(No Model.) 4 Sheets—Sheet 1.

# J. O. DECKERT.

## COPYING MACHINE.

No. 553,805. Patented Jan. 28, 1896.

FIG. 1.

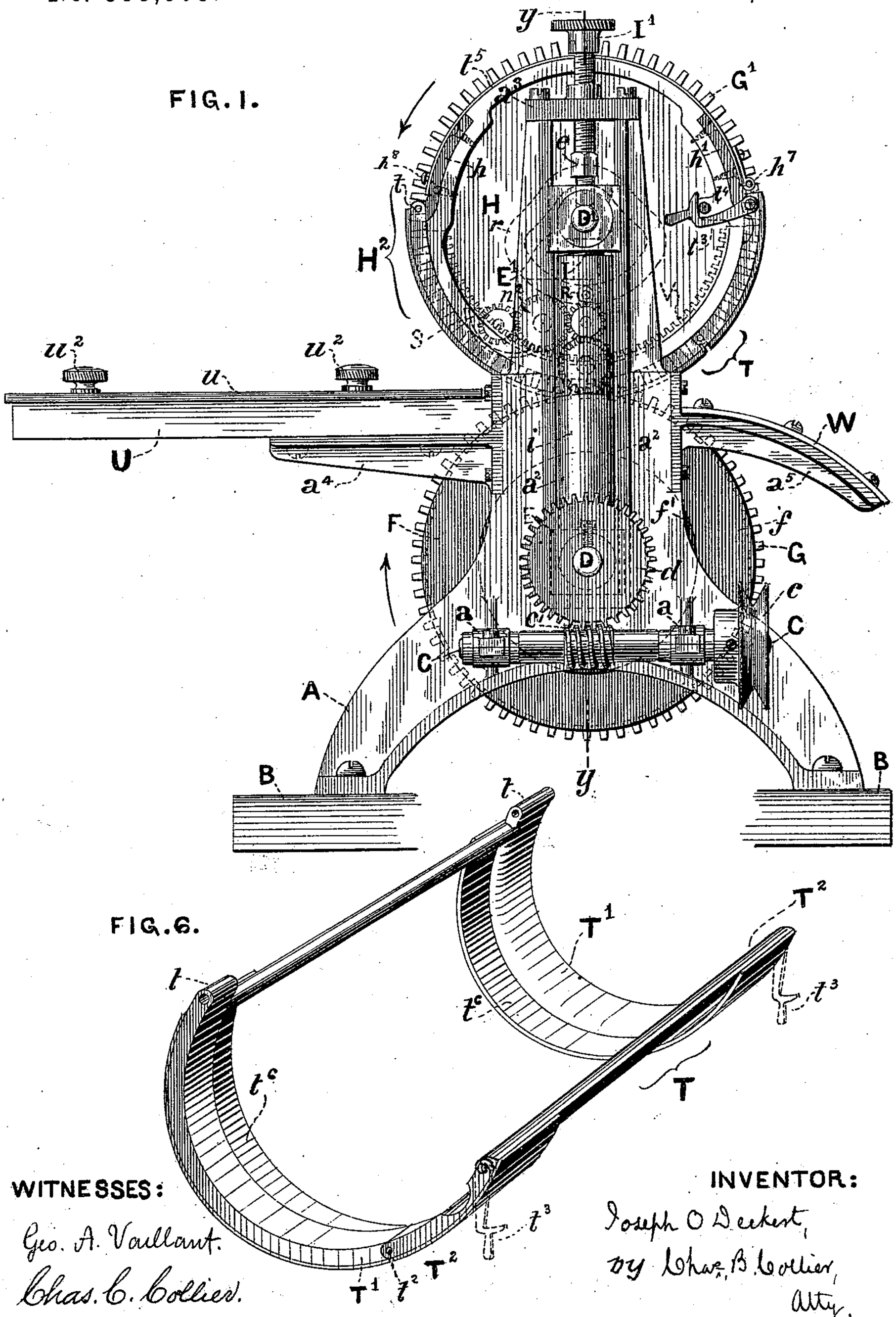



FIG. 6.

WITNESSES:

Geo. A. Vaillant.

Chas. C. Collier.

INVENTOR:

Joseph O Deckert,

by Chas. B. Collier,

Atty.

(No Model.)

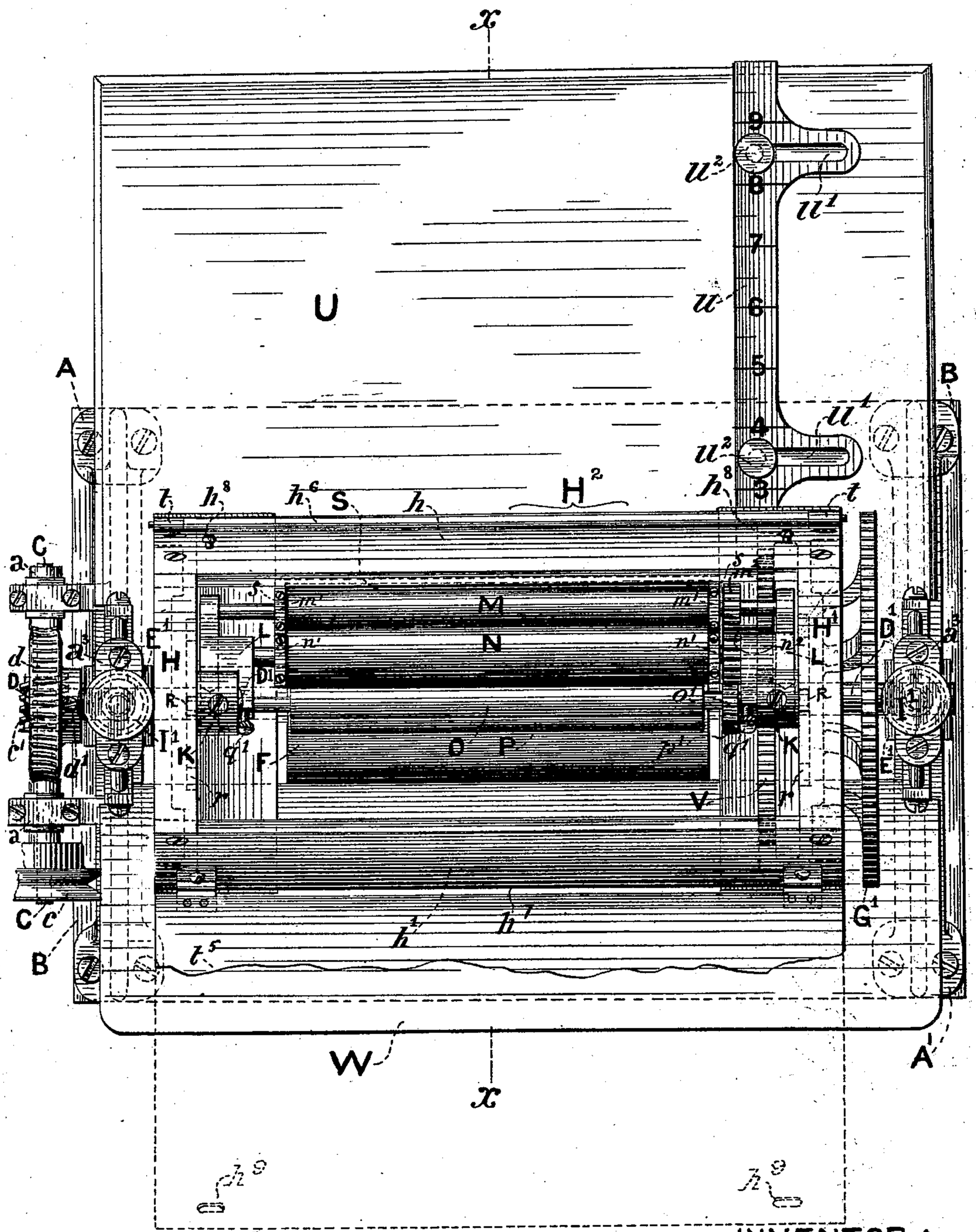
4 Sheets—Sheet 2.

# J. O. DECKERT.

## COPYING MACHINE.

No. 553,805. Patented Jan. 28, 1896.

FIG. 2.




WITNESSES:

Geo. A. Vaillant.

Chas. C. Collier.

INVENTOR:

Joseph O. Deckert,

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(No Model.)

4 Sheets—Sheet 3.

# J. O. DECKERT.

## COPYING MACHINE.

No. 553,805.

Patented Jan. 28, 1896.

FIG. 3.

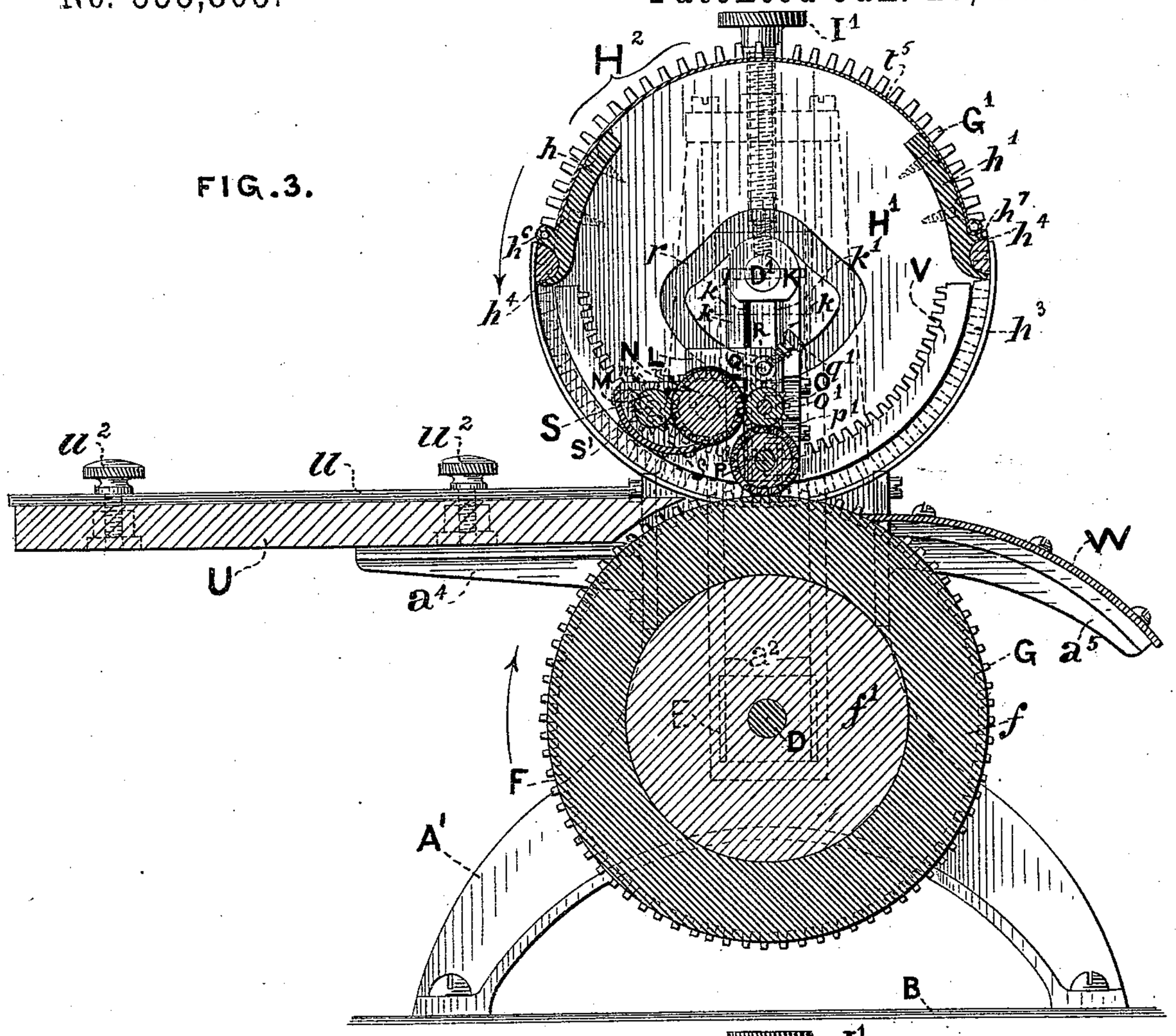



FIG. 7.

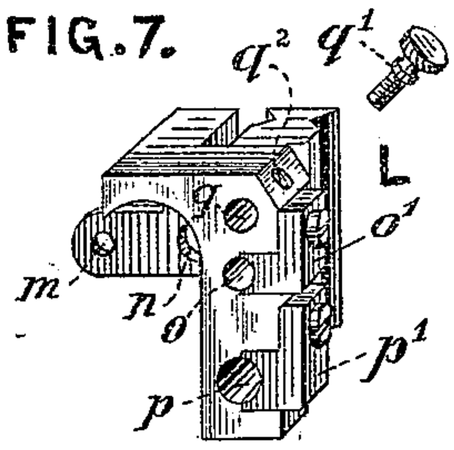



FIG. 4.




WITNESSES:

Geo. A. Vaillant

Chas. C. Collier.

INVENTOR:

Joseph O. Deckert

by Chas. B. Collier,

Atty.

(No Model.) 4 Sheets—Sheet 4.

# J. O. DECKERT.

## COPYING MACHINE.

No. 553,805. Patented Jan. 28, 1896.

FIG. 5.

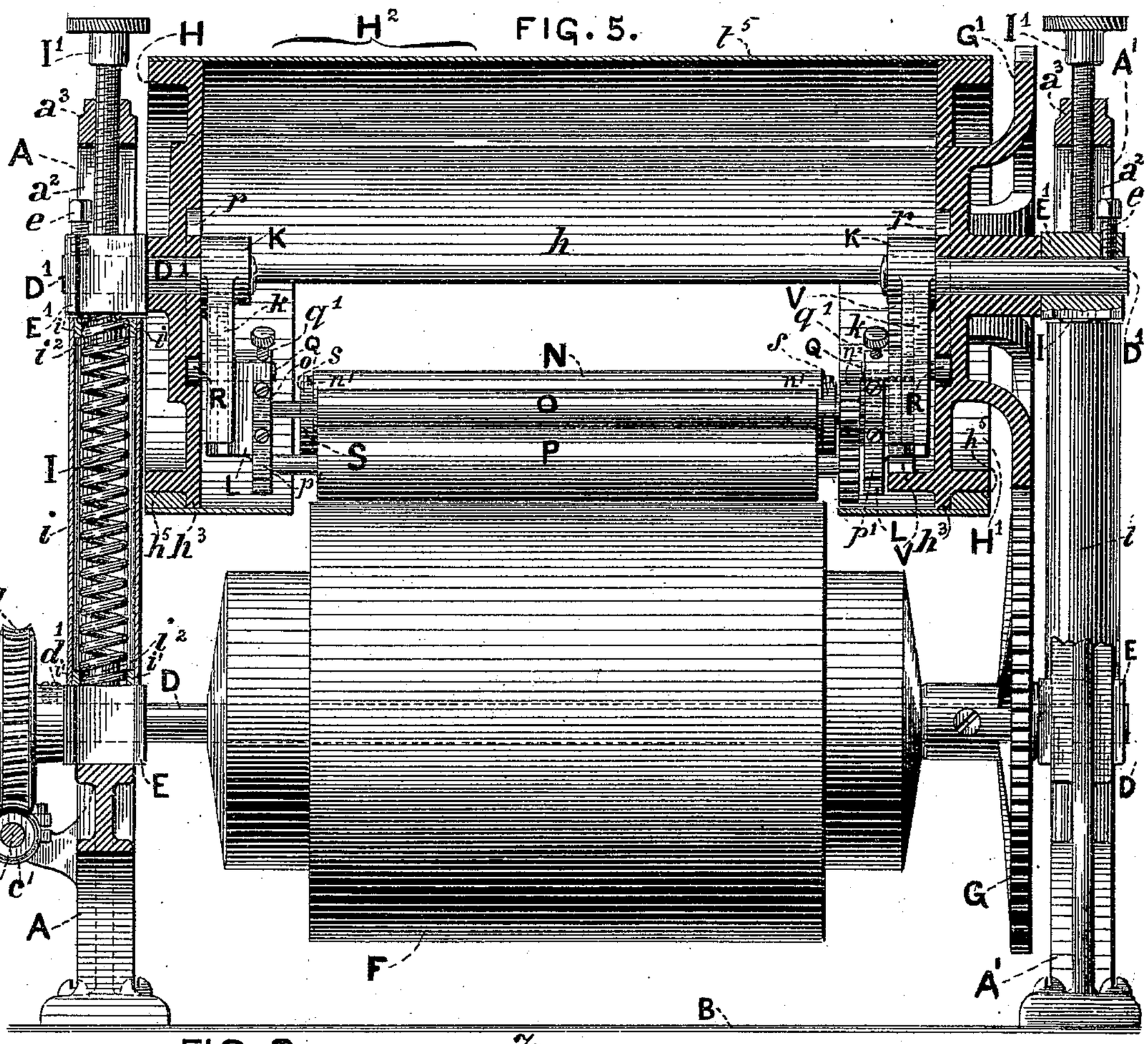
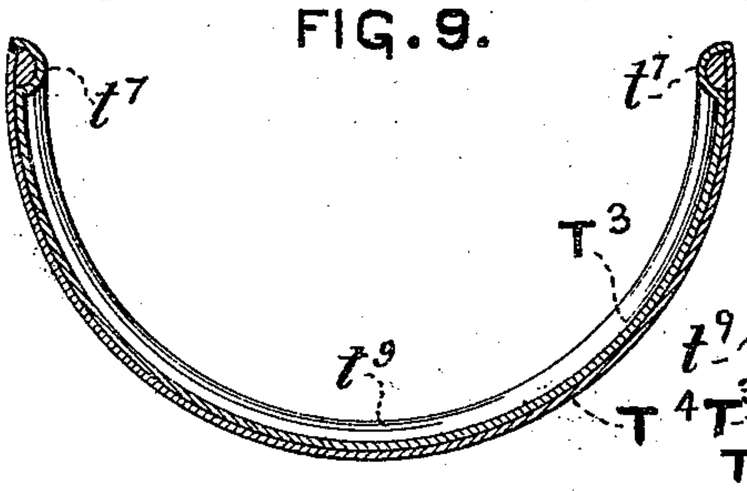



FIG. 9.



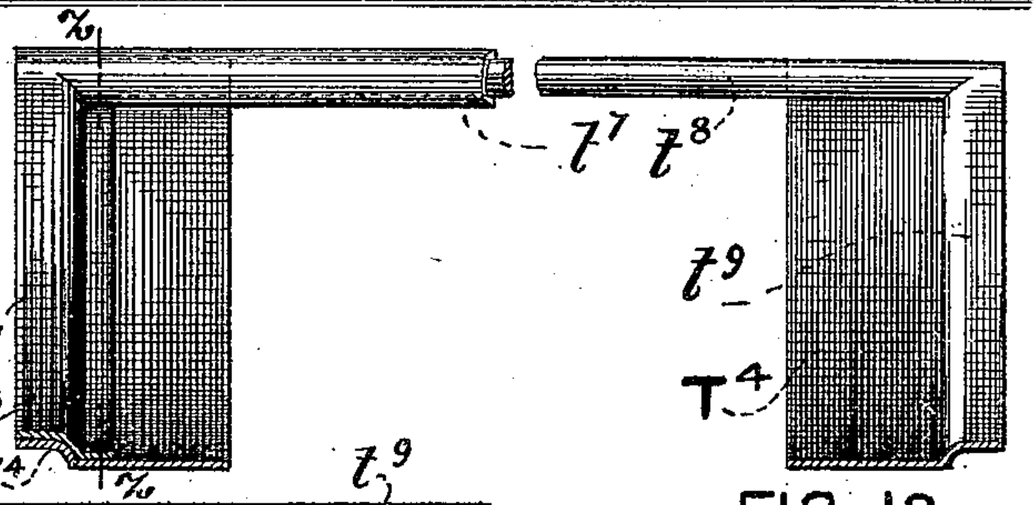
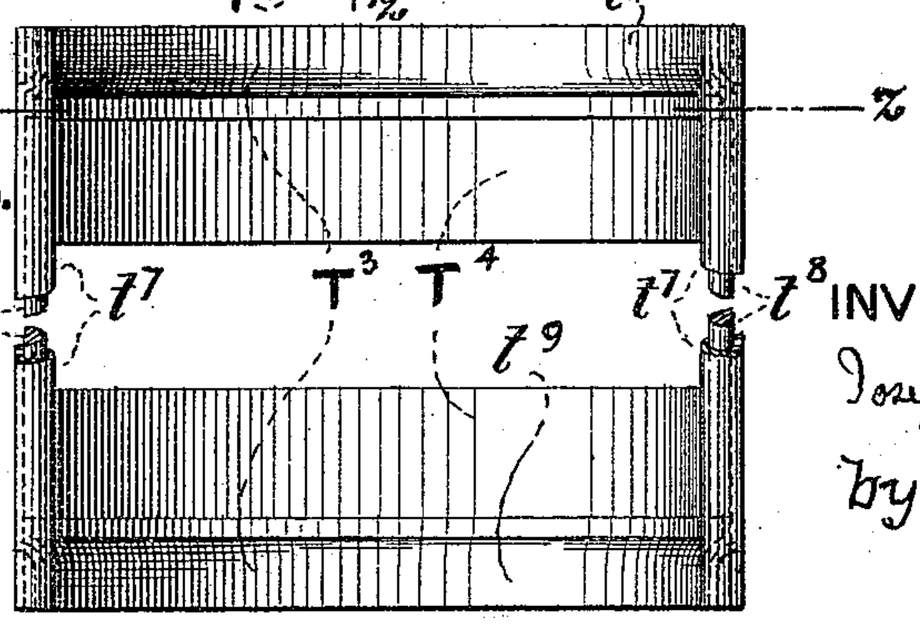




FIG. 10.

FIG. 8.




WITNESSES:

Geo. A. Vaillant.

Chas. B. Collier.

INVENTOR:

Joseph O. Deckert,

by Chas. B. Collier,

Atty.

# UNITED STATES PATENT OFFICE.

JOSEPH O. DECKERT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE WILLIAM MANN COMPANY, OF SAME PLACE.

## COPYING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,805, dated January 28, 1896.

Application filed December 31, 1894. Serial No. 533,420. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH O. DECKERT, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Duplicating or Copying Machines, of which said improvements the following is an explicit and exact specification, enabling one skilled in the art to make and construct the same.

My invention relates to that class of duplicating or copying machines in which a stencil having been previously formed by means of a pen especially adapted to that purpose upon a sheet of thin waxed paper known as "Yoshino paper," or paper similarly prepared, or by the action of the type, when a type-writing machine is employed, upon similar paper backed by a sheet of perforating gauze, said stencil-sheet properly backed with a porous protecting-sheet pervious to ink, preferably of silk bolting-cloth, being placed in a frame forming part of the periphery of a hollow rotating drum, passes between two pressure-rollers, one exterior and the other within the said rotating drum, at each revolution, blank sheets being fed to the machine so that a separate copy of the writing, sketch, drawing or type-writing is obtained at each and every revolution of the hollow rotating drum aforesaid.

Heretofore copying-machines of this character of the most improved pattern have been limited to such as were operated by hand upon a flat surface, the stencil-sheet with a porous protecting-sheet being stretched over a frame designed for that purpose and laid over the paper to receive the copy, an ink-distributing roller held in the hand being passed over the porous backing of the stencil-sheet, the ink passing through the same and through the stencil forming the copy upon the paper beneath. These processes, while sufficiently efficient when only one copy or a limited number of copies is required, are open to the objection of being necessarily slow and expensive where a large issue is required. The time of removing and placing each successive sheet consuming so much time as when an edition, say, of one or two thousand or more copies is required would almost prohibit their use for that purpose; also by reason of the irregular inking of the inking-roll, due to inattention or fatigue on the part of the operator, or irregularity in the degree of pressure upon the roller, due to the same cause, it follows that there is considerable inequality in the impressions, frequently apparent on individual copies—*i. e.*, one part of the copy being printed much darker than the other.

The object of my invention to provide a duplicating or copying machine which will enable the taking of any number of copies of manuscripts or designs, &c., the originals of which have previously been produced in stencil, with dispatch and obviating the defects enumerated hereinabove, and capable of being fed automatically or by hand and driven by power or by hand, that will be readily and easily adjusted, not liable to get out of order, compact and cheap of construction.

To these ends my improvements consist in the employment of a composite pad consisting of a stencil-sheet backed with one or more porous protecting-sheets permitting and inducing the regular distribution of the ink, stretched over a semicylindrical seat extending over one-half of the periphery of a hollow rotating drum of suitable diameter and coinciding with the interior surface of semicylindrical open frame, or between the two parts of a two-part semicylindrical open frame adapted to fit over the said seat and hinged to or clamping the said hollow rotating drum which contains the ink-well and system of ink-distributing and pressure rollers, together with a cam mechanism so timed as to simultaneously supply the ink and apply the required pressure upon the stencil-sheet and its backing as they pass between the distributing pressure-roller and a pressure-roller situated immediately beneath the same and alternately and automatically raising and depressing the said system of ink-distributing and pressure rollers, so that they shall be in operation only during the passage of said stencil-sheet beneath them; devices for regulating the pressure of said rollers; a convenient feed-table and delivery-plate for feeding and delivering the sheets previous and subsequent to the printing of the same, respectively, the entire system, barring the feed-table, delivery-plate

and pressure-regulating device, being connected by continuous and intermittently acting mechanism and capable of being driven by power or by hand, supported upon suitable housings, all as hereinafter more fully set forth.

The nature of my improvements and the manner in which they are to be carried out will be understood, reference being had to the accompanying drawings, in which—

Figure 1, Sheet 1, is an exterior side elevation of the machine. Fig. 2, Sheet 2, is a plan view of the same. Fig. 3, Sheet 3, is a vertical section on the plane *x x* of Fig. 2, showing the ink-distributing and pressure rollers depressed, as when the paper to receive the copy is passing through. Fig. 4, Sheet 3, is a vertical section through the plane *x x* of Fig. 2, showing upper part of machine with the ink-distributing and pressure rollers raised. Fig. 5, Sheet 4, is a partial transverse vertical sectional elevation on the plane *y y* of Fig. 1, showing the ink-distributing and pressure rollers depressed as in Fig. 3. Fig. 6, Sheet 1, is a view, in perspective, of the semicylindrical open holding-frame with locking-hooks dotted in. Fig. 7, Sheet 3, is a view, in perspective, of the friction, ink-distributing, pressure-roller, and friction-roller hanger or bearing-block; and Figs. 8, 9, and 10, Sheet 4, are plan view and transverse and longitudinal sections, respectively, of a modification of a semicylindrical open holding-frame so constructed as to be detachable from machine.

A A′ are the main housings of the machine secured firmly to the base-plate B parallel to each other and at a sufficient distance apart to receive the working mechanism, the length of the latter being determined by the character of the work which the machine is intended to perform.

Projecting outwardly from the side of the housing A are two brackets terminating in bearings *a a*, in which is journaled the shaft C carrying the pulley *c* and worm *c′*. The latter meshes with and drives the worm-wheel *d* upon the shaft D, to which it is secured by means of the set-screw *d′*.

The shaft D is journaled in sliding boxes E E capable of sliding vertically in the guideways $a^2$ $a^2$ of the housings A A′, normally resting at the bottom of the same, but capable of being raised or depressed by the introduction or removal of plates for the purpose of adjustment.

Mounted upon the shaft D and securely keyed or otherwise fastened thereto is the pressure-cylinder roller F, consisting of a wooden core *f′* and an outer covering of gelatine or other suitable elastic material *f*, the periphery of the said roller F being equal to or approximate to the diameter of the spur gear-wheel G at pitch-line for reasons which will become obvious farther on. The spur gear-wheel G is keyed or otherwise secured upon the shaft D and meshes with the gear G′, projecting from and forming part of the cam-disk H′. Plates *h h′* of segmental cross-section connect the cam-disk H′ with the cam-disk H, being countersunk in the rim of each and firmly secured thereto by means of countersunk screws, so that their outer surfaces coincide with the periphery of said cam-disk, forming in their aggregation a rigid cage or hollow drum $H^2$, bored axially and rotating freely upon gudgeons D′ D′.

The shaft or gudgeons D′ D′ find a bearing in sliding boxes E′ E′ similar to the sliding boxes E E and sliding vertically in the guideways $a^2$ $a^2$ of the housings A A′. Set-screws *e e* in the boxes E′ E′ hold the gudgeons firmly in place, preventing rotation or longitudinal displacement of the same. Each pair of boxes E E′ and E E′ are provided with cylindrical teats or projections $i^2$ $i^2$ upon their upper and lower faces, respectively, for the reception of cylindrical spiral springs I I, whose unimpeded resiliency is sufficient to raise the weight of the upper drum and its inclosed mechanism clear of the elastic pressure-cylinder roller when so desired. Tubular casings *i i* protect the springs I I and are maintained in place by washers *i′ i′ i′ i′*.

The housings A A′ are provided with caps $a^3$ $a^3$ securely screwed thereto, which close the guideways $a^2$ $a^2$ and are centrally tapped for the reception of thumb-screws I′ I′ abutting upon the tops of the sliding boxes E′ E′, thereby counteracting the resiliency of the springs I I and regulating the travel of the same, as hereinafter more fully set forth.

Rigidly keyed or otherwise fastened upon the stationary gudgeons D′ D′ are collars K K provided with depending arms *k k k k*, forming guideways *k′ k′ k′ k′* for the reception of the sliding bearing-blocks L L, which have parallel vertical faces cut vertically to correspond with the V-shaped grooves in the depending arms *k k k k*.

The sliding bearing-blocks or hangers L L, Fig. 7, afford bearings *m m*, *n n*, *o o*, and *p p* for the ends of the spindles of the ink-feeding roll M, the distributing-rolls N and O, and the distributing and pressure roll P, respectively, and also seats *q q* for the gudgeons Q Q of the friction-rollers R R, running in cam-grooves *r r* having a rectangular cross-section and cut in the interior faces of the disks H H′. The gudgeons *q q* are held in place by means of thumb-screws *q′ q′*, working in threads $q^2$ tapped in the body of the bearing-blocks L L, and the distributing and pressure roller bearings are provided with removable caps *o′ p′* to facilitate the removal and replacing of rollers O and P. The bearing-blocks L L are cast right and left, one for each end of the machine. Side cheeks *s s*, having bearings for the spindles of the ink-feeding roll M and the distributing-roll N, provided with caps *m′ m′* and *n′ n′*, whereby they depend from said spindles or shafts,

form, in connection with the curved cross-sheet S′, tightly screwed or brazed thereto, the ink-pan S which supplies the feed-roll M.

The cam-grooves $r$ $r$, cut in the inside faces of the disks H H′, are so timed as to raise the rollers R R and with them the bearing-blocks L L, carrying the inking, distributing, and pressure rolls clear of the inside surface of the hollow rotating drum during one-quarter of a revolution, then depressing them during a quarter of a revolution and keeping them depressed during the remaining half of a revolution, pending which time the cam runs idle, being concentric with the disk-center. It is during this part of the path of the cam that the impression is taken. The disks H H′ are each provided with a peripherally-projecting rib $h^3$, which extends over one-half of the periphery of said disks and coincides in time with that part of the cam-groove which is concentric with the axis of rotation. The ribs $h^3$ $h^3$ are not contiguous to the outer face of the disks, but are parallel thereto at a slight distance therefrom, leaving spaces $h^5$ $h^5$, say, one-half or three-eighths of an inch in width, and extending half-way round the periphery of said disks. The segmental plates $h$ $h'$ are provided near their outer rectilinear and longitudinal edges with semicylindrical grooves $h^4$ $h^4$ extending their entire length and joining with spaces $h^5$ $h^5$ left between the ribs $h^3$ $h^3$ and the exterior faces of the disks H H′, forming a continuous depressed seat consisting of two parallel rectilineal grooves, $h^4$ $h^4$, and two parallel semicircular spaces, $h^5$ $h^5$.

A semicylindrical frame T, Fig. 6, preferably of brass, and conforming on its inner face with the seat formed by the rectilineal grooves $h^4$ $h^4$ and the semicircular spaces $h^5$ $h^5$, and exteriorly presenting a smooth cylindrical face, is hinged by means of pins passing through the bosses $t$ $t$ upon the frame and penetrating longitudinally into the ends of the semicylindrical rib $h^6$ upon the interior edge of the semicircular rectilineal groove $h^4$ of the segmental plate $h$.

Sheet-brass plates $t^6$ $t^6$ are either brazed or otherwise secured on the lateral edges of the frame T, serving as dust-protectors.

The segmental plates $h'$ $h'$ are further provided with semicylindrical ribs $h^6$ $h^7$ adjacent to and parallel with the inner edge of the semicylindrical grooves $h^4$ $h^4$ upon the said segmental plates $h'$ $h'$, respectively, and extending the entire length thereof save where they are cut out at their extremities for the reception of the hinge-bearings upon the frame T and the dust-shield $t^5$, respectively.

The frame T, for the sake of convenience, is made into two parts T′ T², the latter being hinged to the former at $t^2$, as otherwise the plate would be too stiff to adapt itself easily to its seat. Hooks $t^3$ $t^3$ engage with stops $t^4$ $t^4$ and retain their parts in place during the operation of the machine. A dust-protector $t^5$, giving access to the interior of the machine when the stencil-sheet is locked in place, consisting of a semicylindrical sheet-iron shield, conforming in curvature with the half-peripheries of the disks opposite to those occupied by the frame T, is hinged upon the segmental plate $h'$ at $h^7$, and is secured at its free end by means of two slots $h^9$ $h^9$, (shown dotted, Fig. 2,) punched in the shield and fitting over two small studs $h^8$ $h^8$ upon plate $h$, the spring of the shield being sufficient to hold it in place. When not in use, the machine is left standing with this plate uppermost to avoid accumulation of dust upon the rollers.

The friction of the feed-distributing and pressure rollers M, N, O, and P upon each other would be sufficient under ordinary circumstances to keep them in rotation; but I prefer to render this movement positive and thus obviate the possibility of their failure to do so. To this end I cast or secure permanently a segmental rack upon the inner face of the disk H′ and concentric therewith. This rack may be carried all the way round and form in fact an internally-toothed gear. I do not confine myself to either form of structure, but have shown the segmental rack in preference. This rack V meshes with the elongated gear $n^2$ upon the spindle of the distributing-roll N, which imparts its motion to the pinions $m^2$ $o'$, keyed upon the spindles of rollers M and O, respectively, the latter communicating its movement to the pinion $p'$ upon the spindle of the pressure-roller P. The number of teeth upon the gears $m^2$, $n^2$, $o'$, and $p'$ must be calculated so that the face of the pressure-roller P shall travel with the same speed as the face of the lower roller, F. In this connection I would state that while the gears G and G′ are of the same diameter at pitch-line I prefer to put an additional tooth upon either one of them, so as to secure a traveling tooth.

Brackets $a^4$ $a^4$ extend horizontally from the front side of the housings A A′, being integral therewith, and support a feed-table U for feeding the blank sheets to the machine. This table is provided with a combined graduated guide and gage plate $u$, having slots $u'$ $u'$ at right angles to the guide-face and parallel to each other. Clamp thumb-screws $u^2$ $u^2$, screwed into the body of the table or nuts embedded in the under side thereof, pass through slots $u'$ $u'$ and serve to secure the gage when properly adjusted. The gage-plate is further graduated with lines one inch apart and subdivided into half-inch spaces, each inch being indicated by its appropriate integer.

Corresponding brackets $a^5$ $a^5$, having a downward sweep, extend from the rear of the housings A A′, being secured to or forming part thereof, for the reception of a delivery-plate W, securely fastened thereto and preferably of polished sheet-brass or other suitable metal or material, so as to present the

least possible friction to resist the delivery of the printed copies as they emerge from between the rollers.

The operation of my machine is substantially as follows, the proper adjustments having previously been made, to wit: The edge of the guide-plate *u* having been placed at the proper distance from the center of the machine required by the particular work to be copied and secured in place by the clamp thumb-screws $u^2$ $u^2$ the degree of pressure to be imparted by the pressure and distributing roll P and its parallelism with the roller F when at its lowest position having been duly regulated by means of the thumb-screws I′ I′ acting in conjunction with the cylindrically-coiled springs I I, the machine is rotated until the hinged frame T is uppermost, as shown in Fig. 4, Sheet 3. The hooks $t^3$ $t^3$, Figs. 1 to 6, Sheet 1, or other locking devices being released, the frame is raised, leaving the seat formed by the grooves $h^4$ $h^4$ and the open spaces left between the ribs $h^3$ $h^3$ and the exterior faces of the disks H H′ exposed. Upon this seat is laid the stencil-sheet, which should slightly overlap the said seat on all sides. The composition forming the stencil-sheet, although flexible, is not sufficiently tough to bear the friction of the roller directly over it or the strain of being stretched, and a porous protecting-sheet is therefore employed and laid over the stencil. The frame is then closed over the two sheets, to wit: the stencil resting upon the peripheries of the disks and the outer edges of the segmental grooved plates, and the sheet of porous material resting upon the stencil. This being clearly understood, it is evident that the frame in closing over the two sheets will force the latter into the depressions formed by the grooves $h^4$ $h^4$ and the spaces upon the periphery of the disks at $h^5$ $h^5$; but owing to the fact that the stencil is resting upon a stationary bed, while the porous sheet is exposed to the action of the descending frame, it alone is affected by the grinding contact of the ribs upon the under side of the descending frame and consequently alone receives the main strain of stretching, the stencil being merely stretched sufficiently to free it from wrinkles. The porous paper is of such character as to permit the ink to be readily transmitted through it and acts as an additional distributing device in conjunction with the distributing and pressure rollers. The hinged frame having been locked in place by means of the locking devices $t^3$ $t^3$, motion is imparted to the pulley *c* by means of a suitable belt which communicates its motion to the worm-wheel *d* through the shaft C and worm *c*′, the pressure-roller F and gear G are thereby rotated through the shaft D and the gear G communicates its movement to the gear G′ and cage or hollow drum $H^2$. Motion is imparted by the segmental rack upon the inner face of the disk H′ at every half-revolution to the elongated gear upon the stem or spindle of the distributing-roller N and then is conveyed through the pinions *m*, *o* and *p* to the ink-feed roller M, distributing-roller O, and pressure-roller P during all of the time that the said roller P is exerting pressure upon the stencil, being active while the impression is being taken and passive during the balance of the time. At each revolution of the hollow drum $H^2$ the cam-grooves *r* *r*, cut in its terminal disks, elevate and depress the friction-rollers R R carrying with them the bearing-blocks or hangers L L and all the inking mechanism as well as the distributing and pressure rollers, and as the pressure is regulated by the greater or less play-space allowed vertically in the guideways $a^2$ $a^2$ of the housings A A′ by means of the thumb set-screws I′ I′ it follows that this pressure is exerted when the friction-rollers are at their greatest distance from the axial center of rotation of the hollow drum $H^2$. A sheet of blank paper of sufficient length and width being placed in position upon the feed-table is pushed along until its inner edge is caught between the stencil and lower pressure-roller, F. The distributing and pressure-roller P being now depressed is exerting sufficient pressure, at the same time rotating and distributing ink upon the back of the porous sheet, to insure perfect impression. As soon as the points at which the cam-grooves begin to recede toward their axial center come in contact with the friction-rollers, the latter, and consequently the hangers working in the guideways $k'$ $k'$ $k'$ $k'$, are raised away from the lower pressure-roller, F. The stencil being now above the point of contact completes a revolution and returns to the point of contact when a fresh sheet is supplied to the machine, the printed sheet having been automatically delivered previously over the delivery-plate by the combined rotary movement of the upper drum and lower friction-roller, and the operation is repeated *ad libitum*.

A modified form of stretching-frame is shown in Figs. 8, 9, and 10, in which Fig. 8 is a broken plan view, Fig. 9 a vertical section through Z Z of Figs. 8 and 10, and Fig. 10 is a longitudinal central section with the top or interior part removed from the right-hand half of the figure. In lieu of the hinged plate permanently attached to the machine by means of hinges at one end and locking devices at the other I provide a light frame stamped out of sheet-brass or other elastic metal over which another frame likewise of elastic sheet metal clamps itself by its own resiliency by reason of the lightness of structure and elasticity of the material. The composite frame presenting an interior surface analogous to that of the frame T previously described and conforming with the surface presented by the seat of said frame, a hinge such as shown in frame T becomes unnecessary, the frame expanding and contracting sufficiently to embrace and clasp the hollow drum firmly, two rectilinear semicylindrical

bars $t^7$ $t^7$ falling into the corresponding grooves $h^4$ $h^4$ upon the segmental plate $h$ $h$ and semicircular corrugations $t^9$ $t^9$ fitting into the spaces $h^5$ $h^5$. The sheet-brass sections of the under or outer frame are joined together by semicylindrical brass bars $t^8$ $t^8$, brazed or otherwise rigidly secured thereto. In employing this modified form of stencil-holding frame the device is detached from the machine and the parts separated. The backing of porous paper and stencil are laid over the outside of the inner frame, $T^3$, in the order named, and the outer frame, $T^4$, is then forced over them, pressing the stencil and porous backing into and over the irregularities presented by its own interior and the external surface of the frame $T^3$, the resiliency of the parts is sufficient to keep them together and to maintain them in position upon the hollow drum; but when so desired thin bifurcated steel clamping-pins similar in principle to the ordinary clothes-pin or clamping-hooks and eyes can be used to clamp them together. The united plates, stencil and porous material are then forced in their seat upon the hollow drum, where they remain firmly secured, as before mentioned, by reason of the individual and united resiliency of the two frames $T^3$ $T^4$, and the operation of the machine proceeds as already described.

I do not confine myself to the employment of the main pressure-roller F, as I can equally well employ a flat bed of same width and having an elastic surface of material analogous to that upon the roller and impart to the same a reciprocating motion by hand, or mechanically by means of a crank upon the gear G, or otherwise, without in any wise changing any other part of my invention or conflicting with the terms of my claims save in the substitution of the words "reciprocating bed" for "main pressure-roller."

By reason of the steady rotary and continuous operation of my machine a much larger number of copies can be obtained in a given time than by any single machine heretofore employed for that purpose, with greater uniformity and requiring less attention, as by feeding the machine with a continuous strip of paper upon a spool properly mounted in front of the machine the operation is absolutely automatic. The strip being passed through a second time, the blank spaces left between each copy in the previous operation can be filled in in their turn, so that the machine can be fed either by separate sheets or in continuous roll. In the former instance the only duties of the attendant, which can be performed by a child, consist merely in placing the separate sheets upon the table and renewing them as fast as the machine takes them away.

The alternate raising and depressing of the ink feeding, distributing and pressure-applying mechanism at each revolution economizes the ink and saves the wear and tear, as during the time of the elevation of the inking and pressure rollers these elements are idle and there is no effort on the machine.

The time elapsing between each depression of the pressure-rollers gives the attendant time to feed a fresh blank sheet to the machine, so that a perfect copy is produced at each and every revolution, the number of copies procurable in a given time being only limited by the speed of the machine or the dexterity of the operator.

I am aware that machines for producing copies of writings, sketches, plans, &c., through a stencil-sheet are not new and have already been used, and I therefore do not broadly claim such a construction; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination in a "duplicating or copying machine" of a main pressure-roller F, a combined ink-distributing and pressure roller P, a stencil carrying hollow drum $H^2$ revolving upon a non-rotating shaft, or gudgeons D′ D′, and having cam-grooves $r$ $r$ cut or secured to the inner surfaces of its terminal disks, the fixed collars K K forming guides $k'$ $k'$ $k'$ $k'$, and the bearing-blocks L L sliding therein and carrying the ink feeding, distributing and pressure rollers, and the gudgeons Q Q carrying friction-rollers R R running in the aforesaid cam-grooves $r$ $r$, and mechanism for driving the same, substantially as described and shown and for the purpose set forth.

2. In a duplicating or copying machine having the pressure-roller F, the distributing and pressure roller P, the stencil-carrying hollow drum $H^2$ having internal cam-grooves $r$ $r$, collars K K forming guides $k'$ $k'$ $k'$ $k'$, friction-rollers R R, gudgeons Q Q keyed or rigidly held in bearing-blocks L L, the bearing-blocks L L carrying ink-feeding pans and roller M, and distributing-rollers N and O and distributing and pressure roller P, in combination with sliding boxes E′ E′ provided with screws $e$ $e$, and shaft or gudgeons D′ D′ sliding in guides $a^2$ $a^2$ in the housings A A′ of the machine, the springs I I and set-screws I′ I′, substantially as described and shown and for the purpose set forth.

3. In a duplicating or copying machine having pressure-rollers F P, and an ink well or pans, ink feeding and distributing rolls M, N and O and a preferably stencil-carrying hollow drum $H^2$ provided with internally-cut cam-grooves $r$ $r$ and rotating freely upon a non-revoluble shaft, or gudgeons, D′ D′, the entire system with the exception of roller F being supported by said shaft or gudgeons D′ D′, the sliding boxes E′ E′ for said gudgeons sliding in vertical guides $a^2$ $a^2$ in the housings A A′, supported by springs I I and regulated by adjusting-screws I′ I′, in combination with the train of gears G, G′, $n^2$ $n^2$, $p'$ and a segmental rack V cast or secured to the inner face of the disk H′, forming one of the

ends of the hollow stencil-carrying drum $H^2$, substantially as described and shown and for the purpose set forth.

4. In a duplicating or copying machine having pressure, ink feeding and distributing rollers automatically and positively rotated, and having a hollow drum $H^2$ rotating freely upon a fixed shaft or gudgeons, said gudgeons being suspended upon springs and sliding in vertical guides forming part of the main housings of the structure and maintained in place by means of vertical set-screws, said drum consisting of terminal disks H H′ connected by segmental plates $h$ $h'$ lying parallel with the axis of rotation and countersunk into, and forming part of the periphery of said drum, said terminal disks being provided with cam-grooves and a segmental rack and being further provided on their periphery with ribs $h^3$ $h^3$ at a slight distance from and parallel with their exterior faces, said ribs extending half-way round that part of their periphery which coincides with the concentric portion of the cam-grooves aforesaid, leaving spaces $h^5$ $h^5$ between the said ribs and the said faces which, communicating with parallel grooves $h'$ $h^4$ in the segmental plates $h$ $h'$, form a seat countersunk in the periphery upon the said drum, in combination with a hinged open stencil-retaining frame T coinciding on its internal face with the said peripheral seat and hinged thereto and presenting exteriorly a smooth cylindrical surface, having the same radius as the top of the ribs $h^3$ $h^3$ which shall be tangent to the periphery of the pressure-roll F when the stencil is in position for making an impression, substantially as described and for the purpose set forth.

5. In a duplicating or copying machine having an ink-pan, ink feeding, distributing and pressure rollers, and mechanism for driving the same, the combination of a revoluble stencil-bearing hollow drum containing the said ink-feeding and pressure mechanism and having a seat on its periphery, with a stencil-retaining frame T coinciding on its internal face with the said peripheral seat and hinged or clamped thereto by means of hinges and locks, substantially as described and for the purpose set forth.

6. In a duplicating or copying machine the combination of an inner open elastic frame $T^3$ conforming on its inner surface with a receptive seat on said machine and an outer elastic open frame $T^4$ conforming on its inner face with the receptive seat upon the outer surface of the frame $T^3$, substantially as described and shown and for the purpose set forth.

7. In a duplicating or copying machine having ink-pan, ink feeding, distributing and pressure rollers and mechanism for driving same, the combination of a revoluble stencil-bearing hollow drum $H^2$ containing the said ink, ink-feeding and pressure mechanism, and having an open stencil-retaining frame or frames T hinged and clamped as described, with a pliable or elastic dust-shield $t^5$ or cover, giving access to the interior of said revoluble hollow drum or cage $H^2$, and hinged thereto, substantially as described and shown.

8. The combination in a duplicating or copying machine of the pressure-roller F the combined pressure and distributing roller P, the ink-well S, feed-roller M, the distributing-rollers N, P, the friction-rollers R R, all journaled in the bearing-blocks or hangers L L, the rollers being provided with gearing for rotating them from a segmental rack V, and the friction-rollers running in cam-grooves $r$ $r$ upon the inside end faces of the revoluble hollow drum or cage $H^2$, the said drum $H^2$ provided with a semiperipheral seat $h^5$, $h^5$, $h^4$, $h^4$, the mechanism for rotating shaft and the fixed or gudgeons D′ D′ held in sliding boxes E′ E′ supported upon springs I I and adjusted by means of screws I′ I′, the housings A A′ having guideways $a^2$ $a^2$ $a^2$ $a^2$ for the reception of the boxes E E and E′ E′ and provided with caps $a^3$ $a^3$ tapped for the reception of the said adjusting-screws I′ I′, the brackets $a^4$ $a^4$ $a^5$ $a^5$, the feed-table U and delivery-plate W, substantially as described and shown and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

JOSEPH O. DECKERT.

Witnesses:
GEO. W. REED,
CHAS. C. COLLIER.