W. C. HUEBNER.

UNIVERSAL PRINTING MACHINE.

APPLICATION FILED JAN. 2, 1912.

1,051,590.

Patented Jan. 28, 1913.

9 SHEETS—SHEET 1.

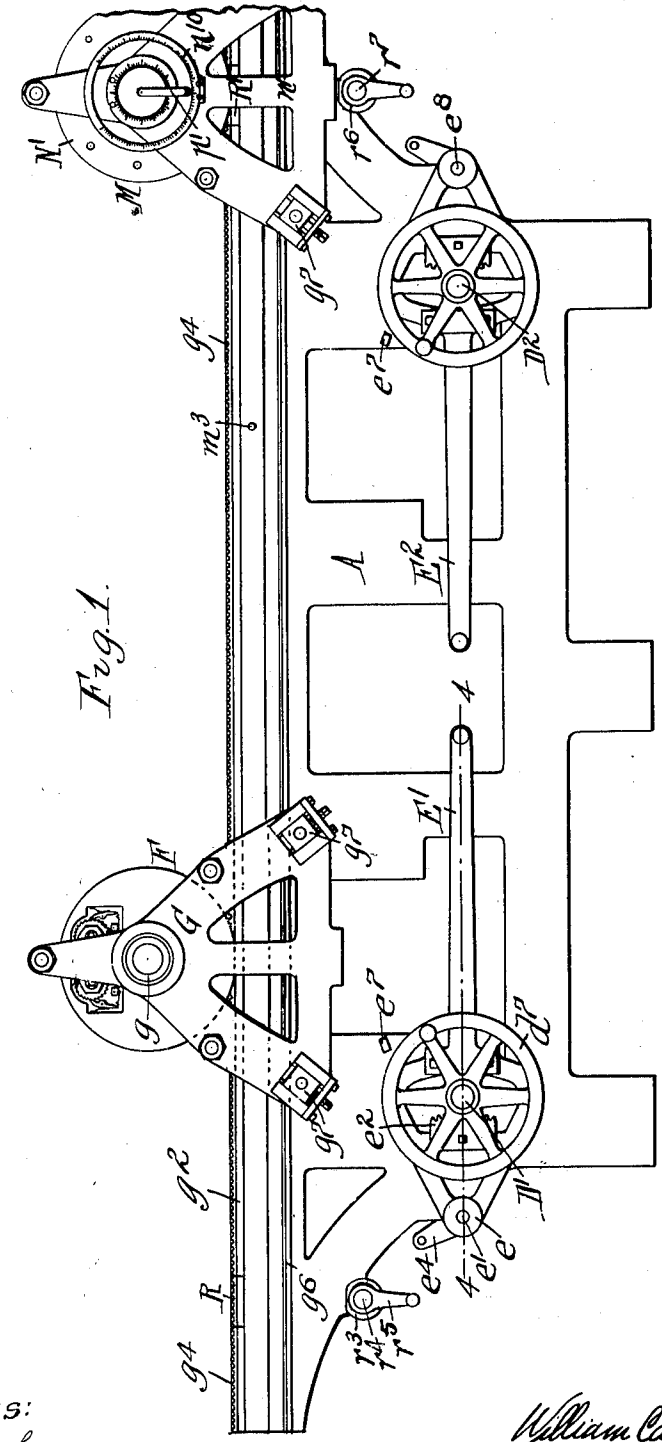

Fig. 1.

Witnesses:
A. Borkenhagen
A. L. McKee.

Inventor:
William Carl Huebner,
by Wheelm, Parker & Haud
Attorneys.

W. C. HUEBNER.

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9 SHEETS—SHEET 2.

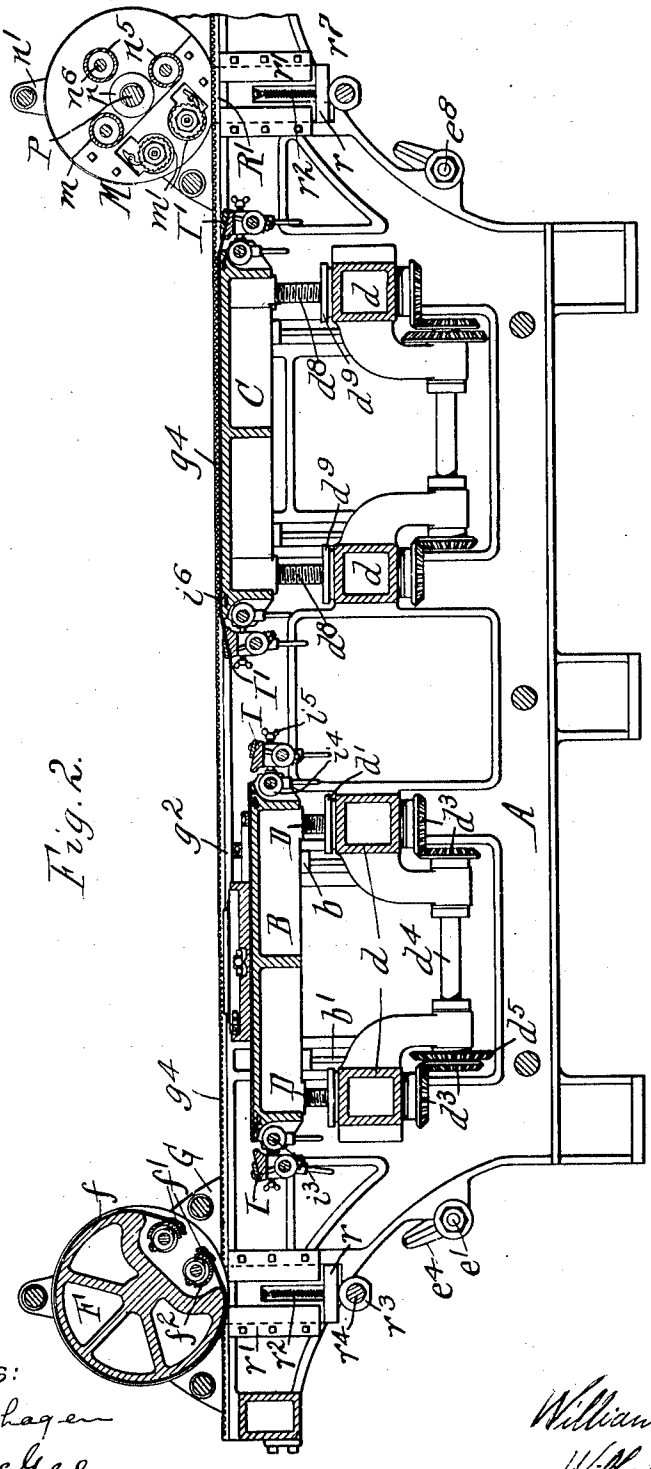

Fig. 2.

Witnesses:
A. Borkenhagen
A. L. McGee.

Inventor:
William Carl Huebner,
by Wilkelm, Fuller & Hand,
Attorneys.

W. C. HUEBNER.

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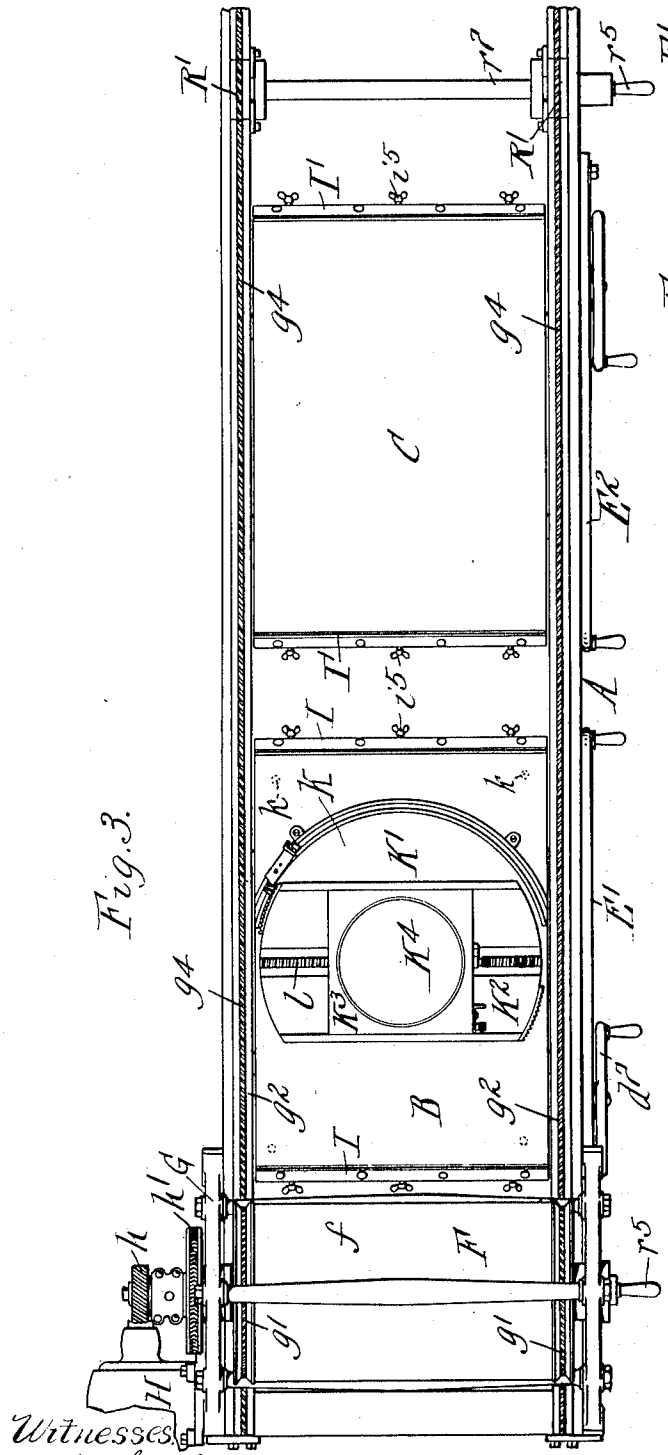

Fig. 3.

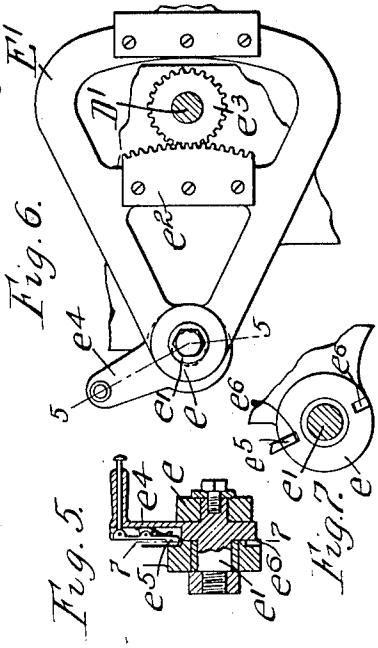

Fig. 6.

Fig. 5.

Fig. 7.

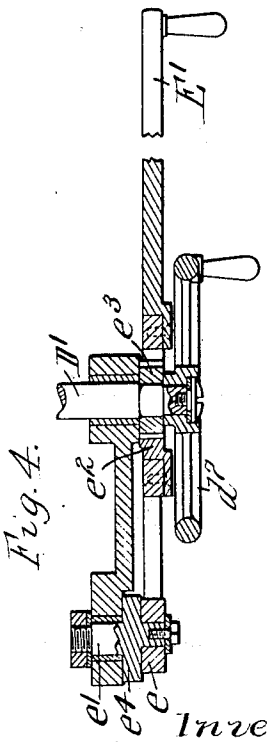

Fig. 4.

Witnesses.
A Borkenhagen
A. L. McGee

Inventor:
William Carl Huebner
by William Parker Hand
Attorneys.

W. C. HUEBNER.

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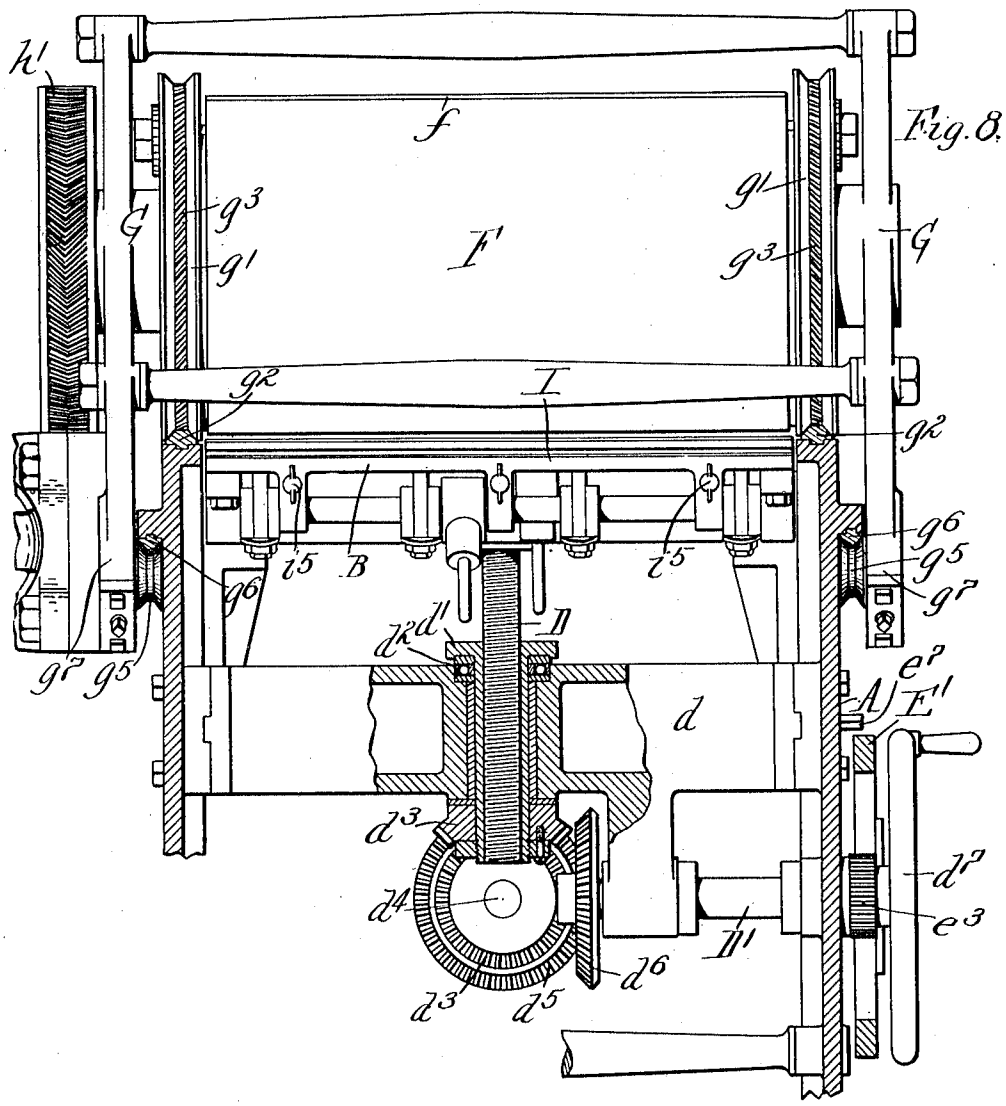
9 SHEETS—SHEET 4.

Fig. 8.



Witnesses:
A. Bruckenhagen
A. L. McKee

Inventor:
William Carl Huebner,
by Wilkelm, Bartlett & Haug,
Attorneys.

W. C. HUEBNER.

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9 SHEETS—SHEET 5.

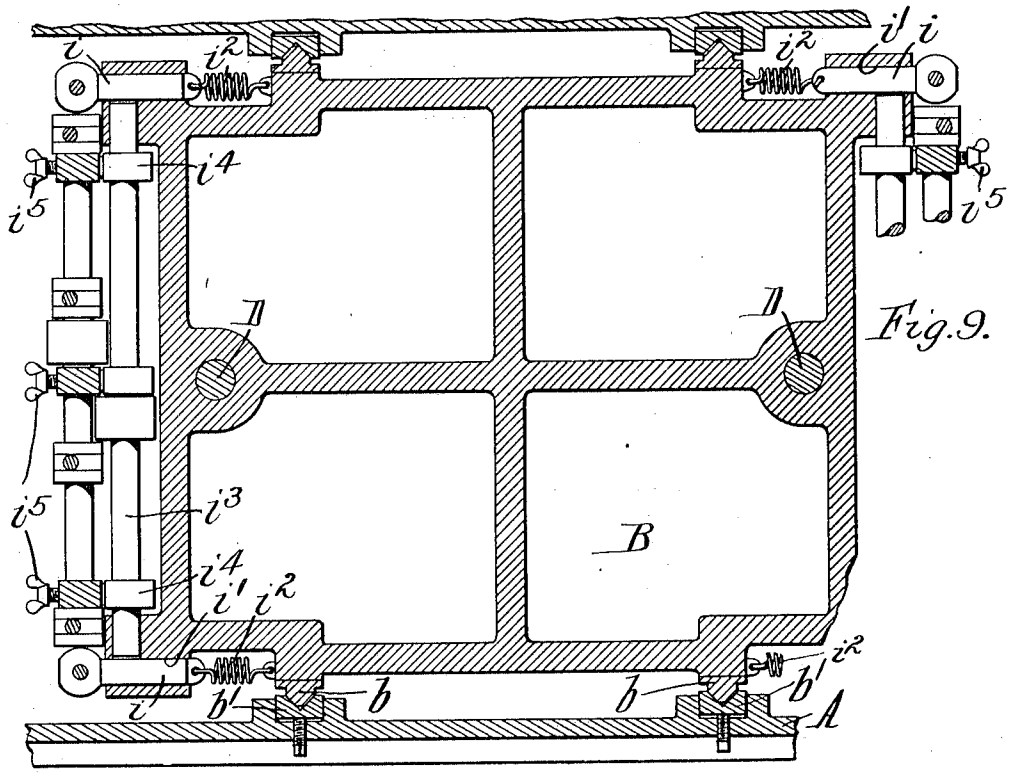
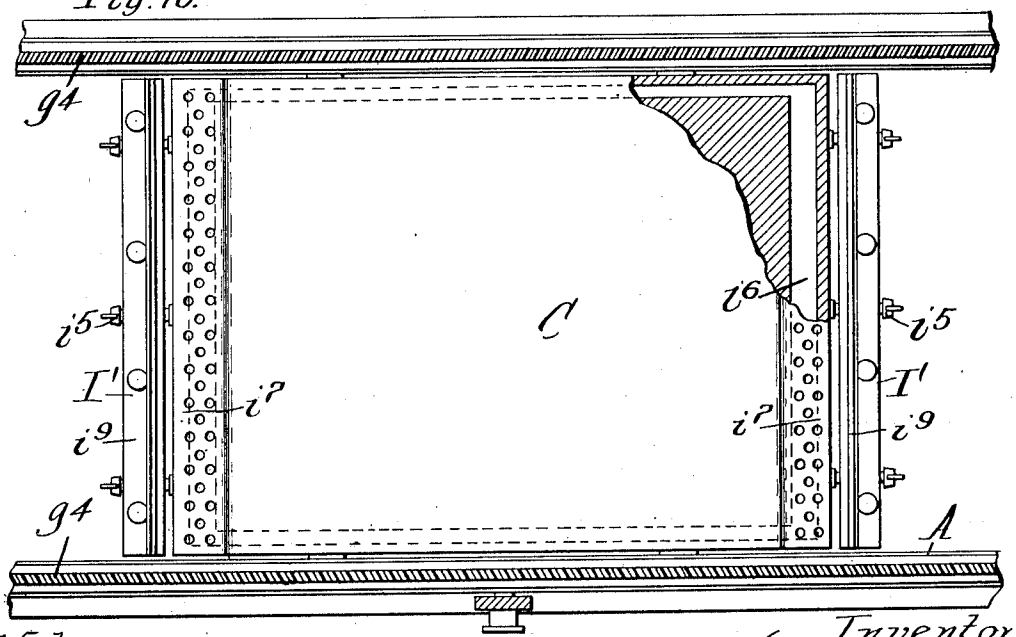


Fig. 9.

Fig. 10.



Witnesses:-
A. Borkenhagen
A. L. McGee.

Inventor
William Carl Huebner,
By Wilhelm, Bruce & Hand,
Attorneys.

W. C. HUEBNER.

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9 SHEETS—SHEET 6.

Fig. 11.

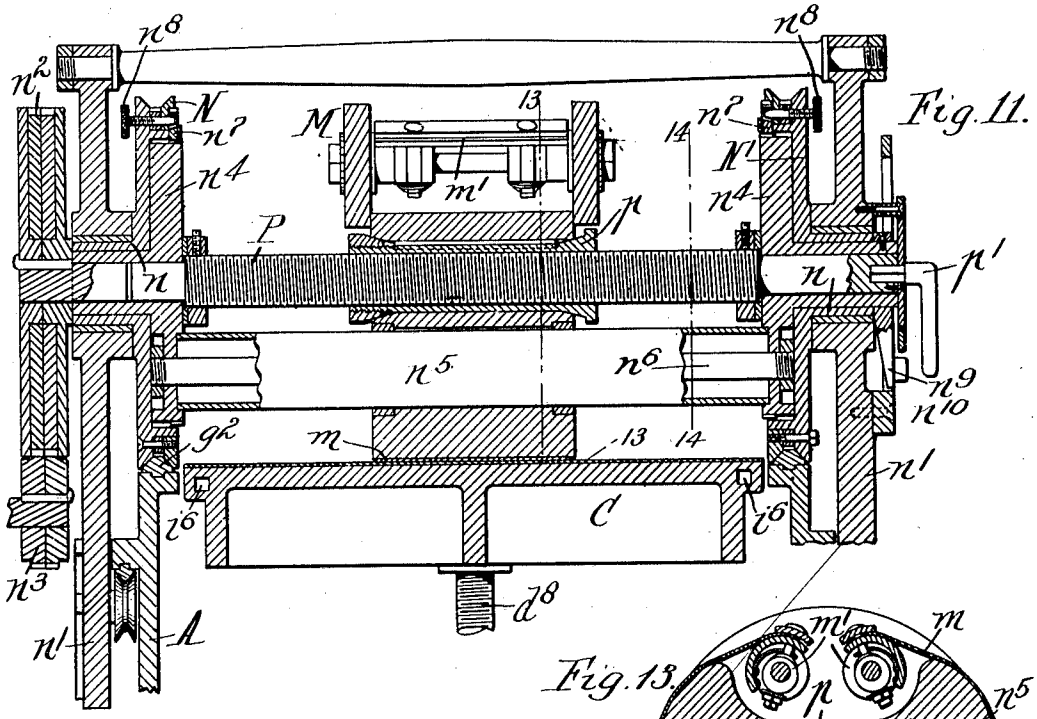


Fig. 13.

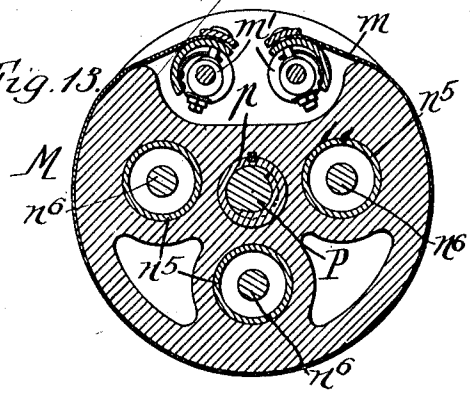


Fig. 12.

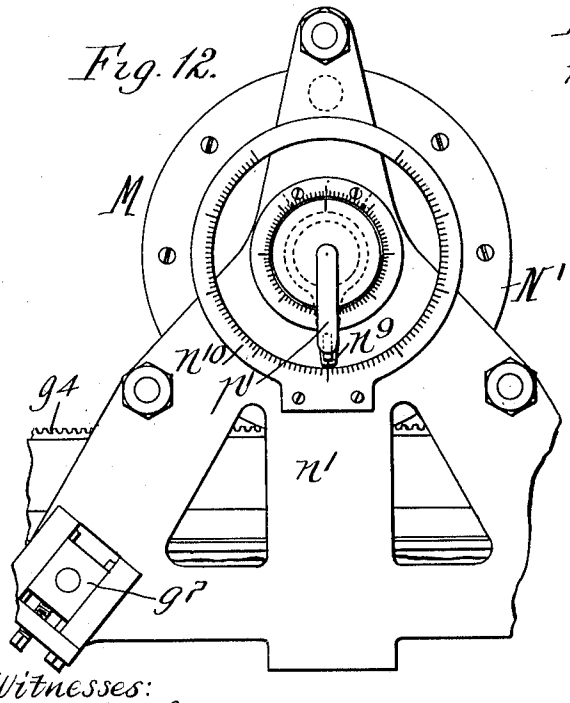
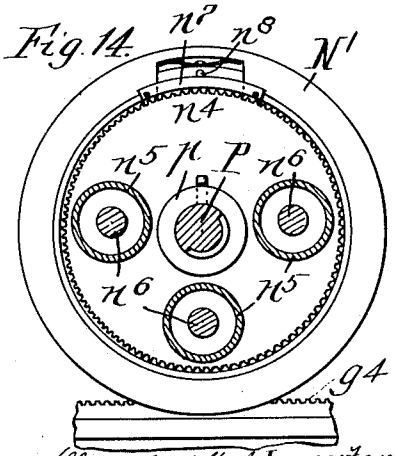


Fig. 14.



Witnesses:
A. Borkenhagen
A. L. Mclsee

William Carl Huebner Inventor.
By Wheeler, Parker & Hand
Attorneys.

W. C. HUEBNER.

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9 SHEETS—SHEET 7.

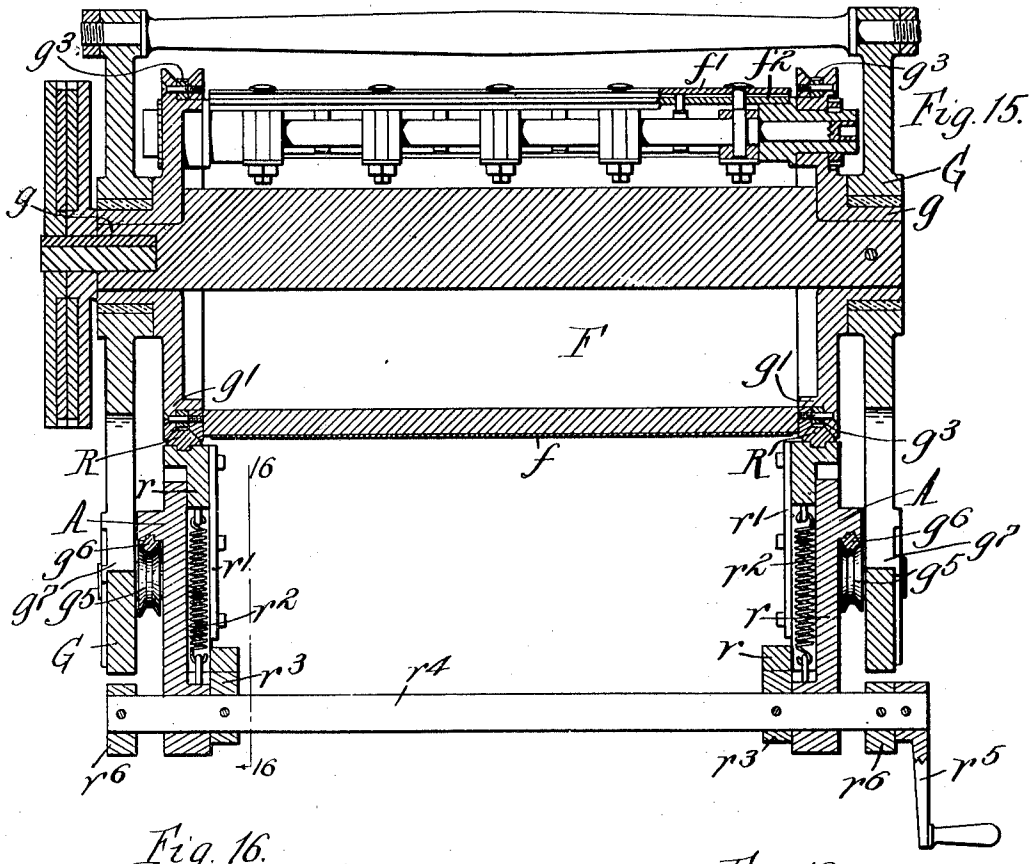


Fig. 15.

Fig. 16.

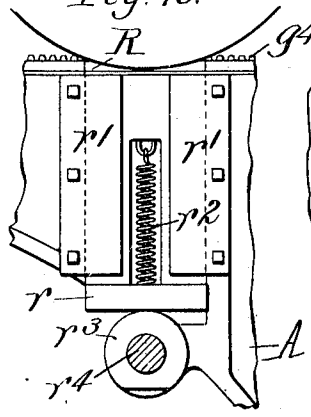


Fig. 17.

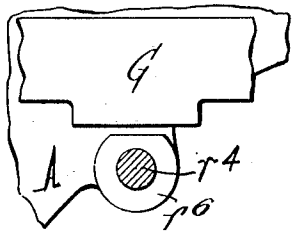
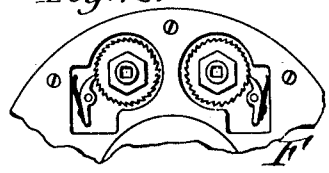


Fig. 18.



Witnesses:
A. Borkenhagen
A. L. McGee

Inventor:
William Carl Huebner,
by Wiselius Parker & Hart,
Attorneys.

W. C. HUEBNER.

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9 SHEETS—SHEET 8.

Fig. 19.

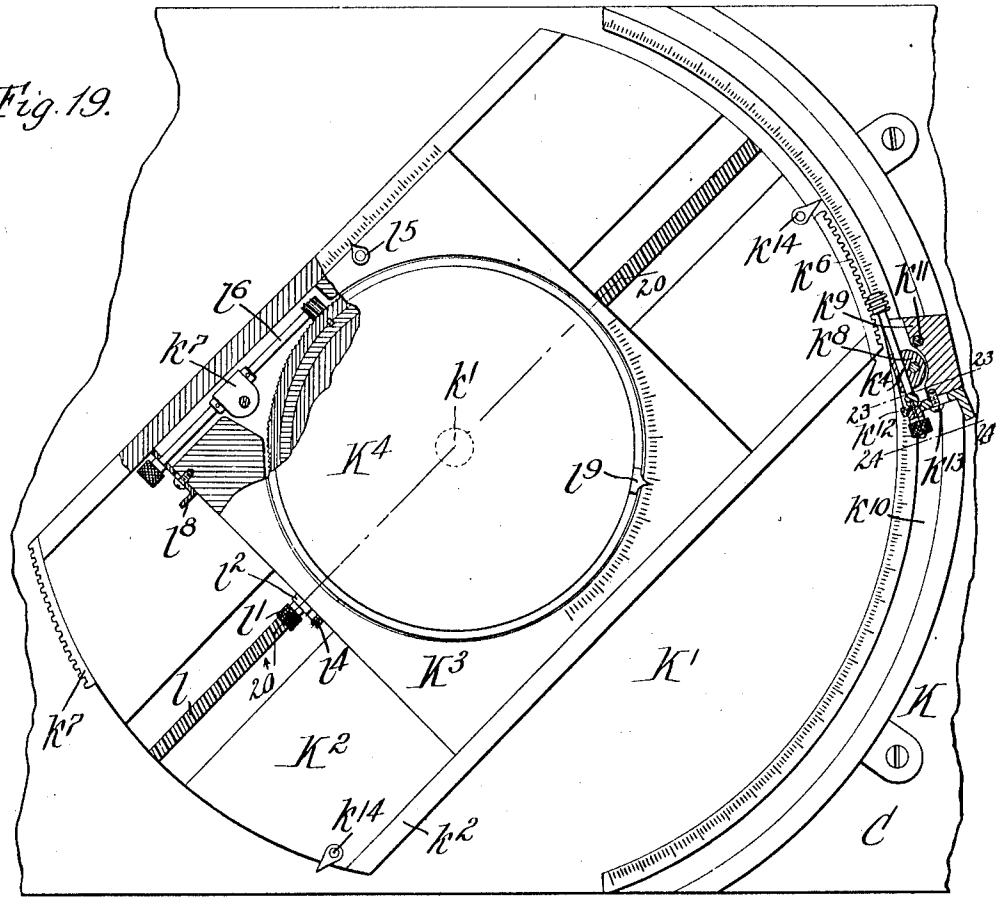


Fig. 20.

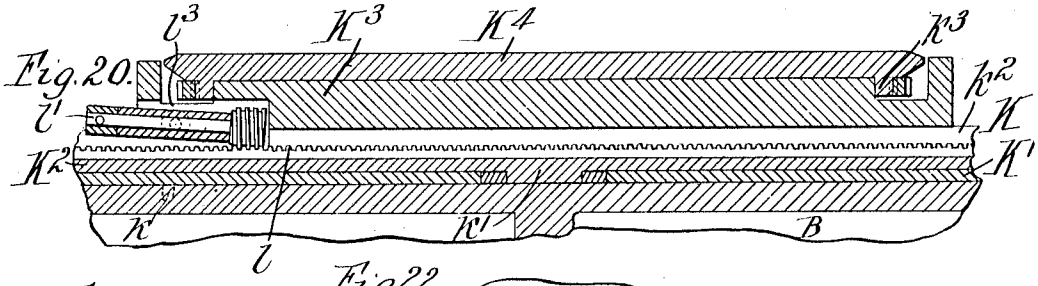


Fig. 21.

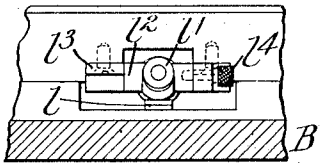


Fig. 22.

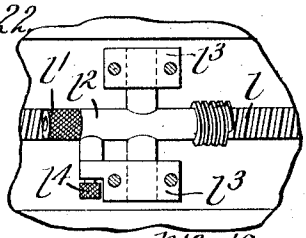


Fig. 23.

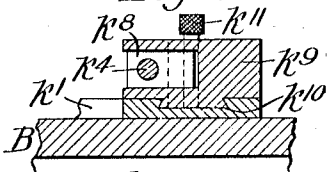
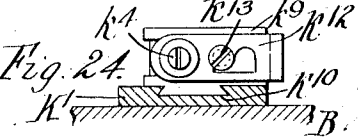


Fig. 24.



Witnesses:-
A. L. McGee

Inventor
William Conrad Huebner,
by Wright, Parker & Hard
Attorneys.

W. C. HUEBNER.

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APPLICATION FILED JAN. 2, 1912.

1,051,590.

Patented Jan. 28, 1913.

9 SHEETS—SHEET 9.

Fig. 25.

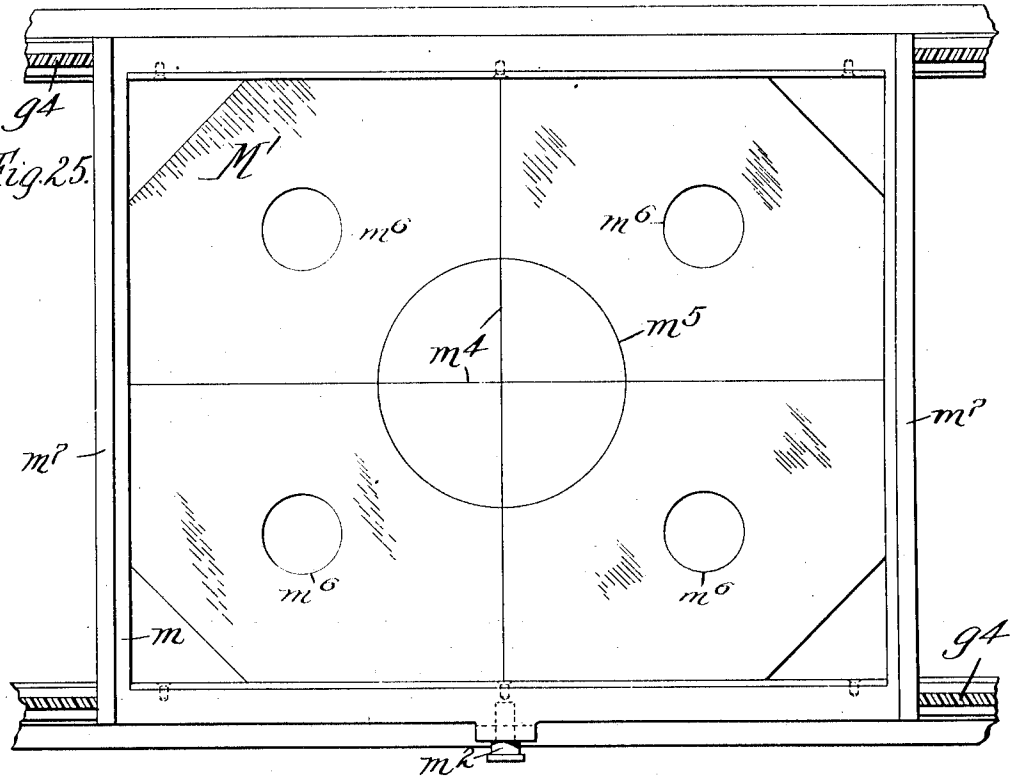


Fig. 26.

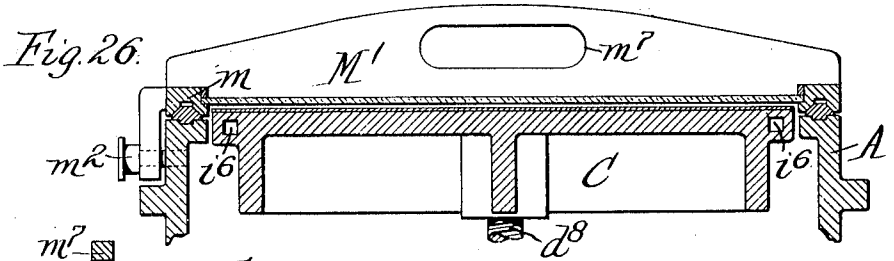
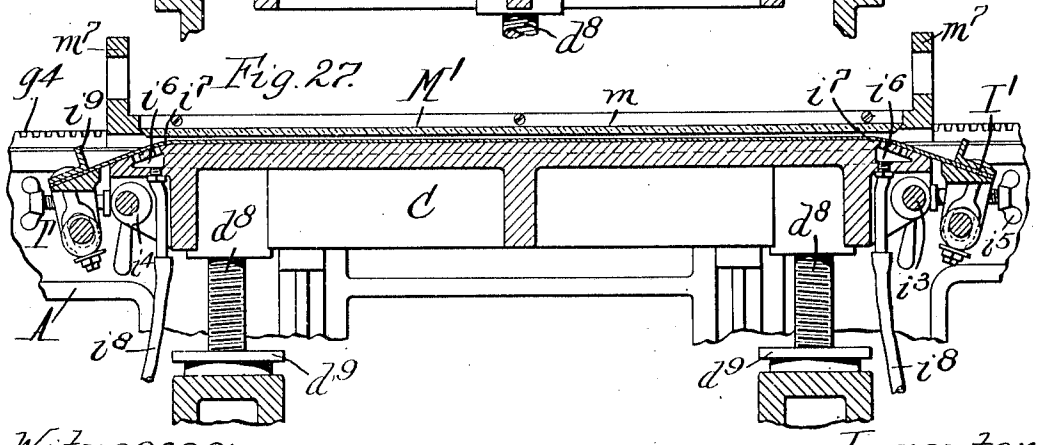


Fig. 27.



Witnesses:—
A. Borkenhagen
A. L. McGee.

Inventor
William Carl Huebner,
By Wright Brown Quinby & Finch,
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM CARL HUEBNER, OF BUFFALO, NEW YORK, ASSIGNOR TO HUEBNER-BLEISTEIN PATENTS COMPANY.

UNIVERSAL PRINTING-MACHINE.

1,051,590. Specification of Letters Patent. Patented Jan. 28, 1913.

Application filed January 2, 1912. Serial No. 668,874.

To all whom it may concern:

Be it known that I, WILLIAM CARL HUEBNER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Universal Printing-Machines, of which the following is a specification.

This invention relates to universal printing machines for producing prints from a primary printing surface in a desired location, position or arrangement on a secondary printing surface, proof sheet or other print-receiving surface.

Machines embodying the invention are especially adapted for producing secondary printing surfaces on which prints from several different kinds of primary printing surfaces, such, for example, as wood cuts, copper plates, steel engravings, drawings on stone, type, and lithographic engravings, or photographic negatives or positives, are assembled in a desired arrangement or grouping; also for printing a plurality of duplicate impressions in prescribed locations and positions on a secondary printing surface, or other print-receiving surface; and for building up designs on printing surfaces, or other surfaces, by repeating thereon in different required locations and positions, impressions from a design unit on a primary printing surface. The secondary printing surface can be a plate, stone or other surface adapted to be used for mechanical printing.

The object of the invention is to provide an efficient, practical and desirable printing machine which is adapted to be quickly, easily and accurately adjusted and rapidly operated for producing different desired results of the nature mentioned.

Briefly stated, the machine comprises a bed or platen for supporting the printing surface, a bed or platen for supporting the print-receiving surface, one in advance of the other, and an offset or transfer cylinder provided with a suitable offset blanket or surface, which cylinder is caused to roll first over the printing surface to take an impression therefrom and then over the print-receiving surface, for producing thereon a print from said impression. One of the beds or platens is provided with a holder which is adjustable with reference to the offset cylinder to enable the impression to be made on the cylinder in any location lengthwise and circumferentially thereof and in any angular position necessary to reproduce the subject in the desired location and angular position on the print-receiving surface. The offset cylinder travels over the platens on a supporting track, and means are provided for raising the platen to place the printing and print-receiving surfaces into printing contact with the cylinder and lowering them out of contact therewith, and means are also provided for adjusting the platens toward the offset cylinder, as required, to obtain the proper pressure or contact between the cylinder and the printing and print-receiving surfaces. The machine also has a supplemental short offset cylinder which is arranged to roll over the printing surface to take an impression therefrom and is adapted to be adjusted after receiving the impression, both axially and circumferentially, for repeating the prints in any desired location, arrangement or grouping on the print-receiving surface.

In the accompanying drawings: Figure 1 is a front elevation of a printing machine embodying the invention. Fig. 2 is a longitudinal sectional elevation thereof. Fig. 3 is a plan view thereof, the supplemental offset cylinder being omitted. Fig. 4 is a horizontal section, partly in plan, on an enlarged scale, in line 4—4, Fig. 1, of the mechanism for raising and lowering the primary platen. Fig. 5 is a section thereof in line 5—5, Fig. 6. Fig. 6 is a fragmentary front elevation thereof. Fig. 7 is a sectional elevation thereof in line 7—7, Fig. 5. Fig. 8 is a transverse section of the machine on an enlarged scale, showing the main offset cylinder, primary platen and other parts in elevation. Fig. 9 is a fragmentary horizontal section, partly in plan, showing the primary platen. Fig. 10 is a plan view, partly in section, showing the secondary platen. Fig. 11 is a fragmentary transverse sectional elevation on an enlarged scale, showing the supplemental offset cylinder. Fig. 12 is an end elevation thereof. Fig. 13 is a sectional elevation thereof in line 13—13, Fig. 11. Fig. 14 is a sectional elevation thereof in line 14—14, Fig. 11. Fig. 15 is a fragmentary transverse sectional elevation showing the main offset cylinder and means for supporting it off of its guide track. Fig. 16 is an elevation partly in section in line 16—16, Fig. 15. Fig. 17

is a fragmentary rear elevation of the device for supporting the offset cylinder off of the guide track. Fig. 18 is a fragmentary end elevation of the main offset cylinder. Fig. 19 is a plan view partly in section, on an enlarged scale of the adjustable holder for the primary printing surface. Fig. 20 is a section on an enlarged scale in line 20—20, Fig. 19. Fig. 21 is a fragmentary elevation, partly in section, on an enlarged scale of the device for adjusting the holder slide. Fig. 22 is a plan view, partly in section, thereof. Fig. 23 is a section in line 23—23, Fig. 19. Fig. 24 is an elevation, partly in section, in line 24—24, Fig. 19. Fig. 25 is a plan view, on an enlarged scale, showing the registering device. Fig. 26 is a fragmentary transverse section of the machine, showing the secondary platen and the registering device in position thereover. Fig. 27 is a longitudinal sectional elevation on an enlarged scale showing the secondary platen and registering device.

Like reference characters refer to like parts in the several figures.

A represents the stationary main frame of the machine which can be of any suitable construction, that shown being of generally rectangular shape and of skeleton form.

B and C represent, respectively, the primary and secondary beds or platens for supporting the primary printing plate or surface and the secondary printing or print receiving surface. These platens are arranged one in advance of the other with respect to the direction of travel of the offset cylinder and are movably mounted on the main frame and provided with means for adjusting them vertically to place the printing and print receiving surfaces in correct printing relation to the offset cylinder and for moving them quickly to and from this position when making prints.

In the machine illustrated (see particularly Figs. 2, 8 and 9) the platen B is provided at opposite sides with guide ribs b which slide vertically in adjustable guide ways b' on the main frame, and is supported and adjusted vertically by two screws D D, secured to the platen and working in rotatable screw sleeves or nuts, which are journaled and held from endwise movement in suitable bearings in cross pieces d of the main frame.

d', Fig. 8, indicates one of the screw sleeves, and d^2 the bearing therefor. The two screw sleeves d' are connected by bevel gears d^3 d^3 to a shaft d^4 by which they are caused to turn in unison. This shaft d^4 is suitably journaled on the main frame and is connected by bevel gears d^5 d^6 to an operating shaft D′ which is suitably journaled on the main frame and is provided at the front of the machine with a wheel or handle d^7 for turning it. The secondary platen C is adjusted by screws d^8 working in screw sleeves or nuts d^9 which are similarly geared to an operating shaft D^2. The platens B and C can thus be independently adjusted vertically by turning the operating shafts D′ and D^2, to place the printing and print receiving surfaces, of whatever kind, supported thereby in the same horizontal plane, or in other necessary printing relation to the offset cylinder. Means are also provided for operating the shafts D′ D^2, to quickly move the platens to and from the printing position relative to the offset cylinder for making the impressions after the platens have once been adjusted for a particular piece of work in the manner above described. These means are preferably constructed as follows:

E′, Figs. 1 and 4–7, represents a hand lever which is fulcrumed on an eccentric pivot e on a shaft e' which is suitably journaled in the front portion of the main frame. The hand lever E′ is provided, in a slotted portion thereof through which the operating shaft D′ passes, with a gear segment e^2 adapted to mesh with a pinion e^3 secured to the operating shaft, D′, so that said shaft can be turned by swinging the lever E′. By turning the fulcrum shaft e' in one direction or the other, by a handle e^4 projecting from the shaft, the gear segment on the lever E′ is moved into or out of mesh with the pinion e^3. The fulcrum shaft is provided with a latch e^5 adapted to engage in one or the other of two notches e^6, Fig. 7, in the shaft bearing for holding the lever fulcrum stationary with the toothed segment either in or out of mesh with the pinion e^3. After the platen has been adjusted to secure the proper printing relation between the printing surface thereon and the offset cylinder, by turning the shaft D′, as above explained, and the machine is ready for printing, the hand lever E′ is raised until it is arrested by engagement with a fixed stop e^7 on the main frame, and the fulcrum shaft e' is turned to place the gear segment in mesh with the pinion e^3. Then by lowering the hand lever, the operating shaft D′ will be turned in a direction to lower the platen away from the offset cylinder, and by again raising the lever E′ until arrested by the stop e^7, the platen will be returned to the printing position. Thus by the simple operation of the hand lever the printing surface can be quickly lowered repeatedly from and returned to exactly the same printing position. When it is necessary to adjust the platen for different work, the hand lever E′ is disengaged from the operating shaft D′ by turning the fulcrum shaft e', and the operating shaft D′ can then be turned, as required, to secure the necessary adjustment of the platen B. The secondary platen C is similarly raised and low-

ered to carry the print receiving surface to and from the printing relation with the offset cylinder by a hand lever E^2 which is provided with a toothed segment adapted to be moved into and out of mesh with a pinion on the operating shaft D^2 by turning the fulcrum shaft e^8 for the lever E^2.

F represents the main offset cylinder which is provided with a transfer surface formed, for instance, by a rubber blanket f secured on the cylinder, and is arranged to roll first over the printing surface on the primary platen B to take an impression therefrom and then over the print receiving surface on the secondary platen C to place the impression thereon. The transfer blanket f can be secured on the cylinder in any suitable way. For example, its ends are secured by clamps f' to bars f^2, Figs. 15 and 18, which are journaled in the ends of the cylinder and are adapted to be turned to stretch the blanket on the cylinder by a tool or wrench applied to the ends of the bars, which are suitably shaped for this purpose.

The offset cylinder is mounted by suitable end journals g in the opposite ends of a carriage G of any suitable construction and is provided at its ends with wheels or rims g' arranged to roll on a guide and supporting track, preferably formed by rails g^2 on the front and rear walls of the frame A. The wheels g' shown are grooved, having smooth beveled faces which roll on corresponding beveled faces on the track rails, and are provided between these beveled faces with gear teeth g^3 which mesh with rack teeth g^4 on the rails, so that by revolving the cylinder it is positively propelled or rolled along the track. The teeth on the wheels and rails are preferably made oblique to reduce to the minimum the lost motion between the wheels and the track and insure a positive motion of the cylinder without slipping or shifting on the track, so that a given point on the cylinder will register with the same points on the platen in the successive traverses of the cylinder. The beveled faces of the wheels sustain the weight of the cylinder and reduce the wear on the teeth of the wheels and the track. The ends of the cylinder carriage depend below the track and are provided with rollers g^5 adapted to roll against downwardly facing rails g^6 on the front and rear of the main frame to prevent the cylinder from lifting off of its guide track. These rollers g^5 are preferably journaled in boxes g^7, Fig. 1, which are adjustable for preventing any play between the cylinder and the guide track.

The offset cylinder is driven for propelling it along the track, preferably by an electric motor H, see Fig. 3, which is supported on one end of the carriage G. The armature shaft of this motor is connected by any suitable gearing h, Fig. 3, to a wheel h', secured to the adjacent journal of the offset cylinder. The described manner of mounting and propelling the cylinder and the means for securing the blanket are practical and efficient for the purpose and, therefore, preferably employed, but the cylinder can be mounted and driven in other suitable ways, and other securing means for the blanket can be used.

I, Fig. 2, represents clamps at the opposite ends of the primary platen for securing and stretching the printing plate thereon, when a thin plate is used. Each of the clamps shown, comprises a lower and an upper bar between which the end of the plate is gripped. The lower bar is carried by pins i arranged to slide horizontally in holes i' in the ends of the platen and is forced outwardly against the pull of springs i^2 to stretch the printing plate, by turning a shaft i^3 which is provided with eccentrics i^4 engaging adjustable thumb screws i^5 on the bar, see Fig. 9. The clamp can be adjusted to a position parallel with or slightly oblique to the adjacent edge of the platen, as may be necessary for stretching the printing plate smoothly and uniformly on the platen. The secondary platen C is also preferably provided at its opposite ends with similar clamps I′ for securing and stretching on the platen a thin printing or print receiving plate. The platen C shown is also provided with suction means for holding paper sheets thereon when the machine is to be used for printing directly on paper. For this purpose the platen is provided with a marginal suction duct or chamber i^6, see Figs. 10, 26 and 27, and the end edges of the platen are beveled at i^7 and provided with perforations which communicate with the end portions of the suction duct. A pipe i^8 connects the duct i^9 with a vacuum pump or other means for exhausting the air from the duct. The flanged upper bar i^9 of the clamp I′ serves as a gage strip for the sheets. The sheets are placed on the platen with one edge against the gage strip i^9 and a suitable controlling device, not shown, is actuated for producing the suction whereby the ends of the sheet will be drawn down against the perforated edges of the platen, so as to hold the sheet smoothly and firmly on the platen.

K, Figs. 3 and 19–24, represents an adjustable holder for securing a printing surface on the primary platen and adjusting the same, as may be necessary to place the impression therefrom in a required location and position on the offset cylinder. This holder may be of any construction adapted to give the necessary adjustments. As shown, the holder comprises a base plate K′ which is adapted to be removably secured on the platen, a pivoted frame or plate K^2 which is adapted to be rotatably adjusted on the

base plate, a slide or plate K^3 which is adjustable radially on the pivoted plate K^2 and a circular top plate K^4 on which the printing plate or surface is adapted to be secured in any known or suitable way and which is adapted to be rotatably adjusted on the slide K^3. The base plate K' is provided with depending pins k, indicated by dotted lines in Figs. 3 and 20, adapted to enter correspondingly placed holes in the platen, or with other suitable means for removably retaining the holder on the platen. The plate K^2 is pivoted on the base plate by a central depending stud k' on the under side of the former seated in a central hole in the latter and the pivoted plate is provided with opposite side flanges k^2 between which the slide K^3 is confined and guided on the pivoted plate. The top plate K^4 is rotatably supported on the slide K^3, for instance, by means of a circular depending flange k^3 on the top plate surrounding a circular raised portion of the slide.

k^4, Figs. 19, 23 and 24, represents an adjusting screw for the pivoted plate K^2. This screw k^4 is provided at one end with a knurled head for turning it and at the other end with a thread adapted to mesh with toothed segments k^6 k^7 on the opposite ends of the pivoted plate. The screw is pivoted by a bearing block k^8 in a cavity in a slide block k^9, so that the screw can be swung into and out of mesh with the toothed segments. The slide block k^9 is arranged to slide in a curved guide way k^{10} on the base plate K' concentric with the center of the pivoted plate K^2. The slide block k^9 can be moved to any desired position in the guide way k^{10} and be secured in such position by tightening a set screw k^{11} carried by the block. The adjusting screw extends through a hole in a finger piece k^{12} which is movably secured on the end of the block k^9 by a screw k^{13} passing through a slot in the finger piece. The finger piece coöperates with its securing screw k^{13} to retain the adjusting screw in the position to which it is moved either in or out of mesh with the toothed segments. When it is desired to adjust the pivoted plate K^2, it is turned on the base plate by hand approximately to the desired position. The slide block k^9 is then moved in its curved guide k^{10} and the adjusting screw k^4 swung into mesh with one of the toothed segments on the pivoted plate and the block secured by means of the set screw k^{11}. Then by turning the adjusting screw the pivoted plate can be adjusted accurately to the desired position. The screw thread engaging the toothed segment holds the pivoted plate stationarily in the position to which it is adjusted. Pointers k^{14} on the pivoted plate, coöperating with a suitable scale on the curved guide k^{10} indicate the adjustment of the pivoted plate.

For adjusting the slide K^3 radially on the pivoted plate K^2 the latter is preferably provided with a toothed rack l extending lengthwise thereof and the slide is provided with an adjusting screw l' which is pivoted by a bearing piece l^2 in suitable bearings l^3 on the under side of the slide plate, whereby the screw can be swung into and out of mesh with the toothed rack. The screw is adapted to be held in engagement with the rack by a set screw l^4, or other holding device. When the adjusting screw is disengaged from the toothed rack the slide K^3 can be moved to any desired position on the pivoted plate K^2 and then by engaging the screw with the toothed rack and turning the screw, the slide can be adjusted accurately to the desired position, as indicated by a suitable pointer l^5 on the slide, coöperating with a graduated scale on the adjacent flange of the pivoted plate.

The rotatable top plate K^4 is adjusted on the slide plate, in a similar manner, by an adjusting screw l^6, Fig. 19 provided with a thread adapted to engage teeth on the edge of the top plate. The adjusting screw l^6 is pivoted by a bearing k^7 in a recess in the slide K^3 and is adapted to be swung into and out of engagement with the toothed rim of the top plate by a sliding finger piece l^8. The top plate or table can be turned approximately to the desired position and then accurately adjusted by moving the adjusting screw into engagement with the toothed rim of the top plate and turning the adjusting screw until a pointer l^9 on the table coöperating with a graduated scale on the slide K^3, indicates the required adjustment.

By rotatably adjusting the pivoted plate K^2 on the base plate K' and adjusting the slide K^3 radially on the pivoted plate, the primary printing surface on the top plate K^4 can be moved to any desired position, within the range of the holder, both lengthwise and transversely of the platen, so as to place the impression in any required location, lengthwise and circumferentially on the offset cylinder, and by adjusting the top plate K^4 rotatably on the slide K^3 the primary printing surface can be turned to any required angular position. The holder K constitutes an attachment which can be readily removed from the platen when it is not required and again placed in position for use thereon. For work in which the primary printing surface does not have to be adjusted to different positions on the platen, the holder is removed and the printing surface is secured directly on the platen by any known or suitable means, or when a thin flexible printing plate is employed, this is secured and stretched on the platen by the clamps before described.

M represents the supplemental offset cylinder which, like the main offset cyl-

inder, is arranged to roll over the primary and secondary platens for transferring an impression from the printing surface to the print receiving surface. The supplemental offset cylinder is, however, shorter than the main cylinder and is arranged, as shown in Figs. 11–14, to be adjusted transversely of the platen to any desired position, and also circumferentially with respect to its supporting wheels, so that an impression on the cylinder can be applied to any desired portion of the print receiving surface. The offset blanket m is preferably secured on the cylinder by securing and stretching devices m' similar to those employed on the main offset cylinder. The supplemental cylinder is connected to grooved and toothed supporting and propelling wheels N and N′ adapted to roll on the supporting track for the main offset cylinder. These wheels are provided with suitable journals n seated in bearings in the ends of a carriage n' which is preferably similar in construction to the carriage for the main offset cylinder and the cylinder is driven by a motor (not shown) supported by the carriage and connected by suitable gears n^2 n^3 to the wheels N. The wheels N N′ are provided at their inner sides with circular disks or plates n^4 which are adapted to be adjusted rotatably with reference to the wheels N N′ and are connected together by guide tubes n^5 and bolts n^6. The guide tubes n^5 pass through the offset cylinder, which is adapted to be adjusted on the guide tubes transversely of the machine to different positions. The adjustable disks n^4 are releasably locked to the supporting wheels N N′, so as to turn therewith, for instance, by spring actuated sliding dogs n^7 on the wheels adapted to engage with teeth on the peripheries of the adjustable disks.

n^8 indicates thumb screws having conical ends engaging with beveled faces on the dogs for moving the dogs to release the disks from the supporting wheels and permit the cylinder to be adjusted rotatably, or circumferentially, with reference to the supporting wheels. The hub of one of the adjustable disks n^4 extends through the hub of the supporting wheel N′ and is provided at its outer end with an arm or handle n^9 for turning it to adjust the cylinder. The position of this handle with reference to a scale n^{10} on the carriage n' indicates the rotary adjustment of the cylinder. When the cylinder has been turned to the desired position the dogs n^8 are operated to lock the cylinder to the supporting wheels N N′.

P represents a screw suitably journaled at its ends and held from endwise movement in the hubs of the adjustable disks n^4 and passing through a screw threaded sleeve or nut p in the supplemental cylinder. This screw is adapted to be turned by a suitable crank or handle p' applied to one end thereof for adjusting the cylinder transversely on the guide rods to any required position. The transverse adjustment is indicated by a disk secured to the end of the screw and provided with an index coöperating with a surrounding scale which is secured to the adjacent end of the carriage n'. The supplemental offset cylinder can be constructed and mounted in any other suitable way which permits it to be adjusted circumferentially and transversely relative to its supporting wheels N N′, and any other suitable means can be employed for indicating the adjustment of the cylinder.

In the use of the machine the main offset cylinder F is used when a large subject is to be reproduced, and in doing work which does not require endwise adjustment of the cylinder. After the printing surface and the print receiving surface have been properly adjusted and registered on the primary and secondary platens, and the platens adjusted by means of the screws D′ D², as before explained, to place the printing and print receiving surfaces in correct printing relation to the offset cylinder, the driving motor for the cylinder is started and the cylinder is thereby caused to roll on the supporting track over the platens. By actuating the hand lever E′ the primary platen is raised, as before explained, to move it into position for the cylinder to receive an impression from the printing surface on the platen. The secondary platen is raised in a similar manner by actuating its lever E², to place it in position for the impression to be printed on the print receiving surface carried by this platen. The platens are then lowered by means of their actuating levers and the driving motor for the offset cylinder is reversed for returning the cylinder. When it is desired to reproduce a small subject, or to place successive impressions in different locations or positions on the print receiving surface, the supplemental offset cylinder M is used, and if the adjustment requires it, the primary printing surface is secured on the adjustable holder K and placed in the required position by the adjustment of the holder. After the supplemental cylinder has been rolled over the primary printing surface to take an impression therefrom, it can be adjusted either circumferentially or transversely, or both, as required to place the print in the required position on the print receiving surface. By appropriate adjustments of the supplemental offset cylinder, or of the holder K, or both, successive impressions from the primary printing surface can be placed in any desired arrangement or grouping on the print receiving surface. In a similar manner impressions from different primary printing surfaces can be placed or grouped

in any desired manner on the print receiving surface. The different described adjustments of the parts enables a practically unlimited variation of the possible arrangements or groupings of the prints on the print receiving surface.

M′, Figs. 25–27, represents a registering device by means of which the printing and print receiving surfaces can be placed on the platens B and C in exactly the same relation to the offset cylinder. This registering device comprises an open rectangular frame m of any suitable construction provided with a glass or transparent plate which is supported by the frame above and close to the printing or print receiving surface. The opposite side bars of the frame m are grooved to rest and slide on the track rails for the offset cylinder, so that the registering device can be slid on the track from a position over one platen to a position over the other, and a pin m^2 on the front of the frame m is adapted to be inserted in holes in the main frame to hold the registering device in corresponding positions over the primary and secondary platens. One of the holes for the pin m^2 is shown at m^3, Fig. 1. The registering glass or plate, shown, is provided with cross lines m^4 and with a circle m^5 concentric with the intersection of the cross lines, and the corners of the plate are cut away and openings m^6 formed in the plate, so that the printing and the print receiving surfaces beneath the plate can be reached to shift them on the platens to place suitable register marks thereon coincident with the register lines on the registering plate. Thus by first placing the registering device in position over the primary printing surface and registering this surface with lines on the registering plate and then moving the registering device into position over the print receiving surface and shifting this surface to a corresponding position with reference to the registering device, the printing and print receiving surfaces can be readily placed in exact registration or relation to each other and to the offset cylinder. After the printing and print receiving surfaces have been properly registered the registering device is removed from the machine. It is provided for this purpose at its ends with handles m^7 for lifting it.

Means are provided for sustaining the offset cylinders with their supporting wheels clear of the guide track, so that the cylinders can be revolved in a stationary position without horizontal movement on the track for cleaning the offset blankets and also to enable the main cylinder to be turned, as may be necessary for an impression to be made in a desired position circumferentially thereon. For this purpose the track rails g g are provided at the end of the machine beyond the primary platen B with short rail sections R which are adapted to be lowered out of engagement with the supporting wheels of the main offset cylinder while the cylinder carriage is stationarily supported with the wheels over the gaps thus made in the track rails. Similar movable rail sections R′ are provided at the other end of the track for enabling the supplemental offset cylinder also to be revolved while held in a stationary position.

The rail sections R are carried by slides r, Figs. 15 and 16, which are movable vertically in suitable guides r' on the inside of the front and rear walls of the main frame. The lower ends of the slides are held by springs r^2 against fixed disks r^3 on a shaft r^4 which is journaled in bearings in the front and rear walls of the main frame and is provided at its front end with a crank handle r^5 for turning it. This shaft is also provided with fixed disks r^6 beneath the ends of the cylinder carriage G for supporting the carriage. The disks r^3 and r^6 are of segmental circular shape, the flat portions of the disks r^3 being diametrically opposite to the flat portions of the other disks r^6. In the position of the shaft r^4, shown in Fig. 15, the circular edges of the disks r^3 support the rail sections R in the line with fixed portions of the rails, while the flat edges of the disks r^6 are uppermost. The wheels g' then rest on the movable rail sections R and support the offset cylinder. By turning the shaft r^4 one-half revolution the circular edges of the disks r^6 will engage the ends of the carriage G and support the cylinder while the flat edges of the disks r^3 being uppermost, the movable rail sections R will be lowered out of engagement with the cylinder supporting wheels by the springs r^2. The carriage G will then be stationarily supported and the offset cylinder is free to be turned therein as may be desired for adjusting its position relative to the platens, or for cleaning the blanket. The wheels of the offset cylinder can thus be disengaged from and engaged with the supporting track without raising or shifting the offset cylinder by simply turning the shaft r^4 one-half revolution. The supplemental offset cylinder is adapted to be similarly supported clear of the guide track by moving it to a position in which its wheels N N′ rest on the movable rail sections R′ and lowering said rail sections by turning a shaft r^7.

I claim as my invention:

1. The combination with a support for a printing surface, a support for a print-receiving surface, an offset cylinder, and means for causing said cylinder to roll over said surfaces, of means for adjusting one

of said surfaces longitudinally, transversely and angularly relatively to the path of said cylinder, substantially as set forth.

2. The combination with a support for a printing surface, a support for a print-receiving surface, an offset cylinder, means for adjusting said cylinder axially, and means for causing said cylinder to roll over said surfaces, of means for adjusting one of said surfaces longitudinally, transversely and angularly relatively to the path of said cylinder, substantially as set forth.

3. The combination with a support for a printing surface, a support for a print-receiving surface, an offset cylinder, means for adjusting said cylinder circumferentially, and means for causing said cylinder to roll over said surfaces, of means for adjusting one of said surfaces longitudinally, transversely and angularly relatively to the path of said cylinder, substantially as set forth.

4. The combination with a support for a printing surface, a support for a print-receiving surface, an offset cylinder, means for adjusting said cylinder axially and circumferentially, and means for causing said cylinder to roll over said surfaces, of means for adjusting one of said surfaces longitudinally, transversely and angularly relatively to the path of said cylinder, substantially as set forth.

5. The combination with a support for a primary printing surface, a support for a print-receiving surface, an offset cylinder, and driving means for causing said offset cylinder to roll over said primary printing surface to receive an impression therefrom and over said print-receiving surface to apply the impression thereto, of devices for adjusting each of said supports relative to said cylinder, an operating member for said adjusting devices, and actuating means for moving said adjusting devices a definite distance adapted to be connected to and disconnected from said operating member, substantially as set forth.

6. The combination with a support for a primary printing surface, a support for a print-receiving surface, an offset cylinder, and driving means for causing said offset cylinder to roll over said primary printing surface to receive an impression therefrom and over said print-receiving surface to apply the impression thereto, of screws for adjusting each of said supports relative to said cylinder, an operating shaft for said screws, an actuating lever adapted to be connected to and disconnected from said shaft, and means for limiting the movement of said lever, substantially as set forth.

7. The combination with a support for a primary printing surface, a support for a print-receiving surface, an offset cylinder, and driving means for causing said offset cylinder to roll over said primary printing surface to receive an impression therefrom and over said print-receiving surface to apply the impression thereto, of means for adjusting said primary printing surface longitudinally, transversely and angularly to different positions relative to the direction of travel of said offset cylinder, substantially as set forth.

8. The combination with a support for a primary printing surface, a support for a print-receiving surface, an offset cylinder, and driving means for causing said offset cylinder to roll over said primary printing surface to receive an impression therefrom and over said print-receiving surface to apply the impression thereto, of means for adjusting said primary printing surface in the plane of the surface longitudinally, transversely and angularly, and means for adjusting said offset cylinder circumferentially and also transversely relative to said supports, substantially as set forth.

9. The combination with a support for a primary printing surface, a support for a print-receiving surface, and an offset cylinder, of a track, supporting wheels for said cylinder which roll on said track and are connected to said cylinder, means for driving said wheels to propel said cylinder along said track and revolve it over said supports, and means for raising and lowering said supports to move said primary printing and print-receiving surfaces into and out of contact with said cylinder, said offset cylinder being adjustable circumferentially to different positions relative to said wheels, substantially as set forth.

10. The combination with a support for a primary printing surface, a support for a print-receiving surface, and an offset cylinder, of a track, supporting wheels for said cylinder which roll on said track are connected to said cylinder, means for driving said wheels to propel said cylinder along said track and revolve it over said supports, and means for raising and lowering said supports to move said primary printing and print-receiving surfaces into and out of contact with said cylinder, said offset cylinder being adjustable circumferentially to different positions relative to said wheels and transversely relative to said supports, substantially as set forth.

11. The combination with a platen and an offset cylinder arranged to travel above said platen, of a holder on said platen for a printing surface, and means for adjusting said holder transversely, longitudinally and angularly relative to said platen to place said printing surface in different locations and positions relative to said cylinder, substantially as set forth.

12. The combination with a platen and an offset cylinder arranged to travel above said

platen, of a holder on said platen for a printing surface, and means for adjusting said holder transversely, longitudinally and angularly relative to said platen to place said printing surface in different locations and positions relative to said cylinder, said holder and the adjusting means therefor being removably secured on said platen, substantially as set forth.

13. The combination with a platen and an offset cylinder arranged to travel above said platen, of a holder for adjustably securing a printing surface on said platen comprising a plate on which the printing surface is secured, a slide on which said plate is rotatably adjustable, a guide frame on which said slide is adjustable, and a base which is secured on said platen and on which said guide frame is adjustable, substantially as set forth.

14. The combination with a platen, and an offset cylinder arranged to travel above said platen, of a holder for adjustably securing a printing surface on the platen comprising a plate on which the printing surface is secured, a member which is supported by the platen and adjustably supports said plate, and an adjusting device for said plate which is adapted to be disconnected from said plate to permit the free movement thereof, substantially as set forth.

15. The combination with a platen and an offset cylinder arranged to travel above said platen, of a holder for adjustably securing a printing surface on said platen comprising a plate on which the printing surface is secured, a slide on which said plate is rotatably adjustable, a guide frame on which said slide is adjustable, a base which is secured on said platen and on which said guide frame is adjustable, and adjusting devices for said plate, slide and guide frame which are adapted to be disconnected from the parts which they adjust to permit the free movement of said parts, substantially as set forth.

16. The combination with a platen, and an offset printing cylinder, of wheels on which said cylinder rolls over said platen, a supporting member for said offset cylinder which is rotatably adjustable on said wheels, means for locking said supporting member to said wheels when adjusted, and a device connecting said cylinder and said supporting member for adjusting the cylinder in the direction of its axis relative to said wheels, substantially as set forth.

17. The combination with a platen, and an offset printing cylinder, of wheels on which said cylinder rolls over said platen, disks which are rotatably adjustable on said wheels, means for locking said disks to said wheels when adjusted, guide rods which connect said disks and support said cylinder, and a screw device for adjusting said cylinder axially on said guide rods, substantially as set forth.

18. The combination with supports for a primary printing surface and a print-receiving surface, and an offset cylinder, of a track on which said cylinder travels over said supports, said track having movable rail sections, and means for moving said rail sections out of supporting relation to said cylinder and for supporting said cylinder off of the track, substantially as set forth.

19. The combination with supports for a primary printing surface and a print-receiving surface and an offset cylinder, of a track on which said cylinder travels over said supports, said track having movable rail sections, and a shaft having disks for supporting said rail sections and other disks for supporting said cylinder off of said track, said first mentioned disks being moved out of supporting position and said other disks moved into supporting position by turning said shaft, substantially as set forth.

Witness my hand this 26th day of December, 1911.

WILLIAM CARL HUEBNER.

Witnesses:

EDWARD WILHELM,

CYESTA B. HORNNBECK.