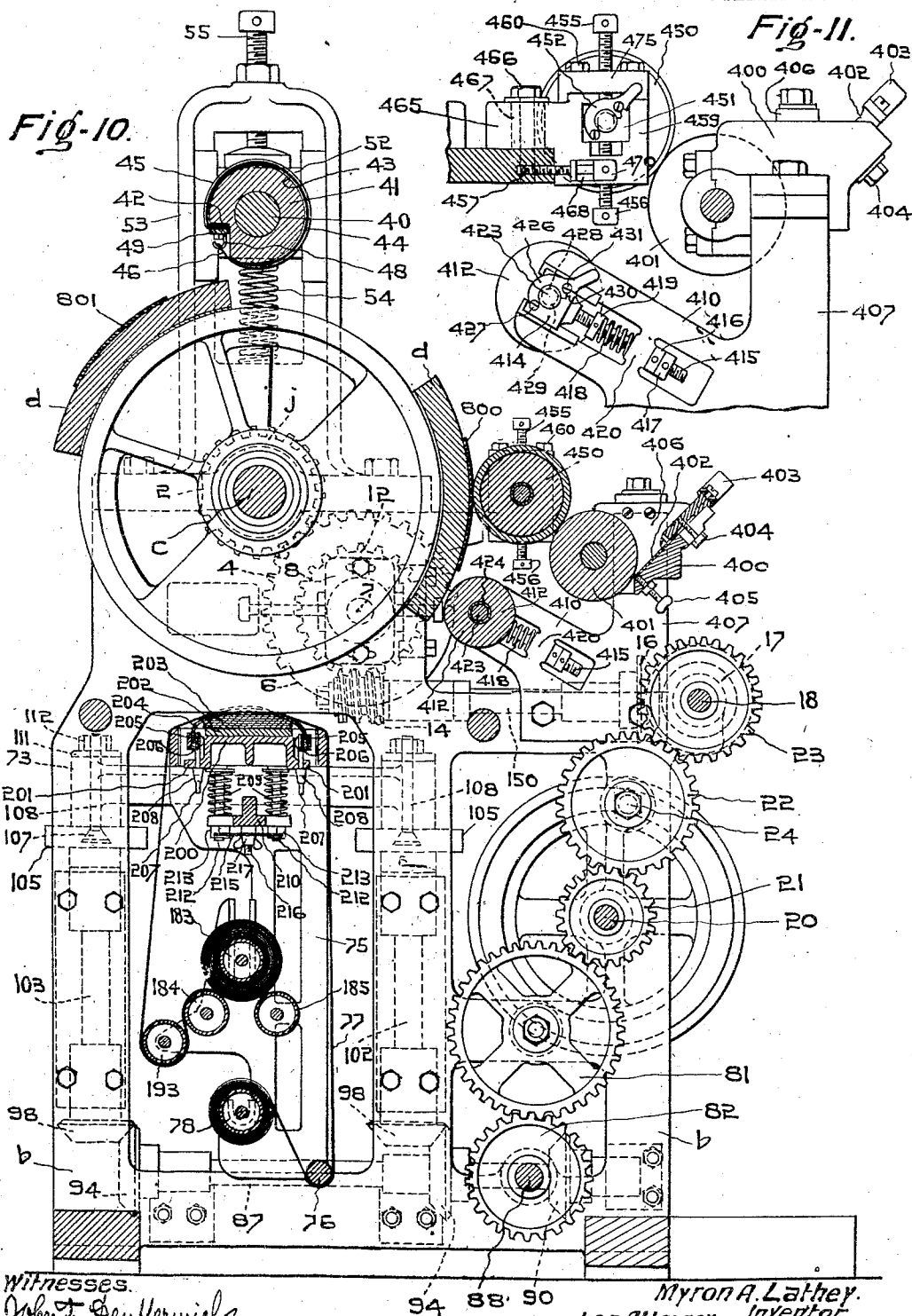
William R. Frost

M. A. LATHEY.
 PRINTING MACHINE.
 APPLICATION FILED DEC. 29, 1911.

1,055,335.

Patented Mar. 11, 1913.

6 SHEETS-SHEET 6.



WITNESSES.
 John F. Seufferheld
 Gordon Cooke

Myron A. Lathey.
 per Attorney. Inventor.
 William P. McLeod

UNITED STATES PATENT OFFICE.

MYRON A. LATHEY, OF OTTAWA, ONTARIO, CANADA, ASSIGNOR TO JEFFREY HALE BURLAND, OF MONTREAL, QUEBEC, CANADA.

PRINTING-MACHINE.

1,055,335.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed December 29, 1911. Serial No. 668,447.

To all whom it may concern:

Be it known that I, MYRON A. LATHEY, residing at Ottawa, in the Province of Ontario, Dominion of Canada, mechanical engineer, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification.

This invention relates to rotary steel plate printing presses and the object thereof is to improve the quality of the work done by printing machines of this class and increase the efficiency of such machines.

This invention comprises a pair of printing members each performing its function while the other comes to position and for a brief period remains stationary for the purpose of permitting a manual action to be performed, as for instance, a printing plate to be polished and have the sheet to be printed placed in position thereon; and the invention further consists of a specific construction and combination of parts hereinafter described and pointed out in the claims. For full comprehension, however, of the invention reference must be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate the same parts, and wherein:

Figure 1 is a front elevation of a printing machine constructed according to my invention; Fig. 2 is a rear elevation thereof; Fig. 3 is an elevation of the right end of the machine looking toward the front; Fig. 4 is a detail end elevation of the cylinder and the gears immediately connected thereto; Fig. 5 illustrates, also in elevation, the angular position of the gears at the opposite end of the cylinder to that illustrated in Fig. 4, when at a certain point in the cycle of operation; Fig. 6 is an elevation of the left end of the machine looking toward the front; Fig. 7 is a plan view of the machine partly in horizontal sectional view on line A A Fig. 6; Fig. 8 is an axial sectional view of the printing cylinder with the beds in diametrically opposite positions, the line being taken through the means for attaching the beds to their carriers. Fig. 9 is a transverse sectional view of the cylinder; the section being taken through one of the beds and the shaft and showing one of the webs in elevation. Fig. 10 is a sectional view taken on line E E Fig. 2; and Fig. 11 is a detail elevation of one end of the ink fountain.

The supporting frame of the machine consists of a pair of side frames *b, b'*, carrying a shaft *c* mounted rigidly therein and rotatably supporting the above mentioned printing members, the shaft being fixed in place by clamping screws and caps *c'* and *c''* respectively. These printing members consist of a pair of beds *d, d'*, curved concentrically with the shaft and each carried by a series of preferably four circular webs *e, e'* and *e''* and *f, f'* and *f''*, the end webs *e'* and *f'* being mounted rigidly on the hubs *g* and *h* of a pair of spur pinions *i* and *j* running loosely on the shaft *c* while the remaining webs are mounted loosely on the shaft, the webs alternating and having the respective beds connected thereto by screws *k* and *m* passed through the beds and threaded into the webs which have their sides opposite to the beds weighted as at 50 to compensate for the beds. This structure, the beds and webs, forms the printing cylinder of the machine, and each bed in its turn is caused to make one complete revolution; and in operation, each bed, after the sheet to receive an impression is placed thereon, is revolved around the shaft until it comes to the position from which it started and in which it receives a new sheet.

The gears *i* and *j* are intermittent in form in that each has a widened tooth 2 presenting a curved face concentric with intermittent spur gears 3 and 4 presenting plane portions 5 and 6 and teeth corresponding in number and pitch with the teeth of the pinions, these gears and pinions being placed on their shafts in the relative angular positions shown in Figs. 4 and 5. The gears are mounted rigidly on a pair of short shafts 7 mounted in adjustable bearings 8 carried at opposite sides of the machine, and the opposite ends of these short shafts have large worm gears 10 and 12 mounted rigidly thereon and intermeshing with a pair of worms 13 and 14 mounted on horizontal shafts 15 and 150 at opposite sides of the machine and having at their rear ends bevel gears 16 intermeshing with and driven by bevel gears 17 on the opposite ends of a shaft 18 extending across the rear of the machine and driven in turn by the initial driving shaft 20 through a train of gears 21, 22 and 23 the first and last mentioned being mounted rigidly respectively on the driving shaft and shaft 18 and gear 22 being an idler loose upon a stud 24 fixed in the frame.

The impression roller comprises a shaft 40, the metal roller proper 41 mounted rigidly thereon, and formed with an angular recess 42 in its perimeter, and extending from end to end of the roller, the surface of such roller being built up of felt 43, a layer of leather 44 and an outer covering 45 of blanket stretched and held in place by a lacing 46 laced through eyes 47 in one end of the cover and tied to hooks 48 carried by a plate 49 held by clamping screws 50 in position clamping the opposite end of the cover to one wall of the recess 42. This shaft 40 is journaled in a pair of bearing boxes 52 slidably supported in vertical extensions 53 of the side frame, by springs 54 and adjusted to proper bearing position by screws 55.

The forward end of the shaft 15 has a spiral gear 30 fixed thereon and intermeshing with a second spiral gear 31 fixed upon the lower end of a vertical shaft 32 supported in bearings 33, 34 and having a worm 35 slidably upon its upper end and splined thereto, such worm intermeshing with a worm wheel 36 mounted rigidly on the shaft of the impression roller. The worm is held yieldingly against vertical displacement in an upward direction by a spring 38, the object being to enable the worm and worm-wheel to remain constantly in engagement while the slidable relation of the worm and its shaft permits different diameters of the impression roller to be accommodated. As, for instance, each time the blankets are put on fresh they present greater diameter than after they have been used for a while, and the varying diameter of the cylinder due to different thicknesses of the printing plates. The spring is held by the washer 39 and nut.

The main shaft 20 is driven by a motor 60, the shaft 61 of which has a pinion 62 fixed thereon and intermeshing with a spur gear 63 fixed upon the said main shaft 20.

In order to effectively and economically operate a printing machine containing the cylinder with its intermittently successively actuated peripheral printing member a wiper is provided capable of being contained within the frame beneath the cylinder and adapted to perform its function and shift during the intermissions between the passage of the said members as follows:—A horizontal carriage capable of being dismembered so be inserted or removed from between the legs of the machine, means for causing this carriage to travel continuously within the confined space, and intermittently actuated wiping devices suspended from the carriage and acting upon the printing members as they pass.

The carriage consists of an oblong body-frame 70 having bolted thereto transverse end bars 71 widened at the middle 72 and

with their ends in the form of hubs 73 receiving flanged bushings 74 to be presently further alluded to. A frame for the wiping mechanism is suspended from the carriage and consists of a pair of side frames 75 fixed to the underside of the carriage and braced at their lower ends by a bar 76 serving also as a guide for the web 77 of wiping material. This wiping material is wound on a feed roller, upon which a brake acts, and is caused to move intermittently over the wiping member by an intermittently operated take-up roller, all of these rollers being journaled in the hanging frame. The feed roller is indicated at 78 one end terminating in a square arbor 79 and the opposite end having mounted rigidly thereon a brake-wheel 179 retarded by a pair of brake shoes or jaws 180 on levers 181 adjusted by a right-and-left-hand screw 182 by which the tension of the web can be minutely adjusted. The web passes from this feed roller around the bar 76 and over the wiping member to the take-up roller indicated at 183 and supported on a pair of rollers 184 185 intermittently rotated by a rocker-bar 186 fulcrumed on the roller 184 and carrying an actuating pawl 187 engaging a ratchet wheel mounted rigidly on this roller, a detent pawl 188 preventing retrograde rotation of the roller, while a pair of spur gears 189, 190 mounted on the respective rollers and an idler 191 transmit rotation from the roller 184 to the roller 185. The web passes around the guide roller 193 and the increasing diameter of the take-up roller is accommodated by its bearing which is vertically elongated.

The wiping member is carried within the frame of the carriage and consists of a yieldingly supported and vertically adjustable table 200 having bored lateral flanges 201 and a wooden block 202 covering the top thereof and in turn covered by a felt pad 203 and leather cover 204. The side edges of the leather are clamped between pairs of bars 205 206 to which are connected drawing screws 207 projecting through the borings in the flanges 201 and having butterfly nuts 208 screwed thereon for drawing the same through the flanges and tightening the cover. This table is supported through the medium of springs 209 on a bar 210 secured at its ends to the sides 75 of the suspended frame and serving the double purpose of a tie-brace for this frame. The springs are guided and the normal height of the table and tension of the springs adjusted by bolts 212 and nuts 213 while a pair of plates 215 are forked at their opposite ends to engage and lock the nuts and are held in place by screws 216 and thumb nuts 217. This wiper is operated by the main driving shaft 20 through a train deriving its power from the gear 21

and consisting of spur gears 81 and 82 and miter-gears 83 and 84, the latter being fixed on a shaft 85 mounted in bearings 86 on the frame of the machine and a similar shaft 87 at the opposite side of the machine is driven from gear 82 through a shaft 88 (upon which the latter is mounted) and a pair of miter-gears 89 and 90 mounted respectively on the shafts 88 and 87, these shafts 83 and 87 having mounted thereon four miter-gears 92, 93, 94 and 95, which consequently work in unison, and they intermesh with miter-gears 96, 97, 98 and 99 mounted respectively on the lower ends of vertical shafts 100, 101, 102 and 103 carried in suitable bearings on the legs of the main frame of the machine. The upper ends of these vertical shafts carry rigidly thereon a series of crank-disks 105, diametrically dove-tail-grooved as at 106 to contain a dove-tail slide 107 from which vertical bolts 108 project, the slide being clamped in position by the bushing 74, before mentioned, cap 111 and nut 112. One of these bolts (that over the shaft 100) has a spur gear 113 splined thereon and intermeshing with a spur gear 114 splined in turn upon the lower end of a worm 115 rotatably mounted on a bolt 116 projecting through and clamped in the frame of the wiper carriage. This worm intermeshes with a worm-wheel 120 mounted rigidly on a stand 121 clamped in a standard 122 fastened to the top of the carriage. The outer face of the worm wheel 35 has a bar 125 fastened diametrically across the face thereof, the bar being of C-cross-section and constituting a guide for a bolt 126 having thereon a bushing 127 serving as a wrist-pin and a distance piece between 40 a clamping nut 128 and the bar, while a connecting rod 130 connects this wrist-pin with the rocker-bar 186, the throw of which is varied by adjusting the bolt 126 to different radial positions in the guide 125. 45 This completes the wiper and its operating mechanism, and the latter is timed to shift the wiping web during the intervals between the intermittent wiping operations.

The inking mechanism comprises a fountain 50 400 having an ink roller 401, knife 402 with handles 403, screws 404 clamping the knife to the fountain frame, screws 405 for adjusting the knife with relation to the roller and adjustable ink guards 406. This fountain is carried by brackets 407 fastened 55 to the top of a rear extension of the main frame of the machine, such brackets carrying in arms 410 disposed radially relatively to the cylinder, a distributing roller 412 mounted in slidable blocks 414 held yieldingly toward the printing cylinder in adjusted position by screws 415, nuts 416 and lock-nuts 417 and springs 418 bearing between a collar 419 on the screw and a cross 60 piece 420 through which the screw is slid-

ably guided. The trunnions of the roller are constituted by the ends of a bar 423 passed through a tubular shaft 424 on which the roller proper 412 is mounted and clamped by nuts 425, the trunnions and consequently the roller being held against longitudinal displacement by a lock 426 fulcrumed at 427 to the block at one end of the roller and notched as at 428 to engage a circumferential slot 429 in the trunnion and as at 430 to engage a screw 431, which, when 70 tightened, locks this plate in engagement with the trunnion. A plate-inking roller 450 receives ink from the ink-roller and applies it to the plates as they pass and it is carried in bearings mounted rigidly directly 80 on the main frame and adjusted at both ends of the roller to bring its full length into juxtaposition with the ink roller and into proper position to be borne upon by the plates as they pass. To this end the roller is mounted in blocks 451 (similar to the blocks 414) in which they are rotatably held against axial displacement by locking plates 452 engaging a circumferential slot 90 in one of the trunnions of the roller. Universal adjustment in a plane at right angles to the axis of the roller is obtained by vertical screws 455 456 and a horizontal screw 457, all three screws and the bearing-blocks 95 451 being mounted in side plates 459 serving as vertical guides for the blocks, such plates being component parts of a pair of right and left hand brackets 465 adjustably secured to a rear extension of the top of the 100 main frame of the machine by a screw 466 projecting through a slot 467 and screwed into a tapped boring in the frame. The horizontal screws 457 are connected to the side plates 459 by forked lateral brackets 105 468 engaging in circumferential channels in the heads 470 of the screws, while the latter is screwed into the rear side of the frame. Horizontal adjustment is obtained by loosening either or both of the screws 110 466 and turning the screw or screws 457 as may be required thus shifting the brackets. The vertical screws 455 are threaded through caps 475 fastened on the brackets by screws 460. Vertical adjustment of the 115 bearing blocks is secured by these vertical screws.

The power for driving the ink roller is transmitted from the shaft 18 at the rear of the machine through a spur gear 300 mounted on the latter, and intermeshing with a large spur gear wheel 301 having a small spur gear wheel 302 rigidly connected thereto to rotate therewith and in turn intermesh with and drive a spur gear 303 125 mounted rigidly on the ink roller which is made to rotate continuously while the machine is in operation.

Operation: A pair of engraved plates 800, 801, are fastened upon the beds *d* by screws 130

802 or any other preferred means and the machine is started, the alternate engagement of the respective plane portions 5 and 6 of the perimeters of the gears 3 and 4 with the teeth 2 of the gears *i* and *j* causing the beds to remain stationary during those portions of the cycle of the machine and the particular trains of gears illustrated secures an overlapping of these portions of the cycle in a manner to start each bed before the other has completed its revolution, to permit each bed to assume the position vacated by the other. While each bed is at rest it is polished and the sheet to receive an impression therefrom is placed in position thereon, and, upon the reengagement of the teeth of its driving gears it will make one complete revolution, the sheet being removed from the plate immediately it issues from beneath the impression cylinder. During the revolution of each bed, as above mentioned, the other is polished and has a sheet placed thereon. During the cycle of each bed, after the printed sheet has been removed therefrom, the bed passes through the inking and wiping zones and while doing so they successively come into contact with the inking roller 250 and wiping member 204 by which they are in turn automatically inked and wiped and consequently the all time that the webs are at rest may be utilized in polishing the plates and placing the paper thereon. Thus in a given time owing to the fact that the plate may be polished with the hand the highest class of work may be produced, while owing to the particular combination and arrangement of parts constituting the inking and wiping mechanisms the plates are effectively inked and wiped while they are being polished with the hand and therefore the efficiency of the machine is considerably increased over other plate printing machines. This is evidenced by the fact that the time occupied in printing each sheet being one revolution of its bed which is equivalent to one cycle of the hand polished plate printing machines at present in use and one half of one cycle of the machine herein disclosed which covers the cycles of both beds and consequently equals two cycles of the plate printing machines at present in use.

To change the padding on the wooden block or the block itself (of the wiper) the screws 1025 and 1050 are first removed then upon the keys 1000 being removed the complete wiper frame can be let down from the carriage, said frame being entirely supported independently of the carriage by these keys.

The advantage of the specific construction of the wiper is that being supported from the carriage, the center of gravity is below

the point of support and consequently its tendency is to maintain correct position.

I do not claim the specific construction of the wiping mechanism herein disclosed as it forms the subject-matter of a separate application filed under Serial No. 703,224 on June 12, 1912.

What I claim is as follows:

1. In a cylinder printing machine, a cylinder the printing perimeter of which is composed of a pair of independently circumferentially movable concentric printing members, means operating the said members to cause them to alternately move and remain stationary for a brief interval and automatic means for inking the said members during their movement, substantially as described.

2. In a cylinder printing machine, a cylinder the printing perimeter of which is composed of a pair of independently circumferentially movable concentric printing members, means operating the said members to alternately move and remain stationary for a brief interval, automatic means for inking the said members during their movement and automatic means for wiping the said members during their movement, substantially as described.

3. In a printing machine, the combination with a supporting frame and an impression member, of a printing cylinder all circumferential parts whereof are of fixed radius, such cylinder comprising a pair of independently circumferentially movable printing members adapted to coact with the impression member, means for operating the said printing members alternately, such means being constructed and arranged to cause each printing member to alternately move and remain stationary for a brief period, automatic means for inking the said printing members during their movement and automatic means for wiping the said members during their movement, substantially as described.

4. In a printing machine, the combination with an impression member, of a cylinder composed of a plurality of series of independently movable carrier members, a plurality of beds carried respectively by the different series of the said carrier members and adapted to coact with the said impression member, printing members upon the beds, means for operating the different series of carrier members alternately, automatic means for inking the said printing members during their movement and automatic means for wiping the said members during their movement, substantially as described.

5. In a printing machine, the combination with an impression cylinder and a fixed shaft, of two alternating series of circular

webs mounted rotatably upon the shaft; a pair of printing plate carrying beds curved concentrically to the shaft; means rigidly securing the beds to the respective series of webs; means intermittently revolving the said respective series of webs alternately, automatic means for inking the said printing plates during their movement and automatic means for wiping the said plates during their movement, substantially as described.

6. In a printing machine, the combination with a supporting frame, an impression cylinder mounted therein, and a driving shaft, of a pair of curved printing plate carrying beds; means independently movably supporting the beds within the frame in concentric relation; means alternately intermittently rotatively connecting the driving shaft to the said respective bed supporting means; means rotatively connecting the said driving shaft to the said impression cylinder, automatic means for inking the said printing plates during their movement and automatic means for wiping the said plates during their movement, substantially as described.

7. In a printing machine, the combination with a supporting frame, an impression cyl-

inder mounted therein, and a driving shaft, of a pair of curved printing plate-carrying beds; means independently movably supporting the beds within the frame in concentric relation; a pair of intermittent gears in operative relation and operatively connected to the supporting means of one of the said beds; a train of gears connecting the said intermittent gears to the said driving shaft; a second pair of intermittent gears in operative relation and operatively connected to the supporting means of the other of the said beds; a second train of gears connecting the said second pair of intermittent gears to the driving shaft; means operatively connecting the driving shaft to the impression cylinder, automatic means for inking the said printing plates during their movement and automatic means for wiping the said plates during their movement, substantially as described.

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

Montreal Nov. 18th 1911.

MYRON A. LATHEY.

Witnesses:

G. E. VALLEAU,
GEO. H. BURLAND.