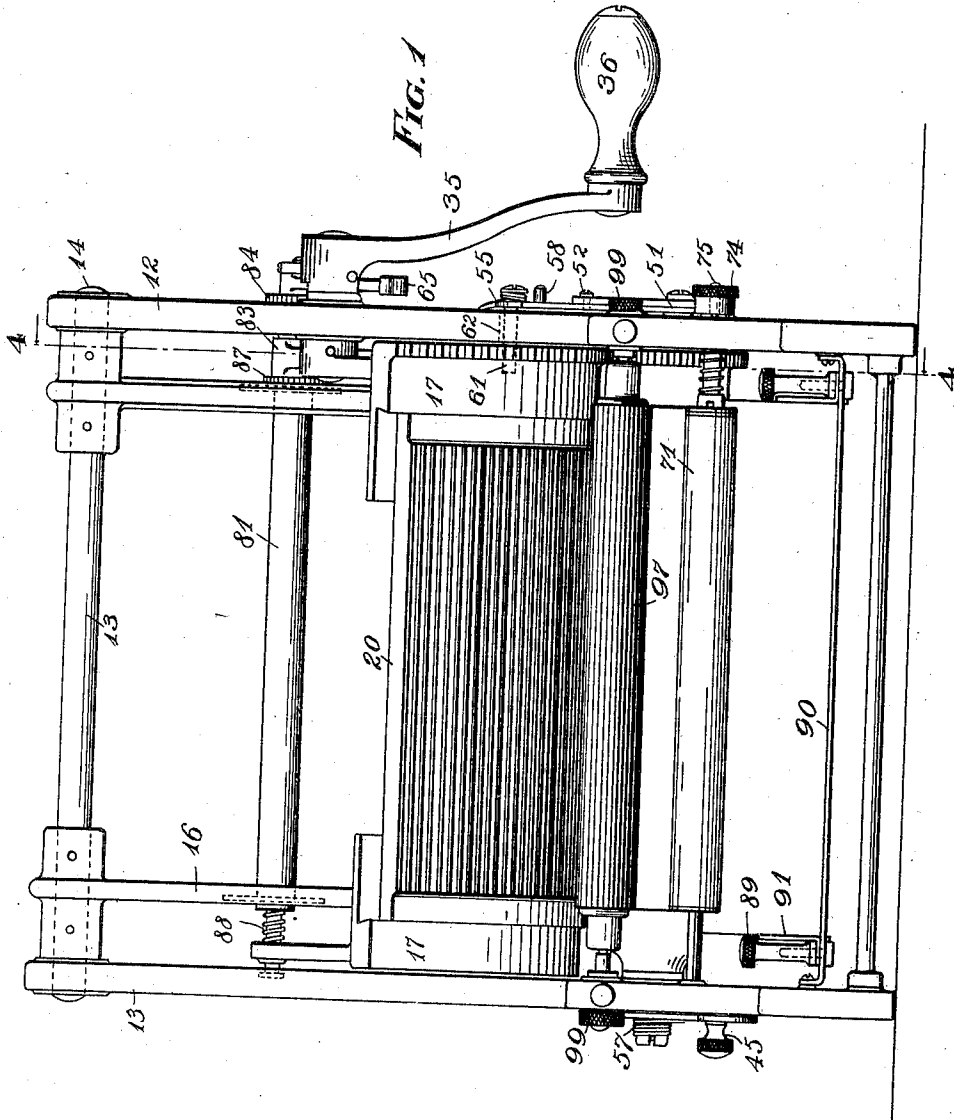


H. C. GAMMETER.
 DUPLICATING MACHINE.
 APPLICATION FILED MAY 22, 1907.

1,051,213.

Patented Jan. 21, 1913.

4 SHEETS-SHEET 1.



WITNESSES:
 Breman West.
 Nathan F. Fretter.

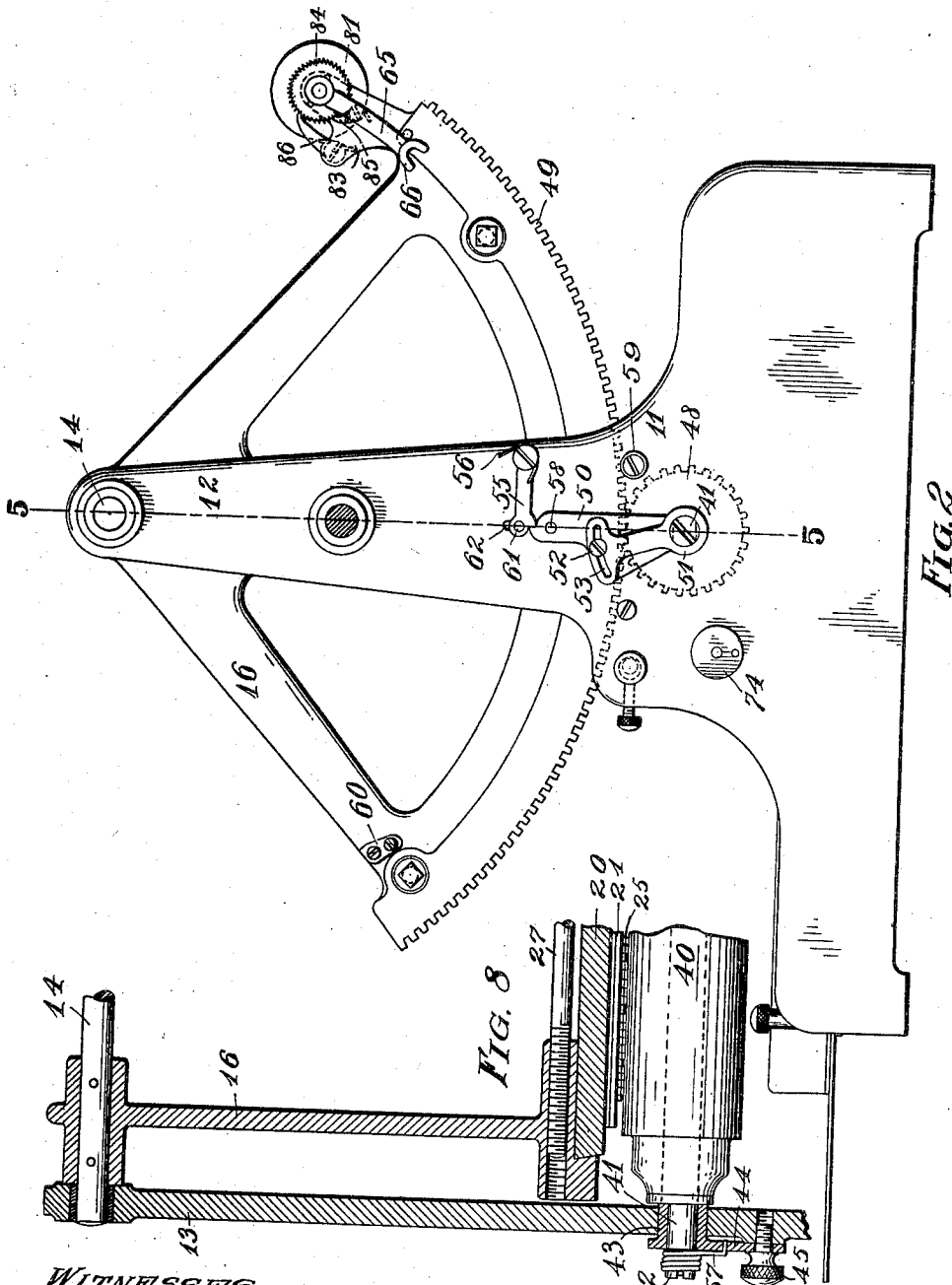
INVENTOR,
 Harry C. Gammeter.
 BY T. Balis, Fenton Hull,
 ATTYS.

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4 SHEETS—SHEET 2.



WITNESSES:

Brennan West.
 Nathan F. Fretter

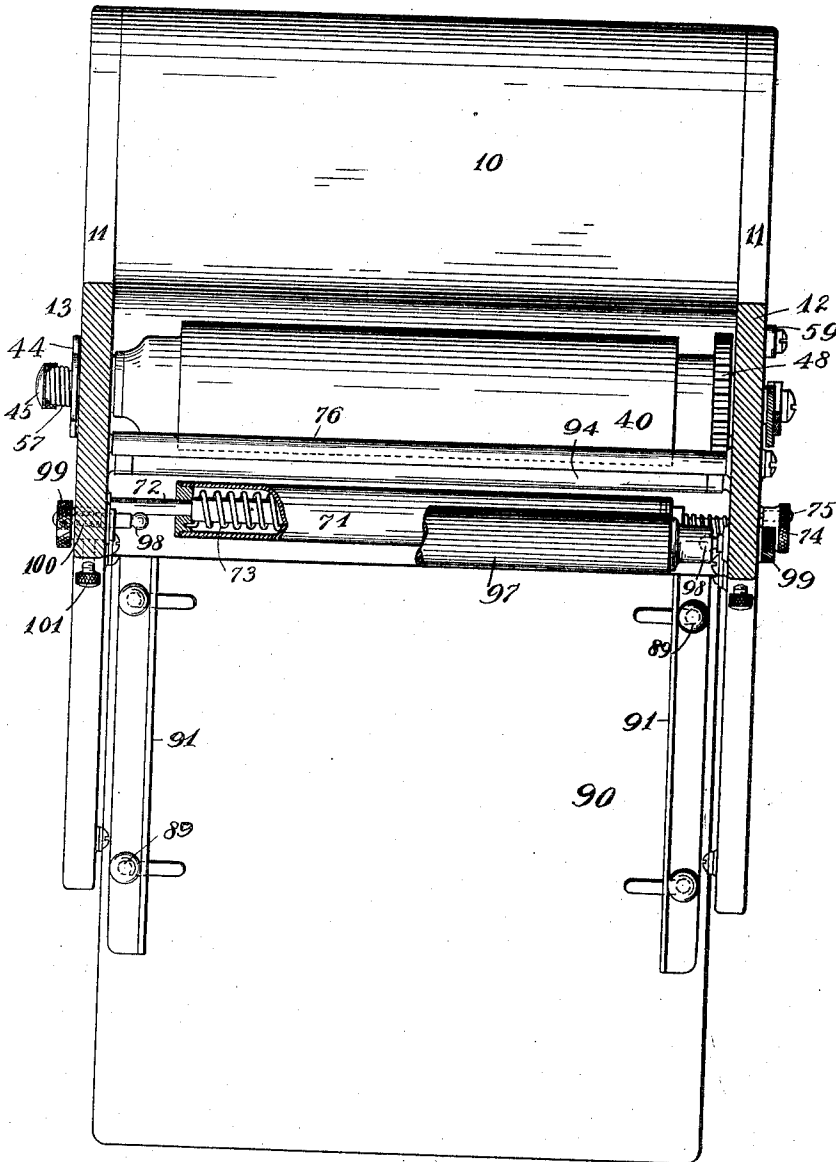
INVENTOR,
 BY Harry C. Gammeter.
 Bates, Font, & Hill,
 ATTYS.

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4 SHEETS—SHEET 3.



WITNESSES:

Brennan B. West.
 Nathan F. Fretten

FIG. 3

INVENTOR.

Harry C. Gammeter

BY Bates, Fouts & Hull,

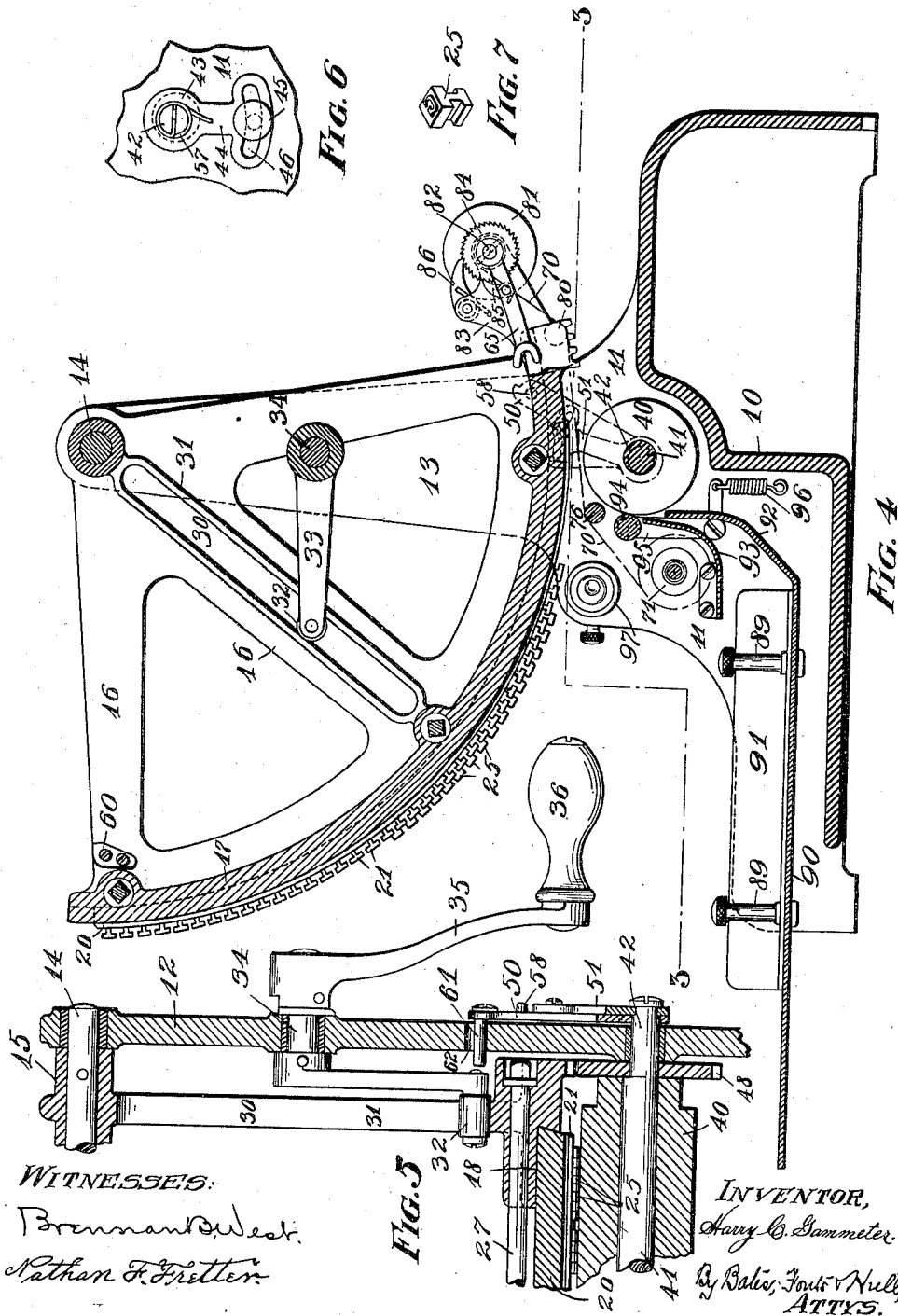
ATTYS.

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Patented Jan. 21, 1913.

4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

HARRY C. GAMMETER, OF CLEVELAND, OHIO, ASSIGNOR TO THE AMERICAN MULTI-
GRAPH COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

DUPLICATING-MACHINE.

1,051,213.

Specification of Letters Patent.

Patented Jan. 21, 1913.

Application filed May 22, 1907. Serial No. 375,169.

To all whom it may concern:

Be it known that I, HARRY C. GAMMETER, 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 Duplicating-Machines, 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 and efficient printing mechanism adapted primarily for embodiment in a small office machine.

My machine is especially adapted for carrying individual type held somewhat loosely in a page form, and printing therefrom through an inked ribbon, whereby imitation typewritten letters may be produced in large quantities with great rapidity.

My machine includes a segment of a drum arranged to carry the page form of individual type, means for rocking such segment on its axis, and an inking ribbon, one end of which is carried by the segment and the other end by a spring barrel, the ribbon passing between the printing member and a suitable under-running platen. Not only this broad idea, but various minor features contributing to the efficiency of my machine are comprised within my invention, wherefore the invention may be most conveniently summarized as consisting of the combinations of cooperating parts, or their equivalents, as hereinafter more fully explained and as set out in the claims.

In the drawings Figure 1 is a front elevation of my machine. Fig. 2 is a side elevation thereof. Fig. 3 is a sectional plan, the plane of the section being indicated by the line 3—3 of Fig. 4. Fig. 4 is a sectional side elevation, the plane of the section being indicated by the line 4—4 of Fig. 1. Fig. 5 is a vertical section through the right hand frame standard and the adjacent portion of the drum segment, as indicated by the line 5—5 of Fig. 2. Fig. 6 is a detail showing the adjustment at the left hand end of the platen, being in side elevation from the direction opposite to Fig. 2. Fig. 7 is a perspective view of the type which the drum segment shown is adapted to carry. Fig. 8 is a vertical section through the left hand standard and the adjacent portion of the printing member and platen.

Referring by reference numerals to the

embodiment shown in the drawings, 10 represents a suitable base, at the opposite ends of which are vertical webs 11 which continue upward in the form of standards 12 and 13. Journaled in these two standards near their upper ends is the shaft 14. Mounted on this shaft is the drum segment which constitutes the printing member. This printing member has hubs 15 surrounding and pinned to the shaft 14, and extending from the hubs are spider arms 16 which at their outer ends carry the arc-shaped rim members 17. These rim members are recessed or rabbeted, as shown at 18, the outer wall of the rabbet being inclined or under cut. The rabbets of the two rim members thus cooperate to produce in effect a wide dove-tailed recess adapted to receive the removable arc-shaped plate 20. This plate has its edge beveled correspondingly to the sides 19 of the recesses. The plate carries projecting rails 21 having T-heads and thus adapted to receive between them rows of type 25 having grooves to cooperate with the T-rails as shown in Figs. 4 and 7.

The type holding plate 20 is locked between the rim members 17 by means of the rods 27 which extend across the printing member, passing through one of the rim members and screwing into the opposite rim member, as shown in Fig. 8. The rods 27 have angular heads seating in recesses in the right hand rim member 17. These recesses allow a suitable socket wrench to be placed over the head to turn the rod, such turning loosening the plate 20 so that it may be removed, or clamping it rigidly in place.

It will be seen that when the plate 20, loaded with type, is clamped in place by the rods 27 as above explained, my machine provides a rigid rocking segment of a drum carrying individual printing type. The type carrying member, however, may be very easily removed to allow assemblage of type thereon or distribution of type therefrom.

At the right hand end of the machine, the central spider arm 16 is shown as having a long radial slot 30 bounded by a reinforcing web 31. Into this slot extends a roller 32 carried by a crank arm 33 mounted on the inner end of a short shaft 34 journaled in the frame standard 12. On the outer end of this short shaft is secured a crank 35 having a handle 36. By means of this handle the crank may be rotated, the roller

and slot connection thereby rocking or reciprocating the drum segment. The crank being rotated in the left hand direction, the drum surface is driven rearward comparatively slowly owing to the roller at such time being in the lower portion of the slot 30. The return stroke, however, is rapid, as the roller is in the upper portion of the slot 30 and much nearer the axis 14. The printing being accomplished on the rearward stroke of the printing surface, it will be seen that the action is slow where the power is required, and provides a quick return for the idle movement of the printing surface.

Regular rotations of the crank therefore give the printing surface just the movement desired.

Located below the printing member and coöperating with it is the rotary impression platen 40, which is positively driven by a pinion 48 connected therewith and meshing with gear teeth 49 on the printing member. This platen is journaled on a shaft 41 which has reduced eccentrically placed extensions 42. The extension at the right hand end of the machine is mounted in the frame web 11 at that end. At the left hand end, this extension 42 is mounted eccentrically in a bushing 43, (Figs. 6 and 8), which is mounted in the frame web 11 at that side. Secured to this bushing is a small flat rock arm 44, this rock arm being secured in place by a thumb nut 45 screwing through a slot 46 in the head of the arm. By this means, the bushing 43 is adjusted and clamped to present the platen in parallelism with the printing surface.

On the right hand end of the shaft, on the extension 42 is loosely mounted a rock arm 50, (Figs. 2 and 5), while rigid on this end of the shaft is an arm 51. The arm 51 is adjustably held to the arm 50 by a set screw 52 screwing through a slot 53 in the arm 51. By this means, the arm 50 is adjustably secured to the shaft 41. The adjustment is so set that when the arm 50 extends vertically as shown in Fig. 2, the platen is held in position to coact with the type, the arm 50 being retained in this position by a dog 55 pivoted to the standard 12 and pressed downward by a spring 56. This is the position of the parts when the printing surface swings rearward, the paper being drawn between the printing surface and platen and thereby impressed.

At the end of the rearward movement of the printing member, an inclined cam lug 60 thereon engages beneath a pin 61 projecting inward from the dog 55 through a slot 62. This raises the dog to release the arm 50, whereupon the shaft 41 is immediately rocked rearward by the spring 57 engaging its left hand end (Fig. 6), the arm 50 coming to rest by engaging the cushioned stop pin 59. The platen is thus swung

downward, out of the way of the type so that the latter may return without impressing the platen. As such return stroke is just being completed, an arm 65, carried near the rear end of the printing member and having a fork 66, engages a pin 58 on the arm 50 and returns it to upright position, thus swinging the platen into active position,—the arm 50 being held in this position by the dog 55 reengaging its upper end.

70 in Fig. 4 indicates the inking ribbon. This ribbon is a page wide and is mounted at its forward end on a spool surrounding and frictionally engaging a spring barrel 71. This barrel has an internal shaft 72 connected with the tubular exterior by a helical spring 73. On the head of the shaft 72 is a knob 74 by which the shaft may be turned to tighten the spring, a suitable pressed plunger 75 on this knob engaging in any of several notches in the frame plate and holding the shaft in position.

From the spring barrel, the ribbon passes over a guide rod 76, then rearwardly between the platen and printing member and under a guide roller 80 carried near the rear end of the printing member. From this point, the ribbon passes onto the upper side of a spool 81 carried at the rear side of the printing member, this spool being held by a spring 88 with its other end in engagement with a short shaft 82 at the rear of the printing member, mounted in the lug 83. Secured on this shaft is a ratchet wheel 84, acted on by a pawl 85 on the arm 65, heretofore referred to. When this arm 65 engages the pin 58 on the arm 50, and returns that arm to normal position on the reverse stroke of the printing member, this same movement swings the arm 65 upward and thus the pawl 85 drives the ratchet 84 rearward and gives the spool a slight turn. Such winding of the spool is held by a suitable detent pawl 86 which engages a suitable ratchet, a second ratchet 87 being shown for this purpose.

By the above described means, a slight feed is given to the ribbon for each printing stroke of the machine, thus causing a continuously fresh portion of the ribbon to be presented to the type. At the same time, the spring barrel maintains the desired tautness of the ribbon. As the spring in the barrel becomes wound up, however, the spool slips on the barrel thus preventing excessive tension.

The paper to be printed rests on the table 90 between guides 91, which are adjustably held thereto to set screw 89. The paper is shoved rearward by hand in the embodiment shown, and its forward edge passes upward along the guide plate 92, which is a continuation of the table 90, and behind the guide plate 93. The forward edge of the paper thus is directed between the platen

and the feed roller 94 mounted in arms 95 and pressed against the platen by a spring 96. The paper being thus engaged is drawn upward by the platen and passes under guide rod 76 and thence rearwardly between the platen and inking ribbon and is impressed by the type through the ribbon, the printed sheet being discharged at the rear above the horizontal portion of the frame 10.

10 I provide an inking roller 97, which may be of felt or other suitable ink carrying material, this roller being positioned to act directly on the type. If the printing ribbon is used, such inking of the type serves to
15 replenish the ribbon for the ink taken therefrom by the impression. On the other hand, should direct printing be desired, the inking ribbon may be removed and the printing ink derived solely from the roller 97. This
20 roller is removably and adjustably held in position by being mounted on the studs 98 which are eccentrically carried in the bushings 99, and one of which is a plunger pressed inward by a spring 100. These
25 bushings have knurled heads whereby they may be positioned and are clamped in place by the set screws 101.

The construction described enables the support for the inking roller to be accurately positioned so that the roller will bear
20 on the type for the full width of the printing surface. The roller, however, may be very conveniently removed by simply being pressed endwise,—the spring 100 allowing
35 the plunger to give sufficiently for the roller to clear the stud at the other end.

It will be seen from the above description that my machine, while being compact and simple, is provided with adjustments, not
40 only for maintaining proper parallelism, but for different sizes and thicknesses of paper and for varying degrees of impression according to the intensity or quality of the ink. An excellent impression may thus be
45 obtained, it only being necessary after the machine is adjusted for the operator to rotate the crank with one hand and feed the paper with the other. By reason of the rolling impression through the inked ribbon,
50 as well as by reason of the fact that the type are slightly loose and not absolutely clamped on the printing member, the machine is adapted to produce most satisfactory imitation typewritten letters. The
55 evenness of the ink from the ribbon is increased by replenishing the ribbon from the type and the inking roller, as explained; while, whenever desired, the inking ribbon may be dispensed with and the ink obtained
60 directly from the roller.

Having thus described my invention, I claim:

1. The combination of a member mounted to turn on an axis and provided with means
65 to carry individual type, a rotary impression

platen, an inking fabric adapted to pass between them and having its forward end carried by the member mentioned, a spring barrel carrying the other end of the fabric, said barrel having its spring in such direction as to apply a tension to the fabric, the fabric unwinding from the barrel during the printing impression and rewinding between impressions.

2. The combination, with an impression platen, of a reciprocating printing member, an inking fabric anchored at the forward end to the printing member, means for giving the printing member a comparatively slow movement in the printing direction and a comparatively quick return, and a spring barrel for winding in the other end of the fabric on said return movement.

3. The combination, in a duplicating machine, of a printing member in the form of a drum segment, a driving crank carrying a roller in a slot in the drum segment and arranged to continuously rotate and thereby reciprocate said segment, a platen cooperating with the segment during movement in one direction, and an inking ribbon passing between the segment and the platen.

4. The combination of an oscillating printing member, and an impression platen, a fabric adapted to pass between them and having one end carried by the printing member, a spring barrel carrying the other end of the fabric, whereby the fabric winds on and off the spring barrel with each complete swing of the member, and means for periodically winding in the fabric away from the spring barrel.

5. The combination of a printing member having a curved surface and mounted to turn on an axis at the center of curvature, a cooperating impression platen, means for reciprocating the printing member about the center of curvature, means for moving the platen to inoperative position for the idle stroke of the printing member, a printing fabric passing between the printing member and platen, and two spools for carrying the ends of the fabric, one of which spools is carried by the printing member and the other independently.

6. The combination of a printing member having a curved surface and mounted to turn on an axis at the center of curvature, a cooperating impression platen, means for moving the platen to inoperative position for the idle stroke of the printing member, a spring barrel, a spool on the printing member, and a printing fabric adapted to pass from the spring barrel to said spool between the printing member and platen.

7. The combination of a printing member having a curved surface and mounted to turn on an axis at the center of curvature, a cooperating rotary impression platen, means for reciprocating the printing member about

15 8. The combination, with a movable printing member, a rotary platen and an inking ribbon, of a movable member carried by the printing member and performing the double duty of moving the platen to active position and feeding the ribbon.

10. The combination of an oscillating segmental printing member, means for swinging it more rapidly in one direction than the other, a rotary platen eccentrically mounted, an arm adapted to turn such eccentric mounting to change the presentation of the platen, a dog adapted to hold said arm in position, and means swinging with the printing member to release said dog.

45 12. The combination of a frame, a drum
segment supported therein with its curved
surface depending, an under-running rotary
impression platen, an arm adapted to ad-
50 just the position of the platen, a dog carried
by the frame adapted to hold the arm with
the platen in operative position, means car-
ried by the printing member adapted to en-
gage said dog to release the arm, allowing
the platen to move to idle position, and
55 means carried by the printing member
adapted to engage the arm near the other
end of the stroke to return it to active po-
sition.

sition of the arm first mentioned and the shaft may be adjusted.

14. In a printing mechanism, the combination of a printing member and a platen, a shaft for the platen, a bushing in which the shaft is eccentrically mounted, a frame on which the bushing is mounted, an arm on said bushing having a pin and slot connection with said frame, a spring for giving the shaft a tendency to rotate, and means for moving the shaft in opposition to the spring.

15. The combination in a duplicating machine, of a type-carrying member and a co-operating platen, a printing fabric adapted to pass between them, a ribbon spool carried by the printing member, a spring barrel, a ribbon running from the spring barrel to the ribbon spool and traveling on and off the spring barrel with each complete operation of the machine, and means for periodically and partially rotating the spool to wind the ribbon.

16. The combination, in a duplicating machine, of a type-carrying member and a co-operating platen, a printing fabric adapted to pass between them, a ribbon spool carried by the printing member, a spring barrel, a ribbon running from the spring barrel to the ribbon spool, means for periodically and partially rotating the spool to wind the ribbon, and an inking roller adapted to act on the type and thereby replenish the ribbon.

17. The combination in a duplicating machine, of a type-carrying member and a co-operating platen, a printing fabric adapted to pass between them, a ribbon spool carried by the printing member, a spring barrel, a ribbon running from the spring barrel to the ribbon spool and traveling on and off the spring barrel with each complete operation of the machine, means for periodically and partially rotating the spool to wind the ribbon, and means for periodically moving the impression platen into and out of coöperation with the printing member, so that it shall be out of coöperation when the printing member is moving toward the spring barrel.

18. The combination of a curved structure mounted to turn on an axis at its center of curvature, a member having a series of parallel connected rails formed to loosely carry rows of individual type, said member being adapted to be placed as a unit in an incomplete arc on a portion of the surface of said structure and being removable therefrom as a unit without disassembling the page form of rows of type carried thereby, a platen adapted to cooperate with the type, an inking fabric adapted to lie between the type and platen, and a spring constrained device adapted to pull on one end of the fabric to keep it taut, the other end being anchored to the structure.

19. In a printing mechanism, the combi- 130

5 nation, with a printing member and a platen, of an eccentric shaft for the platen, an arm surrounding the axis of the shaft for operating the shaft, an adjustable connection between the arm and shaft, and an abutment for the arm.

10 20. In a printing mechanism, the combination, with a printing drum and a platen, of an eccentric shaft for the platen, a member secured about the axis of said shaft, an arm about the axis of the shaft for operating the shaft, an adjustable connection between said member and said arm, and an abutment for the arm.

15 21. In a device of the character described,

the combination of a printing member, a platen, a shaft on which the platen is eccentrically mounted, an arm secured to the shaft, a second arm alongside of the first arm, a pin and slot connection between said arms, and an abutment for one of the arms whereby the position of the platen when the arm engages the abutment may be varied by the adjustment mentioned.

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

HARRY C. GAMMETER.

Witnesses:

ALBERT H. BATES,

S. E. FOUTS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."