No. 829,936. PATENTED AUG. 28, 1906.

J. W. WOODILL.

PRINTING APPARATUS.

APPLICATION FILED NOV. 2, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

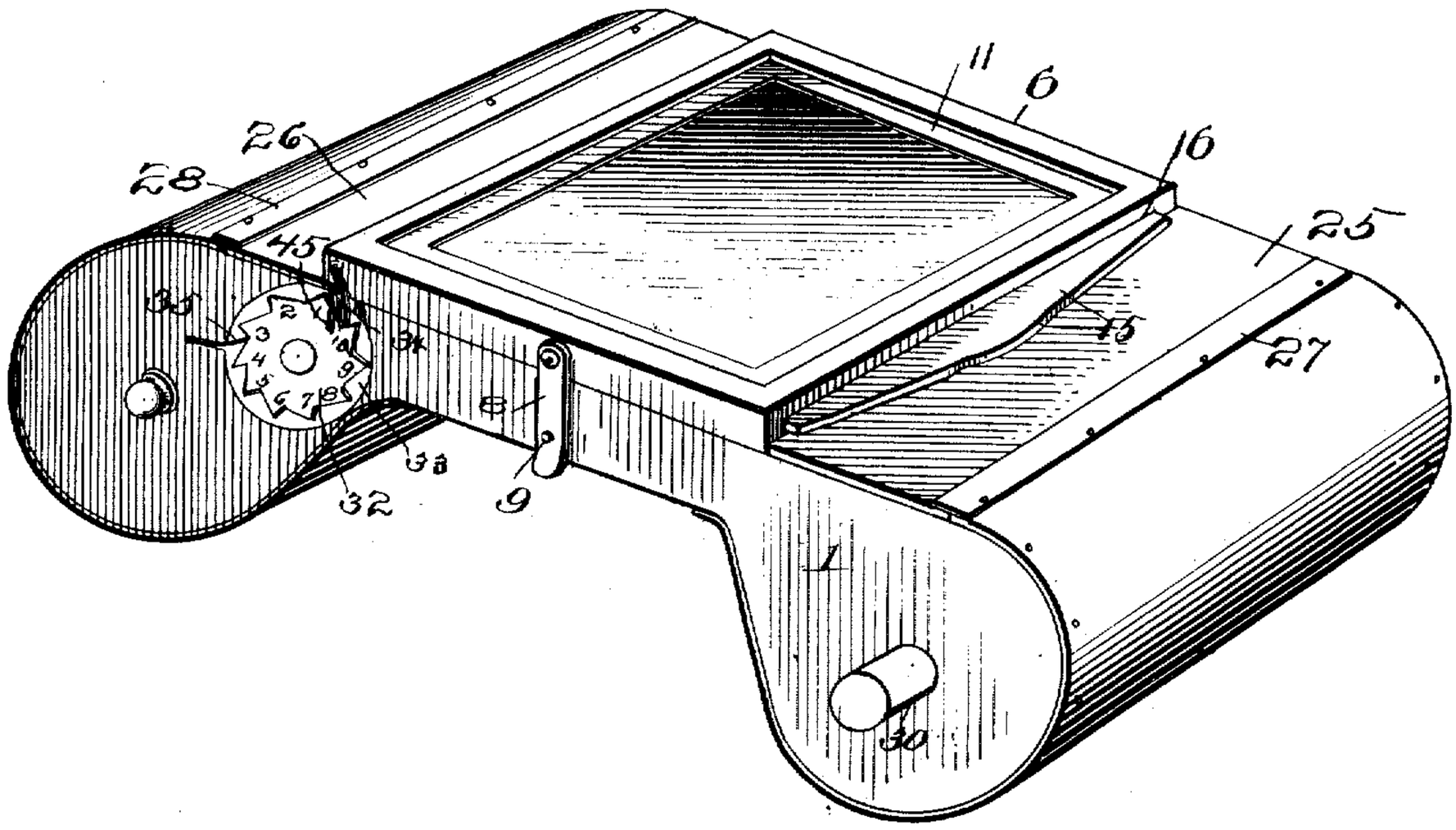
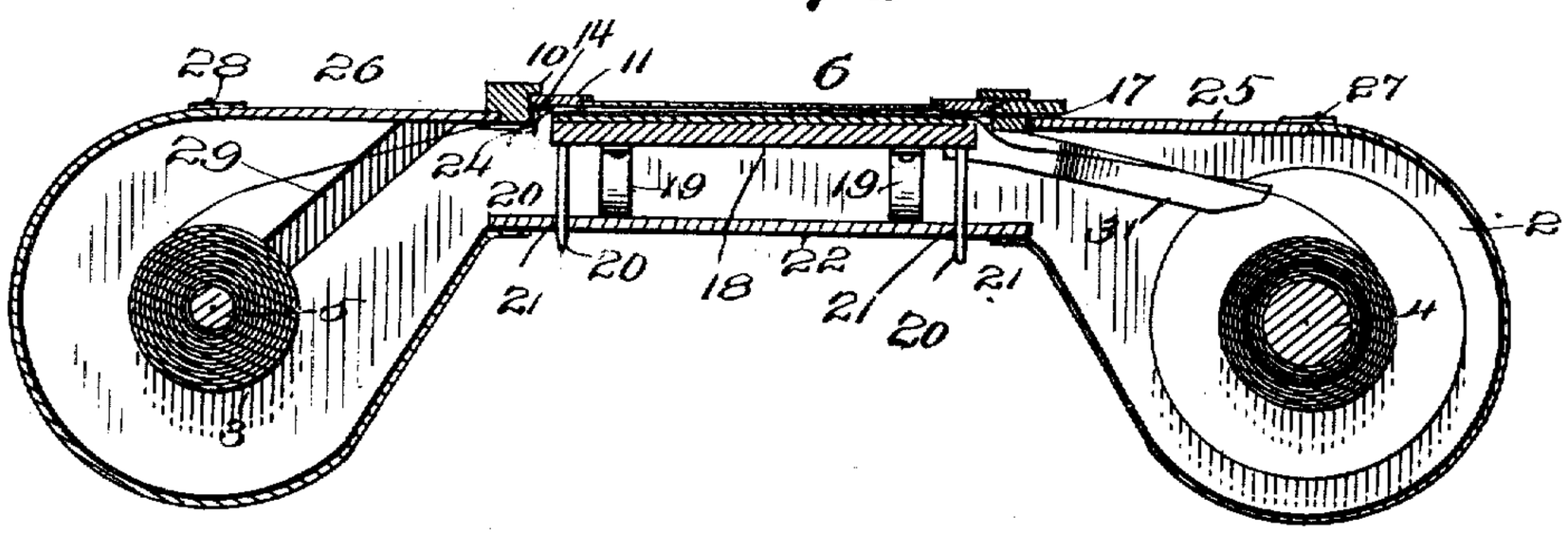


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

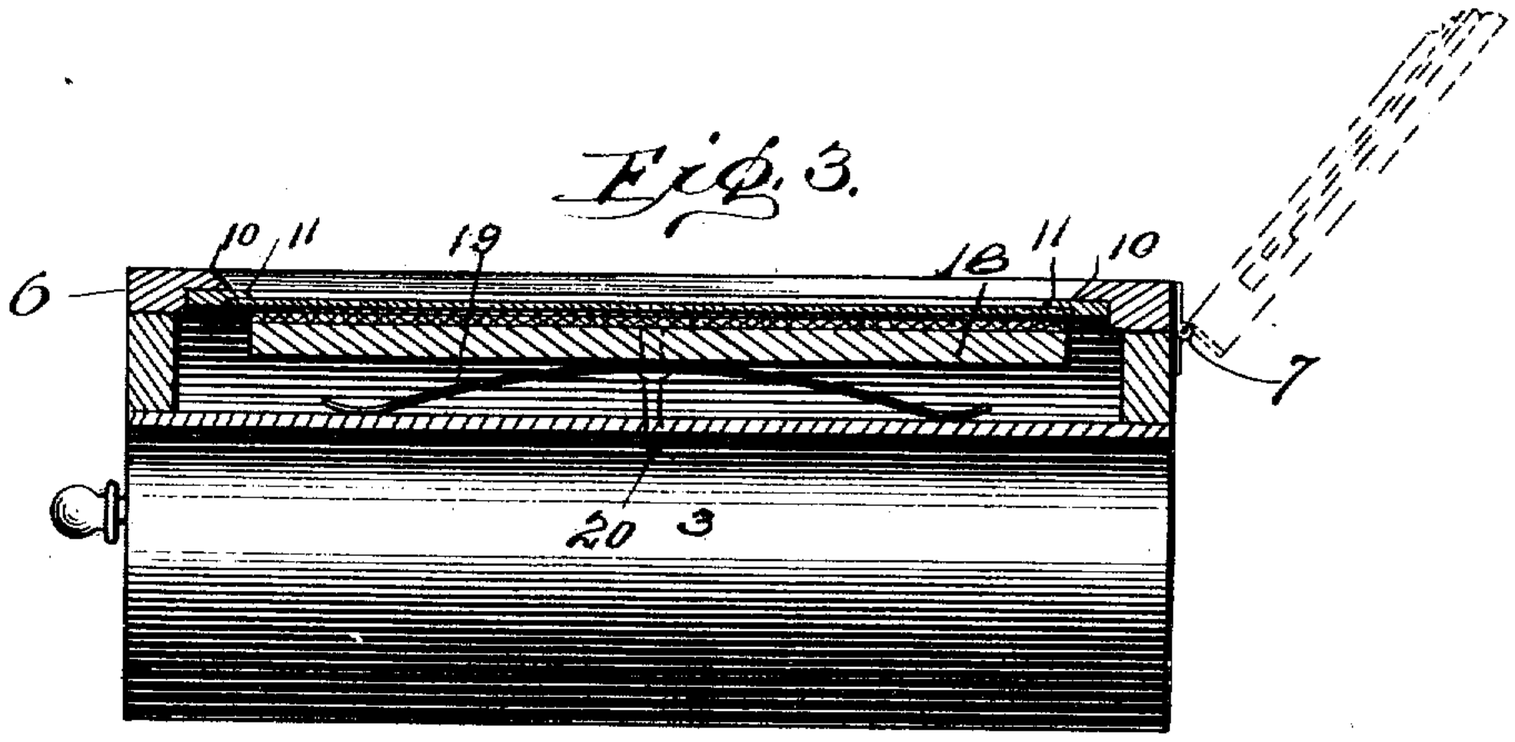


Fig. 4.

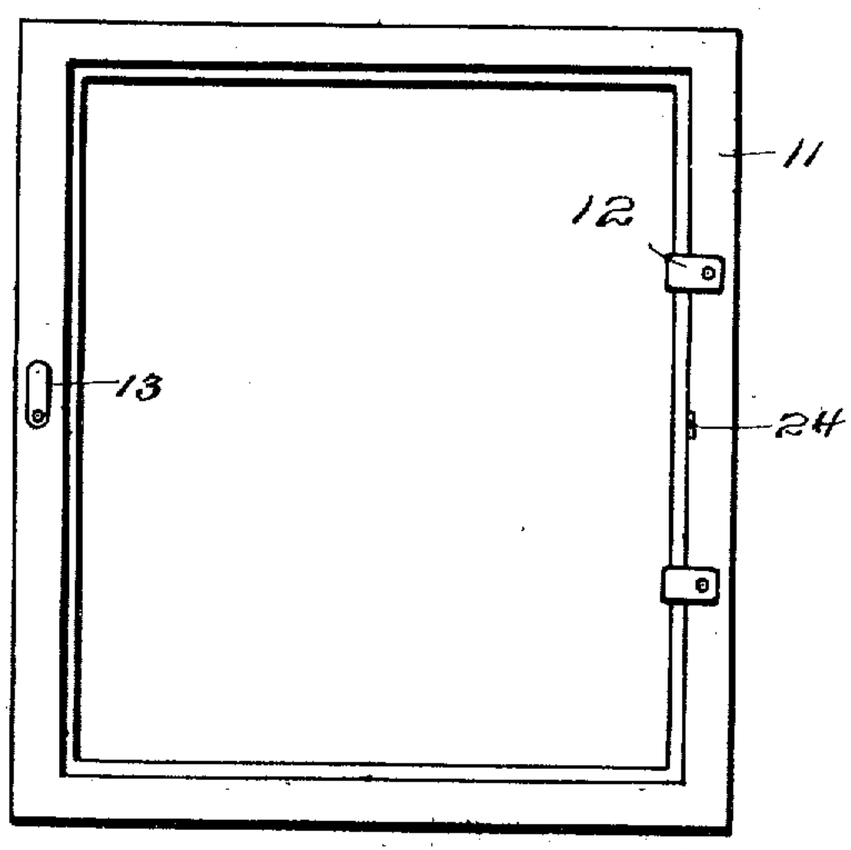
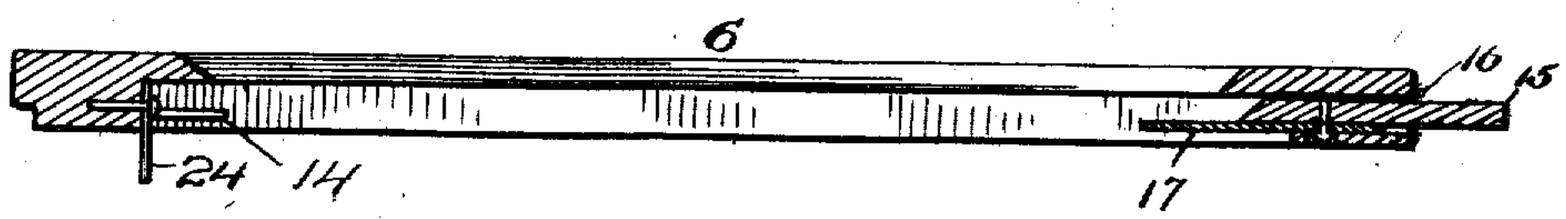


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6

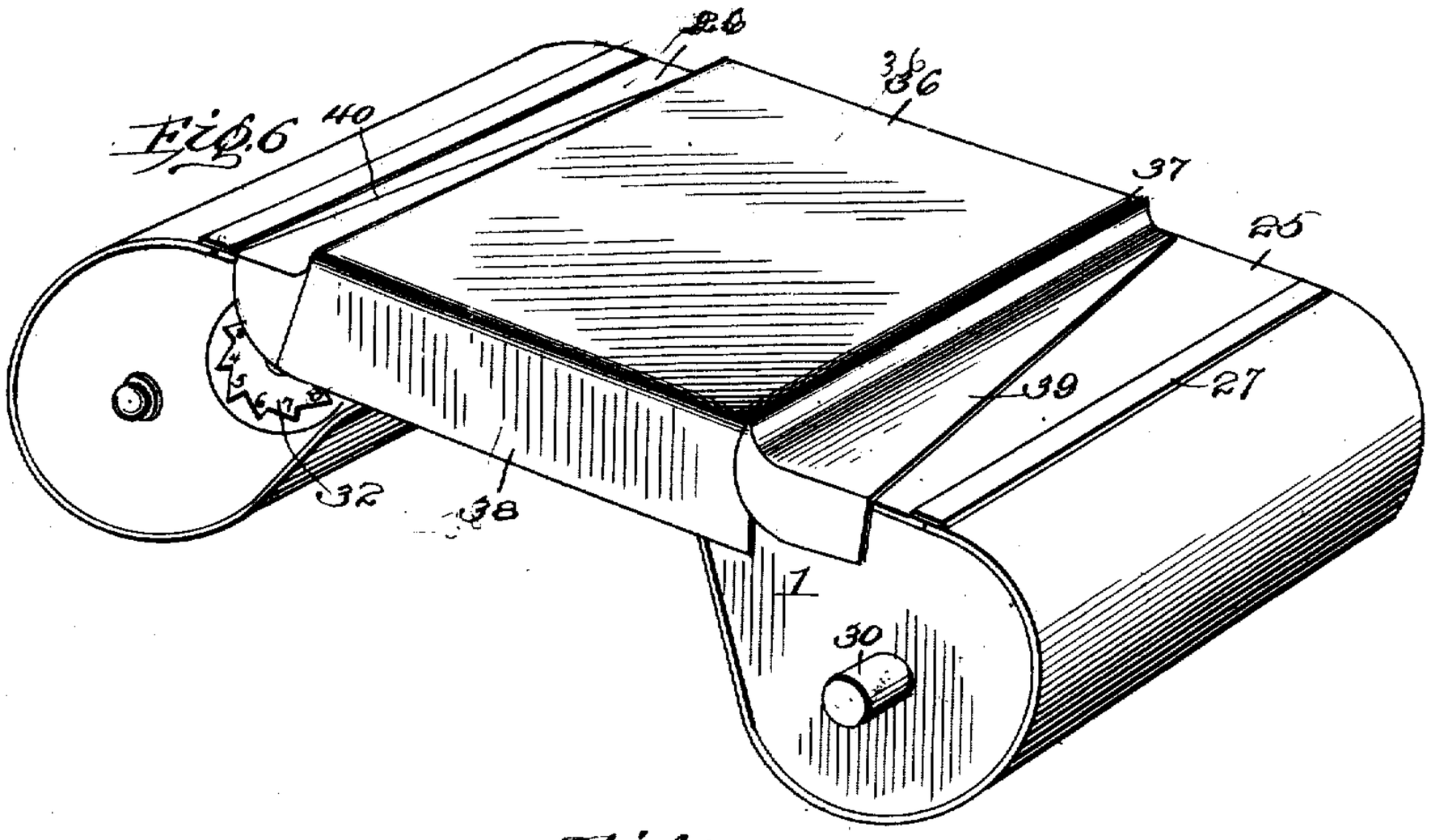


Fig. 7.

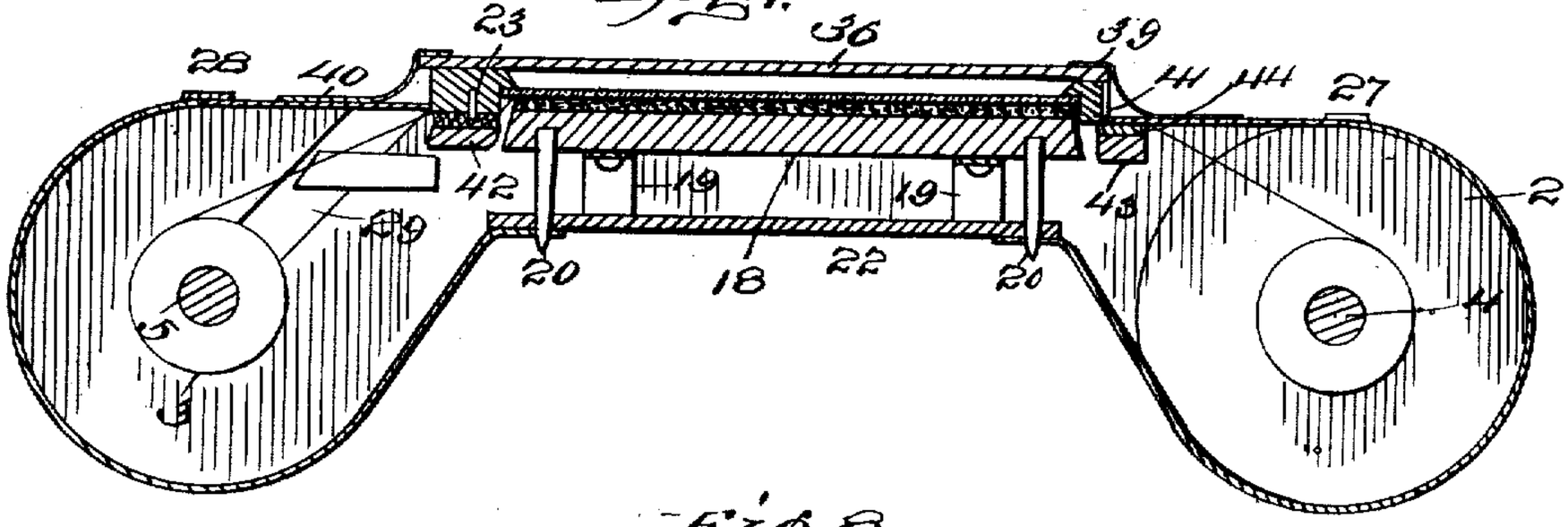
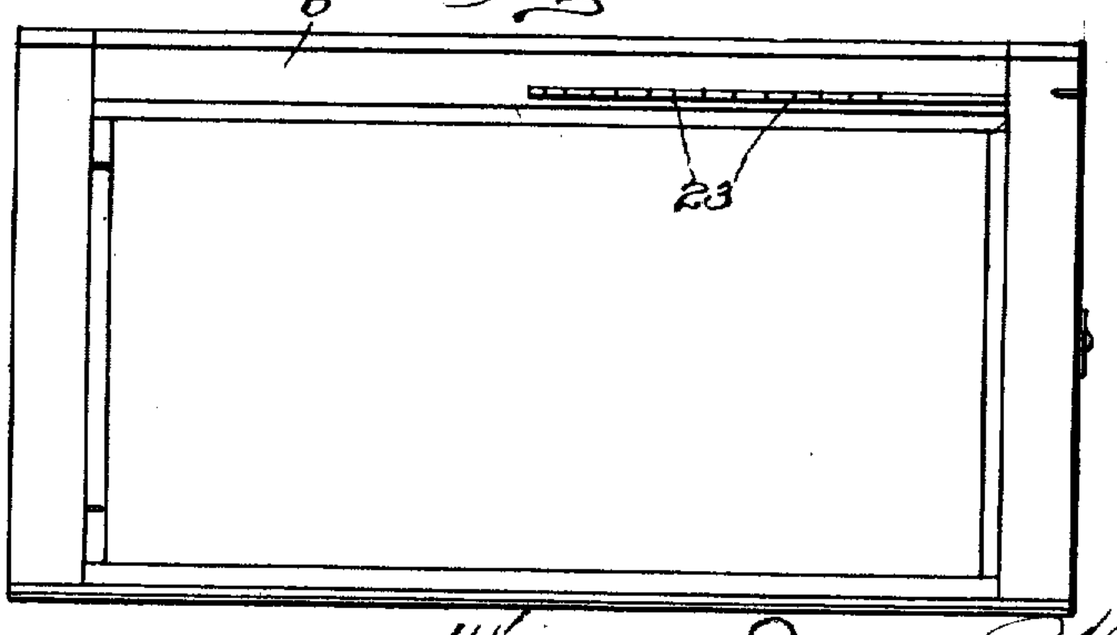


Fig. 8.



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UNITED STATES PATENT OFFICE.

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PRINTING APPARATUS.

No. 829,936. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed November 2, 1904. Serial No. 231,126.

To all whom it may concern:

Be it known that I, JAMES W. WOODILL, a citizen of the United States, residing at Dorchester, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Printing Apparatus; 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.

My invention relates to improvements in photographic apparatus, and particularly to mechanism for printing pictures upon properly-sensitized paper.

The invention consists in an apparatus comprising a paper-inclosing casing, a negative-holding casing, and means for keeping the paper in proper contact with the negative during the printing operation.

The invention also consists in a closed casing having compartments for receiving and storing sensitized paper, a negative-casing carried by the said inclosed casing, and means for exerting a pressure upon the sensitized paper and holding it in contact with the paper.

The invention further consists in a light-excluding casing for holding sensitized paper, a negative-casing mounted thereon, and an indicator carried by the casing and operated by the negative-casing for keeping a tally of the number of exposures made upon the sensitized paper.

The invention also consists in certain other novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a perspective view of my improved printing apparatus. Fig. 2 is a longitudinal vertical section through the same. Fig. 3 is a transverse vertical section through the central part of the printing-casing, showing the means for holding the sensitized paper in contact with the negative with an even pressure. Fig. 4 is a detail view showing the negative-carrying casing. Fig. 5 is an enlarged vertical sectional view through the negative-holding casing. Fig. 6 is a perspective view of the printing apparatus with the light-excluding cover in its closed position. Fig. 7 is a vertical longitudinal section through the apparatus with the cover closed; and Fig. 8 is a detail view in elevation of the negative-carrying frame in inverted position, showing the marking-teeth carried thereby and the cutter mounted thereon.

The apparatus forming the subject-matter of the present invention is designed for the purpose of printing a number of images upon a continuous strip or piece of sensitized material or paper, and the device is so constructed that a roll of sensitized material may be placed in the casing of the apparatus and be passed from one portion thereof to another beneath a negative, the paper being kept from the light, and thus preserved in a fresh and active condition during the time taken for making a large number of prints.

A practical structure for carrying out the features of the invention is illustrated in the accompanying drawings, in which 1 indicates a casing, formed with dark compartments 2 and 3, adapted to receive rolls 4 and 5, upon which sensitized materials, such as paper or the like, may be wound, the said paper being cut in an elongated strip for that purpose. Upon an intermediate portion of the casing 1 is mounted a negative-carrying casing 6, which is preferably hinged to the said casing at one edge thereof, as shown at 7. The opposite edge of the negative-casing carries a catch, as 8, which engages a detent or pin 9. The catch proper has a spring action and slips over the end of the projecting detent 9, so as to snap over the same and positively hold the frame in its closed or folded position, as shown in Figs. 1, 2, and 3. The negative-casing 6 is provided with an overhanging flange 10, forming a rabbeted recess upon the inner surface of the casing for receiving a negative-frame 11. The negative-frame 11 is also provided with a rabbeted recess upon its inner edge for receiving the negative. The said negative-frame is provided with inwardly-projecting lugs 12, overhanging the rabbeted recess upon one edge of the frame, and in inserting a negative the edge of the negative is first slipped beneath the said lugs 12 and then permitted to fall into the rabbeted recesses in the frame.

A turn-button or pivoted catch 13 is secured to the opposite edge of the frame and may be turned so as to overhang the edge of the negative and hold it positively in position

in the frame. The frame, with its negative, is then in condition to be inserted in the negative casing 6. The casing is also provided with inwardly-overhanging lugs or detents 14, projecting from one edge of said frame and adapted to prevent the negative-frame from falling from the casing when the said casing is being folded or unfolded upon the casing 1. The negative-frame may be locked in the casing in any suitable manner, but I preferably employ a removable slide or bar 15, which fits into an elongated slot 16, formed in the edge of the casing 6. The slide 15 is made to fit snugly in the slot 16, and its inner edge is beveled, so as to overhang the edge of the negative-frame and holding said frame against the flange 10 of the casing 6. The said slide also carries a projecting lug or detent 17, which extends a little distance over the edge of the negative-frame for positively holding the negative-frame in position and preventing the possibility of it falling from its position. The slot 16 in the negative-casing may be made sufficiently large to receive the negative-frame, and the negative-frame may be inserted in said casing or removed therefrom through the said slot, if desired. It will be observed, however, that the negative-frame can be quite readily removed from the interior of the casing by folding it back upon its hinges and withdrawing the slide 15, after which one edge of the frame may be lifted and the other edge then withdrawn from beneath the lugs or pins 14. When the negative-frame is in position beneath the said lugs or pins 14 and the slide 15 has been inserted in place, the negative-casing may be turned downwardly upon the casing 1, as shown in Fig. 1, without danger of the negative or its frame falling from its position.

Mounted in the casing 1 and directly beneath the negative-frame is a pressure-producing platen or board 18. This platen 18 is forced upwardly normally by one or more pressure-exerting springs 19, which are secured to the under surface of the said platen. The platen is guided in its vertical movement by depending pins 20, which are secured to the platen and extend through guiding-apertures 21, formed in the bottom of the casing 1. The depth of the casing is greatly diminished beneath the negative-casing, so that there is not a great space left between the said platen and the bottom 22 of the casing 1. The platen or pressure-board 18 carries upon its upper surface a cloth or yielding material of some character for engaging the sensitized paper, which passes over the platen, and pressing the same evenly against the under surface of the negative-paper. The strength of the springs 19 is such that when the negative-casing 6 is turned backwardly upon its hinges the platen will rise, so that its upper surface is above the upper contour of the inclosing casing 1. When the negative-casing is closed or folded, it forces the platen downwardly against the action of the springs 19, and thus the proper pressure is exerted in holding the sensitized paper in contact with the negative.

The casing 6 may be provided with a projecting marker 23, which may be in the shape of one or more pins or projections, as shown in Fig. 8. These projecting pins form marking means and engage the web of the paper when the casing is closed and serve as an indication of how much of the paper is exposed at one time and how far it should be moved in order not to produce a lap of the exposures. It will be apparent, of course, that the negative-frame 11 may be provided with such pin, as at 24, if desired, in which event it need not be placed upon the casing. It is preferable to place it upon the casing, however, as it can then be used whether an auxiliary negative frame or casing 11 is employed or not. It will be apparent that a crayon or other color-depositing means may be employed instead of the pin above referred to.

It will be evident that the negative frame or kit might be dispensed with, if desired, if the negative is large enough to fit into the rabbeted recess of the negative-casing 6. In this event the negative itself takes the place of the negative-kit and is inserted beneath the projecting pins 14 and is further secured in the negative-casing by the insertion of the bar 15, with its overhanging projections 17.

It will be understood that different sizes of inner frames 11 may be employed to hold the different-sized plates, and a number of such frames or kits may be kept on hand to adapt the printing mechanism to various sizes of negatives. In this manner the printing device can be used with a large range of negatives. The end portions of the casing 1, which form the dark compartments 2 and 3, are provided with pivoted lids or covers 25 and 26, which are hinged at 27 and 28, so that when the negative-casing is opened they may be folded back upon the ends of the casing 1 to permit of access to the dark compartments for the insertion or removal of the rolls of paper mounted therein. The inner edges of the hinged covers 25 and 26 are held downwardly by the overhanging edges of the negative-casing when it is folded downward upon the casing 1. The covers 25 and 26 are thus prevented from opening when the printing-frame is exposed in the sunlight or in an artificial light in performing the printing operation. The rolls 4 and 5 are so mounted in the dark compartments 2 and 3 that they may be removed at any time, whether wound or unwound. As shown in Fig. 2, the side walls of the casing 1 are provided with inclined grooves 29, which receive the ends of the roll carrying the sensitized paper. It is only necessary to provide a groove upon one side of the frame for facilitating the insertion

or removal of the roll 4 or 5. The journal at one end of the roll is first inserted in a socket formed in the side wall of the casing, and then the journal at the other end of the roll is permitted to drop into position through the groove 29. In compartment 2 the groove 29 is placed in the wall on the opposite side of the casing from that shown in compartment 3. In this manner no matter at which end of the casing the aperture stands the roll may always be lifted at the left-hand end. Any desired means might be employed for holding rolls in position in the said dark compartments after they have been placed therein. One of the rolls—as, for instance, the roll 4—may be provided with a projecting axial portion, as 30, which extends through one of the walls of the casing 1. The said projecting portion may be provided with any suitable handle by which the roll may be turned. In this manner the sensitized material employed in the printing apparatus may be wound from the roll 5 upon the roll 4, the said material being drawn across the pressure-platen 18 in this manner. In order to direct the winding of the paper or other sensitized material upon the roll 4, I contemplate using pivoted guide-arms 31, secured upon the inner surface of the walls of the casing 1 at points near one edge of the platen 18. The other ends of the said projections are offset and extend toward the roll or spool 4. The pivotally-mounted guide-arms may be set at such an angle as to engage the edges of the web of paper as it travels toward the roll 4, upon which it is being wound.

As the images taken from the negative are formed upon a traveling strip of sensitized paper which is kept within the closure of the casing to protect it from the effects of light, it is desirable to have some means of determining the number of prints secured. In the drawings I have shown a simple and yet effective means for accomplishing this purpose, comprising a ratchet-disk 32, which is pivotally mounted in a recess 33, formed in the side of the casing 1. The ratchet-disk is engaged by a spring-bar 34, carried by the free edge of the negative-casing 6. The ratchet-disk 32 is prevented from taking a retrograde movement by means of a spring-pawl 35, which is secured to the wall of the casing 1 and projects into the recess 33, so as to engage the ratchet-teeth upon the edge of the ratchet-disk 32. The ratchet-teeth upon the disk are provided with numbers adjacent thereto, the said numbers being shown in the drawings as extending from "1" to "10". The parts of the ratchet mechanism are so proportioned and arranged with respect to each other that when the negative-casing 6 is closed the ratchet-disk will be turned the distance of one point or ratchet-tooth upon its pivot. Since the casing 6 must be opened after each exposure, so that the sensitized paper may be moved forwardly to present a fresh portion thereof for the next print, the frame must be closed after each of such operations and will operate the ratchet-disk 32. In this manner the number of exposures of a particular negative can be reckoned, and although the images upon the sensitized material cannot be seen before developed, yet the indicator informs the operator when the desired number of prints have been secured. At the time when each negative is placed in the frame the disk may be reset, beginning at "1," in order to count the number of prints for the said negative. The disk may be turned by pushing the ratchet-teeth about, or the casing may be opened or closed a number of times on setting the disk at its starting-point. As will be observed, all the teeth on the ratchet-wheel are of the same size and in the proper position, except the one which has the slot 45. This particular tooth is longer than any of the other teeth in order that it will require the ratchet to be manually operated before the automatic means will again come into operation. By this means the mechanism will count ten and then cease to operate, because the spring 34 contacts with the tooth having the slot 45 therein. Thus when the ratchet-wheel is moved manually, so as to allow the spring to rest upon the tooth 1, the ratchet will then automatically operate until the spring comes to the slot 45, when it will remain in that position until manually operated again.

As shown in Figs. 6 and 7, I contemplate employing a cover or shutter, as 36, for the negative-frame, which assists materially in obtaining successful prints and in guarding the printing-paper from too much exposure to the light. Such a shutter is hinged at one edge, as at 37, to the negative-casing 6, while the other edge is formed with a loose flap 38, which overhangs the edge of the casing, as is shown in Fig. 6. I also employ laterally-extending auxiliary flaps 39 and 40, which overhang the edges of the casing and which extend transversely of the frame. One of the said flaps, as 39, may be made of comparatively thin material, so that in lifting the flap slightly to examine the paper beneath enough light will be permitted to enter around the flap and through it to make it possible to see the marks on the paper which are left by the marking projections 23. The flaps hang over the edges of the frame sufficiently to permit the frame to be raised enough to disengage the sensitive paper from the markers for moving the sensitized paper longitudinally without the danger of admitting too much light.

In order to be able to sever the prints from the web, I provide the casing 6 with a cutter or knife 41, extending along one edge of the frame transversely of the apparatus. As shown in Fig. 7, transverse bars or supports

42 43 are arranged in the frame of the casing so as to lie beneath the marker 23 and the cutter 41. The upper surface of the transverse bar 42 is supplied with yielding material, forming a pad into which the teeth of the marker may embed themselves after perforating or indenting the paper. The upper surface of the transverse bar 43 is likewise padded; but I usually form this pad, as 44, of rubber or like material. This forms a suitable material to underlie the paper when the cutter or knife 41 is forced against the same. It will be apparent that in marking impressions upon the continuous web of paper and storing the web with its printed impressions within a casing the indicator above described will be useful in keeping account of the number of prints wound up upon the roll. When severing each print from the web, however, as they are made, it is not necessary to employ the indicator. When not using the indicator, the disk 32 is turned so that the end of the spring 34 will engage a slot 45, formed in the edge of the disk. This slot is made sufficiently deep to prevent the turning of the disk by the action of the spring 34. When the disk is to be used, it is only necessary to rotate it sufficiently to bring the spring 34 into engagement with the first counting-tooth to one side of the slot 45.

In the operation of the device a roll of sensitized material is placed in one of the dark compartments, as 3, and the end thereof carried over to the spool or roll 4, mounted in the other dark compartment 2, the web of the paper passing over the upper surface of the pressure-platen 18 and beneath the negative. The negative from which it is desired to secure prints is then placed in the negative-casing, which is folded downwardly upon the casing 1 and held in position by catch 8. The printing device is so placed that the plate may be exposed in the rays of the sun or an artificial light the proper length of time, after which the negative-casing is opened and the web of paper wound upon the spool 4 until a fresh stretch thereof is brought beneath the negative. The negative-casing is then closed again and the operation is repeated. This operation is performed as many times as is necessary to secure the desired number of copies of the particular negative. The opening and closing of the frame or casing 6 in the meantime operates the indicating-disk, so that a tally is kept upon the number of prints made upon the negative. After all the prints have been made which can be accommodated on the strip of sensitized paper the roll thereof may be removed from the casing 1 and the prints may be finished, they being either toned or developed according as a printing-out paper or a developing-paper is employed. If preferred, the prints may be developed or toned in the strip or they may be cut apart and developed singly or in small batches. Of course when thus cutting the prints the sensitized material is not rolled upon the roll 4, but is merely pulled over the platen from roll 5, and after each print has been taken the end of the roll lying upon the platen is pulled sufficiently far beyond the said platen to rest upon the cross-bar 43, and by lowering the frame 6 the knife 41 will sever the paper, and the undeveloped or untoned print may be immediately developed or toned for finishing purposes.

In operating the mechanism the cover 36 can be raised slightly at the edge for inspecting the paper and the markings or indentations produced upon the paper by the marker 23 and will show the operator how far to unwind the web and will also indicate the points at which the prints should be cut and detached from the web. The device will thus be seen to be admirably adapted for the printing of pictures from negatives of all kinds and sizes, and although the prints are placed successively upon a continuous web of paper the paper printed upon is thoroughly protected from the light and preserved while these operations are being performed. In removing or replacing the sensitized paper in the casing the negative frame and casing is folded back, as well as the covers 25 and 26, and in this manner ample access is had to the entire interior portion of the said casing 1.

Having now described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A printing apparatus, comprising a casing having compartments for holding sensitized material and provided with an opening in its top wall, means overhanging the said opening for supporting a negative above the paper, and means mounted upon the casing for forcing the paper above the level of the top wall for bringing it into contact with the negative.

2. A printing apparatus, comprising a dark casing for holding sensitized material, a spring-pressed platen mounted upon the casing, means on the platen engaging the said casing for guiding the platen in its movement, the top of the casing being provided with an opening, and means covering the opening and extending above the platen for holding a negative in position with respect to the sensitized paper.

3. A printing apparatus, comprising a casing having enlarged dark compartments, means therein for holding a continuous web of paper, the casing being elevated between the compartments, a yielding platen movably guided upon the said casing and a negative-holding means arranged in the top or upper wall of the casing and overhanging the platen.

4. A photographic-printing apparatus comprising a casing having enlarged end dark compartments, means therein for holding a

web of sensitized paper, a negative-frame mounted upon the top of the casing, the said top being formed with a central aperture, spring-actuated means mounted upon the casing beneath the said aperture for pressing the sensitized paper against a negative and means carried by the spring-actuated means for guiding it with respect to the casing.

5. A photographic-printing apparatus, comprising a casing having enlarged end compartments, means for holding and passing a web of sensitized material from one compartment to the other, a raised portion of the casing arranged between the compartments, a spring-actuated platen mounted on the casing, guiding means on the platen and extending through the casing for directing the platen in its movement, the top of the casing having a central opening over said platen, and a pivoted negative-carrying means secured to one side of the casing and folding downwardly over said opening.

6. A photographic-printing apparatus, comprising a casing having an enlarged dark compartment at each end, a raised central portion, a spring-pressed platen mounted thereon, guides projecting from said platen and engaging said portion, the top of the casing being formed with a central aperture, and means forming the cover or top of the casing comprising a central movable negative-frame and exterior end flaps pivotally secured to the end portions of the casing.

7. A photographic-printing apparatus, comprising a casing having dark compartments for holding sensitized material, a platen mounted upon the casing between the dark compartments, springs secured to the platen and bearing upon the said casing, guiding means secured to the platen and engaging the casing, and means for holding a negative against the said platen.

8. A printing apparatus for photographic operations, comprising a casing having dark compartments for holding sensitized material, a spring-controlled platen movably mounted on the casing, a pivoted frame extending across the top of the casing and capable of holding a negative, the platen being adapted to press the paper against the negative, and flexible means carried by the frame for excluding light around the edges of the frame.

9. A photographic-printing apparatus, comprising a casing closed against light having dark compartments formed therein for holding a web of sensitized material, the top of the casing being provided with a central opening, means for supporting a negative above the opening in the casing, and means mounted upon the casing for pressing the sensitized material upwardly through the opening against the negative.

10. A photographic-printing apparatus, comprising a casing having dark compartments formed therein, winding means in said dark compartments for holding a strip of sensitized material, the top wall of the casing having an opening formed therein, a frame pivoted to the casing and extending transversely over said opening, the said frame being capable of holding a negative in position, and means carried by the said frame for marking the web of sensitized material.

11. A photographic-printing apparatus, comprising a dark casing, a cover hinged to the said casing and having an opening in the top wall thereof, flaps secured to the ends and one of the side edges of the cover for excluding light from crevices between the frame and the casing, and means for pressing a web of sensitized material upwardly against a negative in said frame.

12. A photographic-printing apparatus, comprising a casing having sensitized paper-holding compartments, a cover or top for the casing having an opening formed therein, a frame hinged to the casing and capable of holding a negative over said opening, a platen mounted upon the bottom of the casing, guiding-points projecting through apertures in the said casing-bottom, the said points permitting of an up-and-down movement of the platen, and springs carried by the platen and engaging the floor of the casing for forcing the platen upwardly against the sensitized material passing over the same.

13. A photographic-printing apparatus, comprising a casing having end dark compartments and a contracted central portion, a platen mounted upon the floor of the casing, means for covering the platen and the dark compartments comprising a hinged frame mounted so as to extend laterally across the casing, and hinged flaps secured to the dark compartments and having a movement at right angles to the hinged movement of the frame, and means for excluding light from the joints in the parts.

14. A printing-frame comprising a casing for holding sensitized paper, a negative-frame mounted thereon having a rabbeted recess upon its under surface, and having a slot to one side of said recess through which a negative may be inserted or removed, a strip or bar for closing the said slot or opening, the said bar having means for holding the negative in place, and means carried by the frame overhanging another edge of the negative for further holding the same in position.

15. A printing apparatus comprising a casing for inclosing a sensitized paper having an opening in one side, a hinged negative-carrying casing mounted adjacent to said opening, a removable negative-frame mounted in the said hinged casing, overhanging lugs for engaging one edge of the negative-frame, a removable retaining-strip overhanging another edge of the negative-frame, and

means for removably holding a negative in the frame, and means for latching and holding the negative-casing in its folded position over the sensitized paper in the casing.

16. A printing mechanism comprising a light-excluding casing, a strip of sensitized paper movably mounted therein, a frame for carrying a negative and pressing the same to the sensitized paper, and means projecting from the said casing and engaging the strip of paper for preventing its movement during the printing operation.

17. A printing mechanism comprising a closed casing, a hinged negative-carrying frame mounted upon the casing, means in the casing for moving and holding a strip of sensitized paper in position beneath the negative, and a projecting point or detent carried by the negative-frame and engaging the said sensitized paper.

18. A printing mechanism comprising a closed casing, means for movably holding an elongated strip of sensitized paper in the said casing, a hinged negative-carrying casing, a negative-frame mounted therein and a projecting penetrating-point carried by the negative-frame and engaging the sensitized paper when the print is being made, the said point preventing any movement of the sensitized paper with respect to the negative.

19. A printing apparatus comprising a closed casing for holding sensitized paper, a hinged printing-frame mounted thereon, a marker carried by one edge of the frame and a cutter carried by the other edge thereof for severing the prints as they are made.

20. A printing apparatus comprising a closed casing for holding sensitized material, a negative-holding frame mounted thereon, a marker and a cutter carried by the said frame and pads arranged beneath the marker and cutter for holding the sensitized material against the same.

21. A printing apparatus comprising a closed casing for holding sensitized material, a negative-frame mounted thereon, a cover arranged to cover the negative-frame and provided with flexible flaps, for excluding the light when the frame is raised to wind in the last exposure.

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

JAMES W. WOODILL.

Witnesses:
IDA M. HASKELL,
E. B. TOLMAN.