

H. C. OSBORN.
PRINTING MECHANISM.
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1,044,907.

Patented Nov. 19, 1912

2 SHEETS—SHEET 1.

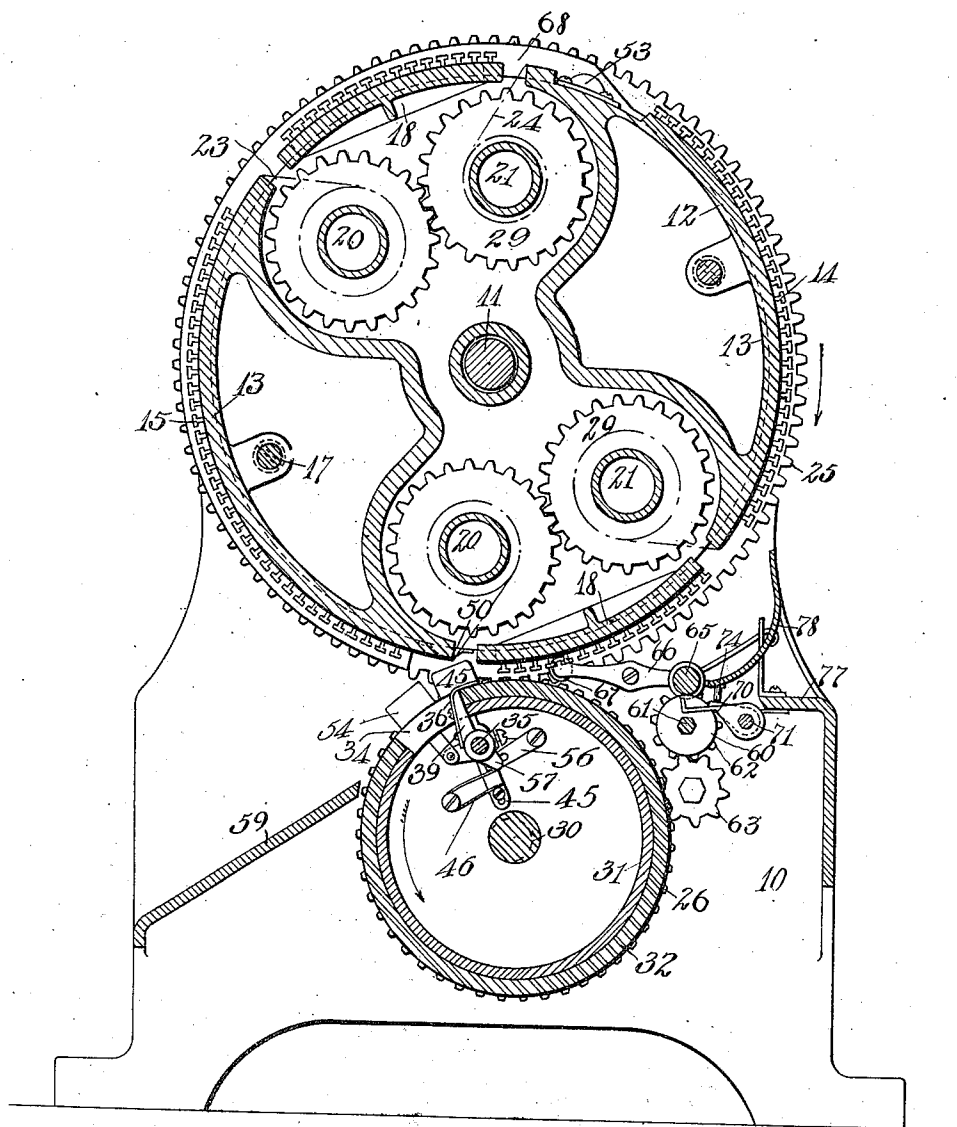


FIG. 1

WITNESSES:

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Oliver M. Kappeler.

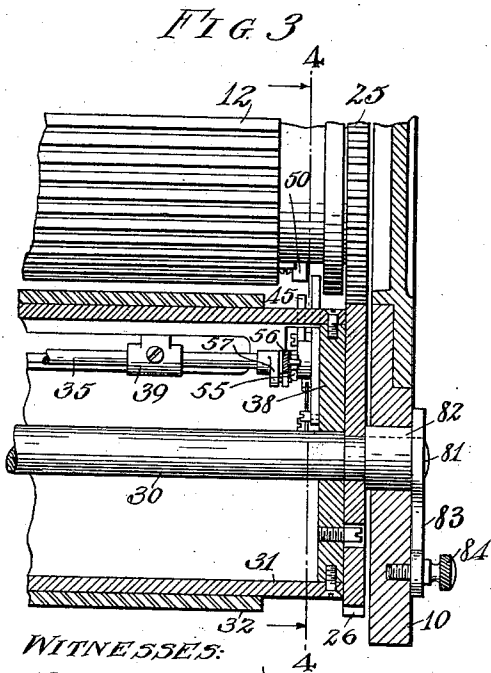
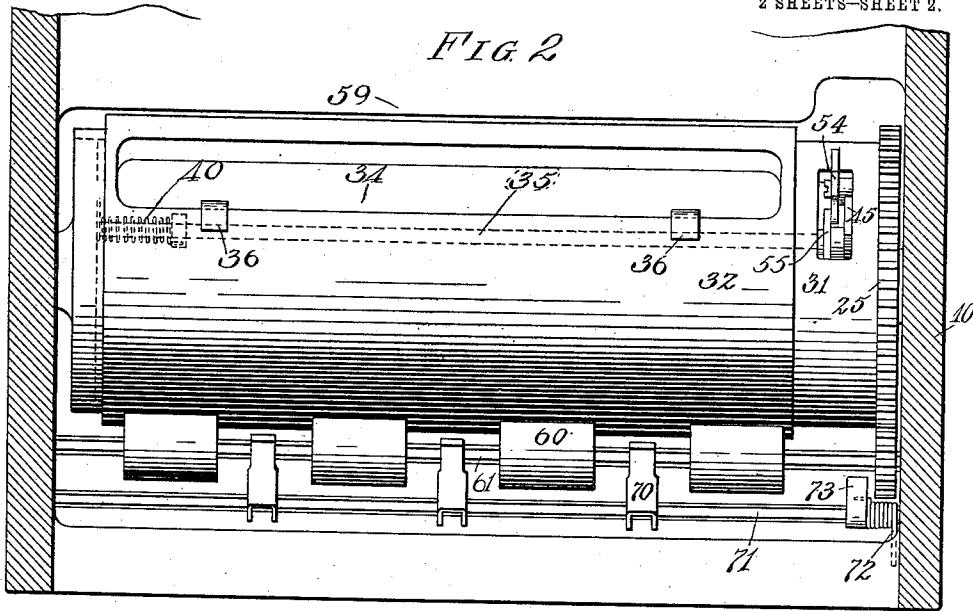
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1,044,907.

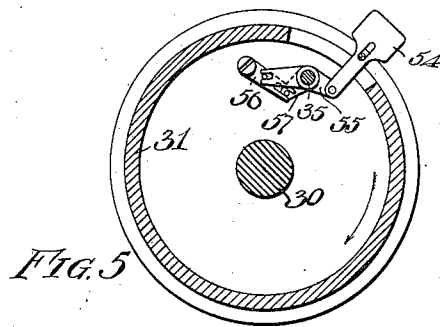
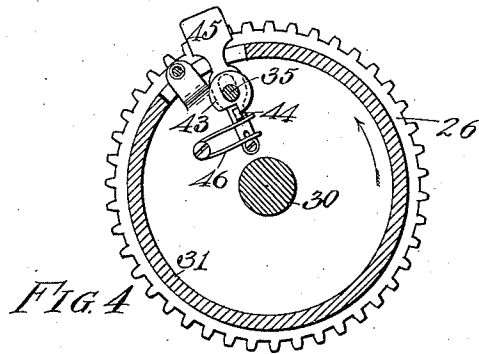
Patented Nov. 19, 1912.

2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY C. OSBORN, OF CLEVELAND, OHIO, ASSIGNOR TO THE AMERICAN MULTIGRAPH COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

PRINTING MECHANISM.

1,044,907.

Specification of Letters Patent.

Patented Nov. 19, 1912.

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To all whom it may concern:

Be it known that I, HENRY C. OSBORN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Printing Mechanisms; of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide a very simple printing machine adapted to automatically print successive impressions on the same sheet.

My invention adapts itself particularly well to printing in a plurality of colors on one sheet.

It comprises a rotating drum carrying a plurality of forms, a cooperating platen making a plurality of presentations for each rotation of the drum, and mechanism for causing the paper after one impression to be returned with the platen, and after another to be fed from the printing couple.

The more particular embodiment of the invention hereinafter described is also included within my invention.

In the drawings,—Figure 1 is a vertical section through a rotary printing machine embodying my invention, the structure shown being adapted for an office printing press; Fig. 2 is a sectional plan of the machine, partly broken away and with the printing drum removed; Fig. 3 is a partial vertical section on the axis of the platen; Fig. 4 is a transverse section of the platen on the line 4—4 of Fig. 3, looking toward the right; and Fig. 5 is a section of the platen on the same line, looking toward the left.

As shown in the drawings, 10 indicates the frame of the machine comprising a pair of vertical end plates and a base portion carrying the same. Journaled in the end plates is a shaft 11 on which is mounted the drum 12. This drum is adapted to carry a plurality of printing forms. These forms may consist of individual type grooved on their opposite sides and held in undercut channels provided by overhanging rails. The drawing shows two sets of rails, each adapted to carry a page form, one set being designated 14 and the other 15, these rails being mounted on segmental plates 13 which may be secured between the end members of the drum by means of rods 17, or otherwise, as desired.

Between the edges of the members 13 are shown two other segments 18 which may carry a letter head, for example. Within the drum is a recess in which are mounted four spools designated 20—20 and 21—21. These spools will carry the wound-up ends of inking fabrics extending over the respective forms 14 and 15. Thus the fabric 23 extends from one spool 20 over the drum 15 to the other spool 20, while the fabric 24 extends correspondingly between the spools 21 over the form 14. These two fabrics may be of different color.

The mechanism so far described is shown, described and claimed in my prior application No. 409,434 which uses a similar printing drum with a different platen and paper feed arrangement. In that application suitable mechanism is shown and claimed for periodically feeding the ribbon spools, and the same mechanism may be employed here if desired, each of the spools 20 being preferably geared with the adjacent spool 21 by gears 29, so that the feeding action on any of the spools will affect both ribbons. My prior application referred to also shows means for directly inking the letter head forms carried by the members designated herein 18 and such mechanism may be employed here if desired. For simplicity and clearness, I have not shown any inking means for the forms 18. Further, these forms may be employed or omitted, as desired.

Journaled in the frame beneath the printing drum is a shaft 30 on which is mounted a rotary platen shell 31 carrying a suitable platen surface 32, preferably of rubber. This platen is geared with the drum by means of a gear 26 on the platen shaft and connected with the platen and meshing with the gear 25 on the drum. In the embodiment shown this gear is such that the platen makes two revolutions to one revolution of the drum.

Extending through the shell and rubber surface of the platen is an elongated slot or opening 34. Within the platen, adjacent to this opening, is a rock-shaft 35. This rock-shaft carries spring fingers 36 which are adapted to be actuated to grip the forward edge of a sheet of paper and to release that edge as desired. The mechanism about to be described operates to cause these fingers to grip the sheet as it is first fed be-

tween the platen and the printing drum, so that during the first impression the sheet wraps around the platen. The platen diameter as shown is half the diameter of the drum with its type surface, so that while the platen is making one revolution one of the letter heads is moving past the platen. Then as the second form on the drum comes into coöperation with the platen the fingers 36 are moved to idle position within the platen and the sheet is freed, so that after the second impression it is fed out of the machine. Accordingly, by making the two ribbons 23 and 24 of different color, I am enabled by one rotation of the drum to make impressions in two colors on the same sheet.

The mechanism referred to for operating the fingers 36 includes the rock-shaft 35 which is journaled in the end plates 38 of the platen. This shaft has rigid rock arms 39 which carry the fingers 36. A spring 40 surrounding the rock-shaft tends to twist it in the direction to clamp the paper, as shown in Fig. 1. The fingers may be held back in idle position within the slot 34 by means of a shoulder provided by a notch on a collar 43 (Fig. 4) rigid on the shaft 35. This collar may engage a lug 44 on a radially slidable plunger 45 held outwardly by the spring 46. At the proper time to grip the sheet, however, a cam 50 on the drum contacts with the plunger 45 and forces it inwardly, thereby withdrawing the lug 44 from the collar 43, whereupon the spring 40 rocks the shaft 35 to cause the fingers to grip the sheet. This gripping continues throughout that rotation of the platen, the sheet thus wrapping around the platen as it is impressed. At the end of a complete rotation of the platen, as the sheet is being presented a second time to the drum, (but this time to the other printing form thereon), a cam 53 on the drum engages another plunger 54 and forces it inwardly. This plunger is connected with a lever 55 which is loose on the shaft 35 and has its other end connected with a lever 56 which has a pin-and-slot connection with a rock arm 57 rigid on the shaft. The result is that the movement of the plunger 54 rocks the shaft in the direction to carry the fingers back into the opening 34, and as they come into idle position the shoulder provided by the collar 43 clears the lug 44, and the plunger 45 springs back into the position shown in Fig. 4, holding the fingers in idle position. The forward end of the sheet being now freed, it does not wrap around the platen in this second impression, but is fed out of the machine on the discharge table 59 which forms a portion of the machine frame or is carried by it.

To feed the paper to the printing couple I employ mechanism substantially as shown and claimed in Patent #846,992 of H. C. Gammeter. Such mechanism is illustrated

in Figs. 1 and 2 and may be briefly described as follows: 60 indicates a series of elastic rolls mounted on a shaft 61 on which is a gear 62 connecting with an idler 63 which meshes with the platen gear 26 heretofore referred to. Above the rolls 60 is a roller 65 carried by arms 66, one of which carries at its opposite end a roll 67 adapted to be engaged by a cam 68 on the periphery of the drum and extending for a considerable distance about the drum. 70 designates stop fingers which normally stand in the path of the paper, these fingers being on a rock-shaft 71 which is provided with a suitable spring 72 tending to elevate the fingers and is controlled by having a rock arm 73 which is engaged by a projection 74 on the front end of the arm 66.

When the high portion of the cam is rotating past the roller 67 the roller 65 is out of engagement with the rollers 60 and the fingers 70 are in the path of the paper. During this period a sheet of paper is shoved inwardly by hand over that portion 77 of the bed which may form the paper table against the stop fingers 70. Then when the low portion of the cam comes opposite the roller 67 the roller 65 is lowered into coöperation with the roller 60 and the shaft 71 is rocked to withdraw the fingers 70, and the paper is automatically fed to the couple and its forward edge is grasped by the fingers 36, as heretofore explained. After the sheet has been grasped by the fingers 36 and is within the grip of the couple, the cam 68 again returns the paper feed to idle position. A suitable guide plate 78 may be provided at the front of the machine to direct the paper being fed by hand.

The platen may be adjusted to cause the proper presentation to the drum by any means desired. As shown, this is accomplished by means of an eccentric mounting, the shaft 30 on which the platen turns freely, having an eccentric portion 81 on which is the hub 82 of an arm 83. This hub is journaled in the frame member 10 and locked in adjusted position by the set-screw 84 which passes into the frame through an arcual slot in the arm.

It will be seen from the foregoing description that my printing machine is extremely simple in construction and may be operated with great rapidity to make a plurality of impressions on the same sheet. For example, the first impression may be through a black ribbon with certain portions of the sheet left blank, and the next impression may be through a red ribbon and operate to print in such blank portions, so that for each rotation of the drum there is delivered a sheet printed in two colors. By mounting on the rails individual type of typewriter pattern, a product imitative of typewriter work may be produced, this imitation being

particularly close, due not only to the ribbon printing, but to the digging action which the rolling contact of loosely held type produces. The invention, however, is not limited to the employment of this particular kind of type, or to individual type, and the structure shown is to be taken as illustrative of any printing form.

Having thus described my invention, what I claim is:

1. In a printing machine, the combination of a rotary printing drum, a rotary platen geared therewith, and making a plurality of rotations for each rotation of the drum, gripping fingers carried by the platen, mechanism operated to bring said fingers into active position, mechanism to bring said fingers into inactive position and there hold them, and two alternately acting cams on the printing drum for operating the two mechanisms mentioned.

2. In a printing machine, the combination of a rotary printing drum, a rotary platen geared therewith and adapted to make a plurality of rotations for each rotation of the drum, gripping fingers carried by the platen, a spring tending to move said fingers into active position, mechanism for restraining the spring, mechanism for releasing the spring to allow the fingers to come into active position, and mechanism for returning the fingers to inactive position.

3. In a printing machine, the combination of a rotary printing drum, a rotary platen geared therewith, gripping fingers carried by the platen, a spring tending to seat said fingers, mechanism for moving the fingers to idle position, a latch for holding them in this position, and means for alternately actuating the latch and the returning mechanism.

4. In a printing mechanism, the combina-

tion of a rotary printing drum, a rotary co-operating platen, a rock shaft carried by the platen, gripping fingers on the rock shaft, a spring acting on the rock shaft and tending to seat the fingers, a latch acting on the rock shaft adapted to hold the fingers in idle position, and mechanism acting on the rock shaft tending to rock it in a direction opposed to the spring.

5. In a machine of the character described, the combination of a rotary printing drum, a rotary platen geared therewith and bearing an aliquot relation thereto, a plurality of printing forms on the drum, a rock shaft carried by the platen, gripping fingers carried by the rock shaft, a spring tending to turn the rock shaft to seat the fingers, a latch adapted to hold the rock shaft with the fingers in idle position and the spring constrained, mechanism for turning the rock shaft into such position, and two alternately operating cams acting on the said latch and the said mechanism respectively.

6. In a printing machine, the combination of a rotary printing drum, a rotary platen geared therewith, a shaft within the platen, gripping fingers thereon, a spring tending to swing said shaft to bring the fingers into active position, mechanism for rocking said shaft to bring the fingers into inactive position and there locking them, mechanism for releasing such lock to allow the spring to return the fingers, and two cams on the printing drum for operating the two mechanisms mentioned.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HENRY C. OSBORN.

Witnesses:

W. DUNLAP,

ALBERT H. BATES.