No. 863,227. PATENTED AUG. 13, 1907.

L. W. SHELDON & A. M. & J. W. AYERS.

CUTTING MACHINE.

APPLICATION FILED MAY 31, 1905.

3 SHEETS—SHEET 1.

Fig. 1

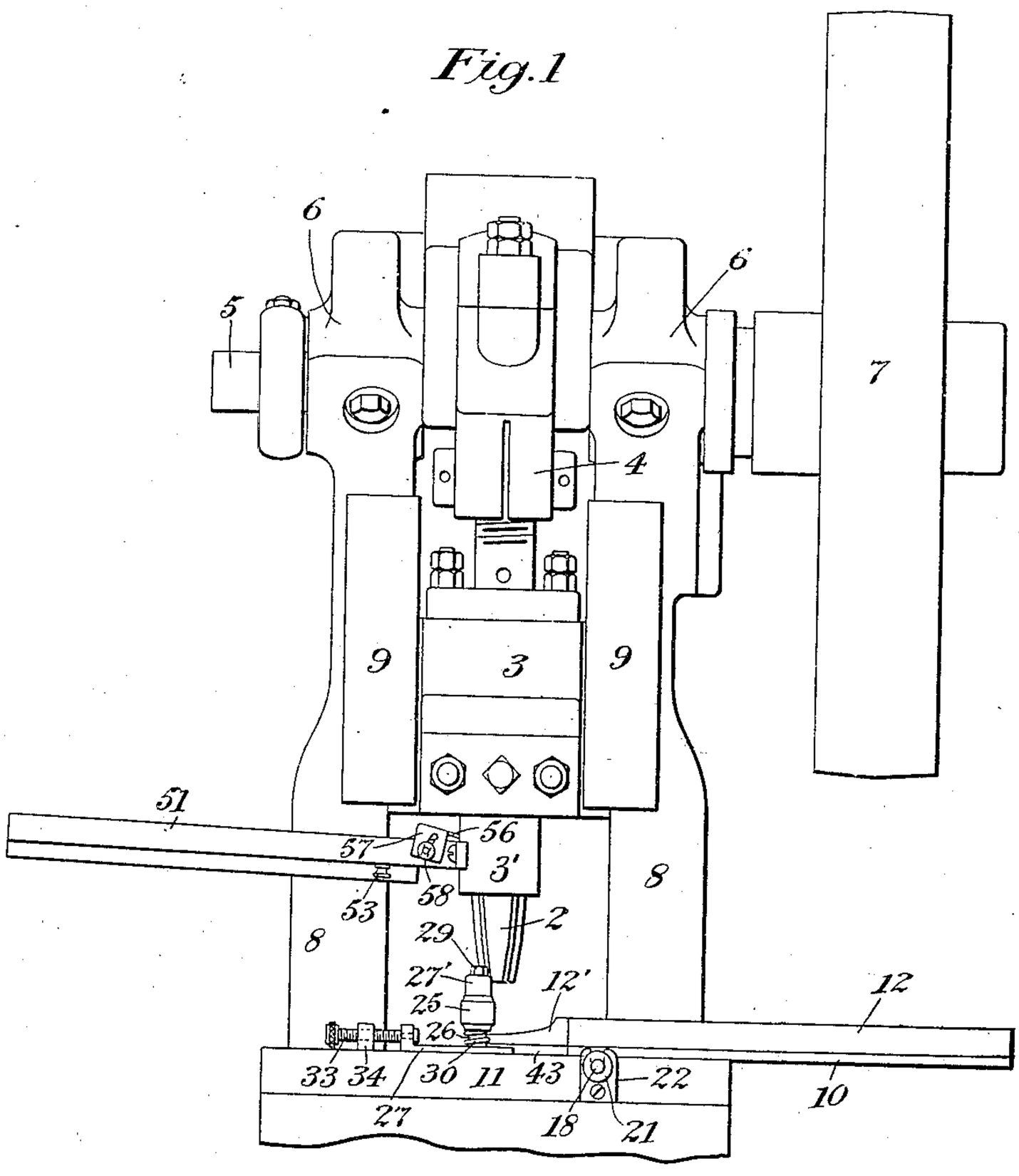


Fig. 10

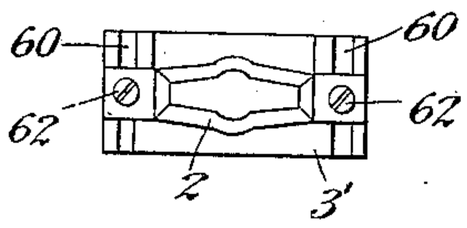
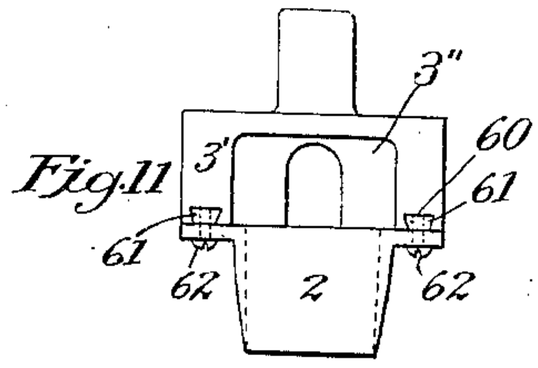


Fig. 11



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3 SHEETS—SHEET 2.

Fig. 2

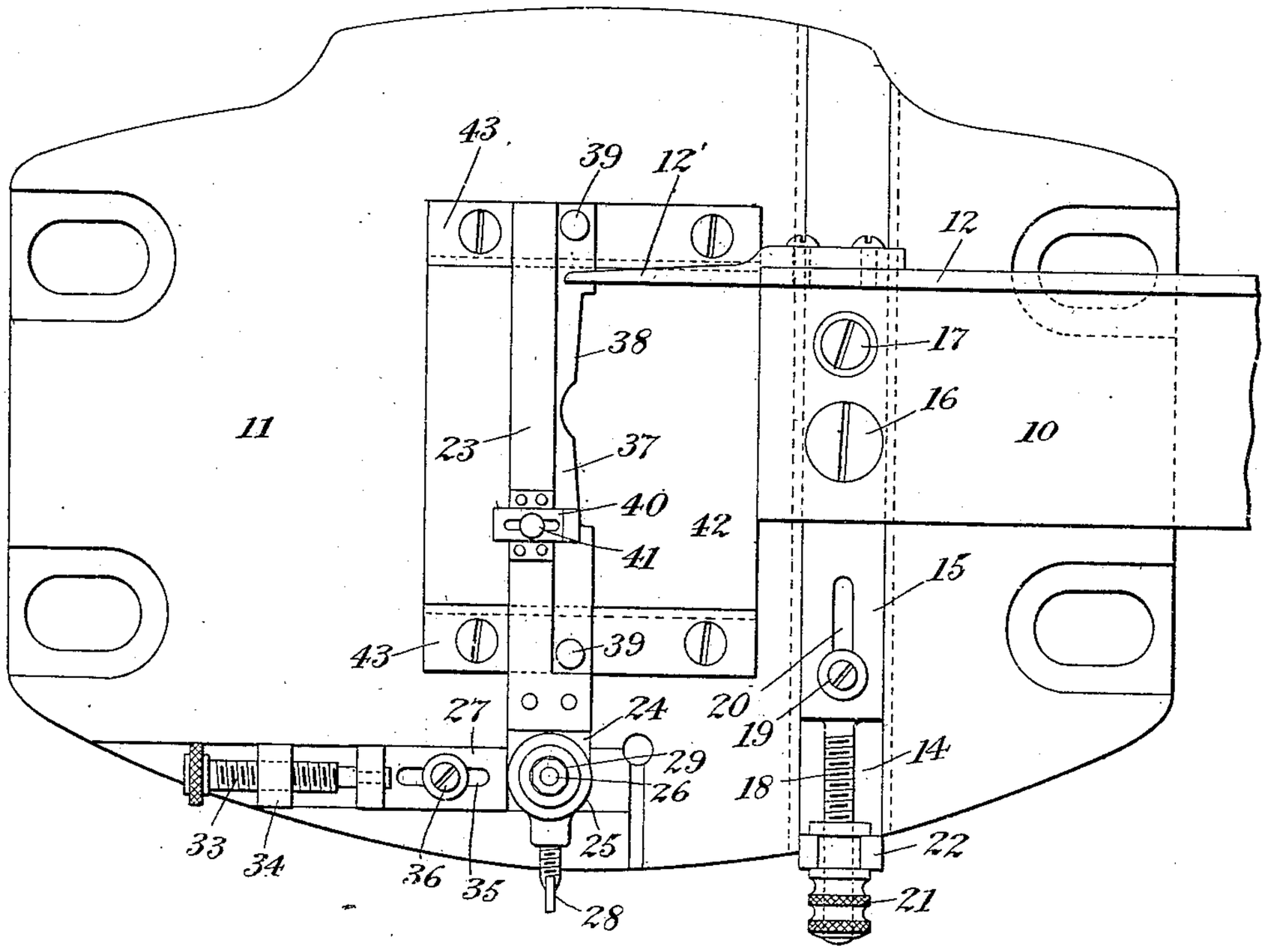
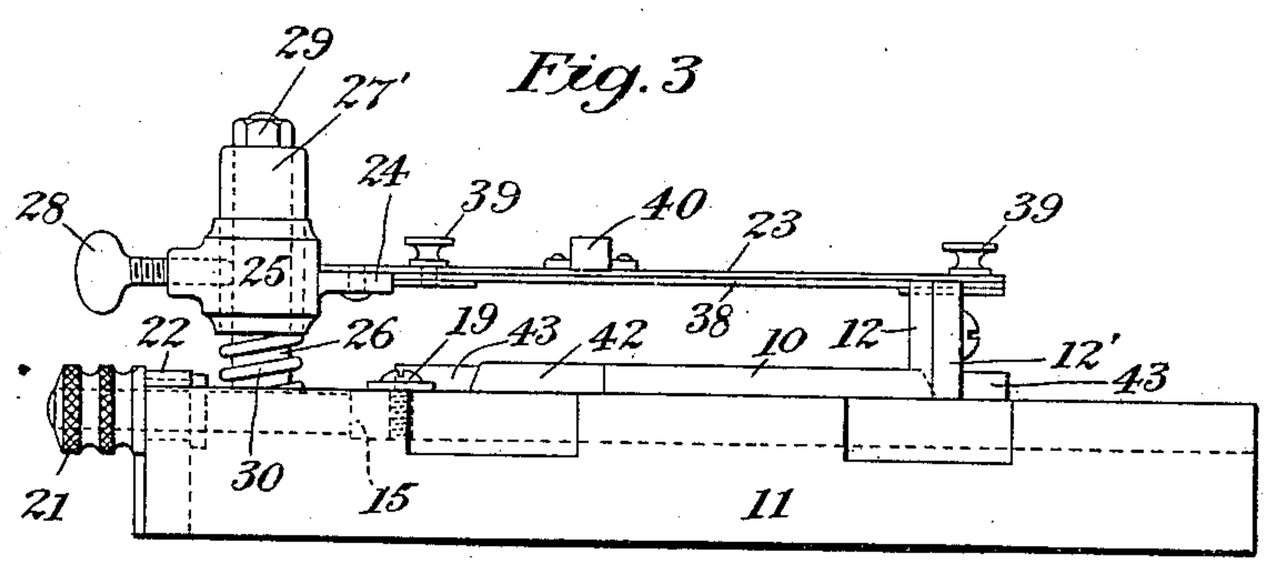


Fig. 3



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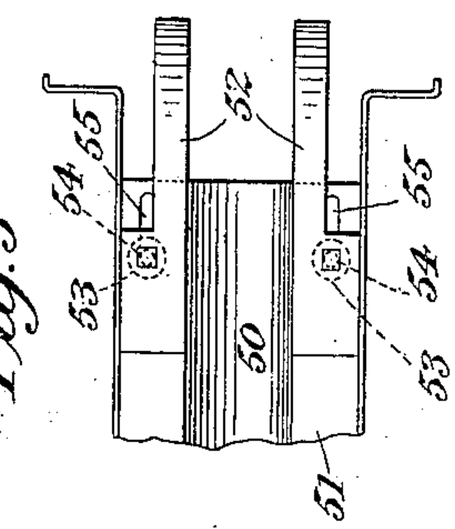
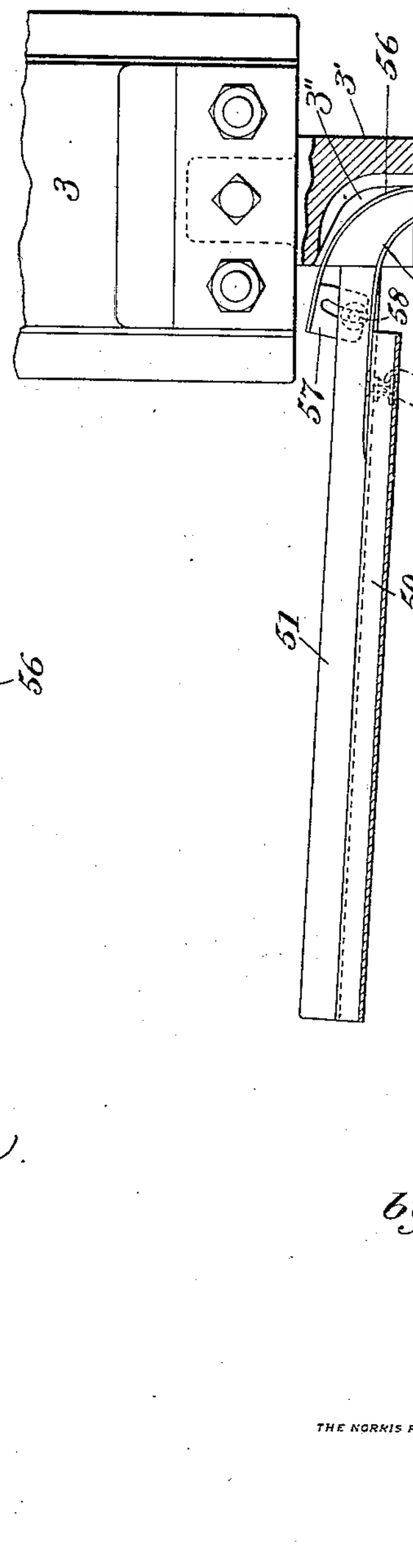
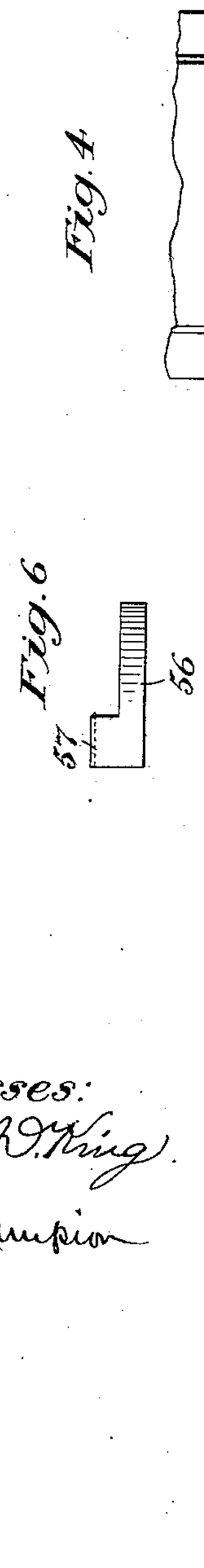
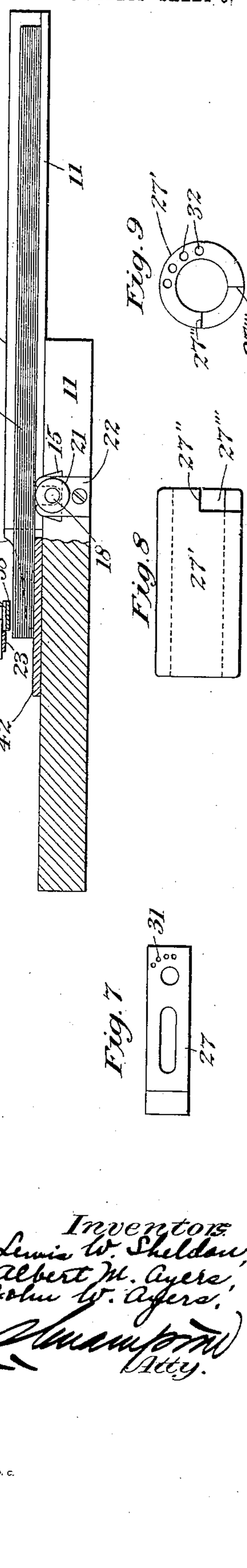
3 SHEETS—SHEET 3.









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UNITED STATES PATENT OFFICE.

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CUTTING-MACHINE.

No. 863,227. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed May 31, 1905. Serial No. 262,990.

To all whom it may concern:

Be it known that we, LEWIS W. SHELDON, ALBERT M. AYERS, and JOHN W. AYERS, citizens of the United States, and residents of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Cutting-Machines, of which the following is a specification.

This invention relates to cutting machines, and particularly to a machine for cutting out prints, such for example as labels, from sheets.

Labels and similar articles of small size are printed in multiple on long sheets or strips, and separate prints are always irregularly spaced, the intervals between successive prints varying slightly, but sufficiently to be easily noticeable. Efforts have been made to separate the individual labels from a sheet by intermittently imparting to such sheet by means of automatic mechanism regular feed movements. Because of the variations in the intervals between prints it is, however, impossible to locate such labels in registering cutting relation with the die or knife with which they are cut from the sheet, for the reason that the labels are irregularly spaced on the sheet, and for the further reason that the error which results from irregular spacing of the labels is cumulative, and unless corrected the location of the successive labels with respect to the cutting die will be more and more inaccurate as the end of the roll or sheet of labels is approached.

The principal object of the present invention is to provide an improved machine by means of which articles such as irregularly-spaced labels, may be properly located in registering cutting relation with a die or knife before being cut from the sheet. In order to accomplish this result we provide gaging means which coöperates with the forward end of the sheet, or preferably with the forward end of a bank or pad of sheets in which superposed labels on different sheets register with one another, in such a manner as to gage or locate the first article or label on the sheet in registering cutting relation with the die or knife before it is cut from the sheet by the knife. As each print is thus cut from the sheet by the knife the next print consitutes the first of a new series and is individually gaged in the manner just described to bring it also into registering cutting relation with the die. By thus gaging individually the first print or label of each series from the forward end of the sheet, that is to say, by means of a gaging device or devices coacting directly with the first print, that is, the print at the forward end of the sheet and nearest the cutting die, the successive prints as they reach the gaging means may be readily located and gaged in such a manner as to eliminate not only the cumulative error which results from feeding the sheet a series of equal feed distances by automatic mechanism, but also the individual error which results from feeding the sheet a predetermined feed-distance when the interval between two succeeding prints is not the same as the distance represented by such feed.

Another important feature of our invention is a delivery-chute coöperative with a cutting die or hollow knife of the usual type in such a manner as to permit the automatic delivery of the cut-out articles or prints from the knife without any alteration in the knife itself, this chute serving to receive cut-out articles or prints from the opening in the top of the knife and to deliver the same automatically at any desired point. The delivery means employed is also of such a type as to adapt it for use with knives of different sizes, the receiving end of the delivery-chute used being preferably adjustable in area to enable it to coöperate with knives having openings in the tops thereof of different sizes. The adjustment of the area of the receiving opening at the receiving end of the delivery chute may be effected by suitable adjustable guide-walls or guide-fingers forming a passage constituting a continuation of the opening in the die.

Other features of our invention not hereinbefore referred to will be hereinafter described and claimed and are illustrated in the accompanying drawings, in which

Figure 1 is a front elevation of the upper portion of a cutting machine embodying our invention and illustrates all of the new features of the mechanism. Fig. 2 is an enlarged plan of the bed-plate or bolster-plate of the machine with sheet-holding and gaging means secured thereto. Fig. 3 is an end elevation of the same, looking from the right in Fig. 2. Fig. 4 is an enlarged sectional front elevation of a portion of said machine, showing the knife, delivery-chute, the sheet-supporting means and the gaging means therefor in cooperative relation with one another. Fig. 5 is a detail illustrating in plan a portion of the receiving end of the delivery-chute. Fig. 6 is a detail of one of the upper guide-fingers of the delivery-chute. Figs. 7, 8 and 9 10 and 11 are details which will be hereinafter described.

Similar characters designate like parts in all the figures of the drawings.

Any suitable means may be employed for supporting and operating the cutting die or hollow knife by means of which articles such as labels are cut from a sheet or sheets. This knife will usually be secured to or in fixed relation with the plunger or cross-head of a power press of any suitable type. One type of power press suitable for the purpose is illustrated in Fig. 1, 2 designating the die or hollow knife for cutting out the articles or labels from the sheets, 3 a cross-head or plunger with which the die 2 is fixedly connected, 4 a pitman to which the plunger is secured, 5 a crank-shaft for operating said pitman, 6 a pair of bearings for said crank-shaft, 7 a fly-wheel for regulating the movements of the crank-shaft, 8 the uprights carrying the shaft-bearings,

and 9 guides for the sliding plunger 3. All of these parts are of well-known construction and operate in a manner which is well understood.

The cutting die 2 is preferably a hollow knife open at both top and bottom and having walls which taper externally to a cutting edge, the contour of which is determined by that of the articles to be cut from the sheets. The walls of the opening in the knife 2 are substantially parallel in order that they may form guides for delivering the cut-out articles or labels to suitable delivery means. This knife is secured to the cross-head or plunger 3 in such a manner as to reciprocate in fixed relation therewith.

The sheet or sheets from which the articles or labels are to be cut may be supported in any desired manner in coöperative relation with the cutting die or knife. Here a sheet-support or pad-support in the form of a relatively long shelf is shown at 10 and is connected to a suitable fixed part of the machine, preferably to the bolster-plate 11. The support 10 also preferably has at its back edge a rectangular projection rising therefrom and constituting a stop-wall or back-gage 12 for locating the back edge of a sheet or bank of sheets supported on the shelf 10. Such a bank of sheets is indicated at 13. The shelf 10 and the back-gage 12 may be shifted crosswise of the line of feed of the sheets by any suitable adjusting means in order to obtain a fine adjustment of the labels in a direction crosswise of the sheet, and thus bring them into perfect registration with the knife 2 in such direction. For the purpose of accomplishing this adjustment the bolster-plate 11 has a guideway 14 therein for the reception of a transverse slide 15, which is fastened to the support 10 as by means of screws 16 and 17, an adjusting-screw 18 being adjustably connected to said cross-slide 15 by means of a screw-and-slot connection 19 and 20, said screw having a knurled thumb-nut 21 screwed onto the end thereof, which thumb-nut is held against longitudinal movement by means of a guide 22 fastened to the front edge of the bolster-plate 11. By turning this thumb-nut to the right or the left the cross-slide 15 may be shifted in one direction or the other and the adjustment of the back-gage 12 correspondingly changed.

The most important element of the gaging means for locating the first print of each series in registering cutting relation with the knife 2 is an end-gage for the purpose of effecting registration of the print with the knife in the direction of the length of the sheet of prints. Any suitable type of end-gage coöperative with the forward end of a sheet or bank of sheets may be employed. The principal feature of the end-gage shown herein is a gage-holder 23, preferably of sheet-metal and secured to a bracket 24 having a hub 25 journaled on a stud 26 secured to a gage-slide 27. This gage-holder is preferably capable of movement in different directions, the chief movement being a movement in a straight line in the direction of the sheet of prints, another being an adjustment depthwise of the sheet or bank of prints for the purpose of adapting the gage to coöperate with banks or pads of sheets of different thicknesses, and the third adjustment being about the axis of the stud 26, this adjustment being obtained by turning the hub 25 on, and changing its adjustment relative to, a sleeve or collar 27′ journaled directly on the stud 26 and interposed between the stud and the hub 25. A thumb-screw is provided at 28 for the purpose of clamping the hub 25 and the sleeve 27′ together in any desired adjusted position. A stop, such as the nut 29, serves to limit the upward movement of the collar 27′ and the gage-holder secured thereto. The vertical position of said collar and of the gage-holder may be determined by means of the adjusting-screw 28. A spring, such as 30, will normally force up the gage-holder and locate it in its uppermost position on the stud 26. This spring is a coiled spring, the upper and lower ends of which extend into holes drilled in the lower end of the collar 27′ and the upper side of the gage-slide 27 respectively. A series of such holes may be drilled in each of these parts, as shown at 31 and 32 respectively, for the purpose of adjusting the tension of the spring 30. This spring serves not only to keep the end-gage in the vertical position to which it is adjusted but also constitutes a means for returning the gage-holder to its normal gaging position after it has been turned about its axis to shift it away from such position, as will be hereinafter more fully explained. The movement of the gage-slide 27 and of the end-gage lengthwise of the sheet of prints may be effected by an adjusting-screw 33 which is mounted in a screw-stud 34 driven into the bolster-plate and is connected at its inner end with the slide 27. By means of this screw 33 a fine adjustment of the end-gage may be obtained for the purpose of securing perfect registration of the first print of each series with the die regardless of the irregularities in spacing between said prints. The slide 27 has a slot 35 through which passes a clamping-screw 36, by means of which the slide may be clamped in place when desired. The end-gage proper is shown at 37 and is preferably a strip of fiber the edge or gage-line 38 of which conforms to a part of the outline of the print or label to be cut from the sheets. This strip of fiber may be renewed or changed as often as desired, and may be held in place in any suitable manner, as by means of screws 39 at the opposite ends of the holder 23. This gage-holder 23 also carries in this case a gage-operating device in the form of a fiber slide 40 adjustably secured to the gage-holder by means of an adjusting-screw 41, the forward end of this slide having an inclined or cam-shaped face which coöperates with the inclined or cam-shaped lower outer wall of the knife 2. This fiber slide 40 and the cutting die or knife constitute means for shifting the end-gage away from and back to its gaging position on the working and return strokes respectively of said die. The object of this is to shift the fiber gage 38 out of the path of the cutting edge of the knife before the knife comes in contact with the sheet from which the print is to be cut. This swinging movement of the end-gage is permitted by the cut-away portion of the sleeve 27′, the limits of movement being defined by the stop-walls 27″ and 27‴. The fiber slide 40 may be renewed or its adjustment changed as often as necessary.

At the forward end of the support 10 the back-gage 12 preferably has secured thereto an extension 12′ preferably in the form of a hard-wood bracket which tapers gradually as it approaches the end-gage. Should this back-gage be struck accidentally by the knife, the knife will not be spoiled, and the wooden extension may be replaced when necessary. This extension also constitutes a gage which coöperates with the sheet or bank of sheets to locate the same properly with respect to the end-gage 38 when the last end of a sheet

or bank of sheets is fed beyond the forward end of the main part 12 of the back-gage.

At the point where the cutting operation takes place is a sheet of fiber or other suitable material, such as 42, for the purpose of preventing injury to the knife. This sheet of fiber or other material may be held in place by means of bevel-edged clamps 43 secured to the bolster-plate.

The sheets of material to be cut are preferably in multiple, in which case the superposed prints of the different sheets must register accurately with one another. This registration may be best effected by forming a bank of sheets into a pad in the manner in which writing-sheets are usually formed into pads. Such a pad 13 may be then fed forward by hand, a perfect registration of the first group of prints at the forward end of the pad being obtained by properly adjusting the back-gage and the end-gage by the devices before described. The height of the end-gage will be regulated by the adjusting-screw 28, and the gage proper 38 and the gage-holder 23 should be immediately above and clear the pad, so as to permit the pad to move freely thereunder.

When the cutting die or knife 2 is brought down it will cut through the labels registering therewith, and the bunch of labels thus cut out will be forced up into the opening in the die. On successive operations successive bunches or sets of prints will be cut from the pad, each set being first accurately registered with the knife by properly adjusting the gages 12 and 38.

As the cut-out prints are forced up into the die they should be removed by suitable delivery means. The means employed by us in this place is preferably a delivery-chute such as 50, which coöperates with the opening in the top of the die and forms a passage which is substantially a continuation of that through the die. This chute may be of any suitable type having a bottom wall and parallel sides walls for holding in place the cut-out labels. The chute illustrated herein is designated generally by 51. It will usually be made from sheet-metal, the body thereof being in one or more pieces as desired, and the receiving end thereof being so constructed as to coöperate properly with the die. In the preferred construction a single delivery-chute is so formed as to be capable of coöperation with cutting dies or knives of different sizes and contours, and in order that a single chute may be adapted for use with such different sizes of dies, the receiving end of the delivery-chute is preferably adjustable in area, it having one or more walls capable of adjustment to vary the area of the receiving openings. Here one or more guide-fingers, such as 52, are secured to the chute in such a manner as to form continuations of the bottom of the chute, at the receiving end thereof, and these fingers are preferably adjustable by means of nuts, such as 53, on screws, such as 54, working in slots 55 in the bottom of the chute; the chute itself, that is, the main portion thereof, being secured directly to the removable head 3′ at the lower part of such cross-head, and the fingers 52 being movable independently of the chute to obtain such adjustment. The fingers 52 are curved and extend down into alinement with the inner walls of the opening in the die, but do not extend into such opening. The opposite side of the guide-passage through which the cut-out prints pass may be also formed by an adjustable wall. This wall, as here shown, consists of a pair of adjustable curved guide-fingers 56 somewhat similar to those shown at 52 but having slotted ears 57 which are adjustably secured to the sides of the delivery-chute 51 by means of screw-and-nut connections 58 similar to those just described for adjusting the lower fingers 52. These two sets of guide-fingers 52 and 56 may be so adjusted as to adapt them to coöperate with a large number of dies of different sizes and contours.

It will be noticed that the knife-holder or head 3′ has an opening 3″ in one side thereof into which the fingers of the chute extend, and that this opening is formed by cutting away such side of the head to a sufficient depth, the back and side walls of the opening 3″ being properly shaped, as shown in Figs. 4, 10 and 11, to coöperate with said fingers. As the back wall of the opening 3″ is located in a fixed position it is necessary in order to permit knives of different widths to cooperate properly therewith, to provide means for obtaining a relative adjustment between the head 3′ and such knife. We prefer to employ the adjusting means shown herein for this purpose, the under side of the head 3′ having therein parallel guideways 60 running in the direction of the chute, in which guideways are placed adjustable wedges 61 to which the knife 2 may be secured by means of clamp-screws 62 passing through threaded openings in lugs 63 extending outwardly from opposite ends of the knife. When these clamp-screws are tightened up they draw the pieces 61 into wedging engagement with the sides of the guideways 60, and thus the knife is securely clamped in place with the back wall of the opening therein in alinement with the back wall of the opening 3″. By means of these adjustable wedges knives of various widths may be readily clamped in place and in their various proper positions with respect to the head. It will be obvious that in order to coöperate properly with knives of different widths the opening 3″ must not have a fixed front wall, and when made as shown with no front wall it is only necessary to locate the knife with respect to the back wall, the fingers 52 constituting the front guides for the cut-out labels as these are forced up through the opening in the knife. It will be noticed that the body of the chute is secured directly to the holder 3′ and that the fingers 52 and 56 extend into the opening 3″ and are adjustable therein with respect to the walls of the opening in the knife, these fingers serving to guide the cut-out labels into the body of the chute.

From the foregoing description of the mode of cutting out the prints and of the construction of the delivery-chute it will be evident that as the prints are cut out and pass up through the opening in the die they will be guided by the inner walls of the guide-fingers which form continuations of the inner walls of the opening in the die, but preferably do not project into such opening, and are forced up over the fingers 52 and onto the bottom of the delivery-chute in the proper positions with the upper sides of the labels facing toward the delivery end of the chute, at which point they may be removed by an attendant.

What we claim is:

1. In a machine for cutting out articles from a sheet, the combination with a cutting die and with power mechanism for actuating said die, of means for supporting the

sheet in coöperative relation with the die, and gaging means coöperative with the forward end of said sheet and embodying a stop and means for imparting a fine adjustment thereto for independently gaging the forward end of the first article of each series before it is cut from the sheet and securing a registering cutting relation between the die and each such article.

2. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die and with power mechanism for actuating said die, of means for supporting the sheet in coöperative relation with the die, and gaging means coöperative with the forward end of said sheet and embodying a stop and means for imparting a fine adjustment thereto for independently gaging the forward end of the first print of each series before it is cut from the sheet and securing a registering cutting relation between the die and each such print.

3. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die and with power mechanism for actuating said die, of means for supporting the sheet in coöperative relation with the die, and manually-adjustable gaging means coöperative with the forward end of said sheet and embodying a stop and means for imparting a fine adjustment thereto for independently gaging the forward end of the first print of each series before it is cut from the sheet and securing a registering cutting relation between the die and each such print.

4. In a machine for cutting out articles from a sheet, the combination with a cutting die, of means for supporting the sheet in coöperative relation with the die, and gaging means adjustable both lengthwise and crosswise of the sheet and coöperative with the forward end of said sheet for gaging the first article of each series before it is cut from the sheet and securing a registering cutting relation between the die and each such article.

5. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die, of means for supporting the sheet in coöperative relation with the die, and gaging means adjustable both lengthwise and crosswise of the sheet and coöperative with the forward end of said sheet for gaging the first print of each series before it is cut from the sheet and securing a registering cutting relation between the die and each such print.

6. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die, of means for supporting the sheet in coöperative relation with the die, and gaging means manually adjustable both lengthwise and crosswise of the sheet and coöperative with the forward end of said sheet for gaging the first print of each series before it is cut from the sheet and securing a registering cutting relation between the die and each such print.

7. In a machine for cutting prints out of sheets, the combination with a cutting die, of means for supporting a pad of registered printed sheets in coöperative relation with the die without clamping said pad, and means for securing a registering cutting relation between the die and the forward ends of the successive prints.

8. In a machine for cutting irregularly-spaced prints out of sheets, the combination with a reciprocatory cutting die and with power mechanism for actuating said die, of a cutting-bed for supporting a bank of registered printed sheets in coöperative relation with the die, and gaging means coöperative with the forward end of said bank of sheets and embodying a stop and means for imparting a fine adjustment thereto for independently gaging the forward end of the first print of each series before it is cut from its sheet and securing a registering cutting relation between the die and each such print.

9. In a machine for cutting irregularly-spaced prints out of sheets, the combination with a cutting die and with power mechanism for actuating said die, of means for supporting a pad of registered printed sheets in coöperative relation with the die without clamping said pad, and gaging means coöperative with the forward end of said pad for gaging the forward end of the first print of each series before it is cut from its sheet and securing a registering cutting relation between the die and each such print.

10. In a machine for cutting irregularly-spaced prints out of sheets, the combination with a cutting die, of means for supporting a pad of registered printed sheets in coöperative relation with the die, and pad-gaging means manually-adjustable both lengthwise and crosswise of the pad and coöperative with the forward end of said pad for gaging the forward end of the first print of each series before it is cut from its sheet and securing a registering cutting relation between the die and each such print.

11. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die and with power mechanism for actuating said die, of means for supporting the sheet in coöperative relation with the die, a gage coöperative with the forward end of said sheet, and means for effecting a fine relative adjustment between the gage and such supporting means to locate the first and each succeeding print in registering cutting relation with the die before such print is cut from the sheet.

12. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die, of means for supporting the sheet in coöperative relation with the die, a gage coöperative with the forward end of said sheet, and means for effecting relative adjustments between the gage and such supporting means in two directions running lengthwise and crosswise of the sheet to locate the forward end and one side of the first and each succeeding print in registering cutting relation with the die before such print is cut from the sheet.

13. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die, of means for supporting the sheet in coöperative relation with the die, a gage coöperative with the forward end of said sheet to locate the forward end of the first and each succeeding print in registering cutting relation with the die before such print is cut from the sheet, and means for imparting a fine adjustment to said gage in the direction of feed of the sheet and shifting said gage in different directions in a plane parallel with the sheet.

14. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die, of means for supporting the sheet in coöperative relation with the die, a gage coöperative with the forward end of said sheet to locate the forward end of the first and each succeeding print in registering cutting relation with the die before such print is cut from the sheet, said gage being movable about a pivot in a plane parallel with the sheet, and means for imparting a fine adjustment to said gage in the direction of feed of the sheet.

15. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die, of means for supporting the sheet in coöperative relation with the die, a gage coöperative with the forward end of said sheet to locate the forward end of the first and each succeeding print in registering cutting relation with the die before such print is cut from the sheet, said gage being movable about a pivot in a plane parallel with the sheet, means for imparting a fine adjustment to said gage in the direction of feed of the sheet, and means for turning said gage about said pivot.

16. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die and with power mechanism for actuating said die, of means for supporting the sheet in coöperative relation with the die, a print-gage coöperative with the forward end of said sheet and having a gage-line which conforms to a part of the outline of each print, and means for effecting a fine relative adjustment between said gage and such supporting means to locate the forward end of the first and each succeeding print in registering cutting relation with the die before such print is cut from the sheet.

17. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a cutting die and with power mechanism for actuating said die, of means for supporting the sheet in coöperative relation with the die, and gaging means coöperative with the forward end of said sheet for gaging the first print of each series before it is cut from the sheet and securing a registering cutting relation between the die and each such print, said means including an adjustable back-gage at the forward end of the sheet for shifting the same transversely, an

adjustable end-gage at the forward end of the sheet for shifting the same longitudinally, and means for imparting a fine adjustment to said end-gage.

18. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a reciprocatory cutting die and with power mechanism for actuating said die, of means for supporting the sheet in cooperative relation with the die, an end-gage at the forward end of said sheet for securing between the die and the first print of each series a registering cutting relation longitudinally of the sheet before such print is cut from the sheet, said gage being movable away from and back to its gaging position on the working and return strokes of said die, and means for imparting a fine adjustment to said end-gage and controlling said movements of the gage.

19. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a reciprocatory cutting die and with power mechanism for actuating said die, of means for supporting the sheet in coöperative relation with the die, an end-gage at the forward end of said sheet for securing between the die and the forward end of the first print of each series a registering cutting relation longitudinally of the sheet before such print is cut from the sheet, means for imparting a fine adjustment to said end-gage and means governed by the working and return strokes of the die for first shifting said gage away from and then returning it to its gaging position.

20. In a machine for cutting irregularly-spaced prints out of a sheet, the combination with a reciprocatory cutting die, of means for supporting the sheet in coöperative relation with the die, a pivoted end-gage at the forward end of said sheet for securing between the die and the first print of each series a registering cutting relation longitudinally of the sheet before such print is cut from the sheet, said gage being shiftable away from its gaging position by the die on the working stroke of the latter, and a spring for returning said gage to its gaging position on the return stroke of the die.

21. In a machine for cutting irregularly-spaced prints out of sheets, the combination with a cutting die and with power mechanism for actuating said die, of means for supporting the sheet in coöperative relation with the die, gaging means coöperative with said sheet for securing a registering cutting relation between the die and the successive prints, said means including a pivoted end-gage at the forward end of said sheet and adjustable about its pivot, and means for imparting a fine adjustment to said end-gage.

22. In a machine for cutting irregularly-spaced prints out of sheets, the combination with a cutting die, of means for supporting the sheet in coöperative relation with the die, gaging means coöperative with said sheet for securing a registering cutting relation between the die and the successive prints, said means including a pivoted end-gage adjustable lengthwise of the sheet and also about its pivot, and means for imparting a fine adjustment to said end-gage in a plane parallel with the sheet.

23. In a machine for cutting irregularly-spaced prints out of sheets, the combination with a cutting die, of means for supporting a bank of registered printed sheets in coöperative relation with the die, and gaging means coöperative with said bank for securing a registering cutting relation between the die and the successive prints and embody a gage-face located above the bank of sheets in all its positions and adjustable depthwise of the bank of sheets for banks of different thicknesses and also embodying means for imparting a fine adjustment to said gage-face.

24. In a machine for cutting irregularly-spaced prints out of sheets, the combination with a cutting die, of means for supporting a bank of registered printed sheets in coöperative relation with the die, and gaging means coöperative with the forward end of said bank of sheets for gaging the first print of each series before it is cut from its sheet and securing a registering cutting relation between the die and each such print, said means including an end-gage the gage-face of which is located above the bank of sheets in all of its positions and is adjustable depthwise of the bank of sheets for banks of different thicknesses and also embodying means for imparting a fine adjustment to said gage-face.

25. In a machine for cutting irregularly-spaced prints out of sheets, the combination with a cutting die, of means for supporting a bank of registered printed sheets in coöperative relation with the die, gaging means coöperative with the forward end of said bank of sheets for gaging the first print of each series before it is cut from its sheet and securing a registering cutting relation between the die and each such print, said means including an end-gage adjustable depthwise of the bank of sheets for banks of different thicknesses and also movable away from and back to its gaging position on the working and return strokes of said die, and means for controlling said movement of the gage in all of its positions depthwise of the bank of sheets and for imparting a fine adjustment to said gage lengthwise of the bank of sheets.

26. In a machine for cutting out articles from a sheet, the combination with a cutting die having an opening through which cut-out articles are delivered, of a delivery-chute coöperative with such delivery opening in the die and having a receiving opening adjustable in area.

27. In a machine for cutting out articles from a sheet, the combination with a cutting die having an opening through which cut-out articles are delivered, of a delivery-chute coöperative with such delivery opening in the die and having a receiving opening one wall of which is adjustable to adapt the chute to knives having delivery openings of different sizes.

28. In a machine for cutting out articles from a sheet, the combination with a cutting die having an opening through which cut-out articles are delivered, of a delivery-chute coöperative with such delivery opening in the die and having a receiving opening the opposite sides of which are formed by walls adjustable to adapt the chute to knives having delivery openings of different sizes.

29. In a machine for cutting out articles from a sheet, the combination with a cutting die having an opening through which cut-out articles are delivered, of a delivery-chute coöperative with such delivery opening in the die and having a receiving opening one wall of which is formed by an adjustable guide-finger constituting a continuation of the bottom of the chute.

30. In a machine for cutting out articles from a sheet, the combination with a cutting die having an opening through which cut-out articles are delivered, of a delivery-chute coöperative with such delivery opening in the die and having a receiving opening one wall of which is formed by a curved adjustable guide-finger constituting a continuation of the bottom of the chute and the opposite wall of which is formed by a similar finger constituting a top-guide.

31. In a machine for cutting out articles from a sheet, the combination with a hollow knife open at the top and bottom, through which openings cut-out articles are delivered and received respectively, of a delivery-chute, the walls of which at the receiving end of the chute constitute continuations of the inner walls of the knife at the top thereof, and one of said walls of the chute being adjustable.

32. In a machine for cutting out articles from a sheet, the combination with a hollow knife open at the top and bottom, through which openings cut-out articles are delivered and received respectively, of a delivery-chute the walls of which at the receiving end of the chute constitute continuations of the inner walls of the knife at the top thereof, and opposite walls of said chute being adjustable to adapt the chute to knives of different sizes.

33. In a machine for cutting out articles from a sheet, the combination with a hollow knife open at top and bottom, through which openings cut-out articles are delivered and received respectively, of a knife-holder having an opening therein, means for adjusting the knife across the face of the receiving end of the opening in the knife-holder, and a delivery-chute coöperative with said opening in the knife-holder.

34. In a machine for cutting out articles from a sheet, the combination with a hollow knife open at top and bottom, through which openings cut-out articles are delivered and received respectively, of a knife-holder having in one side thereof an opening which has no front wall, means for adjusting the knife to bring the back wall of the opening therein into alinement with the back wall of said opening in the knife-holder at the receiving end of such opening,

and a delivery-chute coöperative with said opening in the knife-holder.

35. In a machine for cutting out articles from a sheet, the combination with a hollow knife open at top and bottom, through which openings cut-out articles are delivered and received respectively and having projecting lugs, of a knife-holder having in one side thereof an opening which has no front wall, means for adjusting the knife to bring the back wall of the opening therein into alinement with the back wall of said opening in the knife-holder at the receiving end of such opening, and to bring three walls only of the top of the knife into engagement with the knife-holder, and a delivery-chute coöperative with said opening in the knife-holder.

Signed at New York, in the county of New York, and State of New York, this 29th day of May, A. D. 1905.

LEWIS W. SHELDON.
ALBERT M. AYERS.
JOHN W. AYERS.

Witnesses:
EDGAR A. FELLOWS,
C. S. CHAMPION.