W. C. HUEBNER.

OFFSET PRINTING MACHINE.

APPLICATION FILED FEB. 9, 1911.

1,109,288.

Patented Sept. 1, 1914.

9 SHEETS—SHEET 1.

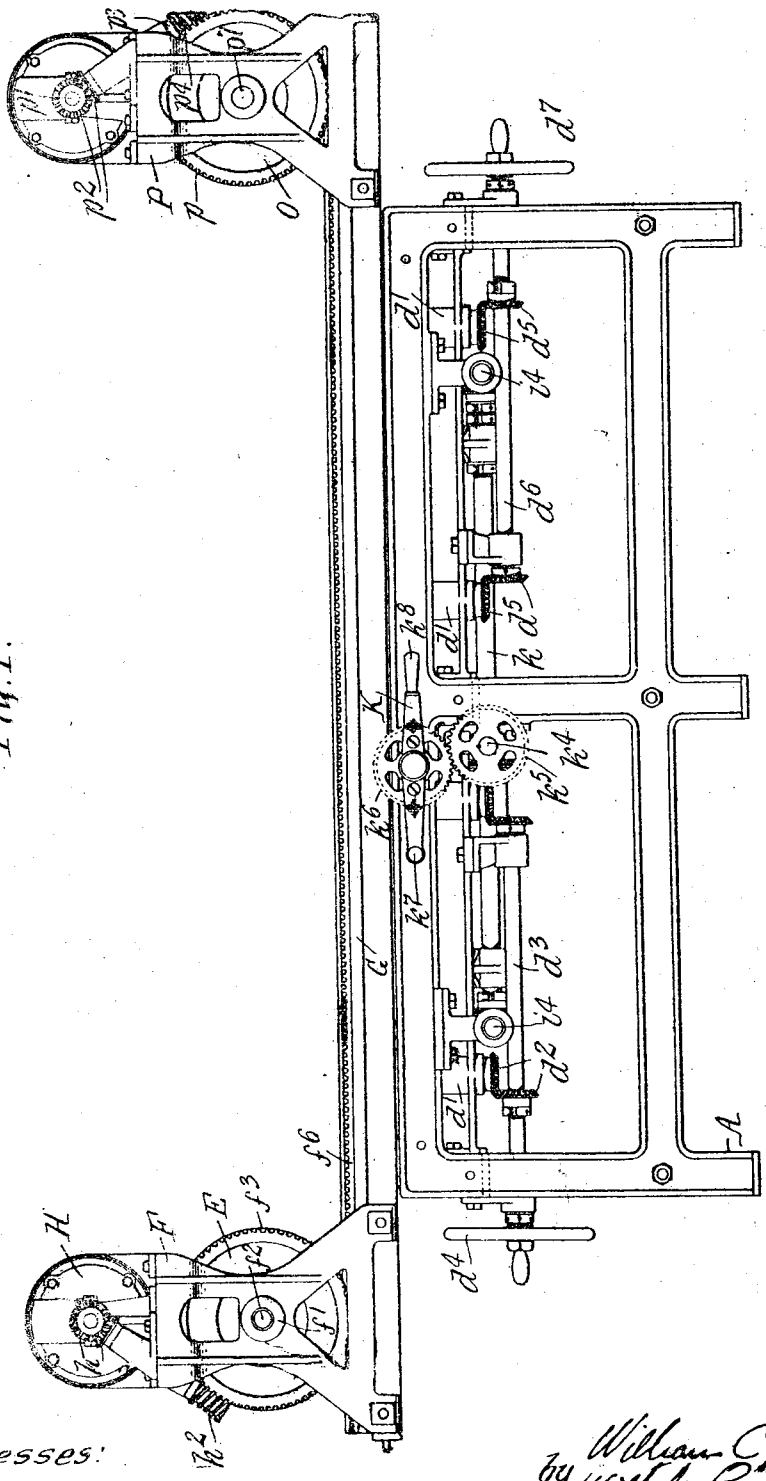


Fig. 1.

Witnesses:
C. A. Bund.
A. F. Dumas.

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1,109,288.

Patented Sept. 1, 1914

9 SHEETS—SHEET 2.

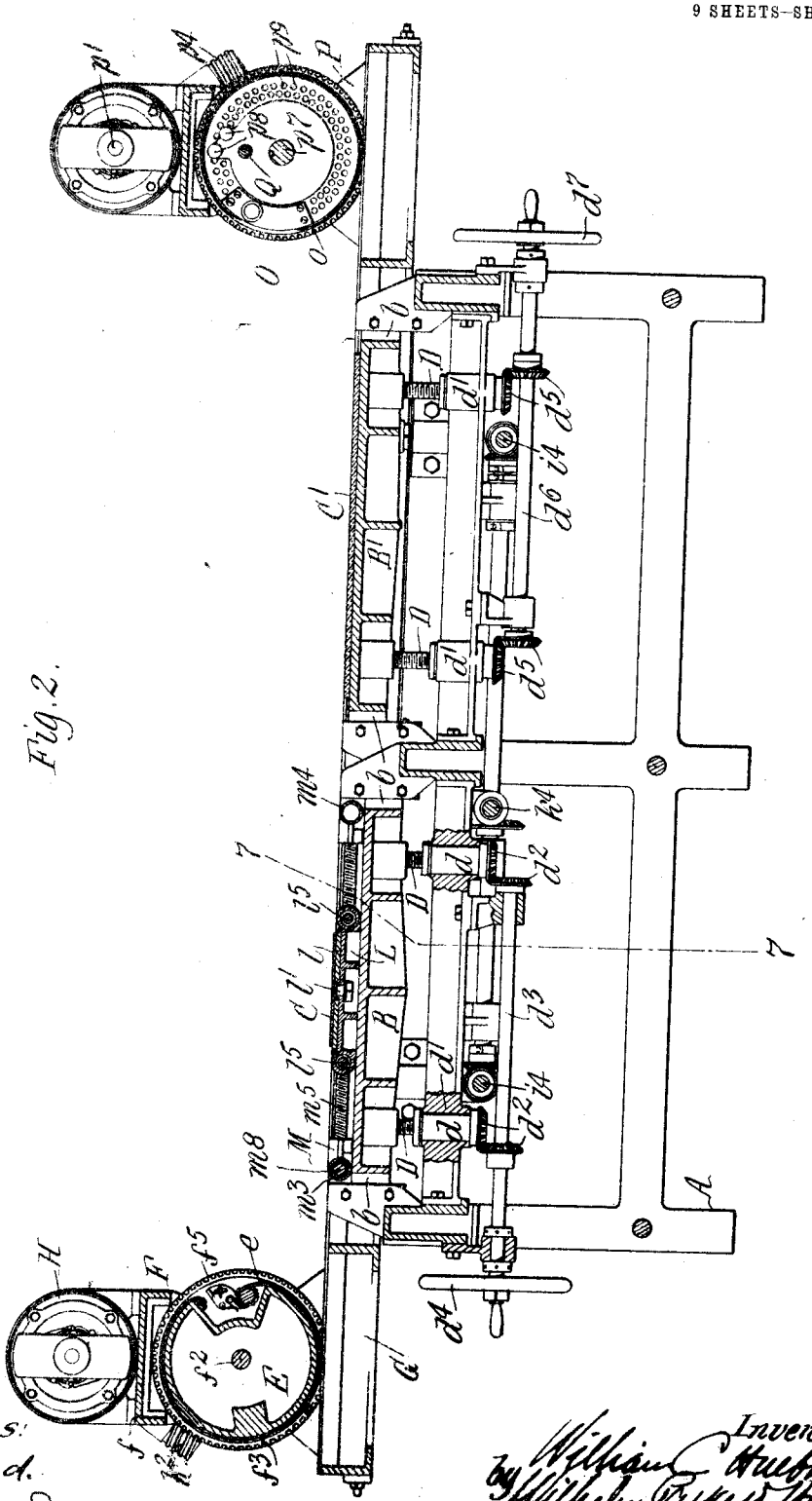


Fig. 2.

Witnesses:
C. H. Bond.
C. E. Bond.

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1,109,288.

Patented Sept. 1, 1914.

9 SHEETS SHEET 3.

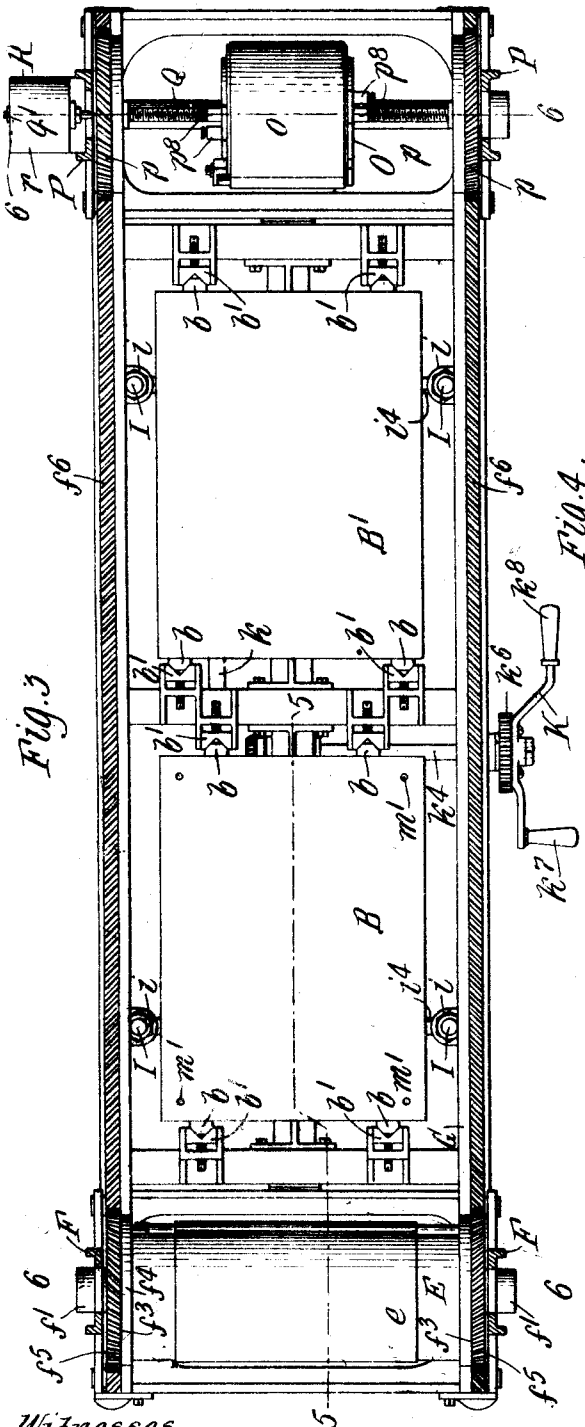


Fig. 3

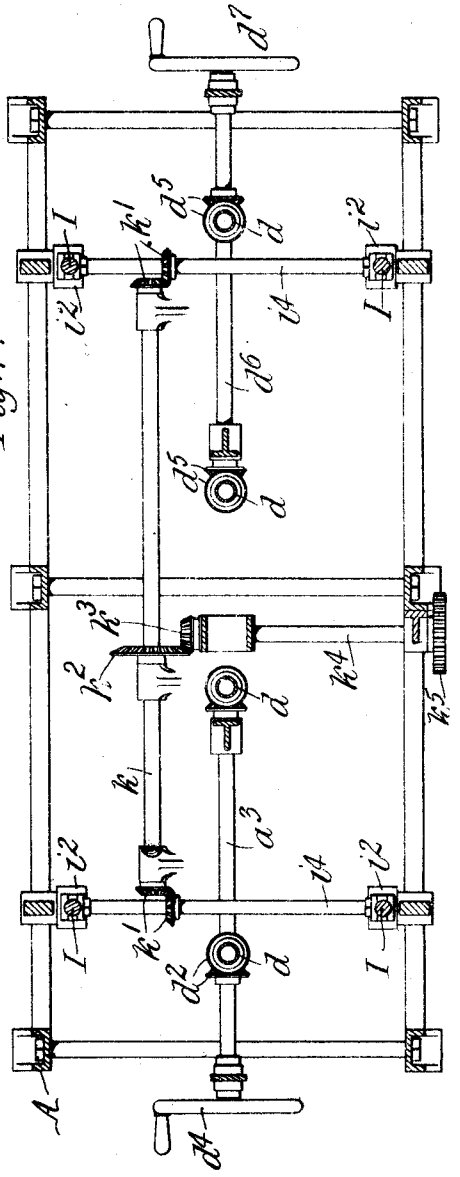


Fig. 4.

Witnesses.
C. W. Bund.
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1,109,288.

Patented Sept. 1, 1914.

9 SHEETS—SHEET 4.

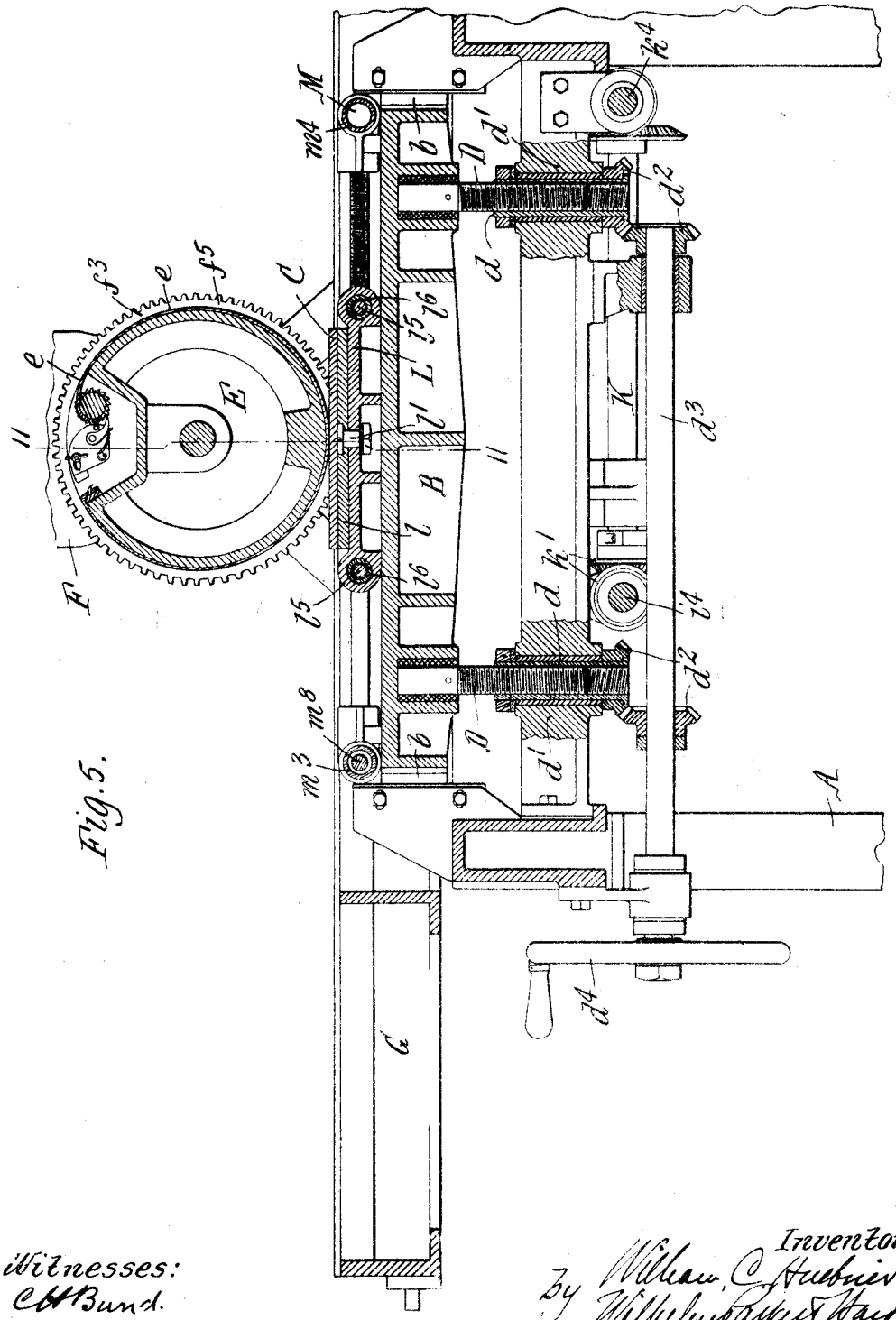


Fig. 5.

Witnesses:
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9 SHEETS—SHEET 5.

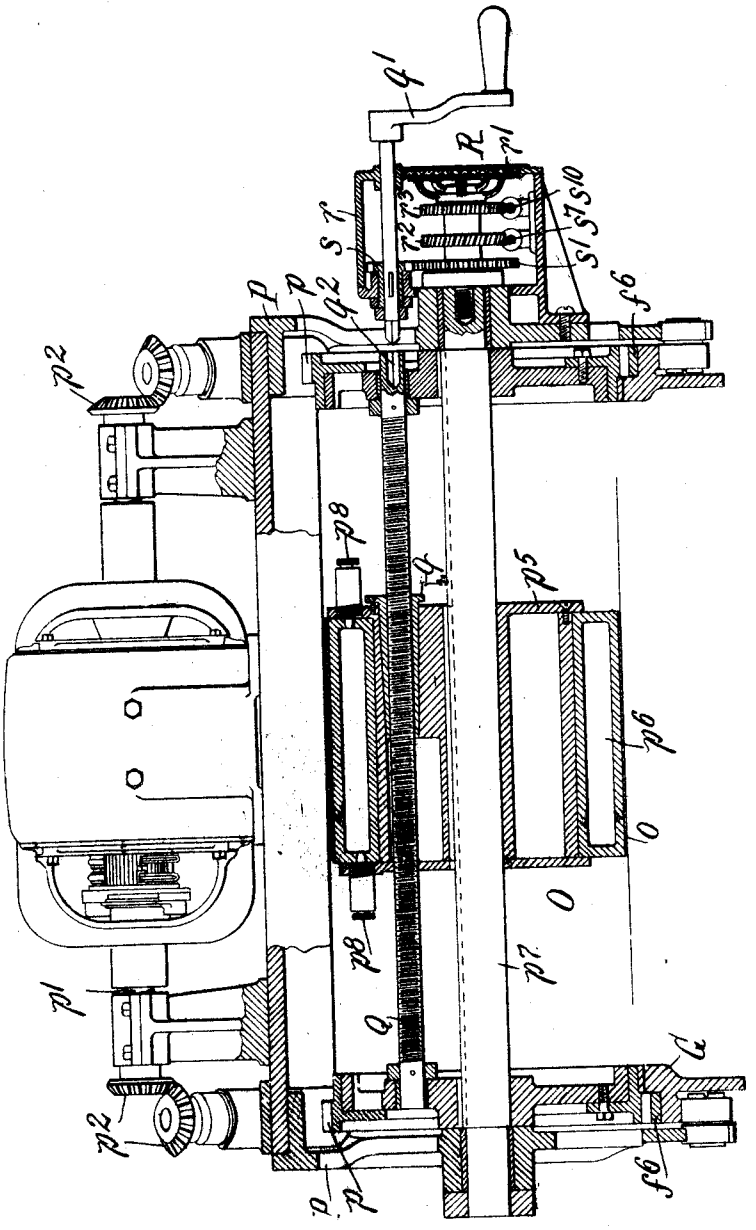


Fig. 6.

Witnesses.
C. A. Bund.
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OFFSET PRINTING MACHINE.

APPLICATION FILED FEB. 9, 1911.

1,109,288.

Patented Sept. 1, 1914

9 SHEETS SHEET 6

Fig. 7.

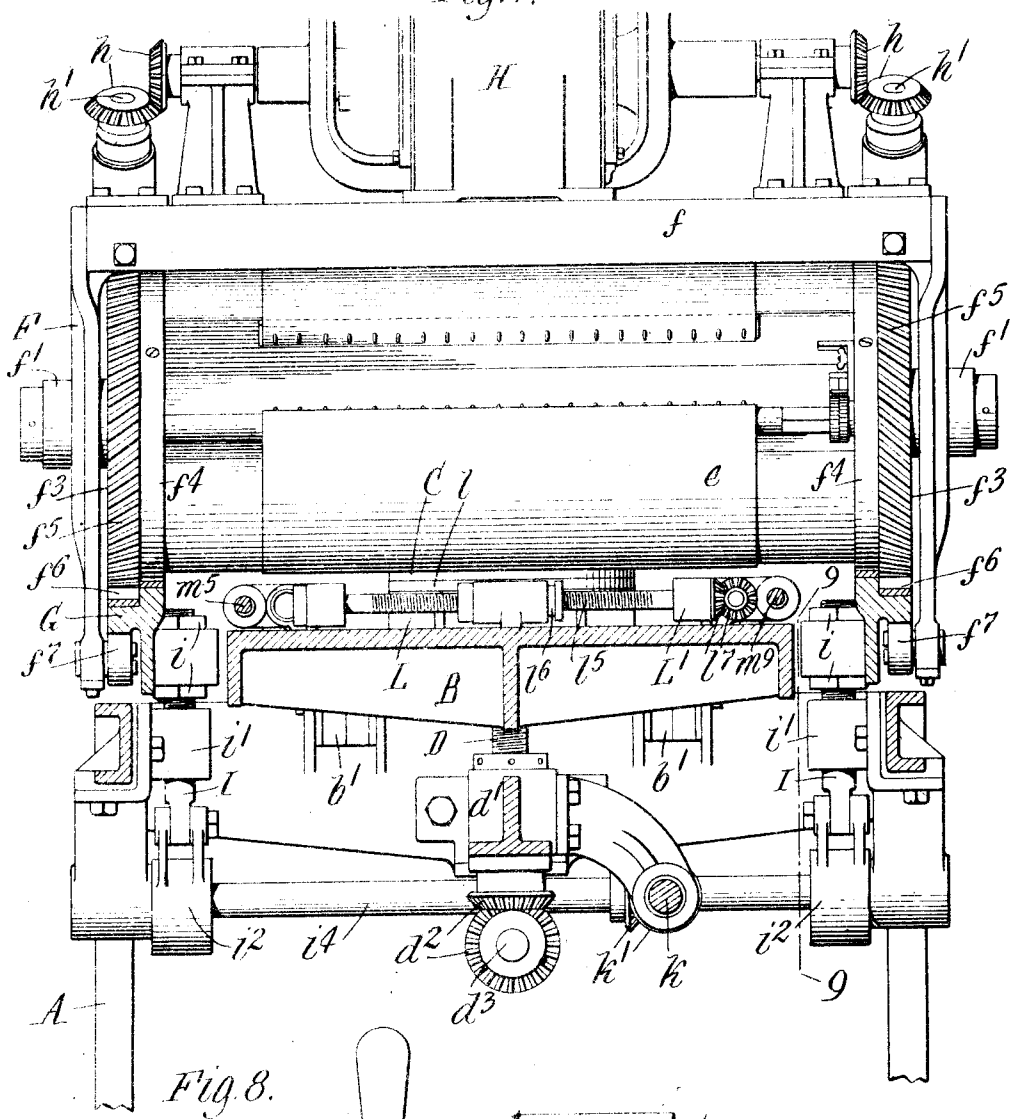


Fig. 8.

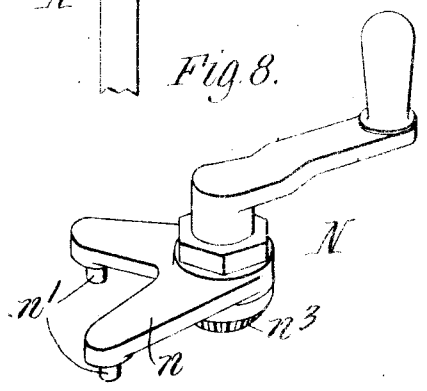
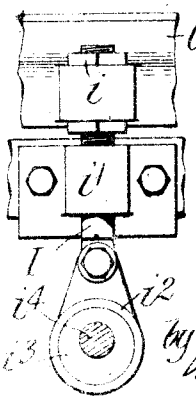


Fig. 9.



Witnesses:
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OFFSET PRINTING MACHINE.

APPLICATION FILED FEB. 9, 1911.

1,109,288.

Patented Sept. 1, 1914.

9 SHEETS SHEET 7.

Fig. 10.

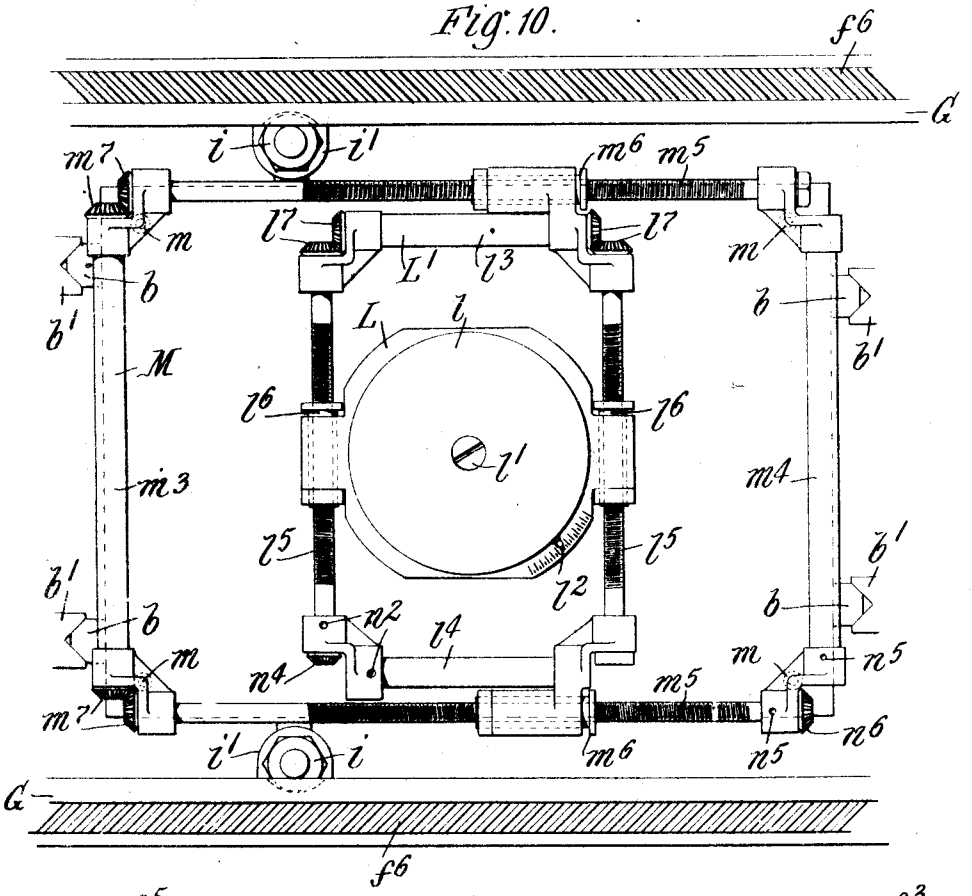
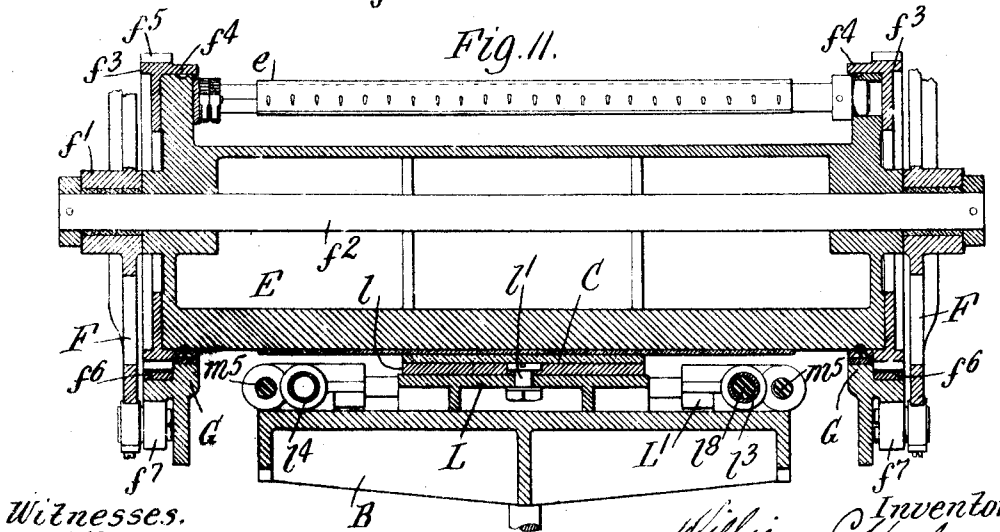


Fig. 11.



Witnesses.
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OFFSET PRINTING MACHINE.

APPLICATION FILED FEB. 8, 1913.

1,109,288.

Patented Sept. 1, 1914.

9 SHEETS SHEET 6.

Fig. 12.

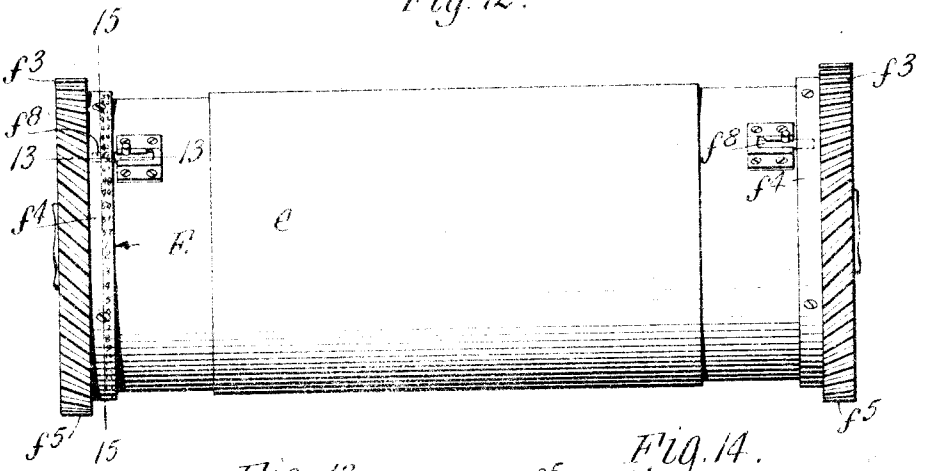


Fig. 13.

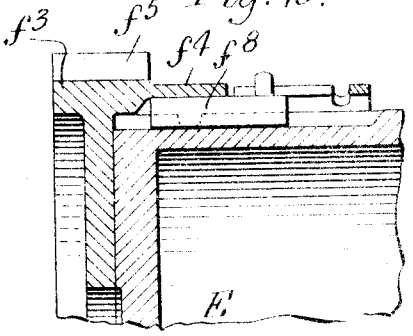


Fig. 14.

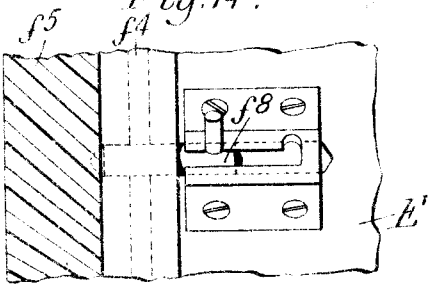
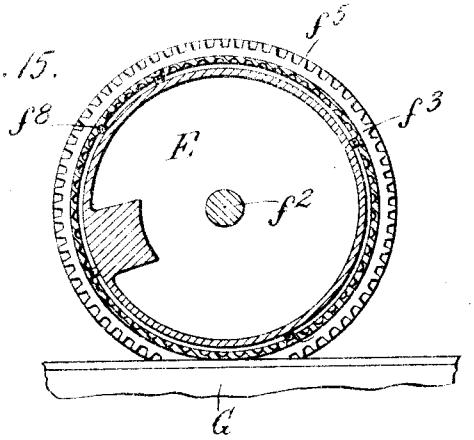


Fig. 15.



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OFFSET PRINTING MACHINE.

APPLICATION FILED FEB. 9, 1911

1,109,288.

Patented Sept. 1, 1914.

9 SHEETS—SHEET 9.

Fig. 16.

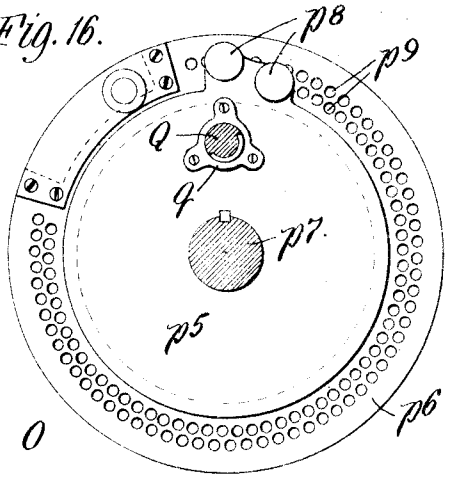


Fig. 17.

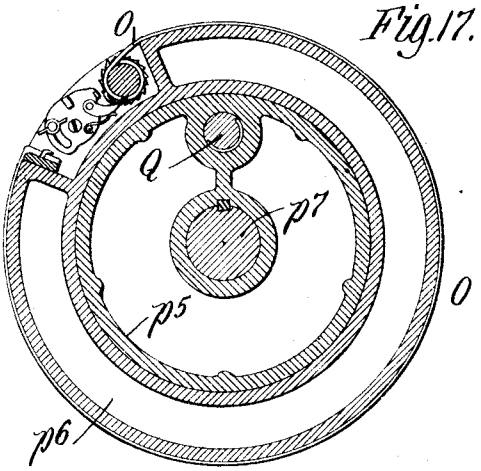


Fig. 18.

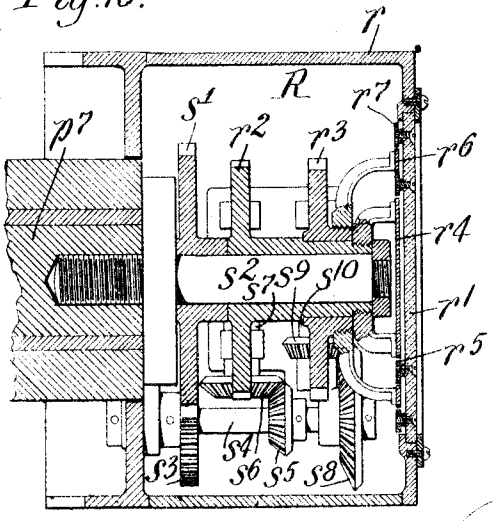


Fig. 19.

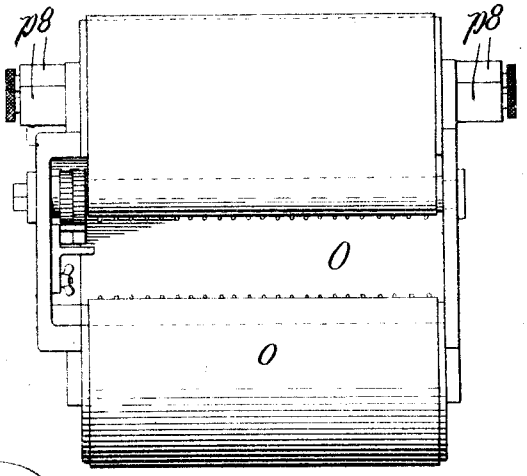
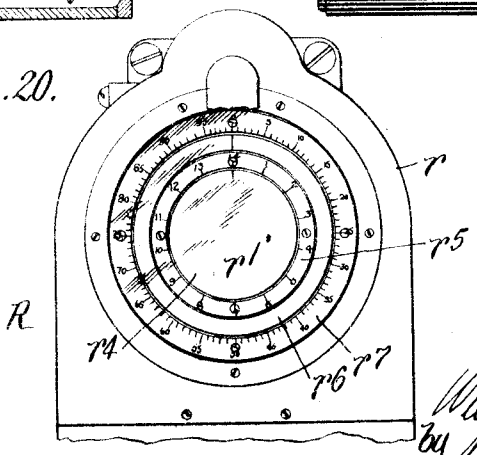


Fig. 20.



Witnesses:

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UNITED STATES PATENT OFFICE.

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OFFSET-PRINTING MACHINE.

1,109,288. Specification of Letters Patent. Patented Sept. 1, 1914.

Application filed February 9, 1911. Serial No. 607,595.

To all whom it may concern:

Be it known that I, WILLIAM C. 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 Offset-Printing Machines, of which the following is a specification.

This invention relates to offset 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, 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 thus produced can be on a transparent plate, sheet or film adapted to be finished in any suitable way and used for making photographic prints, or it can be on a plate, stone or other surface adapted to be finished and used for mechanical printing.

The object of the invention is to provide an efficient, practical and desirable offset 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 primary and secondary beds or supports for supporting the primary printing surface and secondary printing or print-receiving surface in line, one in advance of the other, and an offset cylinder provided with a rubber offset blanket or other suitable surface, which is caused to roll first over the primary printing surface to take an impression therefrom and then over the secondary printing surface, or print-receiving surface, for producing thereon a print from said impression. The primary bed or platen is preferably provided with a holder for the primary printing surface 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 a desired location and angular position on the secondary printing surface. The offset cylinder is mounted to travel over and out of contact with the primary and secondary printing surfaces on the supports, and means are provided for lowering the cylinder into contact with the printing surfaces and raising it out of contact therewith at the proper points in the travel of the cylinder, and means are also provided for adjusting the supports toward the offset cylinder as required, to obtain the proper printing contact of the cylinder with the primary and secondary printing surfaces. A supplemental short offset cylinder is also preferably provided which is arranged to roll over the primary printing surface to take an impression therefrom and is adapted to be adjusted both axially and circumferentially thereof for making duplicate prints in any desired location, arrangement or grouping on the print-receiving surface.

In the accompanying drawings, consisting of nine sheets: Figure 1 is a front elevation of an offset printing machine embodying the invention. Fig. 2 is a longitudinal sectional elevation thereof. Fig. 3 is a plan, partly in horizontal section, thereof. Fig. 4 is a plan, partly in horizontal section, of the mechanism for raising and lowering the offset cylinders and adjusting the supports. Fig. 5 is a fragmentary longitudinal sectional elevation of the machine, on an enlarged scale, in line 5—5, Fig. 3, showing a different position of the cylinder. Fig. 6 is a fragmentary transverse sectional elevation thereof, on an enlarged scale, in line 6—6, Fig. 3. Fig. 7 is a transverse sectional elevation thereof, on an enlarged

scale, in line 7—7, Fig. 2. Fig. 8 is a perspective view of the operating handle for the adjustable holder or table for the primary printing surface. Fig. 9 is a sectional elevation in line 9—9, Fig. 7, of one of the lifting devices for the offset cylinder. Fig. 10 is a plan view, on an enlarged scale, of the holder or table for the primary printing surface and the adjusting means therefor. Fig. 11 is a fragmentary transverse sectional elevation of the machine in line 11—11, Fig. 5. Fig. 12 is an elevation of the main offset cylinder. Fig. 13 is an enlarged fragmentary sectional elevation thereof, in line 13—13, Fig. 12. Fig. 14 is an enlarged fragmentary elevation showing one of the securing bolts for the main offset cylinder. Fig. 15 is a sectional elevation of the offset cylinder in line 15—15, Fig. 12. Fig. 16 is an end elevation, partly in section, of the supplemental offset cylinder. Fig. 17 is a transverse section thereof. Fig. 18 is a sectional elevation of the micrometer adjusting device for the supplemental offset cylinder. Fig. 19 is a side elevation of the supplemental offset cylinder. Fig. 20 is a face view of the micrometer adjusting mechanism.

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 skeleton rectangular form.

B and B′ represent the two beds or supports for respectively supporting the primary printing surface C and the secondary printing or print-receiving surface C′. These supports are arranged one in advance of the other with respect to the direction of travel of the offset cylinder, and are movably mounted in the main frame and are provided with means for adjusting them vertically to obtain the proper printing contact between the printing surfaces which they support and the offset cylinder.

In the machine illustrated (see Figs. 2, 4 and 5) each support of bed B B′ is provided at its opposite ends with guide ribs b which slide vertically in adjustable guideways b' on the main frame, and is supported and adjusted vertically by two screws D secured to the support and working in rotatable screw sleeves d. The screw sleeves are journaled and held from endwise movement in suitable bearings d' on the main frame, and the screw sleeves for the support B are connected by bevel gears d^2 d^2 to an operating shaft d^3 by which they are simultaneously rotated. The operating shaft is suitably journaled on the main frame A and is provided at one end thereof with a hand wheel d^4, or other means, for turning it. The adjusting screw sleeves d for the secondary support B′ are similarly connected by bevel gears d^5 d^5 to an operating shaft d^6 which is provided at the opposite end of the main frame with a hand wheel d^7 or other means for turning it. The supports or beds B B′ can thus be adjusted independently to place the printing surfaces supported thereby in the same horizontal plane or in other necessary relation to the offset cylinder. The supports or beds can be mounted and adjusted vertically in any other suitable way.

E represents the main offset cylinder which is provided with a suitable transfer surface formed, for instance, by a rubber offset blanket e secured on the cylinder in the usual or any suitable way. The cylinder is arranged to roll first over the primary printing surface C on the support or bed B to take an impression therefrom and then over the secondary printing surface, or print-receiving surface C′, on the support or bed B′ to print the subject thereon, and is suitably mounted so that it can be raised and lowered into and out of printing contact with the printing surfaces.

F represents a carriage in which the offset cylinder E is suitably journaled and which is arranged to travel over the supports on a horizontal carriage supporting frame or track G. The carriage track G consists of a rectangular frame which is supported on the main frame A by means, hereinafter described, by which it and the cylinder carriage which it supports, can be raised and lowered. The carriage F shown consists of upright end pieces located at opposite sides of the carriage track G and connected by a top cross-piece f. The end pieces are provided with bearings f' for the ends of the shaft f^2 of the offset cylinder.

f^3 represents gear wheels secured to the opposite ends of the offset cylinder E for supporting and propelling it on the carriage track. These wheels (see Figs. 11—13) are provided with smooth circular rims f^4 that bear and roll on the upper edges of the side rails of the carriage track G, and with peripheral gear teeth f^5 which mesh with toothed racks f^6 on the sides of the carriage track G, so that by driving the wheels the cylinder is propelled along on the track. The teeth of the wheels f^3 and racks f^6 are preferably made oblique to reduce to the minimum the lost motion between the wheels and racks. The rims f^4 of the wheels sustain the weight of the cylinder and reduce the wear on the teeth of the wheels and the racks f^6. The end pieces of the cylinder carriage are preferably provided with rollers f^7 adapted to travel against the under faces of the toothed racks f^6 to prevent the carriage from lifting off of the track G. The gear wheels and racks insure a positive motion of the cylinder and prevent it from slipping or shifting on the track, whereby a given point on the surface of the cylinder

will register with the same points on the supports in successive traverses of the cylinder. The offset cylinder E is adapted to be adjusted circumferentially to different positions relative to the gear wheels f^3 so that one portion or another of the cylinder can be made to register with desired points on the supports, lengthwise thereof, for the purpose of placing the print in a prescribed location on the cylinder or on the point-receiving surface. For instance, the cylinder is arranged to turn within the surrounding rims f^4 and is secured by slide bolts f^5, Figs. 12—15, on the ends of the cylinder adapted to enter notches in the rims of the whels. These notches are preferably numbered, which, with a pointer on the cylinder, enables exact adjustment of the latter. When the bolts are released the operator can freely rotate the cylinder to replace or wash the blanket.

The gear wheels f^3 can be driven by any suitable means for propelling the offset cylinder over the supports, the means shown consisting of an electric motor H mounted on the cylinder carriage with its armature shaft connected by bevel gears h to inclined shafts h' which are provided with worms h^2 meshing with the gear wheels f^3. The motor and its controlling means are not a part of the invention and are not shown or described in detail.

The means shown for moving the carriage track G vertically to lower the offset cylinder into and raise it out of printing contact with the printing surfaces on the supports B B′ are constructed as follows: I (Figs. 3, 4, 7 and 9) represents guide rods or bolts which are secured to the side rails of the carriage track G, preferably adjustably by nuts i, and extend downwardly therefrom through guide lugs i' on the side bars of the main frame A. These guide rods are pivoted at their lower ends to eccentric straps i^2 which surround eccentrics i^3 on two shafts i^4 which extend horizontally across and are suitably journaled in the main frame A. The two eccentric shafts i^4 are caused to turn together by a longitudinal shaft k suitably journaled on the main frame and connected at opposite ends by bevel gears k' k' to the two eccentric shafts i^4. This longitudinal shaft k is connected by bevel gears k^2 k^3, Fig. 4, to a shaft k^4 which extends to the front of the machine and is connected by gear wheels k^5 k^6 to an operating lever K which is suitably journaled on the front of the main frame and is preferably provided at opposite ends with handles k^7 k^8 whereby it can be operated by either or both hands.

In the use of the machine, when the offset cylinder has reached a suitable point over the primary support B, the lever K is swung around far enough to rotate the eccentric shafts i^4 and the eccentrics thereon one-half revolution, thereby lowering the track G with the cylinder carriage and placing the cylinder in contact with the primary printing surface C. When the cylinder has rolled over the primary printing surface it is raised off of this surface by swinging the operating lever K back to the initial position. The cylinder is similarly lowered into and raised out of contact with the printreceiving surface C′. By thus lowering the cylinder after it has passed the front edges of the supports B B′ and raising it before it reaches the rear edges of the supports, injury to the offset surface by contact with these edges is prevented.

L (Figs. 2, 5, 10 and 11) represents a table or holder for the primary printing surface C which is adjustable on the support for placing the printing surface so as to make the impression in any desired location and position on the offset cylinder. The holder or table shown is provided with a circular top plate l on which the printing surface C is secured by any usual or suitable securing devices (not shown) and which is pivoted centrally on the holder or table, on which it can be turned to different angular adjustments and secured by tightening the pivot bolt l'. The angular adjustment can be observed by reference to a pointer l^2, Fig. 10, which coöperates with a graduated scale on the base plate. The table or holder L is adjustable transversely of the support B in a carrying frame L′ consisting of two end pieces l^3 l^4 connected by two adjusting screws l^5 which are journaled at their ends in said end pieces and engage with screwthreaded nuts or sleeves l^6 at the opposite ends of the table or holder L. The adjusting screws l^5 are connected by bevel gears l^7 l^7 to the opposite ends of a shaft l^8 journaled in the end piece l^8, whereby when one screw is turned the other will be turned correspondingly. The frame L′ is, in turn, movable longitudinally on the support B in a stationary frame M which is secured on the support B, preferably removably, by studs or pins m (shown by dotted lines in Fig. 10) at the corners of the frame removably seated in holes m', Fig. 3, in the corners of the support. The frame M consists of end pieces m^3 m^4 connected by two adjusting screws m^6 which are journaled at their ends in said end pieces and engage with screwthreaded nuts or sleeves m^6 at the opposite ends of the frame L′. The adjusting screws m^5 are connected by bevel gears m^7 m^7 to a shaft m^8 journaled in the end piece m^3, whereby when one screw is turned the other will be turned correspondingly.

A single detachable crank or handle N is preferably provided for turning both the transverse and the longitudinal adjusting screws for the holder or table L. This crank

or handle, see Fig. 8, is suitably journaled in a bearing or bracket n adapted to be detachably secured on the frame, for instance, by inserting two pins n' on the bracket in two holes n^2 in one corner of the frame L'. When thus secured, a bevel wheel n^3 on the crank shaft meshes with a bevel gear n^4 on one of the adjusting screws l^5 so that these screws can be rotated for adjusting the table or holder L by turning the crank or handle N. The crank or handle can be similarly secured in two holes n^5 in one corner of the stationary frame M with its bevel wheel n^3 in mesh with a bevel wheel n^6 on one of the adjusting screws m^5 for turning these screws to adjust the frame L' longitudinally in the stationary frame M. After adjusting the table or holder L the crank or handle N is removed and is not in the way of the offset cylinder. The holder or table L with its adjusting mechanism thus constitutes an attachment which can be readily removed from the support B or again placed in position for use thereon. For work in which the primary printing surface does not have to be adjusted to different positions, this printing surface can be secured directly on the support B, the adjustable holder or table L and its adjusting mechanism being, of course, first removed.

O represents the supplemental offset cylinder. This cylinder, like the main offset cylinder E, is provided with an offset blanket o, or other suitable offset surface, and is mounted in a carriage P arranged to travel on the carriage track G over the supports or beds B B'. For this purpose the supplemental cylinder is connected to gear wheels p p, similar to the gear wheels f^3, having circular rims which roll on the side rails of the track G, and peripheral gear teeth which mesh with the toothed racks f^6 of the carriage track. The gear wheels p p are preferably driven by an electric motor supported on the carriage P, the shaft p' of the motor being connected by bevel gears p^2 to inclined shafts p^3 which are provided with worms p^4 meshing with the gear wheels p p. The supplemental offset cylinder is, however, shorter than the main offset cylinder and is adapted to be adjusted to different positions transversely relative to the supports B B', as well as being adjusted circumferentially relative to its propelling gear wheels p p. As shown in Figs. 6, 16 and 17, the supplemental cylinder consists of a flanged core or central portion p^5 and an outer portion or shell p^6 which surrounds and is adapted to be adjusted circumferentially on the core between the flanges thereof. This core p^5 is splined or otherwise secured on a supporting shaft p^7 so that it turns with the shaft but can be adjusted lengthwise thereon. The gear wheels p p are secured to the ends of this shaft. The core p^5 of the cylinder is provided at each end with spring-actuated bolts p^8 adapted to enter holes p^9 in the ends of the shell p^6 for holding the shell in the different positions to which it is adjusted circumferentially on the core p^5. Two holding bolts p^8 and two rows of holes p^9 arranged in staggered order are preferably provided at each end of the cylinder so thereby a finer adjustment is permitted.

Q represents a screw journaled at its ends in the gear wheels p p and passing through a screw sleeve or nut q in the core of the supplemental offset cylinder for adjusting the cylinder on the shaft p^7 transversely of the machine.

q' represents an operating crank shaft for the adjusting screw which is suitably journaled on the cylinder carriage P at one end thereof and is adapted to be coupled to and uncoupled from the adjusting screw Q, for instance, by shoving the square inner end of the crank shaft into or withdrawing it from a correspondingly shaped socket q^2 in the outer end of the screw. By first turning the cylinder to place the adjusting screw in line with the crank shaft, the latter can be coupled with the screw and turned for adjusting the cylinder O axially. After the cylinder is adjusted, the crank shaft is withdrawn to permit the rotation of the cylinder in the operation of the machine.

R represents a micrometer or fine adjusting device with which the machine is preferably provided for enabling the supplemental offset cylinder to be quickly adjusted transversely relative to the platens with great exactness. The adjustment device shown in the drawings, see Figs. 3, 6, 18 and 20, comprises a casing r provided with a glass face plate r', and two index gear wheels r^2 r^3 which are journaled in the casing. The wheel r^2 has a disk r^4 located just inside of the face plate and provided with an index or pointer which coöperates with a surrounding graduating scale r^5 on the face plate, and the wheel r^3 has a rim r^6 located just inside of the face plate and provided with an index or pointer which coöperates with a surrounding graduated scale r^7 on the face plate. The scale r^5 has divisions each representing one inch (or other unit of measure) of transverse movement of the supplemental offset cylinder, and the other scale r^7 has divisions representing small fractions, for instance, hundredths, of the inches or units indicated by the first scale. The wheels r^2 r^3 are geared to the operating crank shaft for the adjusting screw Q so that the units wheel r^2 turns a distance equal to one of the inch or unit divisions of the scale r^5 during a corresponding transverse movement of the offset cylinder, while the other, or fractions, wheel r^3 turns a com-

plete revolution during such movement of the offset cylinder and units wheel. The gearing for this purpose comprises a pinion s splined on the crank shaft q' and meshing with a gear wheel s' which is loose on the axle s^2 on which the index wheels r^2 and r^3 are journaled and drives a pinion s^3 on a shaft s^4. This shaft is connected by bevel gears s^5 s^6 to a worm shaft s^7, and by bevel gears s^8 s^9 to a worm shaft s^{10}. The worm shafts s^7 and s^{10} are provided with worms which respectively drive the index wheels r^2 and r^3. The gears are properly proportioned to give the required differential speed of the index wheels r^2 and r^3. Thus the transverse position of the offset cylinder in inches and small fractions thereof is shown by the positions of the indexes or points on the disk r^4 and rim r^5, and the cylinder can be adjusted quickly with great exactness. Micrometer adjusting devices of different construction operating on a similar principle could be used, and it will be manifest that, if desired, micrometer adjusting devices of this nature could be used for facilitating an exact adjustment of other adjustable parts of the machine.

In the use of the machine, the main offset cylinder E is used when a large subject is to be reproduced or only a simple adjustment is required. The drive mechanism for the cylinder is set in operation and when the cylinder reaches a suitable point over the primary support B, the lever K is operated to lower the cylinder into contact with the primary printing surface C. When the cylinder has rolled over the subject it is again raised by operating the lever K. The cylinder can then be adjusted circumferentially relative to its propelling wheels f^3, if this is necessary to place the print in a particular location on the print-receiving surface C'. The drive mechanism is again started and the cylinder lowered into and raised out of contact with the print-receiving surface at the proper points by means of the lever K, as above explained.

When it is desired to reproduce a small subject, or to make duplicate prints thereof in different locations or positions on the print-receiving surface, the supplemental offset cylinder O is used, and if the adjustment requires it, the primary printing surface C is secured on the adjustable holder L. After the supplemental cylinder has been operated in the same manner as the main cylinder to take the impression from the primary printing surface, it can be adjusted either circumferentially or axially, 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 L, or both, successive impressions from the primary printing surface can be placed in any desired arrangement or grouping 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.

While the preferred construction of the several parts of the machine has been described in detail, the invention is not limited to the described construction of these parts nor to the particular means recited for producing the described adjustments or movements of the supports, the main and supplemental offset cylinders, the table or holder for the primary printing surface, and the supporting track or frame for the cylinder carriage, and for propelling the offset cylinders over the printing and print-receiving surfaces.

The invention in its broader aspects relates to the described organization and cooperation of the parts whereby the subjects can be transferred from the primary printing surface or surfaces to the secondary printing or print-receiving surface or surfaces in predetermined locations or positions, rather than to the particular construction of the instrumentalities employed for effecting this result.

I claim as my invention:

1. The combination with a support for a primary printing surface, a support for a print-receiving surface, an offset cylinder, driving means for causing said offset cylinder to roll over said primary printing surface to take an impression therefrom and over said print-receiving surface to apply the impression thereto, and means for moving said offset cylinder into and out of contact with said printing and print-receiving surfaces, of means for adjusting said primary printing surface on said support in the direction of travel of said offset cylinder comprising a holder which is provided with a movable part which carries the printing surface, substantially as set forth.

2. The combination with a support for a primary printing surface, a support for a print-receiving surface, an offset cylinder, driving means for causing said offset cylinder to roll over said primary printing surface to take an impression therefrom and over said print-receiving surface to apply the impression thereto, and means for moving said offset cylinder into and out of contact with said printing and print-receiving surfaces, of means for adjusting said primary printing surface on said support transversely relative to the direction of travel of said offset cylinder comprising a holder which is provided with a movable part which carries the printing surface, substantially as set forth.

3. The combination with a support for a primary printing surface, a support for a print-receiving surface, an offset cylinder, driving means for causing said offset cylinder to roll over said primary printing surface to take an impression therefrom and over said print-receiving surface to apply the impression thereto, and means for moving said offset cylinder into and out of contact with said printing and print-receiving surfaces, 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.

4. The combination with a support for a primary printing surface, a support for a print-receiving surface, an offset cylinder, driving means for causing said offset cylinder to roll over said primary printing surface to take an impression therefrom and over said print-receiving surface to apply the impression thereto, and means for moving said offset cylinder into and out of contact with said printing and print-receiving surfaces, of means for adjusting said primary printing surface in the plane of the surface to different positions, and means for adjusting said offset cylinder to different positions relative to said supports, 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 take an impression therefrom and over said print-receiving surface to apply the impression thereto, and means for moving said offset cylinder into and out of contact with said printing and print-receiving surfaces, 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.

6. 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 track to move said offset cylinder into and out of contact with said primary printing and print-receiving surfaces, said offset cylinder being adjustable circumferentially to different positions relative to said wheels, substantially as set forth.

7. 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 track to move said offset cylinder into and out of contact with said primary printing and print-receiving surfaces, said offset cylinder being adjustable circumferentially to different positions relative to said wheels and transversely relative to said supports, substantially as set forth.

8. The combination with a support for a primary printing surface, a support for a print-receiving surface, and an offset cylinder, of a carriage in which said cylinder is mounted, 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 carriage along said track and revolve said offset cylinder over said supports, and means for raising and lowering said track to move said offset cylinder into and out of contact with said primary printing and print-receiving surfaces, said offset cylinder being adjustable circumferentially to different postions relative to said wheels, and means for adjusting said primary printing surface in the plane thereof to different positions on its support, substantially as set forth.

9. The combination with a support for a printing surface, and an offset cylinder arranged to travel above said support, of a holder on said support for a printing surface, said holder having an angularly adjustable plate on which the printing surface is secured, a carrying frame for said holder, screws for adjusting said holder in said carrying frame, and screws for adjusting said carrying frame in a direction at an angle to the direction of movement of said holder in said frame, substantially as set forth.

10. The combination with a support for a flat primary printing surface, a support for a flat print-receiving surface, said supports occupying relatively fixed positions, and an offset cylinder, of driving means for rolling said offset cylinder over said primary printing surface to receive an impression therefrom and over said print-receiving surface to produce the print thereon, said offset cylinder being adjustable toward and from the planes of said supports into and out of proper printing relation to said primary printing surface and being adjustable relative to said print-receiving surface to reproduce the print in different desired positions thereon, substantially as set forth.

11. The combination with a platen, and an offset cylinder, of wheels on which said cylinder rolls over said platen, said offset cylinder comprising a central portion, an outer portion which is adjustable circumferentially about said central portion, and means for holding said outer portion when adjusted, and a screw device connecting said central portion of said offset cylinder and said wheels for adjusting said cylinder in the direction of its axis relative to said platen, substantially as set forth.

Witness my hand, this 1st day of February, 1911.

WILLIAM C. HUEBNER.

Witnesses:
C. W. PARKER,
C. B. HORNBECK.