

(No Model.)

3 Sheets—Sheet 1.

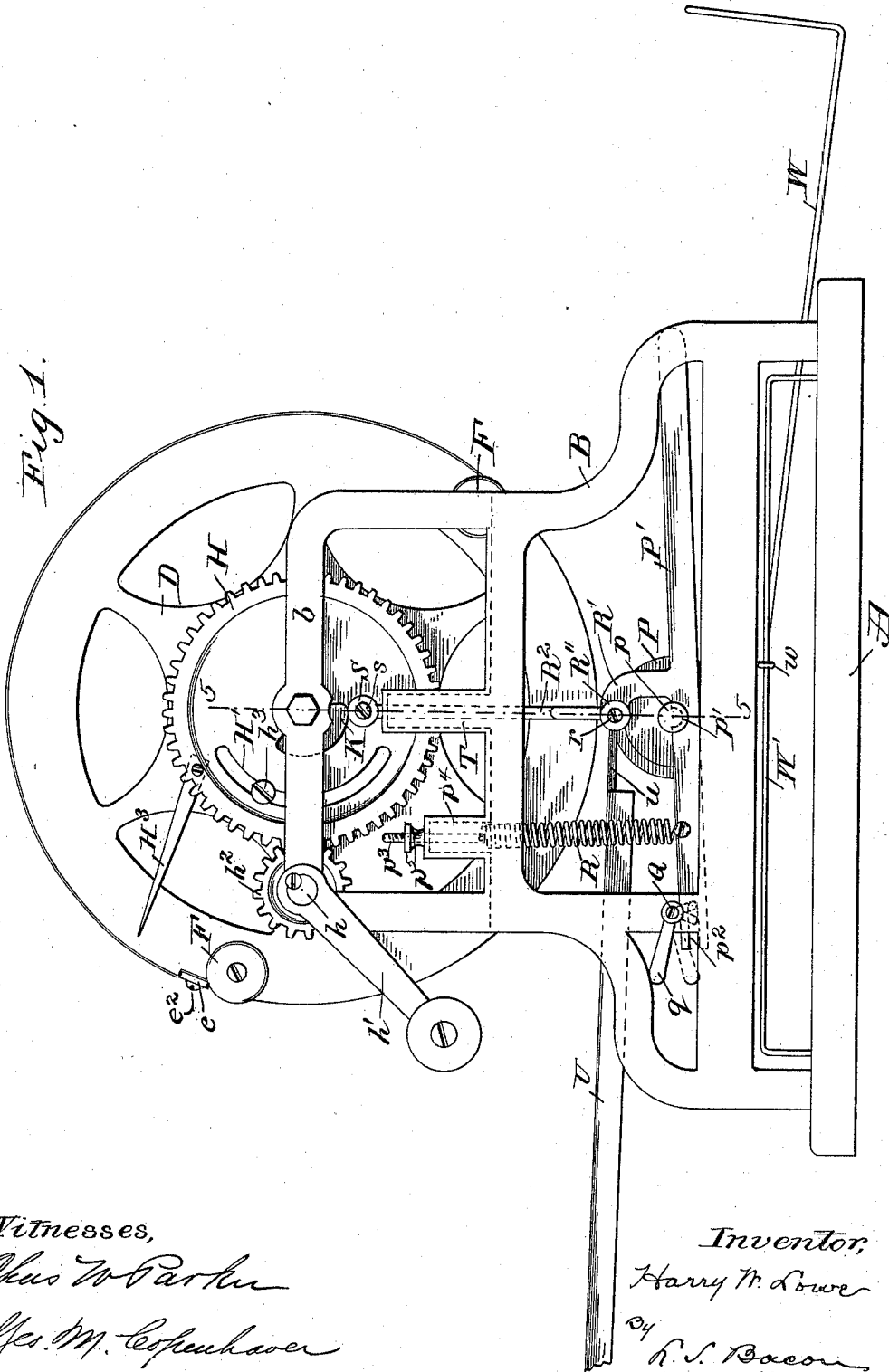
H. W. LOWE.

DUPLICATING OR STENCIL PRINTING MACHINE.

No. 584,787.

Patented June 22, 1897.

Fig. 1.



Witnesses,
Chas W Parker
Jes M. Copenhagen

Inventor,
Harry M. Lowe
By
R. S. Bacon
att'y

(No Model.)

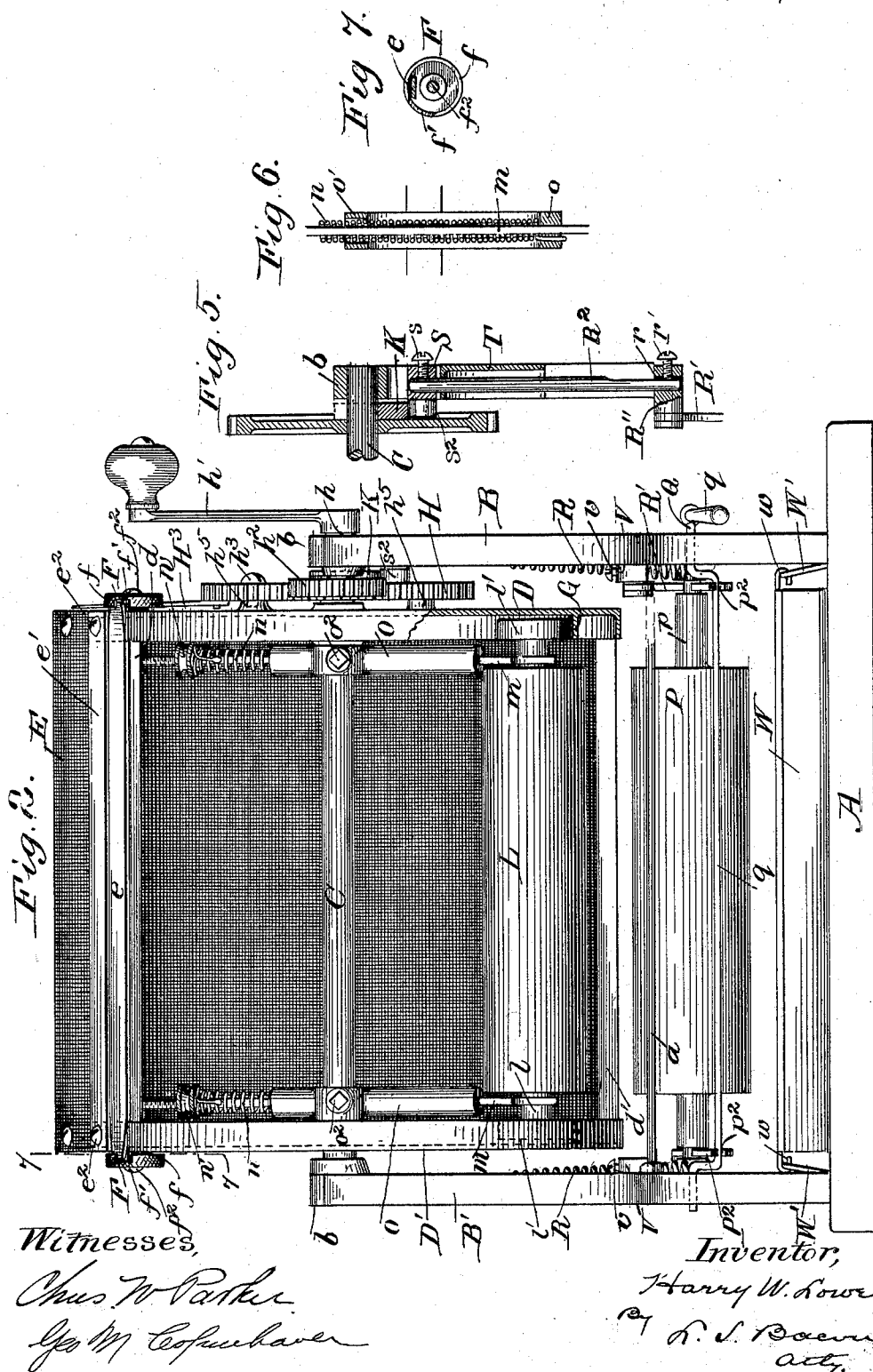
3 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

HARRY W. LOWE, OF OMAHA, NEBRASKA, ASSIGNOR OF ONE-HALF TO
JOHN G. CORTELYOU, OF SAME PLACE.

DUPLICATING OR STENCIL-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,787, dated June 22, 1897.

Application filed August 27, 1896. Serial No. 604,096. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. LOWE, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Duplicating or Stencil-Printing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in duplicating or stencil-printing machines; and it is embodied in the construction and arrangement of parts of the machine illustrated in the accompanying drawings and hereinafter described and claimed.

The invention is designed as an improvement on that class of machines wherein a movable member is employed, which member carries a stencil and is equipped with means for applying ink to the stencil.

The invention, generally speaking, consists in improved means for carrying the stencil, means for regulating the extent of the printing interval, improved means for applying the ink to the stencil, and, further, in means, mechanisms, and features, whereby the machine is rendered perfect, easy, and positive in operation.

In the drawings forming a part of the specification, and in which like letters of reference designate corresponding parts in the different views, Figure 1 is a side elevation of the machine. Fig. 2 is a front elevation showing parts in section. Fig. 3 is a central longitudinal section. Fig. 4 is a similar view showing the machine with its actuating parts in a position opposite that shown in Fig. 3. Fig. 5 is a detail section taken on the line 5 5, Fig. 1. Fig. 6 is a detail section on the line 6 6 of Fig. 4; and Fig. 7 is a detail section on the line 7 7 of Fig. 2, looking to the left.

In the drawings, A designates the base, and B B' the vertical supporting-frames located on opposite sides of the base. The frames B B' are formed with the horizontal top bars b, connected with each other at or near their centers by a shaft or cylindrical bar C, which is held in any convenient manner fixedly against rotation.

On the shaft C at opposite ends are loosely mounted the wheels or spiders D D', each hav-

ing the inwardly-extending marginal flanges D² and being rigidly united or connected together by the cross-bars d d', located at substantially diametrically opposite points at the periphery of the wheels. The bars d d' have the inwardly-extending flanges d² thereon, through which suitable screws are passed into the metal of the wheels, thus forming the securing means between the bars and wheels. The bar d' is formed with a longitudinal channel in its outer face, into which the end of a stencil supporting and carrying plate E is bent, which plate extends from bar to bar.

d⁴ designates a clamping-bar located in the channel over the end of the stencil-carrying plate. This bar is by preference removable and is held in place so that it can be easily detached by the locking-buttons F, one at each end of the bar, each having a flanged periphery f, formed with a recess or cut-out portion f'. The buttons are pivoted on the sides of the wheels by the pins f², and they are arranged directly in line with the channel, so that when the openings or cut-out portions f' are opposite the ends of the channel the bar can be forced down below the flanges f'. The buttons are then turned, bringing the flange over the end of the bar, which is thereby securely locked in place. The purpose of making the bar d⁴ removable is to permit of placing the end of the stencil pad or cloth and the end of the stencil, when desirable, in the channel and clamping the same there.

The bar d is formed in a manner similar to that of bar d', with the exception of the channel, which is of a width substantially twice that of the channel of bar d', for the purpose of accommodating two clamping-bars, which are designated by ee'. The bar e is clamped in place by the buttons F in a manner similar to the bar d⁴, while the bar e' is secured in place by screws e². By this means the stencil cloth or pad can be secured by the bar e', while the front of the sheet of stencil-paper can be independently secured by the bar e.

The stencil supporting or carrying plate E is conveniently formed of perforated metal of sufficient strength or stiffness to maintain its shape. It is secured at its ends by the bars e' d⁴, as above stated, and preferably along its edges by screws or other means directly to the wheels. It is, however, to be understood that the plate can be secured to the wheels in

any convenient or desirable manner, it being necessary only that the same be held firmly on the wheels. By the employment of the plate E a firm even support for the stencil is provided and on which a pad or cloth can be placed and held, it being desirable in this class of machines to have a yielding surface against which the stencil rests, inasmuch as the stencils are generally very thin, being usually constructed of waxed paper. I have not shown the cloth or pad referred to, but have made the reference more particularly for enlarging on the use and importance of the carrier-plate E.

On the inner faces of the wheels D D' opposite the carrying-plate are the inwardly-extending flanges or ledges G, the same being parallel with the flanges on the periphery of the wheels and located a short distance inwardly therefrom. At the ends of the flanges are formed inclined webs *g*, the inner portions of which are formed by the inner edges of the bar-flanges *d*². The webs, ledges, and flanges of the wheels form continuous tracks having a concentric and eccentric section for purposes presently to be explained.

The carriage formed by the construction described is free to rotate on the shaft or bar C, and to provide a convenient means for rotating the same I preferably mount a short shaft *h* in a bearing at the front end of the top bar of frame B. On the outer end of this shaft is keyed a handle *h'* and on the inner end is keyed or otherwise fixedly secured the pinion *h*², which meshes with a gear H, adjustably secured to the outer face of the wheel D, the same being loosely supported on the shaft C. In the gear H is formed a curved elongated slot H', through which a screw-bolt *h*³ is passed, the latter engaging in a threaded chamber of a lug *h*⁴ on wheel D. By tightening the screw *h*⁴ the wheel H is tightly held against the lug and wheel. A series of blocks or lugs *h*⁵ may be employed to form rests for the opposite or other portions of the gear when tightened.

Fixedly secured on the hub of the gear H is a cam K, the active face of which is proportioned in length so that it will act for a period equal or substantially equal to that of one-third of the movement of the carrier. On the inner face of the gear is secured a pointer H³, which extends out to or near the periphery of the carrier and is designed to indicate the position of the heading on the stencil.

L designates the inking-roll, located within the carrier and mounted on a shaft *l*, which carries at its opposite ends the rolls or wheels *l'*, located adjacent to the carrier-wheels D D' and arranged to travel on the tracks formed on the wheels as the carrier is rotated. As the inking-roll engages the inner face of the perforated plate, it serves the dual purpose of distributing the ink as well as positively forcing the ink through the perforations.

The inking-roll is by preference held from outward movement by the wheels *l'* engaging

the track and from inward movement by the yielding - supported rods *m*, which have forked outer ends fitting over the roll-shaft. These rods *m* pass through arms *o o'*, formed on brackets O, which are adjustably secured on the shaft C against rotation by set-screws *o*². On the rods *m* are the coiled springs *n*, their lower ends being fixedly secured to arms *o*, while their upper ends pass through the arms *o'* and are in any convenient manner loosely secured to nuts *n'*, threaded on the ends of the rods, so that as the nuts are adjusted up or down on the rods the tension of the springs will be correspondingly varied.

The inking-roll, as shown in the drawings, is located at the bottom of the carriage; but it is often found desirable to apply the ink at points above or to one side of the center, and it is also often necessary to have the roller at an exposed point beyond the stencil when applying ink thereto. By making the brackets O adjustable the position of the roll can be readily changed.

Below the carriage is located the feeding and impression roll P, mounted on a shaft *p*, which has its ends journaled in semicircular grooves *p'*, formed in the upper edges of the swinging arms P' P², which are pivoted at their rear ends to the frames B B'. The arms P' P² extend forward to a point adjacent to the front of the machine, and they have their forward ends bifurcated at *p*². The cross-bar *q* of a crank-shaft Q passes through the bifurcations of the arms. The shaft Q is journaled at opposite ends in the frames and at one end is provided with a handle *q'*. R designates coiled springs connected to the forward portion of the arms P' P² and having their upper ends secured to screws *p*³, which pass through brackets *p*⁴ on the frame and are capped by nuts *p*⁵. By this means it will be readily understood that the tension of the springs may be varied.

On the upper edge of the arm P' at or near its center is formed the upwardly-projecting lug R', having a forwardly-extending end located directly over the bearing for the roll P. On the forwardly-extending end is secured a projection R'', having a vertical opening *r* therein and a set-screw *r'* passing longitudinally through its end. In the opening *r* is placed the lower end of a link R², the same being secured and held, but capable of adjustment, by the set-screw. The upper end of the link carries a block S, the same being held thereon by set-screws *s*. On the block is formed a short shaft (shown in dotted lines, Fig. 5) which carries an antifriction-roll *s*², arranged in the path of the cam K and with which the same engages during rotation.

To guide the link R², a post T is formed on the frame B, which has a flange at its upper end through which the link passes.

By the employment of the link and cam above referred to it will be seen that as the cam presses the link down the arm P' is pressed down, which in turn rocks the crank-

shaft Q, which causes a simultaneous movement of arm P², thus lowering the roll P evenly. It will also be noticed that the radial length of the cam K is such that the downward movement of the forward ends of the arms P' P² is insufficient to cause the crank-shaft to rock from a horizontal to a vertical position, and thus lock the arms down, as will be seen by referring to Fig. 1, the dotted lines indicating the throw of the shaft by the cam. However, the movement of the crank-shaft can be so timed, through the adjustment of the link R², that at each revolution of the carrier the feed or impression roll will be locked against up movement.

When the adjustment is as shown in Fig. 1 and it is desired to hold the roll P down out of the path of the stencil, it is only necessary to throw the crank-shaft down to a dead-center by using the handle thereon.

U designates a tilting and removable feed-table resting on a cross-bar *a* of the frame and having finger extensions *u* at its forward end. The table is held from longitudinal movement by having lugs *u'* secured in its opposite sides, (shown in dotted lines, Fig. 3,) which work in U-shaped brackets V, cast on the inner face of the frames. To limit the upward movement of the inner end of the table, set-screws *v v* are passed through the tops of the brackets and extend down, so that the lugs *u'* will engage therewith. By this adjustment the fingers on the inner end of the table can be properly arranged, so that they will be out of contact with the carrier as well as in the proper relation to the plane of the upper face of roll P.

W designates a receiving-tray having an up-turned rear end and lateral hooks *w* at its forward end. These hooks take over U-shaped wire guides W', secured to the base adjacent to the frames. The receiving-tray can by this means be moved in, as shown in Fig. 3, or out, as shown in Fig. 1, in which latter position it is in proper place to receive the printed copies as they leave the machine.

In operation when the impression-sheet is properly placed on the table and a stencil has been properly adjusted on the carrying-plate the pointer is then adjusted by moving the gear until the former registers with the commencement of the heading of the stencil-sheet. This adjustment moves the cam to a point where it will act on the link R² and force the roll P down, retaining it in such a position until the heading of the stencil is immediately between the roll P and inking-roll, at which moment the cam will leave the friction-roll of the link R² and the springs on arms P' P² will elevate roll P and cause the impression to be made without acting on the plain part of the stencil above the heading. The carrier having turned, the sheet is printed, and it is then deposited in the tray. During the movement of the carrier the inking-roll is first raised by the inclines and ledges on the wheels. It is then

lowered into position by the springs of the rods *m*, and for the rest of the movement of the carrier the roll travels on the perforated stencil-carrying plate, the pressure forcing the ink through the perforations.

The plate, as will be seen, acts as a pressure-roll, thus avoiding the necessity of employing a separate pressure-roll to act in conjunction with the feed-roll.

When it is desired to remove the inking-roll, it is only necessary to lower the same and then raise the rods *m* until their forked ends escape the roll-shaft.

When the stencil is attached at one end only, the ink will cause its free end to adhere to the pad.

It is thought the operation of the other features will be fully understood from the foregoing description.

I am aware that various changes in the construction and arrangement of the parts can be made and substituted for those herein shown and described without in the least departing from the nature and principle of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a duplicator, the combination with a base, of a rotary open-work carrier thereon, comprising two wheels, bars connecting the wheels, a perforated stencil-carrier and pressure-plate fixed to the wheels, and means for applying ink to the inner face of the plate.

2. In a duplicator the combination with a supporting-frame, of a rotary open-work carrier mounted thereon, comprising end-supporting members, a segmental perforated stencil-carrier and pressure-plate secured to the supporting members, and means for securing a stencil on the plate, an inking device within the carrier, and means for rotating the carrier.

3. In a duplicator, the combination with a rotary carrier, consisting of an open frame, of means for rotating the carrier, a perforated stencil-carrier and pressure-plate secured to the carrier and extending around the same a distance substantially equal to the length of the stencil-sheet to be used, and an ink distributing and forcing device within the carrier.

4. In a duplicator, the combination with a rotary frame, of a perforated stencil carrying and supporting plate on the frame, a pad-clamp, and an independent stencil-clamp at the edge of the plate.

5. In a duplicator, the combination with a rotary frame comprising end sections and channeled bars connecting the end sections at different points, of a perforated stencil carrying and supporting plate on the frame, removable clamping-bars located in the channels, and means for retaining the bars in place.

6. In a duplicator, the combination with a rotary frame comprising end sections and channeled bars connecting the sections, of two

independent clamping-bars in one of the channeled bars, and a single clamping-bar in the other channeled bar.

7. In a duplicator, the combination with a feed-roll, of a pivoted carrier, a perforated or open-work stencil-supporting section on the carrier, the same serving as a compression roll or member acting in conjunction with the feed-roll to produce the impression, and an ink distributing and forcing device within the carrier.

8. In a duplicator, the combination with a rotary carrier, of a gearing for rotating the same, means for adjusting the gearing, comprising a crank and pinion, and means for securing the gear in adjusted positions, a feed-roll, and means associated with the roll actuated by said gearing to vary the relative positions between the carrier and roll.

9. In a duplicator, the combination with a rotary carrier, of a feed or impression roll yieldingly supported beyond the carrier, a cam carried by the carrier, an adjustable connection between the cam and roll, means for rotating the carrier and means for locking the roll in an inactive position.

10. In a duplicator, the combination with a rotary carrier, of a yielding supported roll beyond the carrier, an adjustable extension on the roll-support, a locking device for holding the roll in an inactive position and means on the carrier for engaging said extension for moving the roll outward.

11. In a rotary duplicator, the combination with a rotary carrier, of spring-supported arms below the carrier, a roll carried by the arms, a lock for the arms, a projection on an arm, a cam on the carrier, and an adjustable extension on the projection arranged to be engaged by the cam.

12. In a rotary duplicator, the combination with a rotary carrier, of spring-supported arms below the carrier, a roll carried by the arms, a projection on an arm, a cam on the carrier, an adjustable extension on the projection arranged to be engaged by the same, and a crank for simultaneously moving both arms.

13. The combination with the carrier, of the spring-actuated arms below the same, a roll carried by the arms, and a crank loosely engaging the ends of the arms having a handle thereon.

14. In a rotary duplicator, the combination with the stencil-carrier, of arms pivotally supported below the carrier, springs for maintaining the arms in position, an extension on one of the arms, a slotted projection on the extension, a link adjustably secured in the slot, a block on the link, an antifriction-roll on the block, and a cam on the carrier engaging the roll, substantially as described.

15. In a duplicator, the combination with a rotary carrier, and means for rotating the same, of a perforated stencil-holding plate on the carrier, an impression roll or device, and an inking-roll, a stationary support for the inking-roll, and means for moving the

roll out of the path of the holding-plate, substantially as described.

16. In a duplicator, the combination with a rotary carrier consisting of an open frame, of means for rotating the carrier, a segmental stencil-holder on the carrier, an impression device and an inking-roll stationarily mounted relative to the carrier, means for adjusting the inking-roll to engage the stencil-holder at different points, and means for moving the roll radially, substantially as described.

17. In a duplicator, the combination with a rotary carrier, of a stencil-holder mounted thereon, an impression-roll, means for driving the carrier, and an adjustable yieldingly-supported inking device arranged to engage the inner face of the stencil-holder, substantially as described.

18. In a duplicator, the combination with a rotary carrier, of a perforated stencil-holder secured on the carrier, means for securing a stencil on the holder, means for applying ink to the inner face of the perforated holder comprising a radially-adjustable roll, and an impression-roll.

19. In a duplicator, the combination with a rotary carrier having a stencil-holding section, of a yielding inking device and a yielding impression device, and means on the carrier for moving the inking and impression devices out of the path of the stencil-carrier section of the carrier.

20. In a duplicating-machine, the combination with a frame, of a rotary carrier, a stationary shaft on which the carrier is mounted, tracks on the carrier, adjustable brackets on the shaft, rods yieldingly supported on the brackets, and an inking-roll mounted on a shaft and held in engagement with the track by the rods.

21. In a duplicator, the combination with the rotary carrier, of a stationary shaft on which the same is mounted, brackets on the shaft, rods slidingly engaging with the brackets, springs on the brackets engaging the rods, and an inking device carried by the rods.

22. The combination with the frame, the rotary carrier and feed-roll, of a horizontal support on the frame in advance of the roll, inverted-U-shaped brackets on the frame in the rear of the support, set-screws passing through the brackets, and a table loosely mounted on the supports and having transverse pins normally resting on the brackets.

23. The combination with a carrier, and feed or impression device, of U-shaped guide-rods below the same extending from front to rear of the machine, and a tray loosely connected to said guides.

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

HARRY W. LOWE.

Witnesses:

L. G. FEENEY,
E. H. MAYHEW.