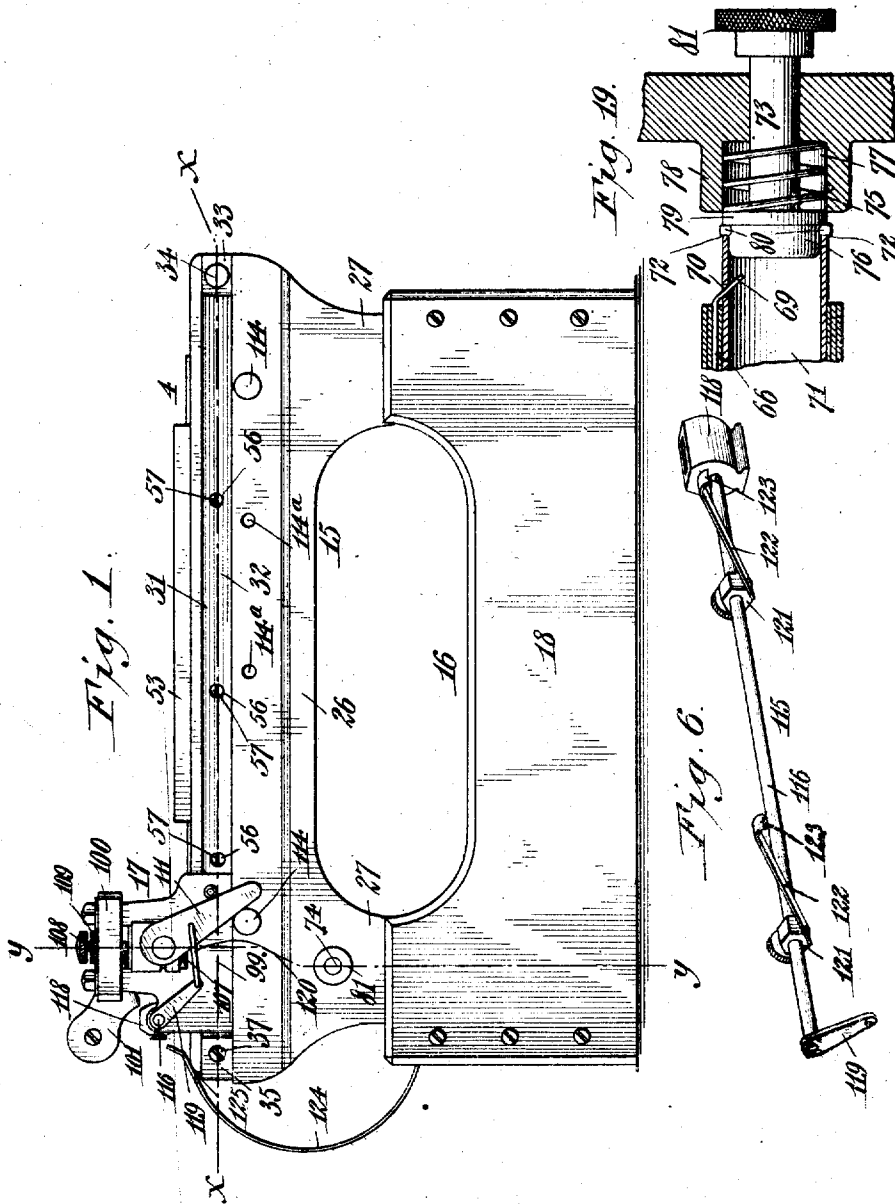


C. E. ADAMSON.
 DUPLICATING MACHINE.
 APPLICATION FILED JULY 30, 1907.

1,015,256.

Patented Jan. 16, 1912.

6 SHEETS—SHEET 1.



Witnesses:
 Christ Feinle.
 Harry D. Rapp.

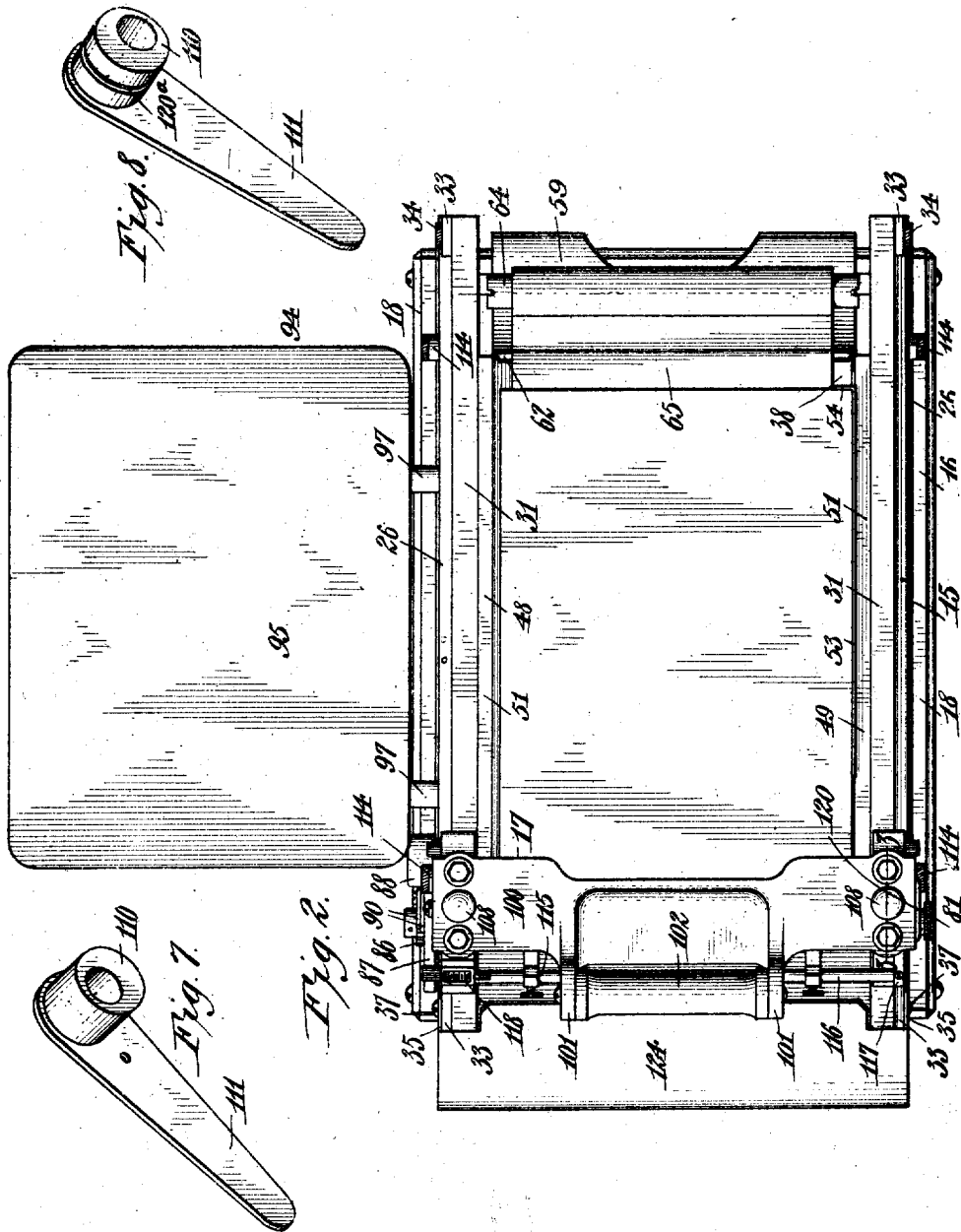
Charles C. Adamson, Inventor
 By Emil Neubach,
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C. E. ADAMSON.
 DUPLICATING MACHINE.
 APPLICATION FILED JULY 20, 1907.

1,015,256.

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6 SHEETS—SHEET 2.



Witnesses:
 Christ Feinle.
 Harry D. Rapp.

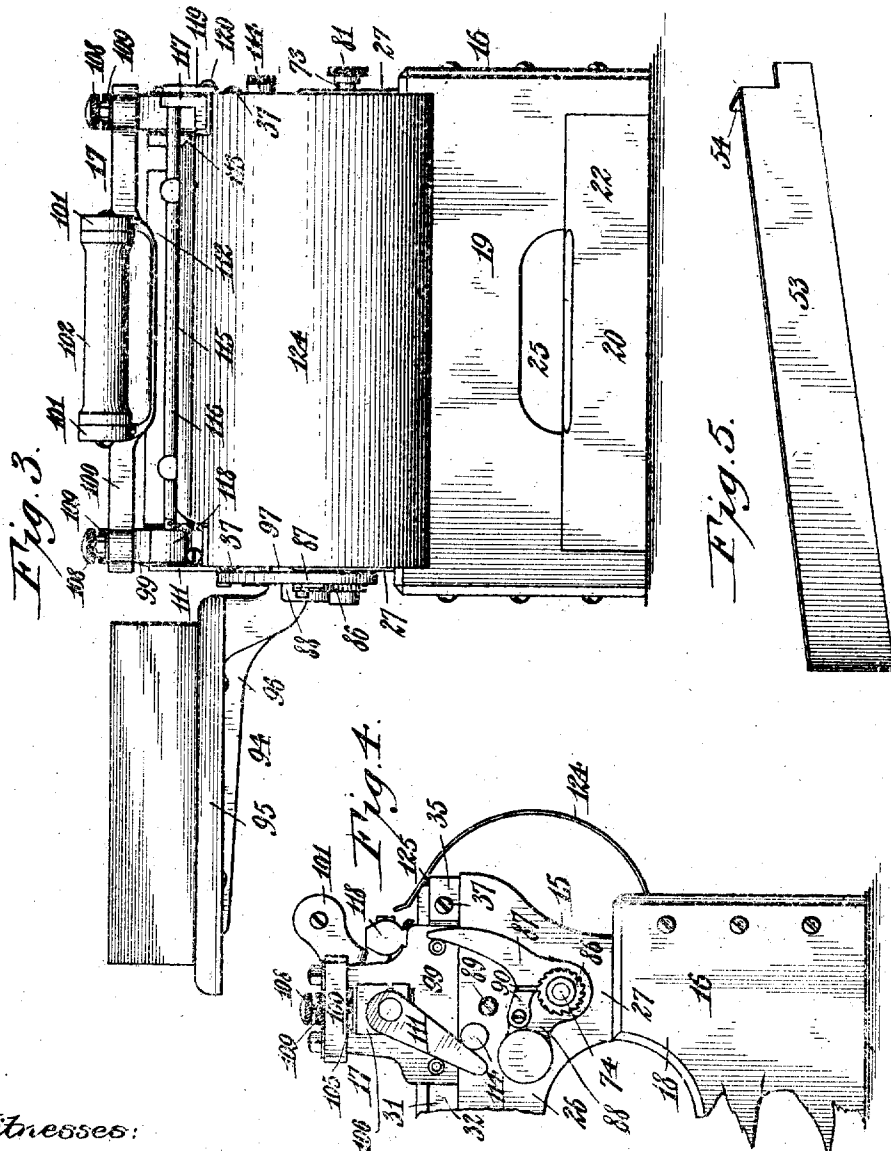
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C. E. ADAMSON.
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6 SHEETS—SHEET 3.



Witnesses:
 Christ Feinle.
 Harry D. Rapp.

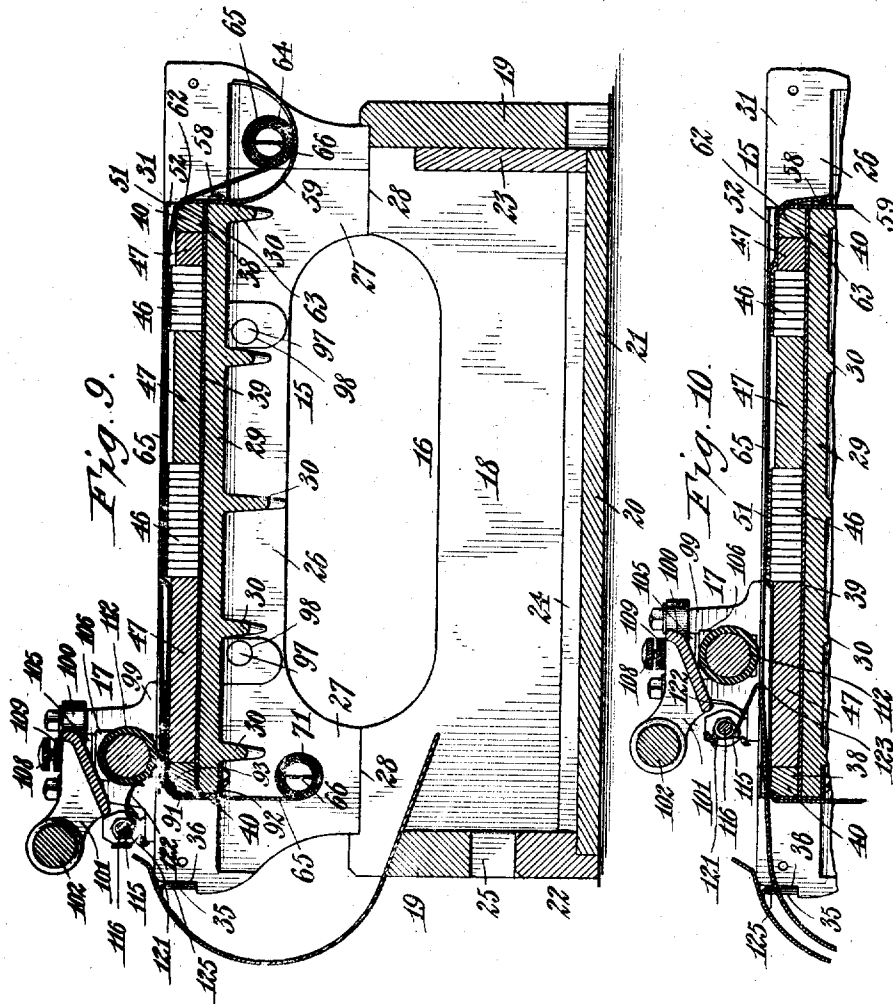
Charles E. Adamson, Inventor.
 By Emil Neuhart,
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1,015,256.

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Patented Jan. 16, 1912.

6 SHEETS—SHEET 4.



Witnesses:
 Christ Feinle.
 Harry D. Rapp.

Charles E. Adamson, Inventor.
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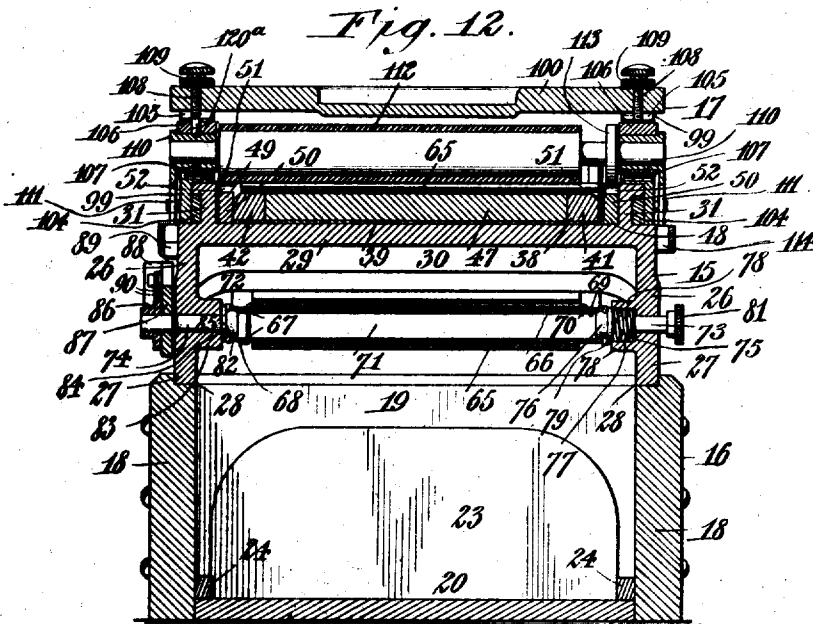
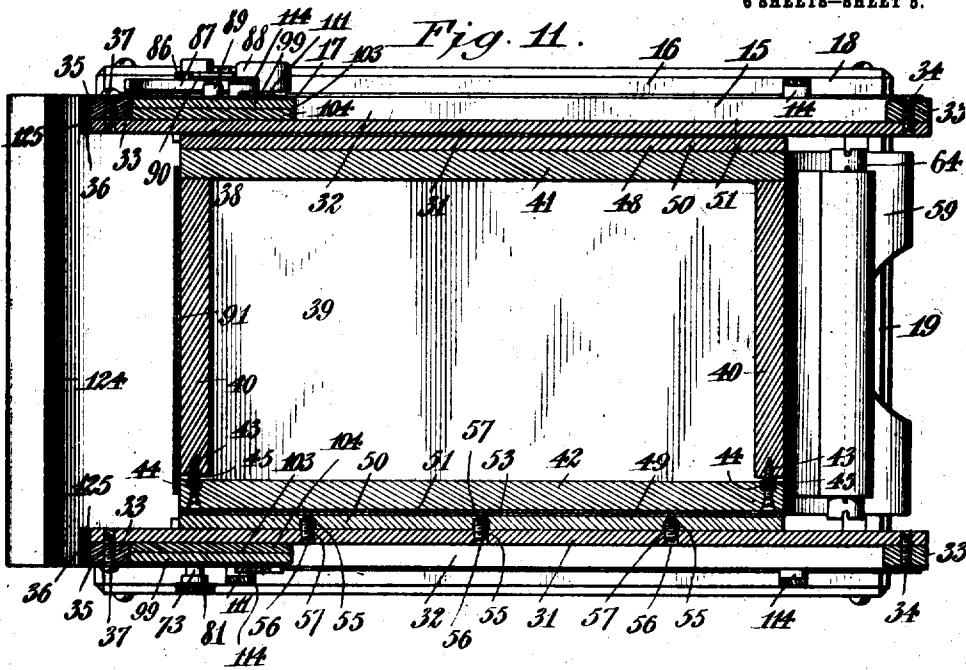
C. E. ADAMSON.
DUPLICATING MACHINE.

APPLICATION FILED JULY 20, 1907.

Patented Jan. 16, 1912.

1,015,256.

6 SHEETS—SHEET 5.



Witnesses:
Christ Feinle.
Harry D. Rapp.

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C. E. ADAMSON.
 DUPLICATING MACHINE.
 APPLICATION FILED JULY 20, 1907.

1,015,256.

Patented Jan. 16, 1912.

6 SHEETS—SHEET 6.

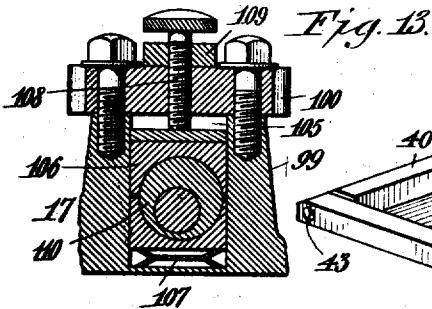


Fig. 13.

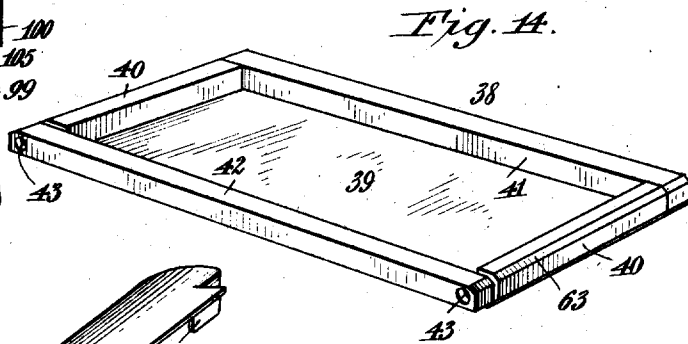


Fig. 14.

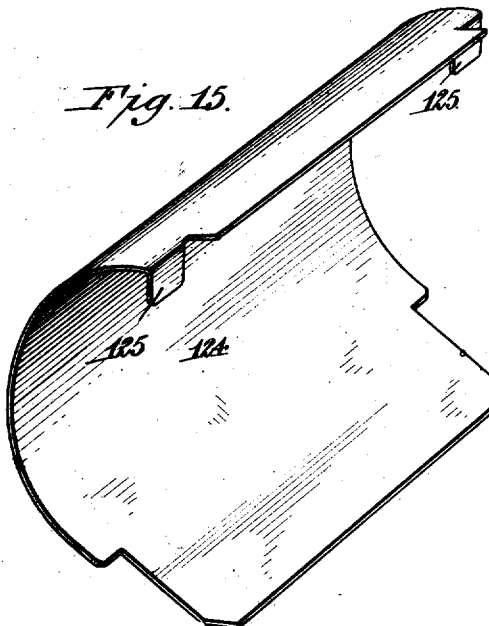


Fig. 15.

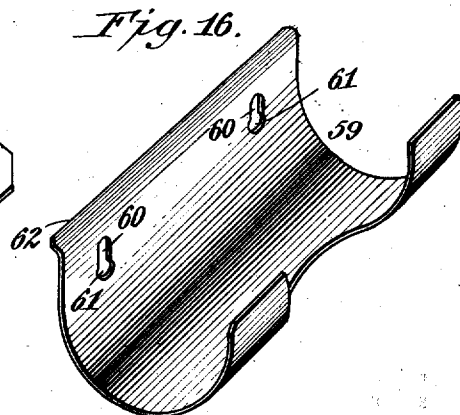


Fig. 16.

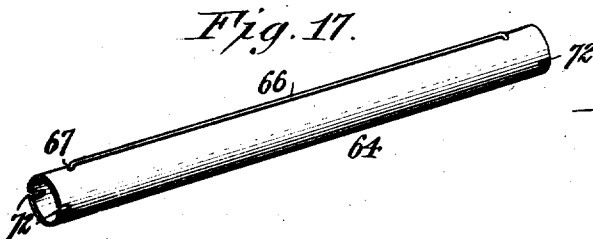


Fig. 17.

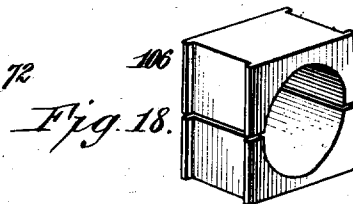


Fig. 18.

Witnesses:
 Christ Feinle.
 Harry D. Rapp.

Charles E. Adamson, Inventor:
 By Emil Neubart,
 Attorney.

UNITED STATES PATENT OFFICE.

CHARLES E. ADAMSON, OF BUFFALO, NEW YORK, ASSIGNOR TO THE WRITERPRESS COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF NEW YORK.

DUPLICATING-MACHINE.

1,015,256.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed July 20, 1907. Serial No. 384,734.

To all whom it may concern:

Be it known that I, CHARLES E. ADAMSON, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Duplicating-Machines, of which the following is a specification.

My invention relates to duplicating machines, such as are used to reproduce circular or imitation typewritten-letters or other matter in any desired quantity.

The primary object of my invention is the production of a machine of the character referred to, in which a reciprocating carriage is provided which is equipped with an impression-roller rotatable on the forward movement of the carriage only, and in which said roller is rotated by frictional contact with a bearing-track or way, preferably measurably-yielding, to render the device free and positively effective in action; and to provide a simple removable chase for the type-form over which an intermittently-movable transfer medium is laid whereby the imprint of the form is transferred upon a sheet of paper laid upon said transfer-medium when the carriage and its contained roller are moved forward.

Other objects are, to provide a machine of the character described in which any printer's job-type can be used, and which can be manipulated and the type set and distributed by any individual of ordinary intelligence; to produce a duplicating machine of simple, inexpensive and durable construction in which metal typewriter type are used and with which perfect imitation typewritten letters can be produced in quantities; to provide simple and effective means for regulating the pressure of the impression roller; and to so arrange the ribbon and its feeding-mechanism that when reversing the direction of movement of the inking or transfer-ribbon, it can be faced about.

Still further objects are to provide an angular carriage-guide having projecting guide-flanges against the upper faces of which the complementary parts of the carriage-press on the forward movement of the latter to assure an even and positive pressure of its contained impression-roller against the sheet of paper which is to receive the impression of the type-form, and against the underside of which guide-flanges

said complementary parts press on the return movement of the carriage, thereby reducing and distributing the wear and rendering the machine more easily operative; also in the production of automatic paper delivery-mechanism brought into action on the return movement of the carriage only, and in the delivery of said papers faced about into a receptacle provided for that purpose beneath the type bed.

Another important feature of my invention is the provision of divided bearing-boxes for the impression-roller which are yieldingly held within the carriage and in which are held eccentric bushings that receive the journals of said roller; said bushings being turned or rocked in opposite directions at opposite ends of the machine.

Other objects will appear in the detailed description following.

My invention consists in the combination and arrangement of devices, and in the construction, arrangement and combination of parts to be hereinafter described and particularly pointed out in the appended claims.

Referring to the accompanying drawings forming part of this specification, corresponding numerals of reference refer to corresponding parts in the several figures.

Figure 1 is a side elevation of my improved duplicating machine. Fig. 2 is a plan view of the same. Fig. 3 is an end view. Fig. 4 is a side elevation of one end of the machine, showing the ribbon feed-mechanism. Fig. 5 is a perspective view of the paper gage. Fig. 6 is a perspective view of the paper delivery-mechanism with the recorder attached thereto. Fig. 7 is a detached perspective view of one of the eccentric bushings in which the journal at one end of the impression-roller is held. Fig. 8 is a similar view of the other eccentric bushing. Fig. 9 is a central longitudinal section of the machine. Fig. 10 is a central longitudinal section through the upper portion of the machine, the roller supporting carriage being in a different position with the paper-delivery-mechanism in action. Fig. 11 is a horizontal section on line $x-x$, Fig. 1, the type and furniture in the chase being omitted. Fig. 12 is a vertical section on line $y-y$, Fig. 1. Fig. 13 is an enlarged section taken on line $z-z$, Fig. 2. Fig. 14 is a perspective view of the type-chase. Fig. 15 is a per-

spective view of the paper-delivery return-shield. Fig. 16 is a perspective view of the ribbon-roller rest. Fig. 17 is a perspective view of one of the ribbon-rollers. Fig. 18 is a perspective view of one of the divided bearing boxes for the impression-roller. Fig. 19 is an enlarged longitudinal section through one end of the journal-supported ribbon-roller and the journal for the spring-pressed spindle to which it is detachably held.

The reference numeral 15 designates the frame of the machine, 16 a support on which the machine is mounted, and 17 the reciprocating carriage slidable on said frame.

The support 16 comprises side-walls 18 and end walls 19 rigidly connected to form a solid support for the machine. Removable on said support is a paper receiving-device 20 in the form of a drawer having a bottom 21, a rear wall 22, and a front end-wall 23 serving as an abutment or stop for the printed papers delivered into the drawer. Said abutment preferably bears against the inner side of the corresponding end wall of the support. The support has guide-ribs or ledges 24 underneath which the bottom of the paper receiving-device is slidably held, said device being adapted to rest upon the table or other object on which the machine is placed. The end wall 22 of the paper-receiving-device fits into an opening formed in the corresponding end wall of the support, and for convenience and accessibility to the papers delivered into said device, the said end wall of the support is cut-away, as at 25, to permit the operator to grasp the drawer and draw it out. The abutment 23 is comparatively high so that it acts as a stop to limit the extent to which the drawer can be moved outward; it striking a part of the machine, as will appear hereinafter.

The frame is preferably formed in one integral casting and machined as desired. It comprises sides 26 with depending legs 27 which fit the rabbeted upper edge 28 of the support, and a flat bed 29 which connects said sides. As shown in Fig. 9, the bed 29 is shorter than the sides of the frame and is provided with ribs 30 with a view of reducing the weight of the frame without effecting its strength. The bed 29 is provided with oppositely disposed longitudinal upstanding guide-flanges 31 of angle formation in cross-section which form grooves 32 having rubber or other suitable buffers or stops 33 at opposite ends; the buffers at one end being secured to the flange 31 by screws 34 that pass through said buffers and take into threaded openings in said flanges. The buffers at the opposite ends of the grooves have angular retainers 35 bearing against their outer faces, the inwardly directed portions of which are separated from the ends of the flanges by intervening spaces 36, for a pur-

pose to appear hereinafter. Screws 37 pass through said retainers and buffers and take into threaded openings in said flanges, thus fastening both securely to the frame of the machine.

38 designates a type-chase which is laid upon the bed 29; said chase by preference comprising a flat metal bottom 39 of comparatively thin but stiff material, end walls 40 secured to said bottom, a side wall 41 also secured to said bottom and to said end walls, so that three sides of the chase are rigid, and a yielding side wall 42 slidable in a transverse direction on said bottom. Said yielding side-wall is held to the end walls 40 by means of screws 43 that pass through openings in said side wall and take into the adjacent ends of the end walls, as clearly shown in Fig. 11. The inner face of said yielding side wall is provided with pockets 44 in which coil springs 45 that surround said screws are held; said springs protruding from said pockets and bearing against the ends of the end walls. The type, designated 46, are set up in the chase to produce the desired reading matter, and furniture 47 interposed for spaces and filling, as required.

Between the sides of chase 38 and the flanges 31, I interpose bearing-tracks 48, 49; each of which is preferably constructed of wood and metal, and comprises a strip of wood 50 of approximately the same height as the chase and which forms the body of the track and a comparatively wide strip of sheet metal 51 secured to said body and having its upper portion bent inward at a right-angle to form an overhanging bearing-flange separated from the body by an intervening space 52 and slightly yielding under pressure; the upper surface of said flange serving as the contact portion of the bearing track.

Clamped between the yielding wall of the chase and the bearing track 49 is a paper-gage 53 which is in the form of a strip of thin metal somewhat wider than the chase is high so that it extends above the latter and gages the position of the paper to receive the imprint of the type-form; the side edge of the paper being placed against the projecting portion of said gage. At one end said gage has an inturned lip 54 which lies over the yielding wall of the chase and against which one end edge of the paper is placed; said lip being at a right-angle to the strip proper so that when adjoining edges of a sheet of paper are in contact with the protruding continuous portion of the gage and the lip 54, proper placement of the paper is assured. With the type-form in the chase and the bearing-tracks and paper-gage between said chase and the flanges 31 of the bed, I find it advantageous to securely clamp said parts between the flanges so that displacement or even the slightest movement

thereof cannot take place. This I accomplish by providing the bearing-track 49 with pockets or depressions 55 and the corresponding flange of the bed with threaded openings 56 which register with said pockets; and by means of screws 57 passing through said openings and having their ends entering said pockets, the yielding side wall of the chase is moved inward on tightening said screws to lock the type-form, and after said wall is moved to the extent allowed by the type-form, the screws act to clamp the bearing-tracks and paper-gage between the chase and the flanges of the bed. By means of this construction the chase may be quickly and conveniently placed upon the bed and as readily removed. By providing two chases for each machine, the type in one may be distributed and another form set therein while the second is in use on the machine. Moreover as the chases so constructed are very cheap, a number may be kept in stock so that forms likely to be used again within a short period of time, may be left in the chase intact. By reason of the type-form herein used being flat, electrotypes may be made of any form with very little additional expense and quickly placed within a chase when needed. Another feature of my invention resides in its adaptability to the use of wood-cuts, zinc-etchings, and other similar reproducing means in connection with any form of type. By the use of common typewriter-type, of which there are more than twenty different styles now in use, this machine can be used to match any style of type so that the body of duplicate letters printed thereon can be made to match the type of any typewriter used to apply the address and salutation to the letters. Errors made in setting the type-form can be quickly corrected without disturbing any type correctly set.

At one end of the bed 29, which may for convenience be termed the "type-bed," two projections 58, which as herein shown may be screws threaded into the bed—are provided to support a concaved rest 59 having slots 60 enlarged at their lower ends, as at 61, so that the rest may be passed over the heads of the screws, and when lowered, said heads bear against the rest on opposite sides of the slots, thus preventing accidental removal. The edge of said rest adjacent said slots is bent outward to form a flange 62 which bears against the beveled edge 63 of the adjacent end wall of the chase. Lying in said rest is a hollow inking-ribbon roller 64 having means for clamping one end of an inking-ribbon or other similar transfer-medium 65 thereon; said clamping-means comprising a spring wire 66 secured at one end to said roller by passing through aligned openings 67 in the latter and bending the end of the wire on the opposite side of the

roller, as at 68. Said wire extends lengthwise of the roller and is bent at its opposite end at an obtuse-angle, as at 69, and enters an opening 70 in the roller; the angle of said end acting to retain the wire throughout its length in contact with the roller, and being removable only by forcibly springing the wire away from the roller and drawing out said bent end. The inking-ribbon is clamped between said wire and the roller and wound around the latter. It is then placed in the concaved rest, which by reason of its concavity assures even unwinding of the ribbon. The ribbon passes over the type-form and has its other end attached to a roller 71 similar in construction to the roller 64 and provided with similar clamping-means. The rollers 64 and 71 have notches 72 at opposite ends; the notches at each end being at diametrically opposite points. The roller 71 is supported on rotatable spindles 73, 74 that are journaled in the frame of the machine, or more particularly, in the legs at one end of the machine. The spindle 73 in addition to being rotatable is lengthwise movable, but normally held against lengthwise movement by a coil-spring 75 surrounding it and bearing at one end against a head or enlargement 76 on said spindle and at its other end against the inner end of a pocket 77 formed in a boss 78 extending inward from the frame. Said head or enlargement has a circumferential flange 79 serving as an abutment for the end of roller 71 and it has two diametrically opposite pins 80 which fit into the notches 72 at the adjacent end of said roller; thus compelling the spindle to turn with said roller. The outer end of said spindle has a knurled button 81 secured thereto which may be taken hold of to draw the spindle out of the roller against the action of the spring 75. The spindle 74 is held against lengthwise movement in one direction by an enlargement or head 82 at its inner end which bears against a boss 83 on the inner side of the leg through which it passes; said enlargement having a circumferential flange 84 against which the adjacent end of roller 71 abuts and pins 85 at diametrically opposite points which fit into the notches 72 in the said end of the roller. Secured to the outer end of said spindle is a ratchet-wheel 86 and between said ratchet-wheel and the frame is a ratchet-arm 87 loosely mounted on said spindle and having a weighted angular extension 88 which tends to hold said arm at one end of its movement against a stop 89 on the frame. The ratchet-wheel and ratchet-arm prevent lengthwise movement of the spindle in the opposite direction.

For the purpose of rotating the ribbon-roller 71, pawls 90 of different lengths are pivotally secured to the ratchet-arm, one of which engages the ratchet wheel to rotate

it on movement of said arm in one direction, and both of which ride idly over said wheel on the reverse movement of said arm. By the use of two pawls of different lengths, assurance is had that one will grasp a tooth of the ratchet-wheel, if for any reason the other fails to do so. When the inking-ribbon is unwound from the roller within the concaved rest 59, the rollers are reversed and the ribbon faced about so that both sides are worn evenly.

At the end of the type-bed adjacent the ribbon feeding-mechanism, I provide a chase-stop 91 which is formed of sheet metal bent at its lower end to form a flange 92 that lies underneath the bed and at its upper end, as at 93, to fit the beveled corresponding end wall of the chase. The overlapping of said stop and the like overlapping of the roller-rest 59 on the end walls of the chase provide a smooth rounded surface over which the inking-ribbon travels and serve to keep the ribbon out of contact with said walls, thus keeping the chase clean and guarding against the soiling of the operator's hands when handling the chase.

A paper-support 94 is provided which comprises a shelf 95 secured to brackets 96 that terminate in studs 97 which enter openings in the side of the frame and securely but removably hold the support in place.

The reciprocating carriage 17 comprises two side members 99 and a transverse top connecting-member 100 having two ears 101 between which is secured a handle 102 adapted to be grasped by the operator to move the carriage back and forth. The side members are grooved on their inner sides, as at 103, and within said grooves I preferably insert fiber wearing-blocks 104 that bear against the underside of the angle flanges 31, said side members filling the grooves 32 formed by said flanges and also bearing against the upper sides of said flanges. The carriage is limited in its movement by the buffers 33 at opposite ends of said grooves. A vertically disposed elongated opening 105 is formed in each of said side-members, and in each opening a divided bearing-box 106 is located; between which latter and the bottom of said opening is a spring 107 of any suitable form. Pressure-screws 108 are threaded through tapped openings in the connecting-member 100 and bear against the bearing-boxes; said screws being adjustable to regulate the pressure of the impression-roller, to be presently described. Lock-nuts 109 serve to retain said screws in any adjusted position. Within each divided bearing-box is an eccentric-bushing 110 having an integral depending arm 111. Said arms lie outside the said side members and are held by the friction of the divided bearing-boxes in either of two positions.

112 designates a rubber-covered impression-roller having end trunnions or journals that enter the bores of said eccentric-bushings. One end of said roller is adapted to bear against the bearing-track 49 and the trunnion or journal at the other end of said roller has a collar 113 thereon which bears against the bearing-tracks 48. By adjusting the pressure-screws 108, the impression-roller may be adjusted to bear against the ribbon-covered type-form with the desired pressure, limited of course to the extent allowed by the bearing-tracks, which are measurably-yielding and therefore render the carriage easy to operate under maximum pressure.

From the foregoing it is apparent that upon turning of the eccentric-bushings from one position to another, the axis of the impression-roller is raised or lowered, as the case may be, and as this change of position is desired at opposite ends of the range of movement of said carriage, stops 114 are provided at opposite ends of the frame; said stops being in the path of the bushing arms 111 so that the latter are moved from one position to another when the carriage approaches the ends of opposite movements. The stops 114 are removable and may be secured in any of the openings 114^a formed in the sides of the frame; depending on the length of paper to be printed upon. By reason of the bearing-boxes being divided and pressure exerted above and beneath the same, the eccentric-bushings are rotatable under force only, and are therefore held in one or the other of two positions until changed by the arms thereof striking the stops 114. This I consider a very important feature of my invention, since it assures rotation and the desired pressure of the impression-roller on the paper and ribbon covered type-form during its forward or printing movement, and positive raising of said roller out of contact with the paper on its return movement. Rotation of said roller ceases also during its return movement, since it is elevated out of contact with the bearing tracks as well. By raising the impression-roller out of contact with the paper during its return movement, the delivery of the printed paper may take place. During the forward movement of the carriage, the side members of the latter exert considerable pressure against the upper face of the angular flanges, and upon the return movement, the action of drawing the carriage back tends to bring the fiber wearing-blocks with pressure against the underside of said flanges; thus reducing the wear on the flanges, and subjecting said wearing blocks to the wear otherwise thrust upon contacting metal parts. When the fiber wearing-blocks become worn, they can be quickly and conveniently replaced.

Connected with arm 111 of one of the eccentric bushings is a paper delivery-device 115 comprising a bar 116 in rear of and parallel with the impression-roller, said bar being journaled at one end in a lug 117 on one side member of the carriage, and at its other end having connection with the spindle of a counter 118 secured to the other side-member of said carriage. Said bar has an arm 119 secured thereto which is connected with said last-mentioned arm 111 by a link 120, so that when said arm 111 is moved through an arc of a circle, the bar 116 is rocked, and by reason of said bar being connected to counter 118, the exact number of copies printed can be ascertained at any time. Link 120 serves as a means to retain the adjacent eccentric bushing within its bearing-box, while the eccentric-bushing at the opposite side of the machine is held in place by a screw passing through the surrounding bearing-box and entering a groove 120^a in said last-mentioned bushing. Bar 116 has two collars 121 adjustable thereon and each collar has a spring drag-arm 122 secured thereto which are movable toward and from the type-form on rocking of said bar. The said drag-arms have their outer or free ends bent, as at 123, and said ends are elevated out of contact with the ribbon and paper-covered type-form during the forward movement of the carriage, but as the latter approaches the end of its forward movement and the arms 111 of the bushings come in contact with the stops 114 at the forward end of the machine, they are caused to gradually lower and on the return movement of the carriage the bent outer ends drag over the inking-ribbon and engage the forward edge of the printed paper, causing the latter to be moved backward until the drag-arms are elevated by a reverse movement of bar 116 caused by the arms 111 of the eccentric bushing striking the stops 114 at the rear end of the machine. During this action of the drag arms their outer bent ends pass underneath the end of the sheet of paper and slightly raise the same so that when said arms move in contact with the ribbon the printed sheet of paper is being delivered from the machine.

124 designates a paper-delivery return-shield which is located in rear of the type-bed and consists of a curved piece of sheet metal having its upper end terminating in a plane above the paper on the ribbon-covered type-form and having its lower end resting upon the end wall of the support 16 and its lower extremity terminating within the latter. At the upper end, said delivery-shield has two depending tongues 125 which enter the spaces 36 between the ends of the flanges 31 and the angular-retainers 35, thus securely holding the shield in place. As the printed sheets are moved backward by the

spring drag-arms 122, the rear ends strike the shield 124, as shown in Fig. 10, and are then curved forward and delivered into the paper receiving-device within the support 16, face up; the sheets striking the front end wall 23 of said device. After the desired number of copies are printed, the drawer forming the paper receiving-device may be drawn out until the end wall strikes the lower end of the paper delivery-shield.

In placing the machine in condition for use, the type are set within the chase in parallel rows to produce the desired reading matter, with furniture and spacers as may be desired. The chase is then placed upon the type-bed and fastened with the bearing-tracks and paper-gage between it and the angular flanges of the bed. The ribbon-rest is next secured to the forward end of the type-bed so that the upper end of the rest overlaps the adjacent end wall of the chase, after which the inking-ribbon is drawn over the type-form and the free ribbon-roller laid in said ribbon-rest. This places the machine in condition for printing any desired quantity of copies from the type-form. The sheets of paper stacked upon the paper shelf are placed successively upon the ribbon-covered type-form and by moving the carriage with its contained impression-roller back and forth, the sheets are printed and delivered into the paper receiving-device face up, as and in the manner above described.

My invention embodies certain principles capable of embodiment in a machine of this character in many ways. Therefore, it is to be understood that the construction herein shown and described, while new and original in itself and claimed as such, is merely a representative embodiment of my invention; and that many changes may be resorted to without departing from the spirit of my invention or sacrificing any of the advantages thereof.

Having thus described my invention, what I claim is,—

1. The combination of a frame having guides and a type-bed between said guides on which type are assembled in parallel rows, a carriage movable on said guides, bearing-boxes in said carriage, pressure-screws passing through said carriage and bearing on said boxes, eccentric-bushings in said boxes having actuating-arms to turn the same, stops on said frame adapted to be engaged by said arms, an impression-roller journaled in said bushings, and an inking-ribbon between the type on said type-bed and the impression-roller.

2. The combination of a frame having guides and a type-bed between said guides on which type are assembled in parallel rows, a transversely-disposed carriage movable on said guides and having vertical openings in opposite ends, bearing-boxes

in said openings, pressure-screws bearing against the tops of said bearing-boxes, springs interposed between said bearing-boxes and the bottoms of said openings, an impression-roller journaled in said boxes, and an inking-ribbon between said roller and the type on said type-bed.

3. The combination of a frame having a type-bed and angular guides on opposite sides of said type-bed, a chase on said bed containing assembled type, a reciprocating carriage bearing on the upper sides of said guides and having fiber blocks secured thereto which bear against the lower sides of said guides, an impression-roller journaled in said carriage, and a transfer-medium movable between said roller and the type within said chase.

4. The combination with a frame having a type-bed, of a chase having type-assembled therein, a concaved roller-support at one end of said type-bed and supported thereby, a ribbon-roller resting in said roller-support, a ribbon wound upon said roller and passing over the type in said chase, a second roller rotatably mounted at the other end of said type-bed and having one end of said ribbon attached thereto, an impression-member movable on said frame, and coöperating mechanism between said impression-member and said last-mentioned roller to cause the latter to rotate.

5. The combination of a type-bearing member, an impression-roller movable lengthwise of said type-bearing member and rotatably mounted, an inking-ribbon adapted to move over said type-bearing member, a concaved roller-rest at one end of said member and supported thereby, a roller lying loosely in said roller-rest and having said inking-ribbon rolled thereon, and means for unwinding the ribbon from said roller and moving the same over said type-bearing member.

6. The combination of a type-bearing member having projections at one end, an impression-roller movable over said type-bearing member and rotatably mounted, a ribbon adapted to move over said type-bearing member, a concaved roller-rest at one end of said member having openings through which the projections on said member are passed, a ribbon-roller lying loosely in said roller-rest and having said inking-ribbon rolled thereon, and means to unwind said ribbon from the roller and draw the same over the type-bearing member by intermittent action.

7. The combination of a type-bearing member, a transfer-medium movable over said member onto which a sheet of paper is to be placed, an impression-member movable over and in contact with the paper in one direction to cause printing and movable in an opposite direction out of contact with

said paper, and a paper delivery-device attached to said impression-member and moving idly over the paper during the printing action of said member an engaging the paper to deliver the same when said member is moved in an opposite direction.

8. Two coöperating members, and a transfer-ribbon between said members between which ribbon and one of said members a sheet of paper is to be printed; combined with two arms out of contact with said ribbon during the printing operation and movable against the ribbon to engage one edge of the paper after being printed and remove the latter from said ribbon.

9. The combination of a flat type-bearing member, a rotatable coöperating impression-member, a ribbon passing over said type-bearing member and between the latter and said impression-member, a reciprocating carriage in which said impression-member is rotatably mounted, a paper delivery-device movable with said carriage and out of contact with said ribbon during the movement of said carriage in one direction, means to cause said delivery-device to engage the paper during the movement of said carriage in the opposite direction.

10. The combination of a flat type-bearing member, a transfer-ribbon movable over said member and in contact therewith and onto which a sheet of paper to be printed is to be laid, a carriage reciprocal on said type-bearing member, a rotatable impression-member movable toward and from said type-bearing member during opposite movements of said carriage respectively, and a delivery-device movable with the carriage and including two arms movable toward and from said type-bearing member so as to engage the sheet of paper when the impression-member is moved away from the type-bearing member.

11. The combination of a stationary type-bearing member, a transfer-ribbon in contact with said member on which the paper to be printed is placed, a carriage movable reciprocally on said member, bearing-boxes on said carriage, eccentric-bushings in said bearing-boxes, an impression-roller journaled in said bushings, means for turning said bushings to move said impression-roller toward or from said type-bearing member, a transverse rock-bar mounted on said carriage, means to cause said bar to rock with the turning of said bushings, and two arms secured to said rock-bar adapted to deliver the paper after being printed.

12. The combination of a stationary type-bearing member, a transfer-ribbon in contact with said member on which the paper to be printed is placed, a carriage movable reciprocally on said member, bearing-boxes on said carriage, eccentric-bushings in said bearing-boxes having actuating-arms, stops on

the type-bearing member which said arms engage as the carriage approaches the end of opposite movements, an impression-roller journaled in said bushings, a transverse rock-bar mounted on said carriage parallel with said roller and having an arm at one end, a link connecting said last-mentioned arm with the actuating arm of one of said bushings, and two arms secured to said rock-bar adapted to engage the paper and deliver the same during the return movement of the carriage.

13. The combination of a stationary type-bearing-member, a transfer-ribbon in contact with said member on which the paper to be printed is to be placed, a carriage movable reciprocally, an impression-roller journaled in said carriage, means for pressing the roller in contact with the paper placed on the ribbon during the forward movement of said carriage and for elevating said roller on the return movement of said carriage, a counter secured to said carriage, a rock-bar secured at one end to said counter, means for causing said bar to rock in one direction at a predetermined point in the forward movement of said carriage and in an opposite direction at a predetermined point in the return movement of said carriage, and an arm secured to said rock-bar and adapted to engage the printed paper on the return movement of said carriage.

14. The combination of a type-bearing member, a transfer-ribbon passing over said member onto which the paper to be printed is placed, a rotatable impression-member adapted to traverse the ribbon-covered type-bearing member, and spring drag-arms adapted to engage one edge of the printed paper.

15. The combination of a type-bearing member, a transfer-ribbon passing over said member on which the paper to be printed is laid, a carriage movable reciprocally on said type-bearing member, an impression-roller journaled in said carriage, a rock-bar mounted on said carriage and rocked in opposite directions during each complete reciprocal movement of said carriage and spring drag-arms secured to said rock-bar and adapted to be moved in contact with the transfer-ribbon to engage the edge of the printed paper on the return movement of said carriage.

16. The combination of a support, a type-bearing member supported above said support, a transfer-ribbon passing over said type-bearing member, a curved shield at one end of said member, a rotatable and reciprocal impression-member acting under pressure to cause a sheet of paper laid upon said transfer-ribbon to be printed, means connected to said impression-member for engaging said sheet of paper when printed and drawing the same backward against said curved shield which serves to direct the paper underneath said type-bearing member.

17. The combination of an elevated type-bearing member, a transfer-ribbon passing over said member onto which a sheet of paper to be printed is to be laid, a curved shield in rear of said member, a rotatable impression-member movable forward under pressure on the paper and ribbon covered type-bearing member and backward without pressure, a rock-bar adapted to travel with said impression-member, and drag-arms on said rocking bar adapted to be brought in contact with one edge of the printed paper during the backward movement of said impression-member to deliver said paper against said curved shield whereby it is directed underneath the type-bearing member.

18. The combination of a type-bearing member, a reciprocating impression-member, an inking-ribbon passing between the two and between which and said impression-member the paper is to be printed, and spring drag-arms movable with said impression-member and arranged to engage the printed paper and deliver the same from the type-bearing-member.

19. The combination with a type-bearing member, an inking-ribbon passing over said member, a rotatable impression-member movable forward and backward over said ribbon-covered type-bearing member and between which and said inking-ribbon the sheets of paper are to be printed, a rock-bar arranged transversely over said type-bearing member and connected to said impression-member to travel therewith, and drag-arms adjustable lengthwise on said rock-bar and adapted to engage the printed paper to remove the same from the machine when said impression-member is moved backward.

20. The combination with a type-bearing member, an inking-ribbon passing over said member, a rotatable impression-member movable forward and backward over said ribbon-covered type-bearing member and between which and said inking-ribbon the sheets of paper are to be printed, a rock-bar arranged transversely over said type-bearing member and connected to said impression-member to travel therewith, and drag-arms rotatably adjustable on said rock-bar to bring the outer ends thereof into the desired position with reference to the inking-ribbon over which they are drawn on the backward movement of said impression-member to drag the printed paper off said ribbon.

21. The combination of a type-bed having longitudinal upstanding flanges at opposite sides, a chase on said bed having a type-form therein, an inking-ribbon movable and in contact with said type-form, bearing-tracks between said chase and the flanges on said type-bed, a paper-gage between the chase and one of said tracks, means for

clamping the chase, tracks, and gage securely between said flanges, and an impression-roller movable over said ribbon-covered type-form.

- 5 22. The combination of a type-bed having longitudinal upstanding flanges at opposite sides, a chase on said bed having a type-form therein, an inking-ribbon movable and in contact with said type-form, bearing-tracks between said chase and the flanges of
10 said type-bed, a paper-gage between the chase and one of said tracks, pressure-screws passing through one of said flanges and bearing against the adjacent track, said
15 screws serving to clamp the tracks, paper-gage, and chase securely between said flanges, and an impression-roller movable over said ribbon-covered type-form.

23. The combination of a type-bed, a
20 chase on said bed having a type-form therein, yielding bearing-tracks on opposite sides of said chase, each track comprising a solid body and a metallic strip secured to said body and having its upper portion
25 bent at a right-angle to provide an overhanging yielding flange, an inking-ribbon passing over said type-form, and an impression-roller rotatable by frictional contact along said bearing-tracks.

- 30 24. The combination of a type-bed having upstanding longitudinal flanges, a chase on said bed having a type-form therein and a yielding side-wall, pressure-screws passing through said flanges and acting to force
35 said yielding side wall inward to lock the type-form within the chase, an inking-ribbon movable over said type-form, and an impression-roller.

25. The combination of a type-bed, an
40 inking-ribbon movable over said type-bed, a type-form on said bed, bearing-tracks on opposite sides of said type-form, a carriage movable reciprocally on said type-bed, and an impression-roller journaled in said carriage and having a metallic collar in contact with one of said bearing-tracks and being directly in contact with the other bearing-track.

26. The combination of a type-bed, a
50 chase on said bed having assembled type therein and being contractible, means on said type-bed for causing contraction of said chase, an impression-member, and a transfer-medium between said impression-
55 member and the type in said chase.

27. The combination of a type-bed having upstanding flanges, a contractible chase on said bed having a multiplicity of type arranged in parallel rows, pressure-screws
60 passing through one of said flanges and serving to contract said chase, an impression-member, and a transfer-medium between said impression-member and the type in said chase.

- 65 28. A type-bearing member, an impres-

sion-member, and an inking-device, the whole acting to print upon a sheet of paper; combined with delivery-mechanism and a reverser at one end of said type-bearing member consisting of a curved guide acting with said delivery-mechanism to deliver the printed paper face about underneath said type-bearing member. 70

29. The combination of a type-bearing member, an impression member cooperating therewith, a ribbon passing over said type-bearing member and adapted to receive a sheet of paper to be printed, a traveling support on which said impression member is rotatably mounted, a paper delivery device
80 movable with said support and out of contact with the paper during the time of printing and adapted to engage the paper after printing and deliver the same.

30. Two cooperating members, one an impression cylinder mounted in a traveling carrier and the other a flat form-carrying member, a transfer ribbon between said members between which ribbon and one of said members a sheet of paper is to be printed combined with an arm mounted on the carrier for the impression member and out of contact with the paper during the printing operation but movable to engage one edge of the paper after being printed
95 and deliver the same.

31. The combination of a type-bearing member, an impression-member movable over the surface of said type-bearing member and being in contact with the latter during a portion of its complete movement and out of contact during the remaining portion of its movement and paper delivery-arms movable toward the type-bearing member into an active position and from the latter into an inactive position, said arms being in their active position when the impression-member is out of contact with the type-bearing member and in their inactive position when said impression-member is in contact with said type-bearing member. 100

32. The combination of a type-bearing member, an impression-member cooperating therewith, a curved shield located at one end of said type-bearing member, and paper delivery-mechanism movable with said impression-member and adapted to force the printed paper against said shield to deliver the same underneath said type-bearing member. 115

33. Two cooperating members, one a traveling impression-member and the other a form-carrying member on which a sheet of paper to be printed is to be laid; combined with means for raising one end of the paper and delivering the same, said means being movable with said impression-member and adapted to engage the edge of the sheet after printing to deliver the same. 120

34. Two cooperating members, one a trav- 130

eling impression-member and the other a form-carrying member on which a sheet of paper to be printed is laid; combined with a paper delivery-device movable with said impression-member and out of contact with the sheet of paper during the time of printing and adapted to engage one end of the paper after printing and slightly raise said end and deliver the paper.

35. Two cooperating members, one a traveling impression-member and the other a form-carrying member on which a sheet of paper to be printed is to be laid; combined with means actuated by one of said members for raising one end of the sheet preparatory to removing the sheet from the machine.

36. Two cooperating members, one a traveling-impression member and the other a form-carrying member on which is to be laid a sheet of paper to be printed; com-

bined with an arm traveling with the impression-member and having its free end curved or bent to engage one end of the paper and raise the same and to deliver the paper after raising said end.

37. Two cooperating members, one a traveling impression-member and the other a form-carrying member on which a sheet of paper to be printed is to be laid; combined with means caused to be actuated during the operation of one of said members for raising one end of the sheet preparatory to removing the sheet from the machine.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

CHARLES E. ADAMSON.

Witnesses:

ELLA C. PLUECKHAHN,
CHRIST FEINLE.

DISCLAIMER.

1,015,256.—*Charles E. Adamson*, Buffalo, N. Y. DUPLICATING-MACHINE. Patent dated January 16, 1912. Disclaimer filed February 8, 1912, by the assignee, *The Writerpress Company*.

Enters this disclaimer—

“To that part of the claim in said specification which is in the following words, to wit:

“1. The combination of a frame having guides and a type-bed between said guides on which type are assembled in parallel rows, a carriage movable on said guides, bearing-boxes in said carriage, pressure-screws passing through said carriage and bearing on said boxes, eccentric-bushings in said boxes having actuating-arms to turn the same, stops on said frame adapted to be engaged by said arms, an impression-roller journaled in said bushings, and an inking-ribbon between the type on said type-bed and the impression-roller.

“2. The combination of a frame having guides and a type-bed between said guides on which type are assembled in parallel rows, a transversely-disposed carriage movable on said guides and having vertical openings in opposite ends, bearing-boxes in said openings, pressure-screws bearing against the tops of said bearing-boxes, springs interposed between said bearing-boxes and the bottoms of said openings, an impression-roller journaled in said boxes, and an inking-ribbon between said roller and the type on said type-bed.”

[*Official Gazette*, February 20, 1912.]

eling impression-member and the other a form-carrying member on which a sheet of paper to be printed is laid; combined with a paper delivery-device movable with said impression-member and out of contact with the sheet of paper during the time of printing and adapted to engage one end of the paper after printing and slightly raise said end and deliver the paper.

35. Two cooperating members, one a traveling impression-member and the other a form-carrying member on which a sheet of paper to be printed is to be laid; combined with means actuated by one of said members for raising one end of the sheet preparatory to removing the sheet from the machine.

36. Two cooperating members, one a traveling-impression member and the other a form-carrying member on which is to be laid a sheet of paper to be printed; com-

bined with an arm traveling with the impression-member and having its free end curved or bent to engage one end of the paper and raise the same and to deliver the paper after raising said end.

37. Two cooperating members, one a traveling impression-member and the other a form-carrying member on which a sheet of paper to be printed is to be laid; combined with means caused to be actuated during the operation of one of said members for raising one end of the sheet preparatory to removing the sheet from the machine.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

CHARLES E. ADAMSON.

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“2. The combination of a frame having guides and a type-bed between said guides on which type are assembled in parallel rows, a transversely-disposed carriage movable on said guides and having vertical openings in opposite ends, bearing-boxes in said openings, pressure-screws bearing against the tops of said bearing-boxes, springs interposed between said bearing-boxes and the bottoms of said openings, an impression-roller journaled in said boxes, and an inking-ribbon between said roller and the type on said type-bed.”

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“2. The combination of a frame having guides and a type-bed between said guides on which type are assembled in parallel rows, a transversely-disposed carriage movable on said guides and having vertical openings in opposite ends, bearing-boxes in said openings, pressure-screws bearing against the tops of said bearing-boxes, springs interposed between said bearing-boxes and the bottoms of said openings, an impression-roller journaled in said boxes, and an inking-ribbon between said roller and the type on said type-bed.”

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