

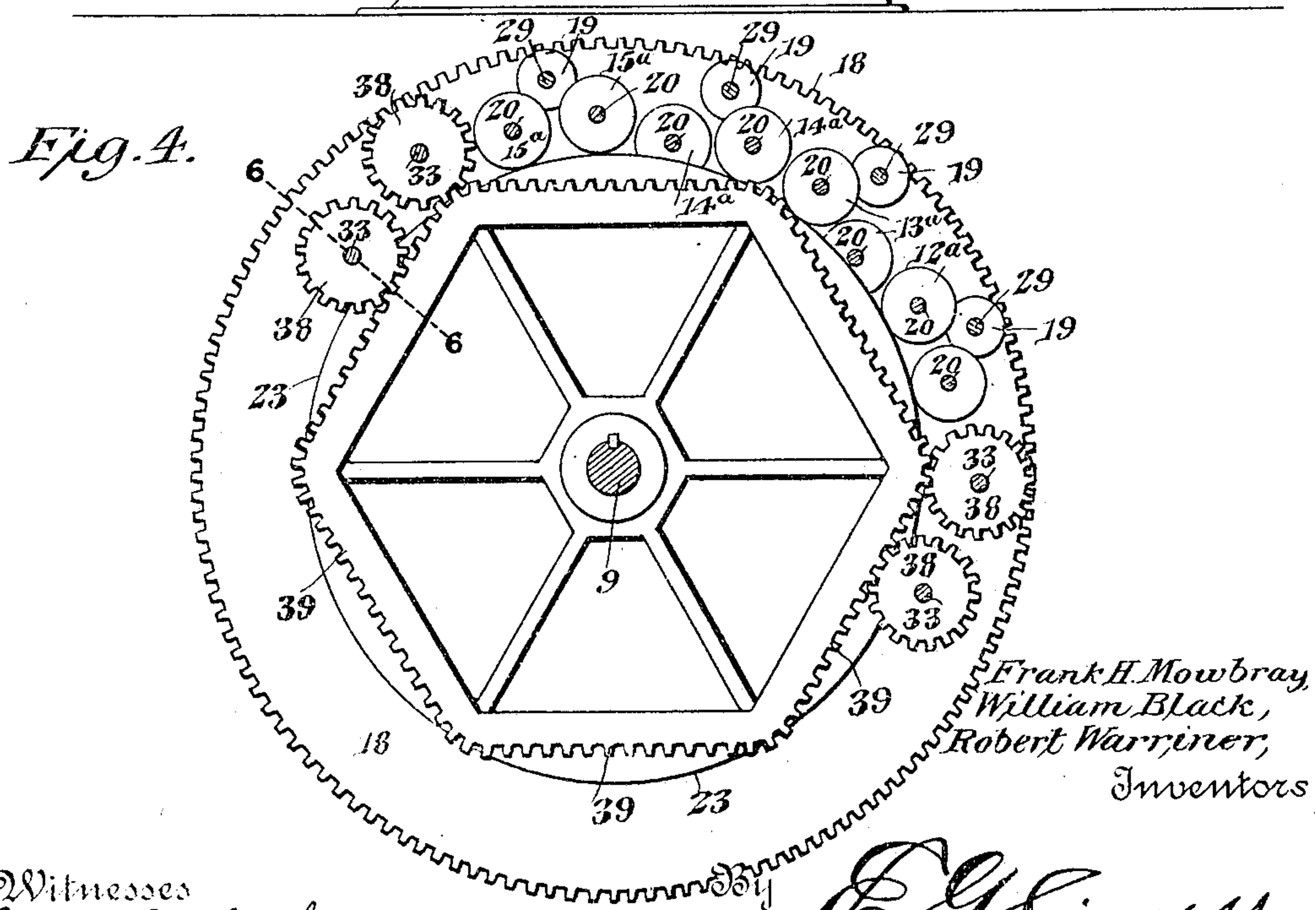
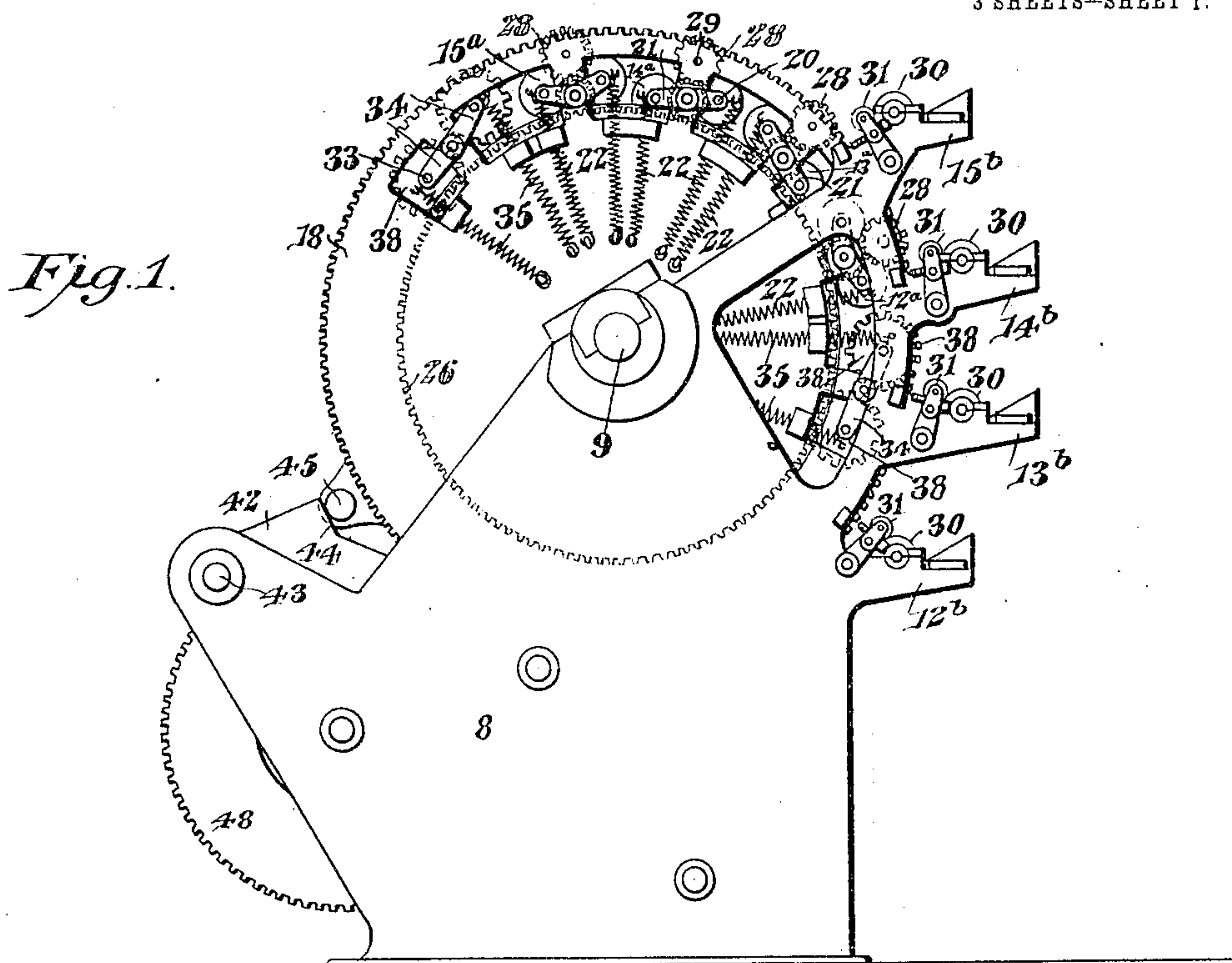
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PATENTED MAY 1, 1906.

F. H. MOWBRAY, W. BLACK & R. WARRINER.
MULTICOLOR PRINTING PRESS.

APPLICATION FILED FEB. 24, 1905.

3 SHEETS--SHEET 1.



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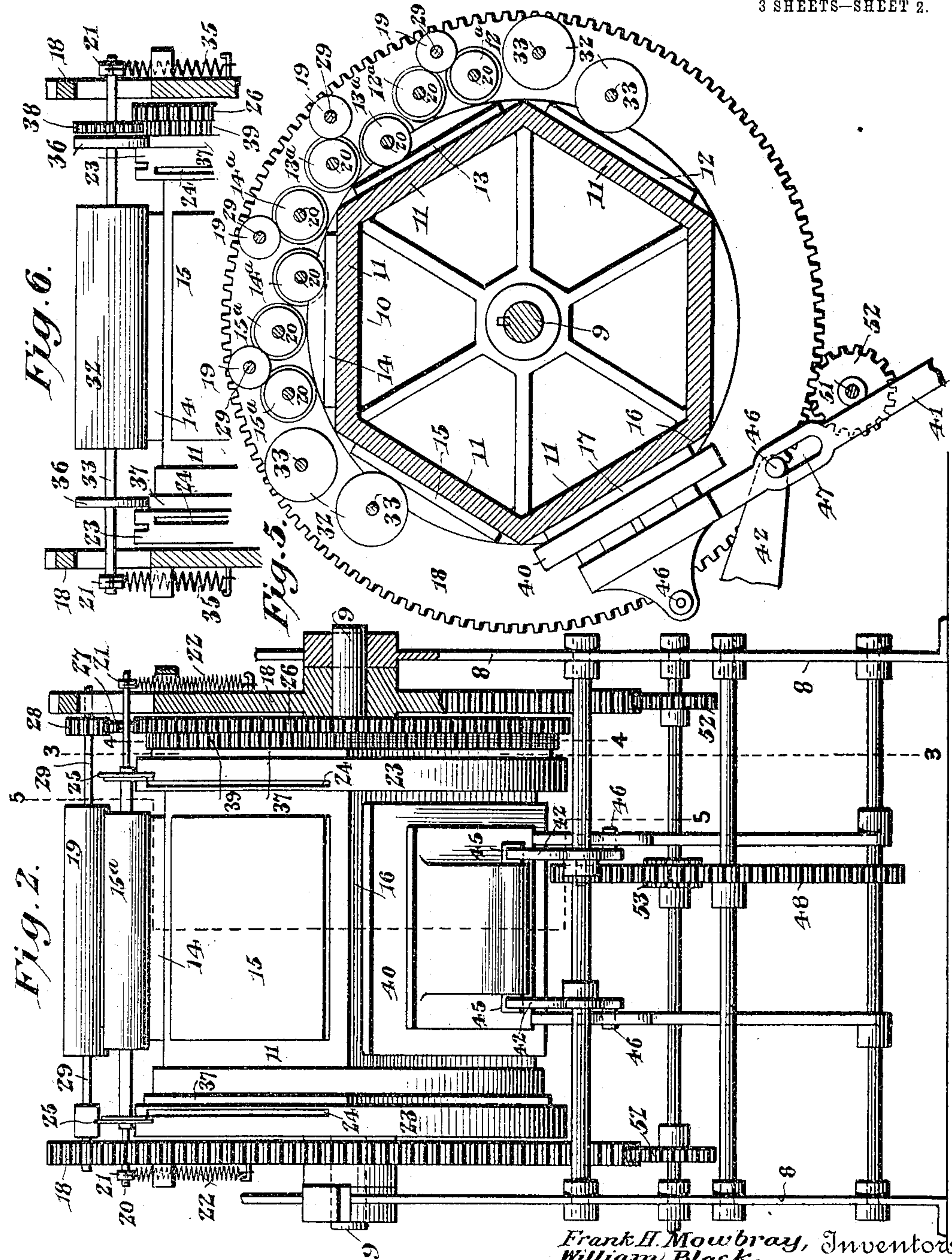
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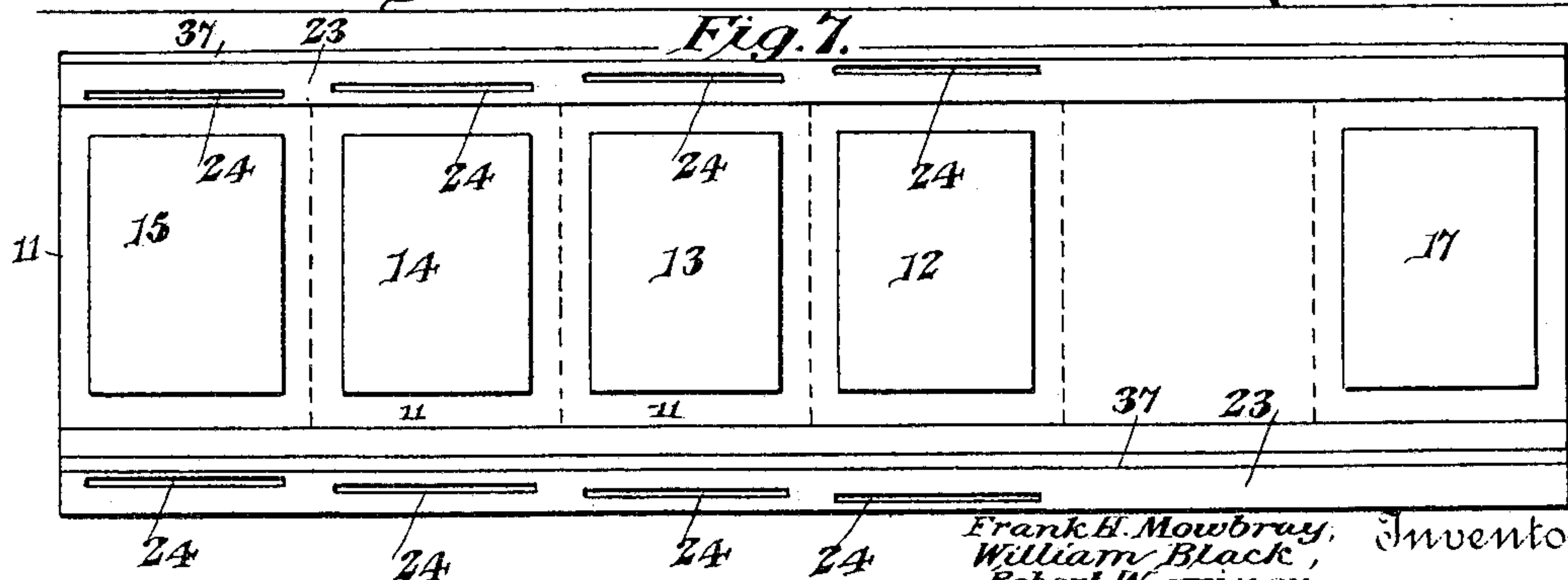
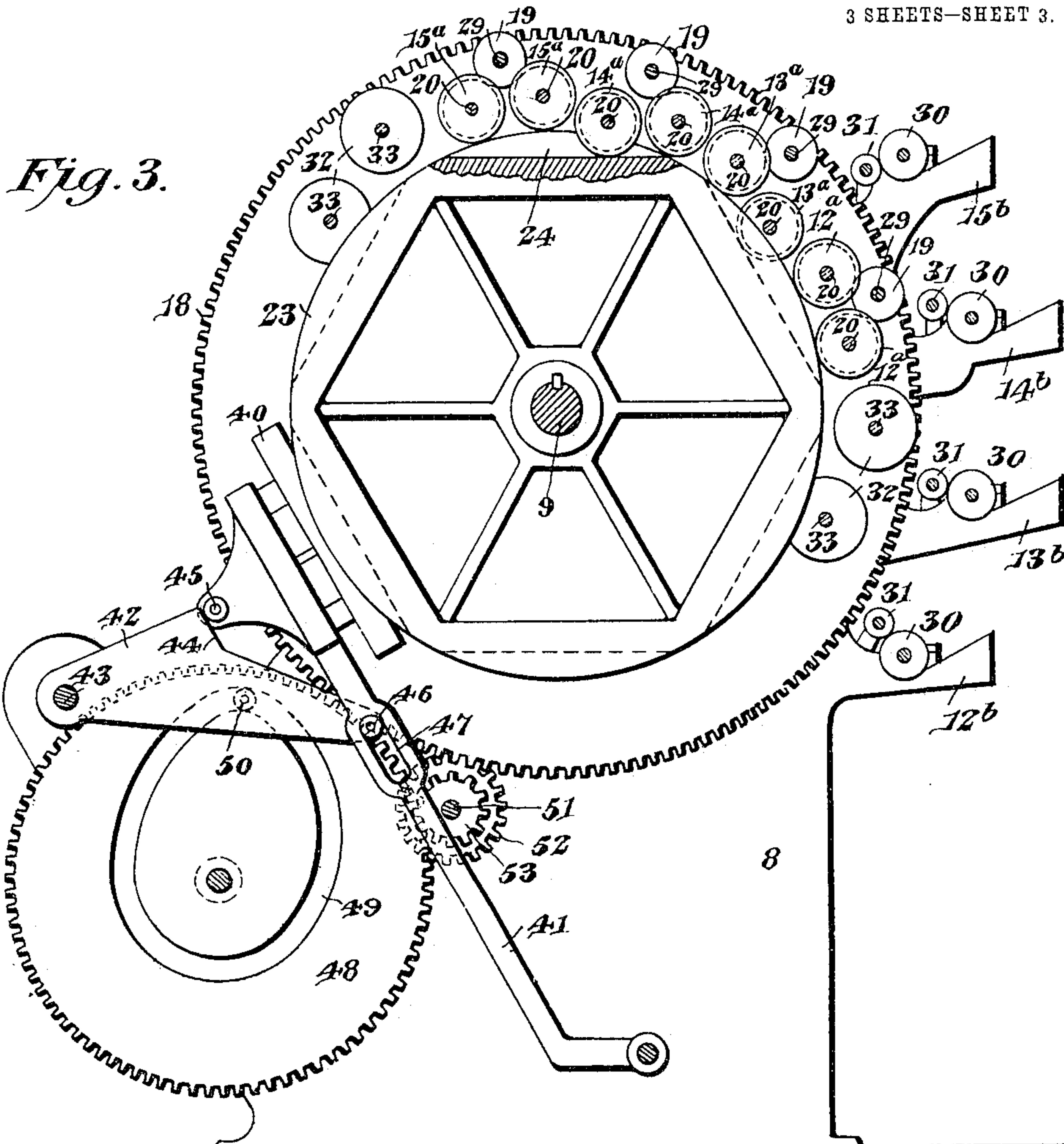
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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ENGLAND.

MULTICOLOR-PRINTING PRESS.

No. 819,157.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed February 24, 1905. Serial No. 247,160.

To all whom it may concern:

Be it known that we, FRANK HERBERT MOWBRAY, of Glenburnie, in the county of Surrey, WILLIAM BLACK, of Wardsworth Common, in the county of Surrey, and ROBERT WARRINER, of Catford, in the county of Kent, England, subjects of the King of Great Britain, have invented a new and useful Multicolor-Printing Press, of which the following is a specification.

This invention relates more particularly to presses for printing in several colors at one impression from a single printing or form plate that receives the various colors in correct register by means of one or more transferring-rollers from a number of flat design-plates, each inked in a given color. Machines hitherto designed for this class of work, so far as we are aware, have been either of the rotary type, with curved color-design plates, or of the bed-and-cylinder type, with flat design-plates. Rotary multicolor-machines lend themselves well to running at high speeds; but the time occupied in curving and registering the plates renders them wasteful for anything but large orders, whereas the bed-and-cylinder machines while little adapted for running at high speeds on account of their long stroke and reciprocatory movement are more economical for small orders, as the flat plates are easier to prepare and register.

One of the principal objects in the present invention is to provide a multicolor machine or press in which with the use of flat plates an output substantially equivalent to that of a rotary machine with curved plates may be attained, the said machine having substantially all the advantages of the above-mentioned press of the rotary type.

One embodiment of the invention is illustrated in the accompanying drawings and is described in the following specification. An inspection of the claims hereto appended will, however, clearly indicate to those skilled in the art that the said invention is not limited to the exact structure set forth, but is open to numerous changes and modifications.

In the drawings, Figure 1 is a side elevation of the new machine. Fig. 2 is an end elevation of the same, a portion thereof being shown in section. Fig. 3 is a vertical sectional view taken on the line 3 3 of Fig. 2.

Fig. 4 is a sectional view taken on the line 4 4 of Fig. 2. Fig. 5 is a sectional view taken on the line 5 5 of Fig. 2. Fig. 6 is a detail cross-sectional view taken on the line 6 6 of Fig. 4. Fig. 7 is a development of the surface of the drum and tracks or guides.

Similar reference-numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated a suitable frame 8 is employed, in the upper portion of which and suitably secured against rotation is a shaft or axle 9. Secured to the said shaft or axle is a polygonal supporting-drum 10, certain of the flat sides 11 of which constitute supports for a plurality of color-design plates, (designated, respectively, 12, 13, 14, and 15,) the outer operative faces of said plates being flat, as shown. One of the other flat sides 16 in like manner constitutes a support for a printing or form plate 17, the operative face of which is also flat. It will thus be seen, particularly by reference to Fig. 5, that the various plates and their outer operative faces are disposed in angular relation to one another. A rotatable supporting device is mounted to revolve around said drum and comprises large gear-wheels 18, journaled upon the axle or shaft 9 at the ends of said drum and supporting a plurality of inking mechanisms. In the present form of the structure these mechanisms comprise sets of inking-rollers, (designated, respectively, 12^a, 13^a, 14^a, and 15^a,) each set of which coacts with a distributing-roller 19, the said inking-rollers being movable into and out of engagement with the distributing-rollers and being therefore movable toward and from the drum 10. To this end, the said rollers 12^a to 15^a, inclusive, are carried on shafts or gudgeons 20, that are journaled in swinging arms 21, pivotally mounted on the gear-wheels 18, which arms, together with the gudgeons and rollers, are drawn toward the drum by means of coiled springs 22 connected thereto.

Each set of inking-rollers is allowed to coact with a predetermined color-design plate, but is maintained out of coaction with the other design-plates and also the printing or form plate 17. In order to accomplish this result, tracks or guides 23 are carried by the ends of the drum and are provided with depressed runways 24, located out of alignment,

as shown in Fig. 7, the corresponding runways being located on the same side of the drum and extending substantially the width thereof. The gudgeons 20 of the inking-rollers are provided with bearer-disks 25, and these disks are so located that they will move in the runways on opposite sides of the color-design plate which the respective rollers are to ink. It will thus be seen that the said disks 25, operating on the tracks 23, will maintain the inking-rollers out of coaction with all the plates, with the exception that each set will be permitted to ink one. Thus, for instance, in Fig. 5, the rollers 12^a are designed to ink the plate 12 and will therefore be out of coaction with the other plates, as shown, while the rollers 13^a have their bearer-disks so arranged that they will move into runways on opposite sides of the plate 13, and consequently will ink the same, as illustrated. In like manner the rollers 14^a are shown as passing into coaction with the plate 14, while the rollers 15^a are disposed out of coaction with said plate 14 and will of course coact with the plate 15. These various sets of inking-rollers receive their supplies of ink from the distributing-rollers 19 and are normally in engagement therewith, except when applying ink to their respective plates. The distributing-rollers 19 are positively revolved from a stationary gear 26, mounted on the axle 9 and having in mesh therewith idlers 27, which in turn operate pinions 28, carried upon the gudgeons 29 of said rollers 19. The distributing-rollers 19 receive their supplies from suitable fountains 12^b, 13^b, 14^b, and 15^b, each of which carries one of the colors, these fountains including feed-rollers 30 and ductor-rollers 31, the latter being swingingly supported in the manner well understood in the art and respectively applying the colors to the proper distributing-roller.

Means are employed for collecting the designs from the different color-design plates and delivering the same to the printing or form plate, these means being also carried by the rotatable supporting device. In the present embodiment two sets of transferring-rollers 32 are employed, located, respectively, in advance and in rear of the inking mechanisms, though this arrangement and the number of rollers may be varied as desired. The rollers 32 are carried upon shafts or gudgeons 33, which are journaled in swinging arms 34, drawn toward the axis of rotation of the mechanism by springs 35, in this respect corresponding to the mountings for the inking-rollers. The rollers 32 are arranged to operate over all the plates, and their positions with respect thereto are maintained by bearer-disks 36, (shown in Fig. 6,) which disks travel upon tracks or guides 37, disposed at the ends of the drum and contiguous to the tracks or guides 23. In order to secure the necessary accurate register, the said trans-

ferring-rollers 32 are positively driven, having pinions 38, carried by their gudgeons 33, each pinion meshing with a stationary polygonal gear 39, the sides of which correspond in number to the sides of the drum and said sides constituting, in effect, racks upon which the pinions 38 move.

Coacting with the side 16, carrying the printing or form plate 17, and consequently with said plate, is a platen 40, movable toward and from said side 16, being mounted on swinging arms 41. An oscillatory movement is given to this platen by means of levers 42, rigidly affixed to a rock-shaft 43, said levers having bearing-tracks 44, which operate against rollers 45, journaled on the rear portion of the platen. Other rollers 46, journaled on the free ends of the levers 42, operate in slots 47 of the arms 41. The levers in turn are actuated by a cam-gear 48, having a camway 49, in which is located a roller 50, carried by one of the arms 42. This cam-groove is so formed that the movement of the platen toward and from the printing or form plate 17 will be comparatively rapid, though the movement just prior to the impression is slow in order to avoid anything in the nature of a blow. The cam, furthermore, has a comparatively long dwell portion in order that when the platen is away from the drum it will remain stationary for a sufficient length of time to permit the passage over the printing or form plate of the inking and transferring rollers. Motion is imparted to the various mechanisms from a driving-shaft 51, having gear-wheels 52, which mesh with the gears 18 of the rotatable support, said shaft also having a pinion 53, meshing with the cam-gear 48.

It is believed that the operation of the machine can now be readily understood. As the carrier or support is revolved each of the distributing-rollers 19 is supplied with the proper ink from one of the fountains, and this ink is in turn transmitted to the inking-rollers. The said inking-rollers will apply it to their respective plates, so that the different designs will thus be colored. The transferring-rollers 32 will then be passed over the different design-plates and, collecting the designs therefrom, will pass over the printing or form plate, transferring said designs thereto. After this passage the platen moves upwardly into coacting relation with the printing or form plate, and the paper applied thereto will of course be properly impressed.

It will be apparent to those skilled in the art that the many features of an ordinary printing-press which are necessary to a highly efficient operation thereof have not been shown in order to avoid confusion and that the structure in this respect may be changed in a variety of ways. The principal feature or advantage to our mind arising from the structure set forth is that a machine of the

rotary type is secured wherein flat-faced color-design plates may be employed, thereby securing the advantages of both the rotary and bed-and-cylinder types of machine.

5 From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

15 Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a multicolor-printing press, the combination with a plurality of flat color-design surfaces located in different planes, of means for automatically inking said flat surfaces, and means for collecting and impressing the designs inked upon said surfaces.

2. In a multicolor-printing press, the combination with a plurality of flat design-surfaces located in angular relation, of means for automatically inking the different flat surfaces, and means for collecting and impressing the designs inked thereupon.

3. In a multicolor-printing press, the combination with means for supporting a plurality of color-design plates having flat surfaces with said surfaces located in different planes, of means for automatically and separately inking each surface, and means for collecting and impressing the designs inked thereupon.

4. In a multicolor-printing press, the combination with means for supporting a plurality of color-design plates having flat surfaces with such surfaces in angular relation with respect to each other, of means for automatically inking the flat surfaces, and means for collecting and impressing the designs inked thereupon.

5. In a multicolor-printing press, the combination with a polygonal support for mounting a plurality of flat color-design plates with their operative faces in angular relation, of means for automatically inking the various surfaces, and means for collecting and impressing the designs upon said surfaces.

6. In a multicolor-printing press, the combination with a polygonal support for mounting a plurality of flat color-design plates with their operative flat surfaces in angular relation, of means for automatically inking the various flat surfaces, and means for collecting and impressing the designs inked thereupon, said inking and collecting means and support being relatively movable.

7. In a multicolor-printing press, the combination with a stationary polygonal drum, the sides of which constitute supports for a plurality of angularly-disposed color-design plates, of a rotatable supporting device, ink-

ing mechanisms mounted on the supporting device and respectively coacting with the color-design plates mounted on the drum, and means for collecting and impressing the designs inked upon the plates.

8. In a multicolor-printing press, the combination with a stationary polygonal drum, the sides of which constitute supports for a plurality of angularly-disposed color-design plates, of a rotatable support, separate inking mechanisms mounted on the support and rotatable therewith about the drum, each of said mechanisms coacting with the plate on one side of the drum, means for maintaining said mechanisms out of coaction with the other plates, and means for collecting and impressing the inked designs.

9. In a multicolor-printing press, the combination with a polygonal drum having flat sides which constitute supports for angularly-disposed flat color-design surfaces, of a supporting device, a plurality of inking mechanisms mounted on the supporting device, each mechanism coacting with one of said surfaces, means for maintaining said mechanisms out of coaction with the other of such surfaces, means for effecting the relative rotation of the support and drum, and means for collecting and impressing the inked designs.

10. In a multicolor-printing press, the combination with a shaft, of a stationary polygonal drum mounted on the shaft, the sides of said drum constituting supporting means for a plurality of color-design surfaces, a rotatable support journaled on the shaft, a plurality of inking mechanisms mounted on the support and rotatable therewith, each mechanism coacting with one of such surfaces, means for maintaining the mechanisms out of coaction with the other surfaces, means for revolving the support and the inking mechanisms carried thereby, and means for collecting and impressing the designs inked upon said surfaces.

11. In a multicolor-printing press, the combination with a polygonal drum having flat sides which constitute supports for angularly-disposed flat color-design surfaces, of a supporting device, tracks or guides carried by the drum and having depressed runways located alongside the sides of the drum, a plurality of inking mechanisms journaled on the supporting device including inking-rollers having bearers operating on the tracks or guides to maintain them out of coaction with design-plates placed upon the sides of the drum, said bearers also moving into certain of the runways to permit the coaction of the rollers with the plates, means for effecting the relative rotation of the support and runway, and means for collecting and impressing the designs inked upon the plates.

12. In a multicolor-printing press, the combination with a shaft, of a stationary drum

mounted thereon and having a plurality of substantially flat sides constituting supports for a plurality of substantially flat color-design plates, tracks or guides located at the ends of the drum and having depressed runways, a rotatable support comprising gear-wheels journaled on the shaft at the ends of the drum, inking mechanisms mounted on the supporting device and including rollers journaled thereon and movable toward and from the color-design plates, bearers carried by the rollers and operating on the tracks, said bearers moving into certain of the runways to permit the movement of the rollers toward the design-plates, means engaging the gear-wheels for rotating the support, and means for collecting and impressing the designs inked upon the plates.

13. In a multicolor-printing press, the combination with a plurality of flat color-design plates having their operative faces located in angular relation, of means for separately inking the faces, a flat form-plate, means for collecting the designs from the design-plates and transferring them to the form-plate, and impression means coacting with the form-plate.

14. In a multicolor-printing press, the combination with means for supporting in angular relation a plurality of color-design plates having flat operative surfaces, of means rotatable about the support for separately inking the plates, a flat form-plate, means also rotating about the support for collecting the inked designs from the design-plates and transferring them to the form-plate, and impression means coacting with the form-plate.

15. In a multicolor-printing press, the combination with a polygonal drum, the different sides of which constitute supports for color-design plates and one of said sides constituting a support for a form-plate, of a supporting device rotatable about the drum, inking mechanism and transferring mechanism carried by the supporting device, and a platen coacting with the side of the drum that constitutes the form-plate support.

16. In a multicolor-printing press, the combination with a polygonal drum, the different sides of which constitute supports for color-design plates and one of said sides constituting a support for a form-plate, of a supporting device rotatable about the drum, inking mechanism and transferring mechanism carried by the supporting device, and a platen movable toward and from the side of the drum that constitutes the support for the form-plate.

17. In a multicolor-printing press, the combination with a polygonal drum, the different sides of which constitute supports for color-design plates and one of said sides constituting a support for a form-plate, of a supporting device rotatable about the drum, inking mechanism and transferring mechanism carried by the supporting device, and an oscillatory platen coacting with the side of the drum that constitutes the support for the form-plate.

18. In a multicolor-printing press, the combination with a polygonal drum, of a rotatable support, inking mechanisms mounted on the support and rotatable therewith, each of said mechanisms coacting with one side of the drum, transferring mechanism coacting with all sides of the drum, and impression means coacting with the transferring mechanism and receiving the inked designs therefrom.

19. In a multicolor-printing press, the combination with a stationary polygonal drum, of a plurality of flat color-design plates mounted on different sides of the drum in angular relation to each other, a form-plate mounted on another side of the drum, a rotatable supporting device revolving about the drum, inking mechanisms mounted on the supporting device and rotating therewith, said mechanisms including inking-rollers, the rollers of each mechanism coacting with one of the color-design plates, means for maintaining said rollers out of coacting relation with the other design-plates and with the form-plate, transferring mechanism including rollers that operate over all of the color-design plates and also over the form-plate, and impression mechanism receiving the designs from the transferring mechanism.

20. In a multicolor-printing press, the combination with a supporting-frame, of a stationary shaft mounted therein, a stationary drum secured to the shaft and having a plurality of flat sides constituting supports for a plurality of color-design plates, one of said sides also constituting a support for a form-plate, tracks located at the ends of the drum and having depressed runways, a supporting device journaled upon the shaft and rotatable with respect to the drum, inking mechanisms mounted on the supporting device and including rollers movable toward and from the drum, bearers carried by the rollers and operating on the tracks or guides, said bearers each running in certain of the runways to permit the movement of the rollers toward the drum, transferring-rollers journaled on the supporting device and rotatable therewith, said rollers having fixed paths of movement with respect to the drum, a polygonal stationary gear-wheel located at one end of the drum, gears carried by the transferring-rollers and meshing with the gear-wheel, a platen movable toward and from the face of the drum that constitutes a form-plate support, and means for rotating the supporting device and moving the platen.

21. The combination with a plurality of flat color-design surfaces, of mechanism for automatically inking the said surfaces, means for moving the inking mechanism continuously in one direction repeatedly over said surfaces, and means for collecting and impressing the designs therefrom.

22. The combination with a plurality of flat color-design surfaces, of mechanism for automatically inking the said surfaces, means for moving the inking mechanism continuously in one direction repeatedly over said surfaces, and means for collecting and impressing the designs therefrom.

pressing the designs inked upon said surfaces.

22. The combination with a plurality of flat color-design surfaces, of mechanism for automatically inking said surfaces, means for moving the inking mechanism continuously in one direction and repeatedly over said surfaces, means for transferring the inked designs, said transferring means being also movable continuously in one direction and repeatedly over the surfaces, and a printing-couple receiving the inked designs from said transferring means.

23. The combination with a plurality of flat design-surfaces located in angular relation, of means for inking the various surfaces, said inking means and flat design-surfaces being relatively rotatable, means for effecting the relative rotation of the same, and means for collecting and impressing the inked designs.

24. The combination with a polygonal support for a plurality of flat-sided color-design surfaces, of circular tracks located at the ends of said support and having depressed portions, inking mechanisms having bearers that run upon the tracks, each of said bearers moving into certain of the depressed portions to permit the engagement of each inking mechanism with a predetermined surface, and means for collecting and impressing the designs inked upon the flat surfaces.

25. The combination with a polygonal support for a plurality of flat-sided color-design surfaces, of separate means for automatically

and independently inking each of said surfaces, and means for collecting and impressing the designs inked upon the surfaces, said means including polygonal racks located at the support and corresponding thereto, and transferring-rollers having gears that mesh with said racks, said rollers operating on the flat surfaces.

26. The combination with a stationary support, of a plurality of flat color-design surfaces mounted on the support and disposed in angular relation thereupon and about a common center, rotatable inking mechanism having rollers, means for mounting the rollers to permit their coaction with the flat surfaces, and means for collecting and impressing the designs inked upon said surfaces.

27. In a multicolor-printing press, the combination with a support for a plurality of color-design plates, of a stationary form, means for inking the plates, means for transferring the inked designs from the plates to the form, a platen coöperating with the form, and means for moving the platen toward and from the form.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

FRANK HERBERT MOWBRAY.

WILLIAM BLACK.

ROBERT WARRINER.

Witnesses:

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A. NUTTING.