

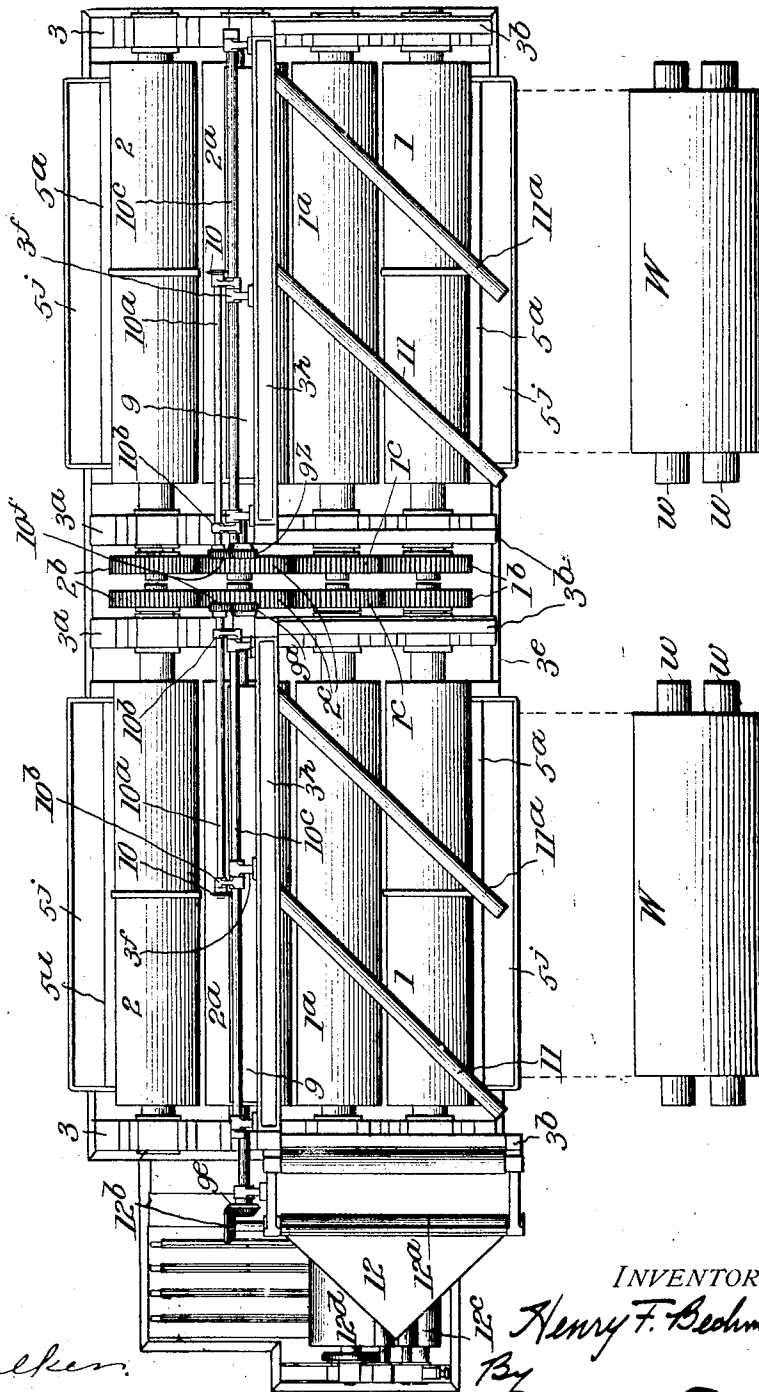
No. 814,510.

PATENTED MAR. 6, 1906.

H. F. BECHMAN.
ROTARY PRINTING PRESS.
APPLICATION FILED JULY 26, 1905.

7 SHEETS—SHEET 1.

Fig. 1.



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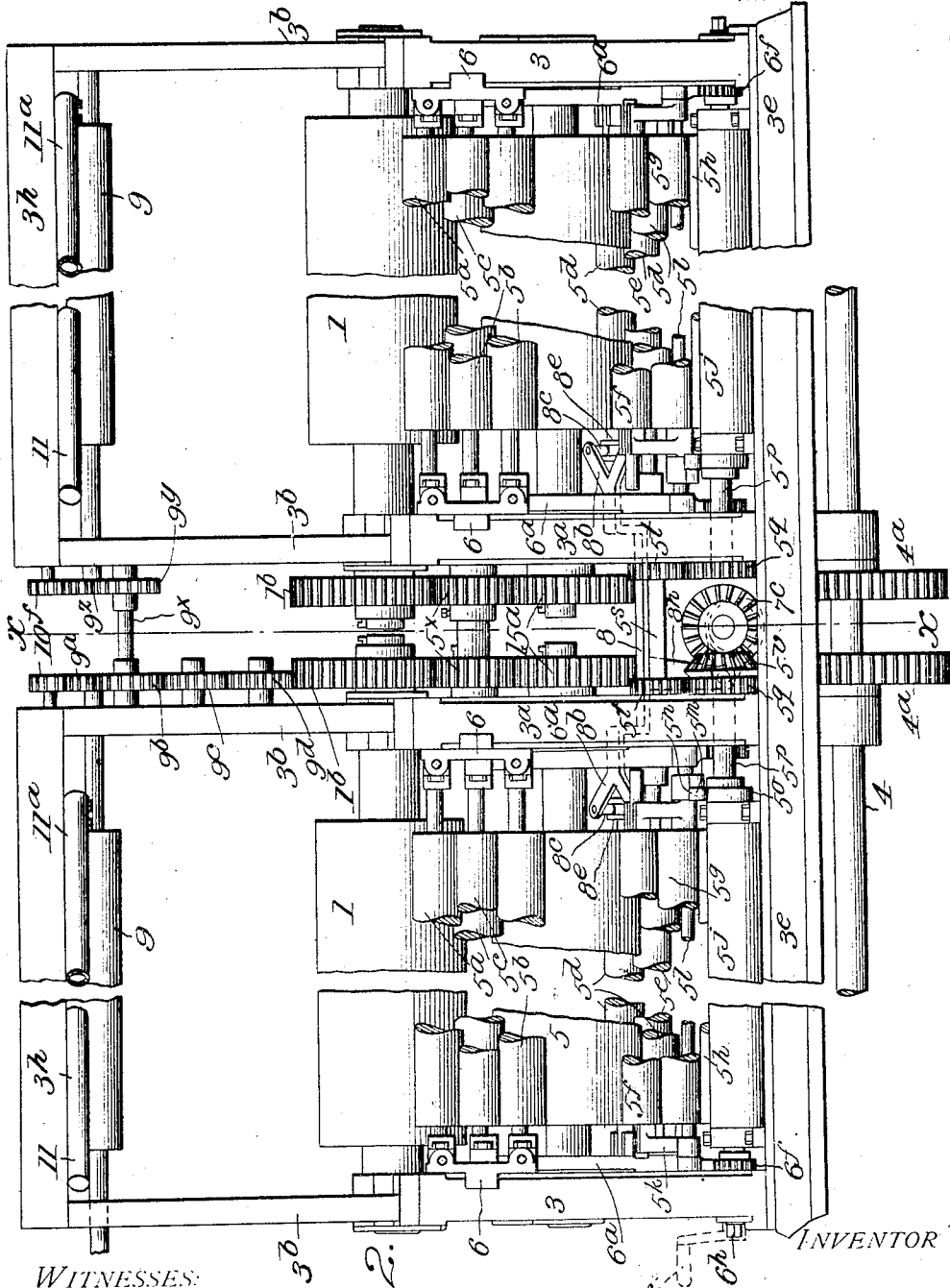
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7 SHEETS—SHEET 2.



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Fig. 2.

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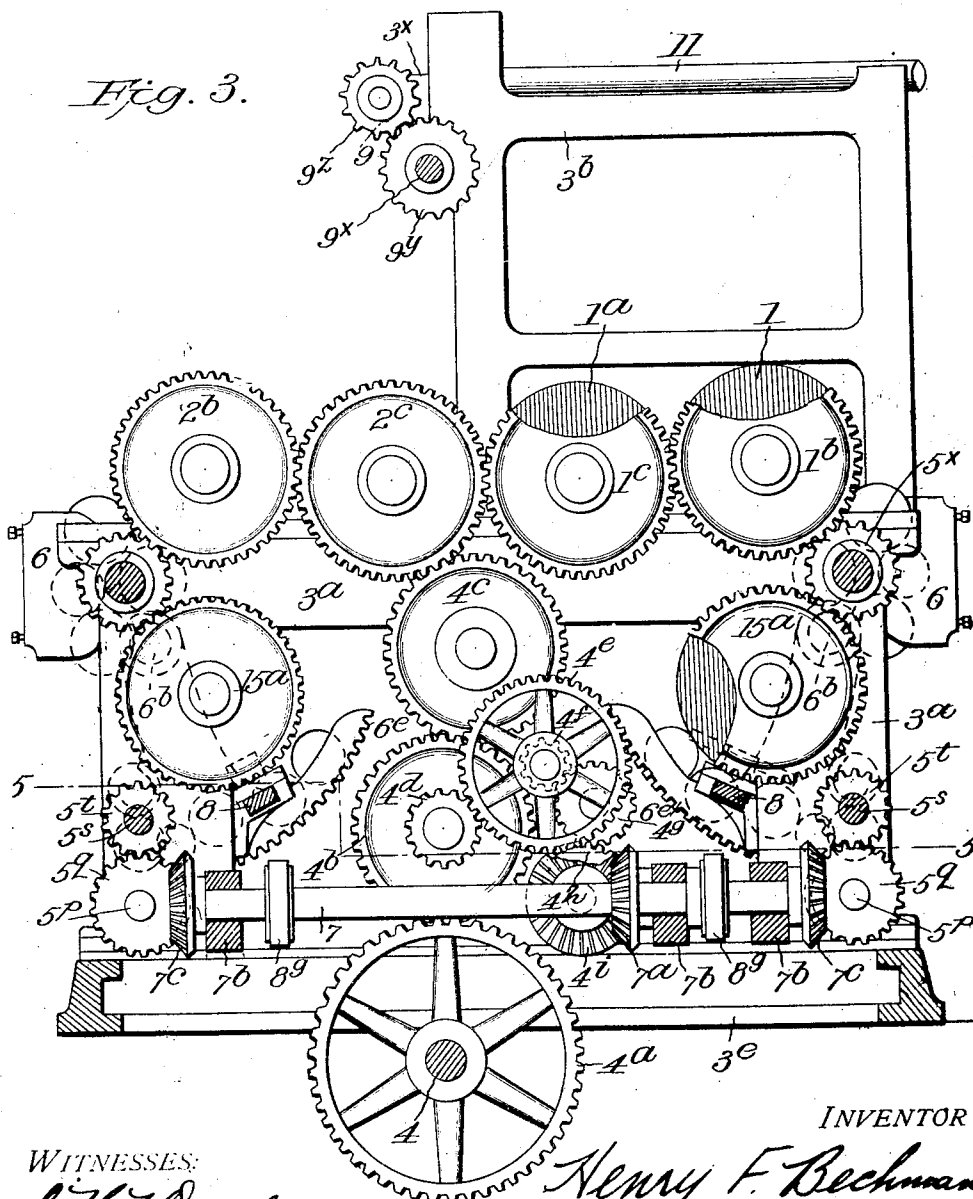
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7 SHEETS—SHEET 3.



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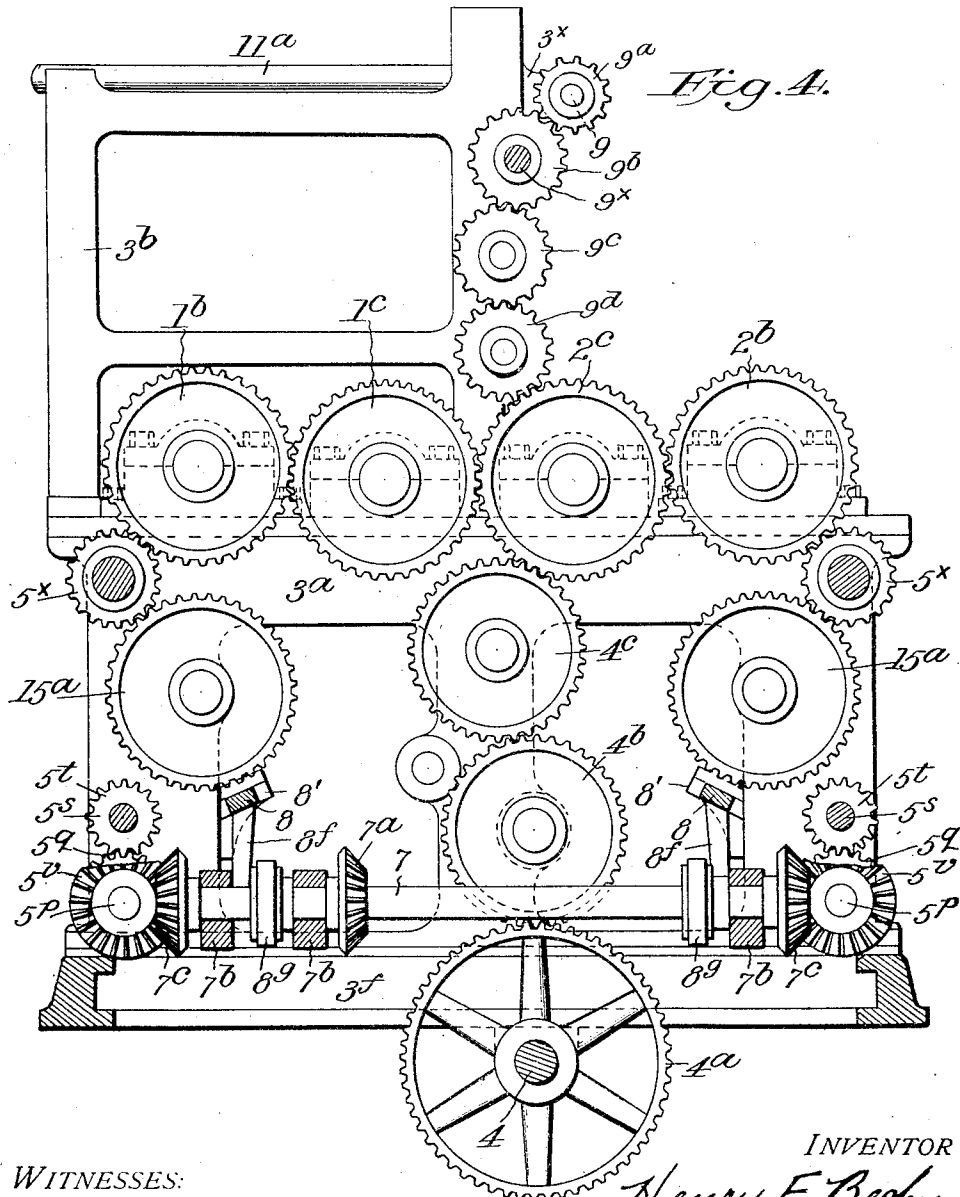
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7 SHEETS—SHEET 5.

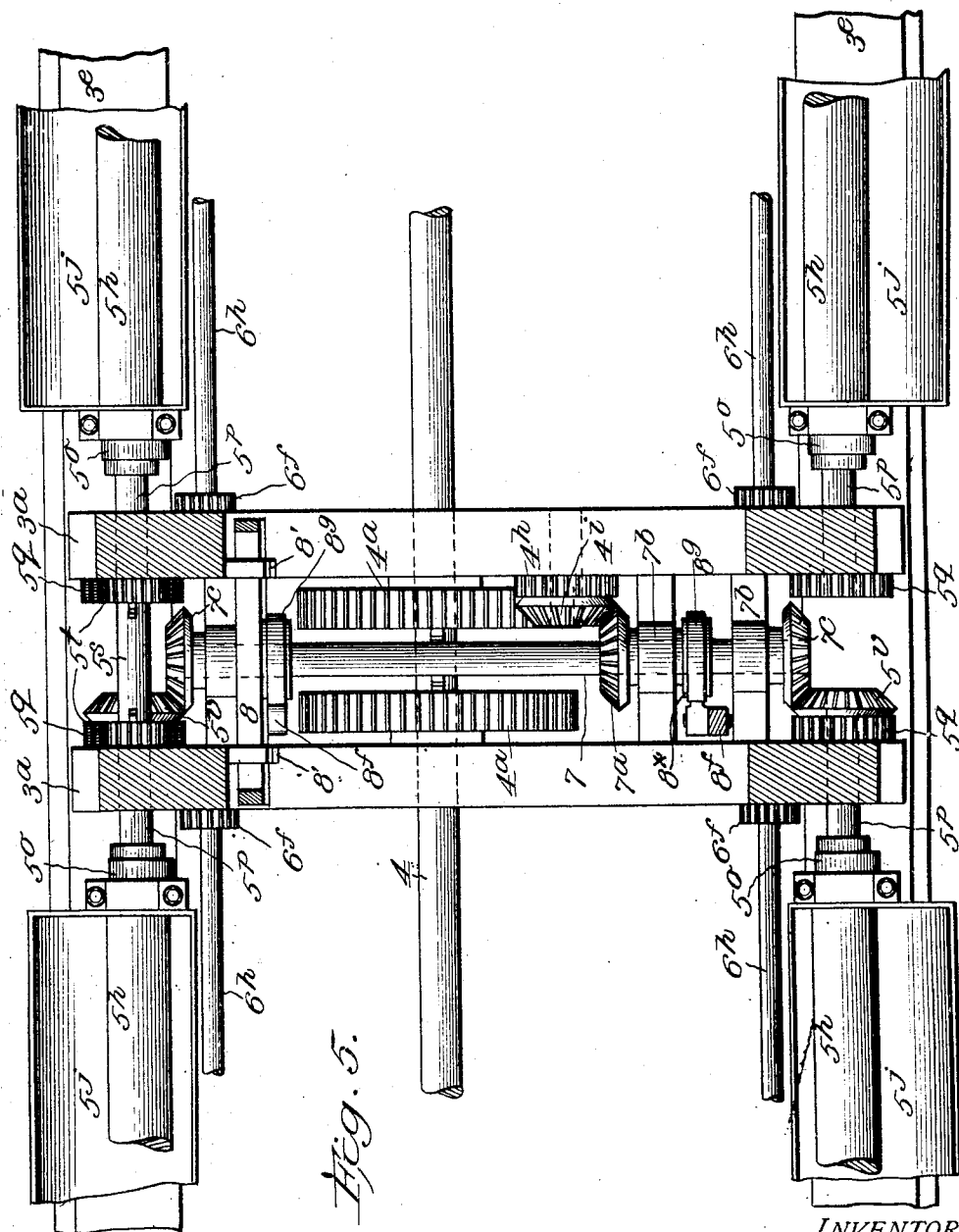


Fig. 5.

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7 SHEETS—SHEET 6.

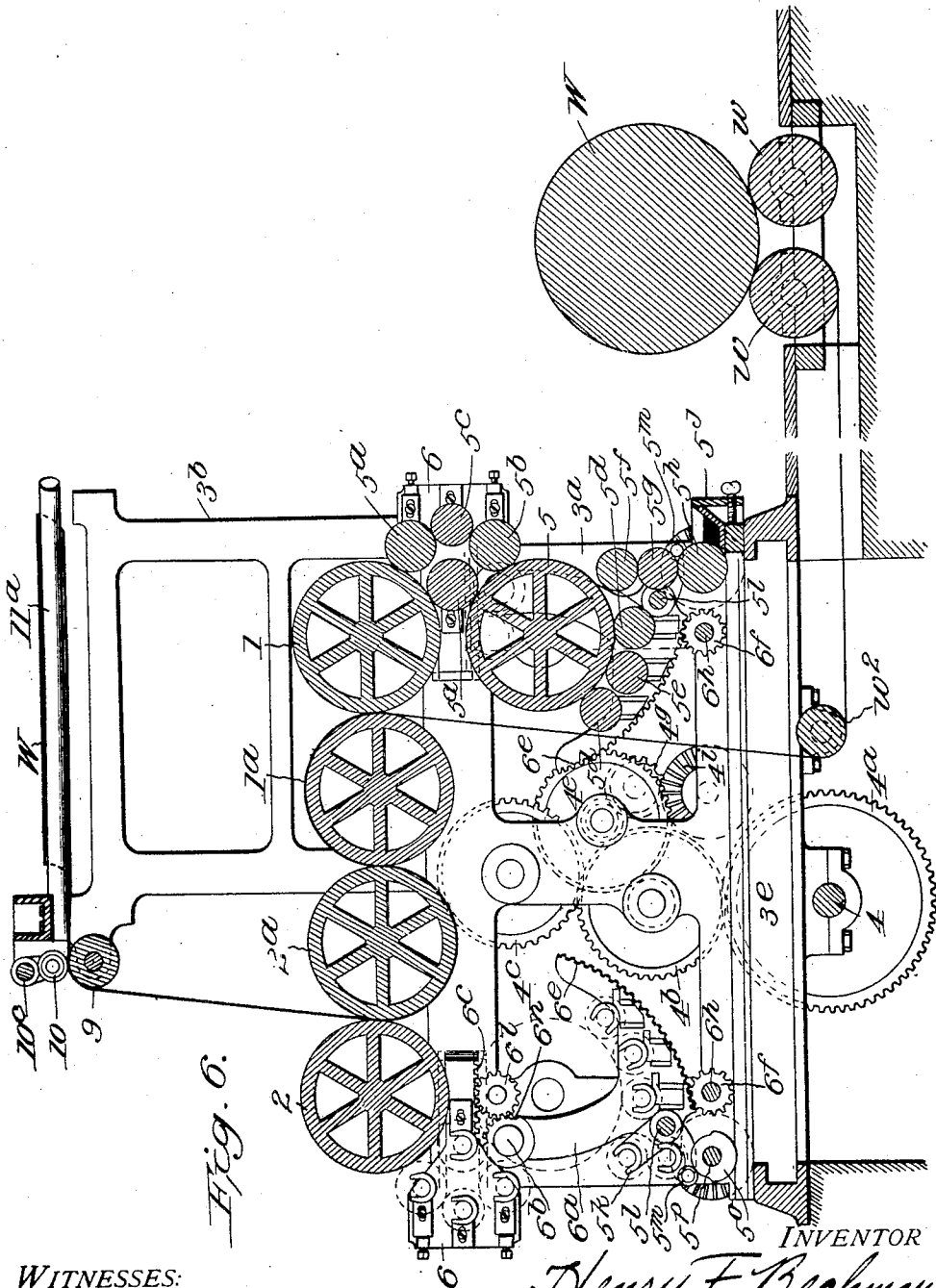


Fig. 6.

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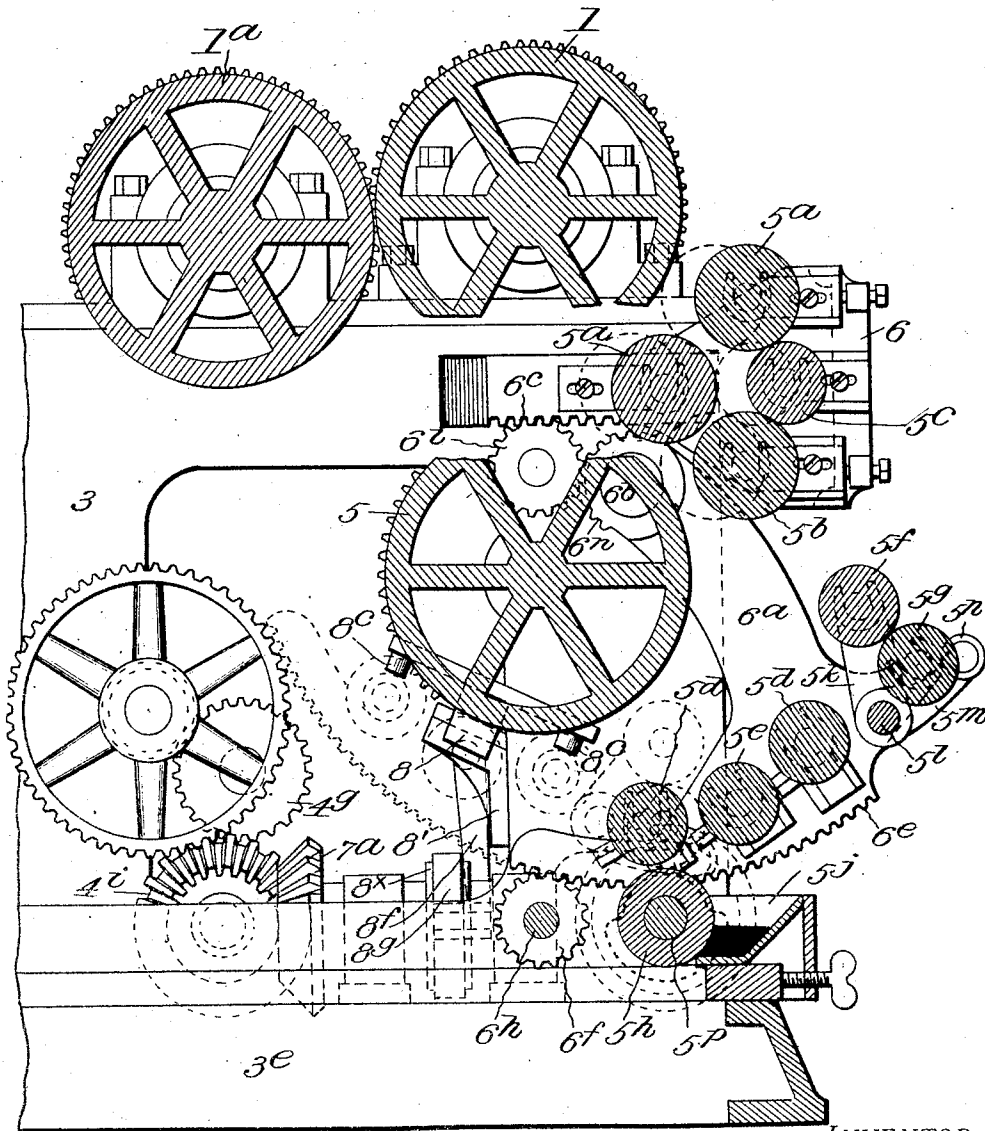
No. 814,510.

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7 SHEETS--SHEET 7.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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ROTARY PRINTING-PRESS.

No. 814,510.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed July 26, 1905. Serial No. 271,267.

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Rotary Printing-Presses; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in rotary-cylinder stereotype-plate web-printing presses; and it consists in the novel features and combinations of parts summarized in the claims.

The primary object of my invention is to produce a rotary printing-press capable of printing perfected newspapers or other publications from stereotype and other plates and equal in speed and capacity to the highest grade of such machines now in general use, while superior thereto in points of durability, accessibility of parts, and ease of threading, and which will be more economical to manufacture, occupy less space, and cost less for maintenance and operation than prior machines and will be free from the serious practical objections, inconveniences, and limitations inherent in the present known large rotary web-printing presses.

In the ordinary stereotype-printing presses now in general use and the so-called "straight line" printing-presses the perfecting printing mechanisms are superimposed one above the other in two or more "decks," the plate and impression cylinders extend transversely of the press between the side frames, and the inking drums and rollers are similarly arranged. In such machines these mechanisms are not easily accessible, being necessarily in the interior of the machine, and many of them are so far above the floor that ladders or stairs are necessary to enable the pressman to reach them.

To more readily understand some of the great advantages secured by my invention, it may be compared with the stereotype-printing presses now in general use for the production of newspapers having, for instance, thirty-two pages. Such presses are ordinarily from twelve to fifteen feet in height, necessitating (when preparing such press for opera-

tion) the lifting of several heavy rolls of paper to heights varying from one to twelve feet, also the lifting of a large number of heavy plate-forms to equal elevation, also the lifting of the ink and the numerous heavy inking-rollers to corresponding heights. The stereotype-plates, moreover, have to be slipped endwise of the cylinders through cramped spaces in the press before they can be put in place, and the pressman has to crawl into dangerous positions to adjust the plates on the cylinders to change the tympan or pack the impression-cylinders and to thread the press. The ink-rollers also have to be slipped endwise through the press from one side thereof to the other. As compared with machines of like capacity in present use my machine occupies no more floor-space and is considerably less in height. All the plate-cylinders or printing-couples are in substantially one horizontal plane. All are low down and within easy reach of the operator. All are arranged longitudinally instead of transversely of the main frame and are directly accessible broadside outermost, and all the plate-cylinders are so low and accessible that the stereotype-plates can be easily put directly in place thereon or removed therefrom by a pressman standing on the floor without using any tackle and without his having to go into or between any parts of the machine. The impression-cylinders are similarly arranged near the floor and easily accessible throughout their entire length, so that they may be packed and tympan changed by an operator standing on the floor. Corresponding advantages exist in my machine with respect to the inking mechanisms, every fountain and every roller being easily accessible throughout its entire length by the operator standing on the floor. Thus the work of preparing my press for operation or "getting ready" is greatly facilitated.

Further important advantages of my machine are its steadiness, it being free from the serious vibrations of the upper portions or decks of the machines now in use, which vibrations shorten the life of the machine and limit its speed. My machine also occupies less than one-half the cubical space of other machines of corresponding capacity and does not require a specially-built high-ceil-

inged press-room for its accommodation. Again, in my machine all the ink-fountains are in the same horizontal plane near the floor, and therefore subject to a uniform temperature, whereas in the presses now in general use the ink-fountains are at various altitudes, and as the temperature in a room is higher in the upper portions of it the ink in the upper fountains is generally of a considerably higher temperature than that in the lower fountains, resulting in very unequal quality of printing. Furthermore, in my press the webs are fed into the machine from the side parallel with the cylinders, and the web-rolls, instead of being elevated above the floor, merely have to be rolled upon unwinding supports beside the press and about on a level with the floor, so that no tackle is required to handle the web-rolls in the press-room. Further, the webs are not turned or deflected until after they are perfected. Then they make but a quarter-turn and pass direct into the folder, and all the webs and parts of webs can be assembled before reaching the folder and are brought into parallel alignment and superposed by merely making a one-quarter turn therein.

The accompanying drawings illustrate a press embodying my invention and adapted to print as many as thirty-two pages, newspaper size, at each operation; but I do not restrict myself to the precise form, dimensions, and construction of parts shown, as the press may be made of greater or less capacity by adding to or subtracting from the number of printing couples or cylinders employed.

In said drawings, Figure 1 is a top plan view of the complete machine. Fig. 2 is a side elevation, enlarged and partly broken. Fig. 3 is a section on line X X, Fig. 2, looking to the left. Fig. 4 is a similar section looking to the right. Fig. 5 is a section on line 5 5, Fig. 3. Fig. 6 is a transverse section through the press. Fig. 7 is an enlarged sectional view showing the inking mechanism.

The printing mechanism.—In the press illustrated in the drawings two sets of perfecting printing mechanisms are employed. Each set contains two plate-cylinders 1 2 and their coacting impression-cylinders 1^a 2^a. The cylinders are arranged longitudinally of the press instead of transversely and extend axially thereof and are all substantially in the same plane. The cylinders in the adjacent sets are, moreover, in axial alignment end to end. The plate-cylinders 1 2 in each set are outermost, and the impression-cylinders 1^a 2^a are between the plate-cylinders and preferably slightly below the level of the plate-cylinders.

The two perfecting printing mechanisms are substantially duplicates of each other, and as similar parts thereof will be marked alike the description of one will apply to both.

The cylinders 1 1^a 2 2^a are journaled upon upstanding transverse end and center uprights 3 3^a of the main frame, which may be tied longitudinally in any suitable manner. The base 3^c of the frame is continuous and underlies all the mechanisms and forms with the four uprights 3 3^a and their ties a very rigid and substantial main frame open on its sides.

As will be seen by reference to Figs. 2, 3, and 4, there is nothing to obstruct access to the several plate-cylinders from the sides of the machine, and as they are only about four feet above the floor the stereotype-plates can be lifted and placed directly in position thereon by the pressman standing on the floor, and the plates can be adjusted and locked without the pressman crawling onto or into the machine. The pressman can likewise arrange the tympan and pack the various impression-cylinders 1^a 2^a from the floor, simply having to reach slightly beyond the outer plate-cylinder for this purpose, but does not have to go onto or into the machine. The several cylinders 1 1^a 2 2^a of each set are intergeared by gears 1^b 1^c 2^b 2^c, as shown, so as to rotate synchronously, and may be driven from the main shaft 4 by means of a gear 4^a and intermediate gears 4^b and 4^c, the latter of which meshes with the gear 2^c. As shown, two gears 4^a are on the main shaft 4, so that each set of printing mechanisms may be driven directly from the main shaft, and this enables either set of printing mechanism to be thrown out of operation by unshipping one of the gears 4^a or 4^c. The sets of gearing for driving the cylinders are duplicated (see Figs. 3 and 4) at the inner or adjacent ends of the printing mechanisms and between the adjacent inner uprights 3^a, which are arranged close together, and the space therebetween may be incased to cover the gearing, the casing not being shown in the drawings, however.

The inking mechanism.—Adjacent and preferably below each plate-cylinder is an inking mechanism, comprising an ink-distributing drum 5, which is journaled in bearings in the uprights 3 and 3^a and receives ink from a fountain 5^j, located below the drum and at the outer side of the press in a convenient position for access. The fountain-roll 5^h gives ink to roller 5^g, from which it is transferred by ductor 5ⁱ to the drum 5, on the surface of which it is distributed by means of vibrator-rollers 5^d and distributing-roller 5^e. From the ink-drum ink is supplied to the form-rollers 5^a 5^a, one of which may contact directly with the drum, and the other is supplied with ink through intermediates 5^b and 5^c. In practice the rollers 5^a, 5^b, and 5^c are mounted in slides 6 and can be moved horizontally to and from the cylinder and drum. The rollers 5^d, 5^e, 5ⁱ, and 5^g are supported on the lower parts of swinging hangers 6^a, which

are pivoted at 6^b to the adjacent uprights 3 and 3^a of the frame and are provided with segmental gears 6ⁿ on their upper ends, meshing with intermediates 6', which in turn mesh with racks 6^o on the under side of the superposed slides 6. The hangers 6^a are also provided on their lower curved edges with teeth 6^o, which mesh with pinions 6ⁱ on a shaft 6^h, extending longitudinally of the frame between the uprights 3 and 3^a and provided on its outer end with a handle or lever 6^z, by which the shaft can be turned so as to swing the hangers 6^a outward or inward. When the hangers 6^a are swung outward, the set of rollers 5^a, 5^e, 5^f, and 5^g are thrown outward and away from the drum, and simultaneously the slides 6 are moved outward, separating the rollers 5^a and 5^b from the plate-cylinder and ink-drum. When the lower part of the hanger is moved inward, the upper set of inking-rollers is also moved inward. Thus both the form-rollers and distributing-rollers are moved into or out of relative position at the will of the operator by simply turning the shaft 6^h, and in their outermost positions the ink-rollers can be removed and replaced, if necessary, and can be lifted broadside into or out of position without disturbing any other parts of the machine, and in their outermost position the inking-rollers can be washed without removing them from their bearings.

It will be seen that all the fountains and rollers are accessible from the side of the press and are entirely under the control and supervision of the pressman, and as all are in substantially the same plane the temperature of the ink therein is uniform and a uniform quality of printing is insured.

The ductor-roll 5^f is supported in rocking arms 5^k, attached to the rock-shaft 5ⁱ, mounted in the hangers 6^a, and this rock-shaft carries an arm 5^m, carrying a roller 5ⁿ, which engages a cam 5^o on the shaft 5^p of the ink-fountain roll 5^h. The shaft of this fountain-roller extends through the upright 3^a and is positively driven, as hereinafter explained.

The ink-drum 5 is driven from the adjacent relative plate-cylinder 1 or 2 by means of a gear 15^a on the inner end of the ink-roll shaft, meshing with an intermediate 5^x, which in turn meshes with the adjacent plate-cylinder gear 1^b or 2^b, as shown in Figs. 3 and 4. The ink-fountain rollers 5^h are driven from the main shaft 4 by intermediate gearing, as shown in Figs. 3, 4, and 5. To one of the gears 4^b, Fig. 3, is attached a small pinion 4^d, which meshes with a larger pinion 4^e on a stub-shaft attached to one of the uprights 3^a of the frame, and on the hub of gear 4^e is keyed a small pinion 4^f, which meshes with a pinion 4^g, mounted on a stub attached to one of the uprights 3^a, and this in turn meshes with a pinion 4^h on a stub-shaft attached to

one of the uprights 3^a, and to the face of the pinion 4^h is attached a bevel-gear 4ⁱ, which meshes with a bevel-gear 7^a on a shaft 7, which extends transversely of the machine intermediate the inner uprights 3^a 3^a, (see Fig. 5,) said shaft being journaled in suitable bearings 7^b between said uprights and having on its ends bevel-gears 7^c, which mesh with beveled gears 5^v on the inner ends of the ink-fountain-roller shafts 5^p and impart proper movement to said ink-rolls and in proper time.

The adjacent alined ink-fountain rollers 5^a may be driven from the first ink-fountain rolls by means of gears 5^q, attached thereto beside gears 5^v and meshing with a pinion 5^t on a short shaft 5^s, journaled between the uprights 3^a 3^a of the frame. Another pinion 5^t on shaft 5^s meshes with the pinion 5^a on the adjacent alined ink-roll shaft, as shown in Figs. 2 and 5. One of the pinions 5^t may be unshipped when it is desired to throw one set of ink mechanism out of operation.

The vibrator-rollers 5^d 5^d may be operated back and forth by means of a sliding bar 8, which is supported in brackets 8', attached to uprights 3^a of the frame, said bar extending longitudinally of the press and having its ends bifurcated, as at 8^b, and provided with pins 8^c, engaging grooved collars 8^e on the shafts of rollers 5^d, as shown. The said bar 8 is also provided with a depending arm 8^f, which is pivotally connected to an eccentric-strap 8^g, surrounding an eccentric 8^h; fastened to shaft 7, (see Figs. 3, 4, and 5,) and consequently as the shaft 7 is rotated the vibrator-rollers 5^d are moved longitudinally back and forth. In this simple way both sets of vibrators in adjacent longitudinally-alined inking mechanisms are operated from one cam.

The web-feeding mechanism.—The paper to be perfected is fed in from a web-roll to each perfecting mechanism. The web-rolls are mounted on suitable unwinding supports, which may be located at the floor-level and beside the press, so that the web-rolls do not have to be lifted by any tackle and can be simply rolled into position on the floor. As shown, the rolls of paper web W are supported on parallel idler rolls or shafts w, which are arranged about on the level of the floor and parallel with the press. There should be one set of these supports for each perfecting mechanism and parallel with the plate-cylinders. The web is led from the roll W around and under one of the supporting-rolls w and under the floor into the pit beneath the press proper and then passes upward around a guide-roller W² to and between the plate and impression cylinders successively, so as to be printed on one side by the first plate and impression cylinders and perfected or printed on its opposite side by the second plate and impression cylin-

ders. Then it passes directly upward to and over a guide-roller 9, before passing which it is slitted by means of a rotary cutter or slitter 10. One half of the web is then carried
5 to and turned under and over an angle-bar 11, which gives the web a quarter-turn, and then the web passes in a direction longitudinal of the machine to a folding mechanism at one end thereof. The other half of the web
10 is similarly turned under and over an angle-bar 11^a and then passes to the folder. It will be noted that there is a guide-roller 9 and two angle-bars 11 11^a for each printing mechanism and that the four halves of the two webs
15 printed in the mechanisms may be alined and simultaneously directed into one folder.

The roller 9 is mounted longitudinally of the press and above the printing mechanisms in brackets 3^a, secured to uprights 3^b, mounted on the uprights 3^a of the main frame. On the inner end of the shaft of roller 9 is a gear 9^a, which is driven by means of intermediates 9^b, 9^c, and 9^d from gear 2^c of the adjacent impression-cylinder.

The cutter 10 is mounted on a shaft 10^a, journaled in arms 10^b, attached to a rock-shaft 10^c, which is journaled in brackets 3^t, attached to a bar 3^h, connected to the uprights 3^b. On the inner end of shaft 10^a is a pinion 10^t, meshing with the pinion 9^a on the shaft of roller 9. The roller 9 above the second printing mechanism is driven by means of a gear 9^z on its shaft meshing with a gear 9^y on a short shaft 9^x, journaled between the adjacent upright 3^b, the gear 9^b being keyed on shaft 9^x.

The angle-bars 11 and 11^a are bolted to the under side of bar 3^h. The said bar, it will be noted, lies about the median line of the members, and the angle-bars 11 11^a are preferably tubular and need only be supported at their inner ends, thereby leaving their outer ends free and unencumbered, which enables the pressman to thread the webs or half-webs through the machine and over the angle-bars with the greatest expedition, as the web can be simply looped over the angle-bars without having to be threaded through any openings or confined spaces to be passed thereover.

The folder may be of ordinary construction. As shown, it has a "former" 12, at the upper end of which is a roller 12^a, over which the web passes to the former. The roller 12^a may be driven by a bevel-gear 12^b meshing with a bevel-gear 9^e on the shaft of roll 9. The webs after passing the former enter between the collector-roll 12^a and cutter-roll 12^c of ordinary construction and after being properly folded are delivered from the machine. I do not herein claim the particular construction of the folder; but it will be noted that the cutting-cylinders thereof are in alignment with the printing-cylinders, but below the plane thereof.

From the foregoing it will be observed that

all the printing-cylinders in the machine are substantially in one plane and can be easily reached by the pressman standing upon the floor. All extend longitudinally of the press and not transversely thereof, and all are readily accessible from the floor. No tackle for elevating plates or webs are required, nor any ladders or platforms. The cylinders are preferably eight-page cylinders, so that the press as a whole can print thirty-two pages, using eight-page webs. After being perfected the webs are slit longitudinally, and each half of the web, which has been traveling transversely of the press theretofore, is given a quarter-turn over one of the angle-bars and led longitudinally of the press directly to the folder. The webs are not turned or deflected out of their course until after they are perfected and then are given but a quarter-turn. In the press as shown all the four halves of the two perfected webs or any less number thereof can be assembled at the top of the former and folded together as one web by the folder. By simply unshifting a few of the gears one of the said perfecting mechanisms can be put out of operation if it is not desired to use the entire press. The inking mechanisms are all longitudinal of the press and readily accessible from the floor. One main drive-shaft operates both sets of inking mechanisms, and the vibrating rollers in the adjacent sets of inking mechanisms are operated by the same cam.

By using long four-page-wide plate-cylinders the number of parts required is materially lessened as compared with two-page-wide cylinders in a press of given capacity, only half the number of inking mechanisms being required. In the press shown each perfecting mechanism can produce sixteen or less pages at each operation. Either set can be used to produce simply sixteen pages or less, and using both sets papers of any even number of pages up to thirty-two can be produced. Obviously the press can be increased in capacity by simply duplicating the printing and inking mechanisms, and additional folding mechanisms may be attached, if desired.

The machine shown is patterned from an actual working machine of thirty-two-page capacity, and the advantages stated above have been practically demonstrated.

In the foregoing description and in the claims the word "longitudinally" has reference to the longest diameter or longitudinal axis of the press, and in this sense it can be readily seen that all the cylinders and inking-rolls in the press are arranged longitudinally thereof, whereas in the ordinary large cylinder printing - presses the cylinders are arranged parallel with the shortest diameter of the press, and therefore may be properly termed as arranged "transversely" thereof.

Having thus described my invention, what

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

1. In a printing-press, the combination of two rotary perfecting printing mechanisms arranged end to end in one frame and closely adjacent, the printing-couples in each being parallel with and adjacent to each other, and a folding mechanism exterior to said mechanisms.
2. In a printing-press, the combination of a plurality of perfecting mechanisms, each comprising two plate and two impression cylinders arranged longitudinally of the press and close together, the perfecting mechanisms being arranged substantially end to end and closely adjacent, and a folding mechanism outside the printing mechanisms.
3. In a printing-press, the combination of a plurality of perfecting mechanisms, each comprising two plate and two impression cylinders arranged longitudinally of the press and close together, the perfecting mechanisms being substantially end to end and adjacent, and a folding mechanism at the outer end of one of the perfecting mechanisms, and means for directing the webs to the folding mechanism.
4. In a printing-press, the combination of a plurality of perfecting mechanisms, each comprising two plate and two impression cylinders arranged longitudinally of the press, the perfecting mechanisms being arranged adjacent; a folding mechanism at the outer end of one of the perfecting mechanisms; and angle-bars above the printing mechanisms whereby the web may be directed to the folder.
5. In a newspaper-printing press, the combination of a plurality of perfecting mechanisms in substantially the same plane, each comprising two plate-cylinders and two impression-cylinders arranged longitudinally of the press, and close together, the perfecting mechanisms being arranged closely adjacent end to end, and a folding mechanism outside the printing mechanism.
6. In a newspaper-printing press, the combination of a plurality of perfecting mechanisms in substantially the same plane, each comprising two plate and two impression cylinders arranged longitudinally of the press and close together; the perfecting mechanisms being arranged closely adjacent end to end; a folding mechanism at the outer end of one of the perfecting mechanisms; and means for directing the webs to the folding mechanism.
7. In a newspaper-printing press, the combination of a plurality of perfecting mechanisms each comprising two plate and two impression cylinders arranged longitudinally of the press and close together; the two perfecting mechanisms being arranged closely adjacent end to end; a folding mechanism outside the printing mechanisms, and angle-bars above the mechanisms whereby the web may be given a quarter-turn and directed to the folder mechanism.
8. In a printing-press, the combination of two cylinder perfecting printing mechanisms arranged end to end in one frame, a folder at one end of such mechanisms, and means for directing all webs after being printed in a straight line to said folder.
9. In a printing - press, a main frame, two rotary intergeared printing mechanisms therein arranged end to end longitudinally of the frame and substantially in one plane, and a folding mechanism at one end of the printing mechanisms.
10. In a printing-press, the combination of two rotary web-perfecting printing mechanisms arranged longitudinally of the press end to end in one frame, a single folding mechanism at one end of the press exterior to the mechanisms, and means for directing all the webs after being perfected into such folder.
11. In a printing-press, the combination of two printing mechanisms in one frame, each comprising rotary plate and impression cylinders extending longitudinally of the press, the printing-couples being arranged closely adjacent without intervening mechanism the plate-cylinders being outermost, and the adjacent mechanisms being arranged closely adjacent end to end and longitudinally of the frame; means for driving the cylinders, and inking mechanisms for the plate-cylinders arranged parallel therewith.
12. In a printing-press, the combination of two sets of perfecting mechanism, each comprising two plate and two impression cylinders arranged longitudinally of the press; the perfecting mechanisms being arranged end to end in one frame and closely adjacent; with gearing for driving said cylinders mounted in the press intermediate the perfecting mechanisms.
13. The combination of two sets of perfecting mechanisms, each comprising two plate and two impression cylinders, arranged in substantially the same plane, the cylinders in the adjacent mechanisms being arranged longitudinally of the press, end to end, and those in adjacent sets being axially aligned; with gearing for driving all the cylinders, arranged intermediate the adjacent ends thereof.
14. The combination with a pair of plate-cylinders and coacting impression-cylinders, arranged end to end longitudinally of the press, and a folder at the end of the press; of parallel diagonally - arranged turner - bars mounted above the cylinders, and unsupported at their outer ends.
15. The combination of two sets of plate-cylinders and coacting impression-cylinders, arranged end to end longitudinally of the press and in substantially the same plane, and a folder at the end of the press; with

diagonally-arranged turner-bars mounted above each set of cylinders, and unsupported at their outer ends.

16. In a printing-press, a main frame, two rotary intergeared printing mechanisms therein arranged end to end longitudinally of the frame and substantially in one plane, a folding mechanism at one end of the printing mechanisms, inking mechanism, and a web-supply parallel with the printing mechanism.

17. In a printing-press, the combination of the main frame, a pair of printing-couples therein arranged end to end longitudinally of the press, an inking mechanism beside each plate-cylinder and parallel therewith, gearing between the printing-couples, a folder, angle-bars above the printing-couples, and means for slitting the web before it reaches the angle-bars, substantially as described.

18. In a printing-press, the combination of a main frame, a pair of printing-couples mounted therein end to end and longitudinally of the press; with the plate-cylinders outermost, and in substantially the same plane, an inking mechanism adjacent to and below each plate-cylinder and parallel therewith, a folder at the end of the press, angle-bars above the printing-couples, web-guides, and means for slitting the web before it reaches the angle-bars, substantially as described.

19. The combination with plate and impression cylinders and a folder at one end of the said cylinders having its cutting-cylinders in alinement with the printing-cylinders; of means for directing a web laterally into the press, means for slitting the web, and angle-bars arranged above the cylinders whereby the halves of the web may be given a quarter-turn after printing, and together directed into the folder.

20. In a rotary web-perfecting printing-press, the combination of two rotary perfecting mechanisms in one frame, each having a pair of plate-cylinders, all of the plate-cylinders being in substantially one plane, and those in adjacent mechanisms arranged end to end; with a folder at one end of the press having its cutting-cylinders in alinement with the printing-cylinders.

21. The combination with a main frame, of two sets of rotary printing-cylinders arranged end to end in and longitudinally of the frame, a folder at one end of the frame, and a set of diagonally-arranged deflectors above each set of cylinders whereby the webs printed by the cylinders may be directed to the folder.

22. A rotary printing-press comprising a main frame, two sets of plate-cylinders and coacting impression-cylinders arranged end to end therein and intermediate gearing whereby the cylinders in each set may be rotated synchronously; with means whereby one set of cylinders may be thrown out of op-

eration, a folding mechanism, and diagonally-arranged web-guides adjacent to each printing mechanism whereby the web printed by any cylinder may be directed to the folder.

23. In a printing-press the combination of two sets of perfecting mechanism, each comprising two plate and two impression cylinders arranged longitudinally of the press; and gearing for driving said cylinders mounted in the press intermediate the perfecting mechanisms; with a folder at one end of the press, and angle-bars above each perfecting mechanism, the angle-bars being parallel and adapted to direct the webs to the folder.

24. The combination of two sets of perfecting mechanism, each comprising two plate and two impression cylinders, arranged in substantially the same plane, the cylinders being arranged longitudinally of the press, end to end, and those in adjacent sets being axially alined; and gearing for driving all the cylinders, arranged intermediate the adjacent ends thereof; with a folder at one end of the press, and parallel angle-bars above each perfecting mechanism adapted to direct the webs to the folder.

25. In combination with plate and impression cylinders and a folder at one end thereof having its cutting-cylinders in alinement with the plate-cylinders; of angle-bars supported at one end only, and arranged above the printing-cylinders, whereby the web is directed to the folder.

26. In combination with plate and impression cylinders in substantially one plane, and a folder at one end of said cylinders, having its cutting-cylinders in alinement with the printing-cylinders; of means for directing a web laterally into the press, means for slitting the web, and means whereby the web may be given a quarter-turn, after printing, and directed into the folder, substantially as described.

27. In combination with plate and impression cylinders in substantially the same plane, and a folder at one end of said cylinders having its cutting-cylinders in alinement with the printing-cylinders; of means for directing a web laterally into the press, means for slitting the web, and angle-bars supported at one end only, arranged above the cylinders, whereby the halves of the web may be given a quarter-turn, after printing, and directed into the folder, substantially as described.

28. In a printing-press the combination of two plate-cylinders, and two coacting impression-cylinders between the plate-cylinders and parallel therewith, the printing-couples being closely adjacent and without intervening mechanism, and all said cylinders extending longitudinally of the press with the plate-cylinders outermost; with ink-drums, ink-fountains, and ink-distributing and form rollers parallel with the cylinders and at the

outer sides of the press, substantially as set forth.

29. In a printing-press the combination of two plate-cylinders and two coating impression-cylinders, in substantially the same plane, the plate-cylinders being outermost, and all extending axially longitudinally of the press, ink drums and fountains at the outer sides of the press and extending parallel with the cylinders, sets of ink-distributing rollers for supplying ink from the fountain to the ink-drum, and from the drum to the plate-cylinders, and means for moving the rollers to and from the drum, and to and from the plate-cylinders respectively, substantially as described.

30. In a printing-press the combination of two sets of perfecting mechanism, each comprising two plate-cylinders and two coating impression-cylinders in substantially the same plane, the plate-cylinders outermost and the cylinders in adjacent sets being end to end, and extending longitudinally of the press; with an ink drum and fountain for each plate-cylinder at the outer sides of the press and parallel with the plate-cylinders, sets of ink-rollers for supplying ink from the

fountain to the ink-drum, and from the drum to the plate-cylinders, and gearing located between the perfecting mechanisms for driving all the cylinders and inking mechanism.

31. In a printing-press the combination of two sets of perfecting mechanism, each comprising two plate-cylinders and two coating impression-cylinders, in substantially the same plane, the plate-cylinders being outermost, and all extending axially longitudinally of the press, ink drums and fountains below the plate-cylinders and at the outer sides of the press and extending parallel with the cylinders, sets of ink-distributing rollers for supplying ink from the fountain to the ink-drum, and from the drum to the plate-cylinders, and means for moving each and any set of rollers to and from its drum, and to and from its plate-cylinder, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY F. BECHMAN.

In presence of—

CHARLES A. GRAMES,
CHARLES G. MECHEN