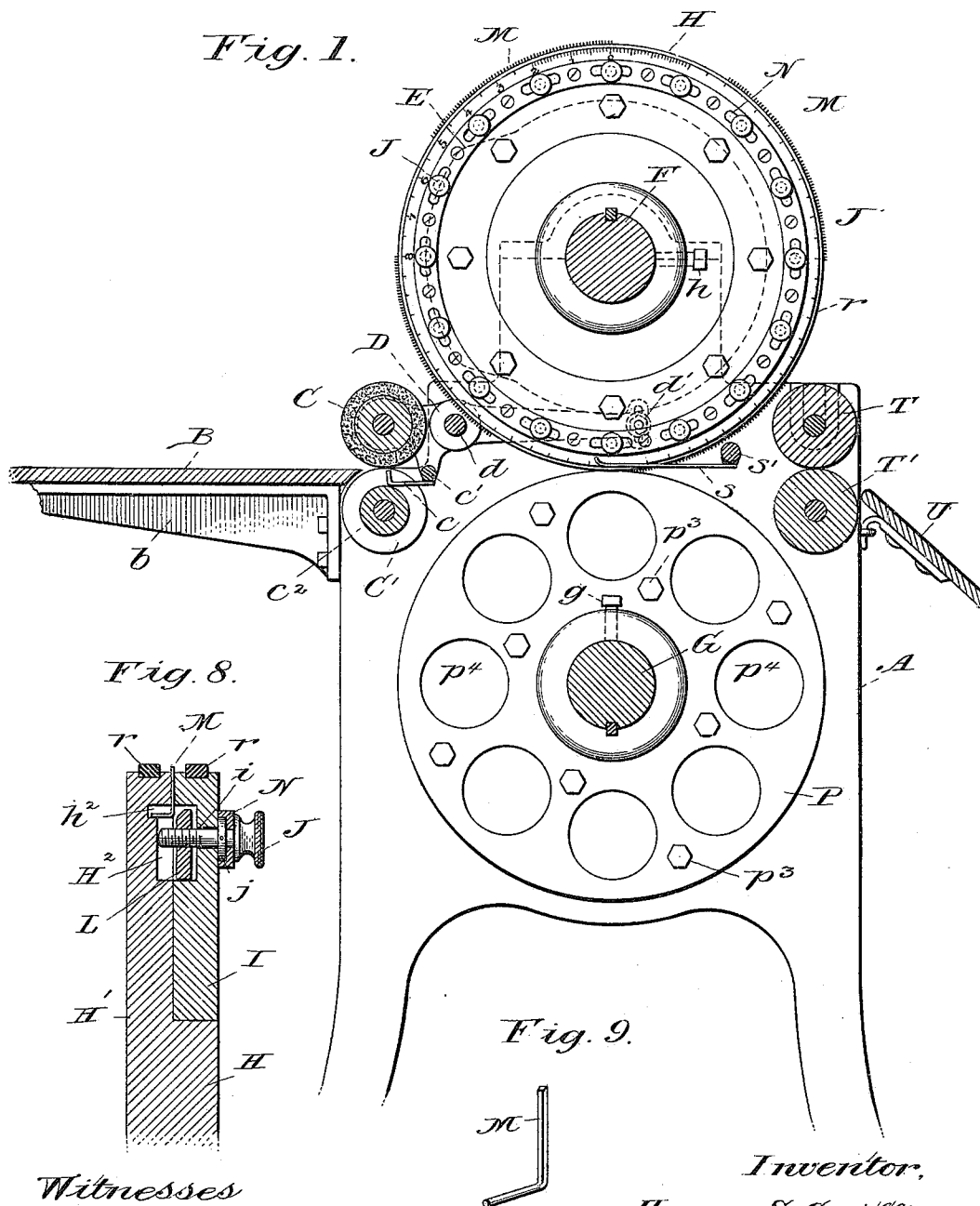


H. S. GRIFFIN.
PERFORATING MACHINE.

(Application filed June 3, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
J. T. Cross.
Harry Miller.

Inventor,
Harry S. Griffin,
by /s/ Wm. Peters,
Attorney.

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(No Model.)

2 Sheets—Sheet 2.

Fig. 2.

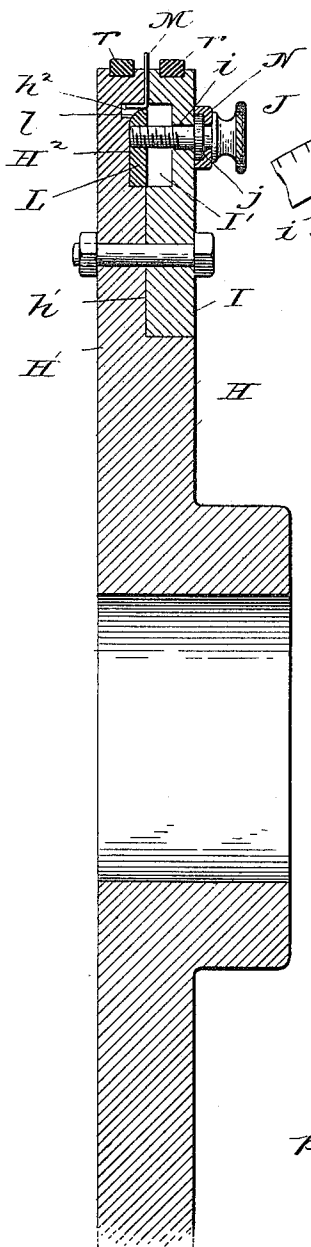


Fig. 3.

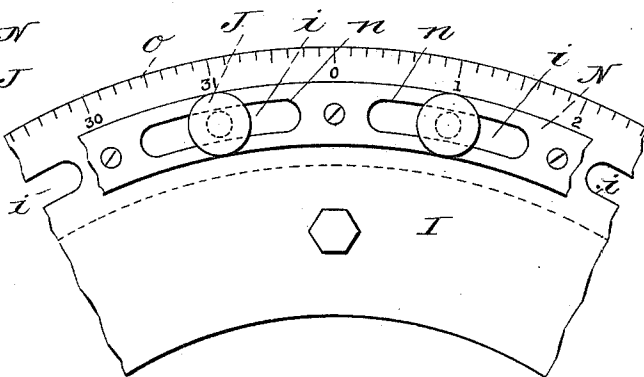


Fig. 4.

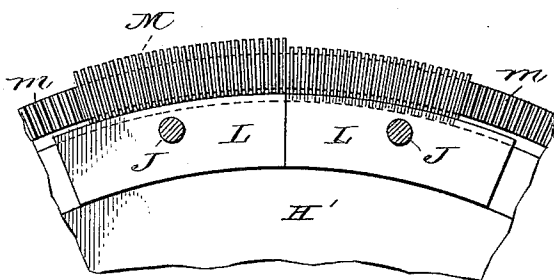


Fig. 5.

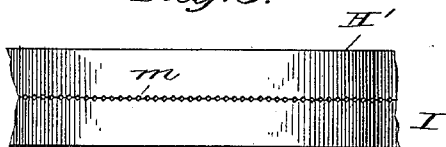


Fig. 6.

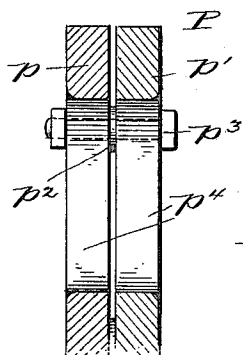
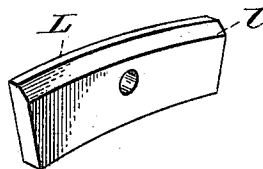


Fig. 7.



Witnesses.
J. I. Cross
Harry Miller

Inventor
Harry S. Griffin,
by I. J. Pettit,
Attorney.

UNITED STATES PATENT OFFICE.

HARRY S. GRIFFIN, OF DUDLEY, NEW JERSEY, ASSIGNOR OF ONE-HALF
TO CEPHAS R. CARVER, OF PHILADELPHIA, PENNSYLVANIA.

PERFORATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 617,012, dated January 3, 1899.

Application filed June 3, 1898. Serial No. 682,425. (No model.)

To all whom it may concern:

Be it known that I, HARRY S. GRIFFIN, a citizen of the United States, and a resident of Dudley, county of Camden, State of New Jersey, have invented certain new and useful Improvements in Rotary Perforating-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to certain improvements in perforating-machines, and particularly to the class known as "rotary perforators" for providing divisional lines on sheet-paper for use as checks, receipts, &c., for the purpose of rendering their separation easy.

The main object of my invention is to provide an improved construction of dies for use in machines of this character and means whereby the accurate adjustment of the perforating-needles may be quickly accomplished, so that they will act on the paper to perforate lines of different lengths.

A further object of my invention is to provide means for rendering any desired number of intermittent needles inoperative in order that the line of perforation may be broken to provide for the stub of the check, receipt, or other article, as may be desired.

A still further object of my invention is to provide an improved form of perforating-needle, together with an improved means for securing it in the die.

With these principal objects in view my invention consists in the construction, combination, and arrangement of parts, such as will be hereinafter fully described, and particularly pointed out in the claims made hereto.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe it, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation of a rotary perforating-machine embodying my invention. Fig. 2 is an enlarged axial section through the upper or male die, the perforating-needles being shown in operative position. Fig. 3 is a detail inside elevation of a portion of the male die, illustrating the retaining-ring

for the adjusting-screws and the graduations. Fig. 4 is a detail in elevation of a portion of the male die, the annular plate being removed to illustrate the perforating-needles and their segmental supporting-plates, one set being shown in operative position and the others in inoperative position. Fig. 5 is a plan view of a portion of the male die, showing the diamond-shaped openings for the reception of the similarly-shaped perforating-needles. Fig. 6 is a detail sectional view of the upper portion of the female die. Fig. 7 is a detail perspective of one of the segmental plates of the male die. Fig. 8 is a detail sectional view through the male die, corresponding to Fig. 2, but showing the perforating-needles in inoperative position; and Fig. 9 is an enlarged detail perspective of one of the perforating-needles.

In carrying out my invention I provide a suitable supporting-frame, as A, which may be of any desired form and constructed of any suitable material. On the front side of the machine I provide a suitable feed-table, as B, which may be secured to the main frame A by means of the bracket b, or in any other suitable and practical manner. A pair of feed-rollers C C' are located at the end of this feed-table B for feeding the material to the revolving dies, the lower roll C' being mounted in stationary bearings provided in the frame A, and the upper roll C being provided with movable bearings and means for automatically raising and lowering the same and operating a gate, so that the paper may be fed evenly between the rolls and then firmly gripped and delivered to the perforating-dies. This is accomplished by providing a rocking arm, as D, on one side of the machine, pivoted to the frame at d, and carrying the said roller C in its forward end. The rearwardly-extending end of the arm D carries a stud-roller d', adapted to engage a cam E, mounted on the upper driving-shaft F, the revolution of said shaft tending through the medium of the said cam E to rock the arm D, which raises and lowers the feed-roller C at the proper intervals. This arm D also carries the gate c, which consists of a series of fingers carried by the rod c' and having their for-

ward ends bent at right angles to form a stop for the paper. When the roll C is raised by the action of the cam E, the gate *c* also rises, the bent portions of the fingers presenting themselves above the surface of the roll C' and the plane of the feed-table, thus forming a stop against which the sheets of paper may be evenly fed. Upon the drop of the feed-roll C the gate *c* also drops, slots *c*² being provided in the lower roll C' for the admission of the fingers of said gate *c*, and the paper is then gripped and fed by the frictional contact of the two feed-rolls, the lower one, C', of which is driven by suitable gearing connected with the main driving-shaft of the machine, thus feeding the material to the perforating devices, which will now be described.

In the frame A are mounted in suitable bearings an upper and lower driving-shaft F G, respectively provided with suitable intermeshing gearing, the lower or main driving-shaft G carrying a belt-pulley, which may be connected with the source of power. On the upper shaft F are located the male dies II, which carry the perforating-needles and which are keyed on the said shaft at suitable intervals and are capable of lateral adjustment by means of the set-screws *h*. This male die II consists of an annular disk II', having a suitable hub formed around its central bore for attachment to its driving-shaft. On one side of this disk II' is formed an annular shoulder or reduced portion *h'* for the reception of an annular ring I, which is secured to said main disk by means of suitable bolts, as shown. On the inner face of the reduced portion *h'* is formed an annular groove or channel H², having in its upper end a narrow supplemental channel *h*², and on the inner face of the ring I is formed a similar channel I', which registers with the channel H², when these parts are bolted together, thus forming an annular chamber, as illustrated in Figs. 2 and 8 of the drawings. A series of slots *i* are formed in the ring I, opening into its channel I', and of an equal distance apart, adapted to receive the adjusting-screws J.

Located in the chamber formed by the channels H² and I' are a series of segmental plates L, snugly meeting at their ends and entirely filling one of the said channels H² or I². Each of the said plates L is provided with screw-threaded openings adapted for the reception of the screws J, by means of which they are adjusted backward or forward to raise or lower the perforating-needles M, as will presently be described. The upper left-hand edges of the plates L are beveled, as at *l*, and most clearly illustrated in Fig. 7 of the drawings. The inner faces of the disk II' and ring I between their channels and their peripheries are provided with radial V-shaped grooves *m*, which form when put together diamond-shaped openings (illustrated in Fig. 5 of the drawings) for the reception of the perforating-needles M.

The perforating-needles M are made sub-

stantially diamond-shaped in cross-section, having their lower ends bent at right angles to form substantially L-shaped needles and are held in the diamond-shaped openings *m*, their lower angular extensions entering the supplemental channel *h*² of the channel II'.

When the needles are in operative position, as illustrated in Fig. 2 of the drawings, they are supported and held against the upper wall of channel *h*² by the segmental plates L and their operating-screws J. Should it be desired to render a series of said needles inoperative, the segmental plates are worked from under the needles by operating their respective screws, which allows said needles to become yielding, the supplemental channel *h*², which receives their angular ends, preventing them from dropping out as the die revolves. (See Fig. 8 of the drawings.) When it is desired to render these yielding needles again operative, the screws J are operated, which works their respective segmental plates under the said needles, the beveled edges *l* coming in contact with the corners of the needles and forcing them out, said plates serving to securely hold them in this position.

The screws J are each provided with a collar *j*, pinned or otherwise secured thereon, over which fits a retaining-ring N, provided with slots *n*, corresponding to and registering with the slots *i* of the ring I, and through which the outer ends of the screws J project. This ring N is secured on the ring I by means of suitable screws located between the slots, as shown. A suitable milled head is provided on the projecting ends of the screws N for operating them.

On one side of the male die II, I provide a scale, as *o*. (Illustrated in Figs. 1 and 3 of the drawings.) In operation the initial step is to adjust a set of needles in operative position a distance corresponding to the length of the line to be perforated, which may be easily determined by referring to the scale *o*, and then providing for the intermissions in said line by rendering inoperative a series of needles corresponding to the desired length of said intermissions. (See Fig. 1 of the drawings, in which the needles are set to perforate five-inch lines and leave three-inch intermissions.)

The segmental plates are capable of lateral adjustment by means of their screws J and slots *i*, so that it will be readily seen that the needles can be adjusted to perforate any length of line or any length of space, as may be desired.

The female die P consists of two circular disks *p p'*, bolted together, leaving a space between them of a sufficient width to admit the perforating-needles of the male die, which may be accomplished by interposing washers *p*² on the connecting-bolts *p*³ between the disks *p p'* or by any other practical manner. These female dies are keyed on the lower driving-shaft G in the same manner as the male dies, and are capable of lateral adjustment on said shaft by means of set-screws *g*. A number

of openings, as p^1 , are provided in the disks $p p$, so that the clippings falling from the perforations may easily escape and not clog up the said female die.

5 On the periphery of the male die II are secured a pair of annular rubber rings r , held in grooves formed in said periphery, as illustrated in Fig. 2 of the drawings. These rings r are in frictional contact with the surface of
10 the lower female die and serve to securely hold and feed the paper during the process of perforation. The strippers, as s , are also provided for pulling the paper off the perforating-needles, which consist of a series of spring-
15 fingers carried by a transverse rod S' , which are located above the paper and serve to pull the same off the perforating-needles and guide it under a pair of feed-rollers $T T'$. From thence it is delivered to a receiving table or chute U .

In describing my invention I have described and illustrated it in its relation principally to a rotary perforator, to which it is well adapted. It is clear, however, that the invention is applicable and may be used upon perforating-
25 machines of other classes than rotary perforators. For instance, my improved perforating mechanism may be used upon hand perforating-machines.

30 It is quite evident that the construction of the machine to which my invention may be applicable, as herein described, may be varied without departing from the spirit of my invention.

35 Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a perforating-machine, a male die comprising two parts adapted to be bolted
40 together, a series of yielding perforating-needles carried thereby, and means for rendering certain sets of needles rigid and operative and intermediate sets yielding and inoperative, substantially as described and for the
45 purposes stated.

2. In a perforating-machine, a male die, a series of yielding perforating-needles carried thereby, means for holding said needles in the die, a graduated scale provided on the said
50 die, and means for rendering certain sets of the said needles rigid to operate on the paper while intermittent sets are yielding and inoperative, substantially as described.

3. In a perforating-machine a rotary die, 55 perforating-needles carried thereby, graduations provided on said die, adjusting means for rendering certain sets of needles rigid, and intermediate sets yielding, and means for the lateral adjustment of said needles,
60 substantially as described.

4. A male die for rotary perforating-machines comprising a pair of annular disks, annular channels formed on the meeting faces
65 of said disks to form an annular chamber, perforating-needles having angularly-disposed ends projecting in said chamber, seg-

mental plates located in said chamber and means for adjusting said plates transversely in said chamber, substantially as described.

5. A male die for rotary perforating-machines comprising a pair of annular disks, annular channels formed on the meeting faces of said disks forming an annular chamber, a supplemental channel formed in the upper
75 side wall of said chamber, perforating-needles having angularly-disposed ends adapted to play in said supplemental channel, and means for adjusting the said needles in rigid and yielding sets, substantially as described.

6. A male die for rotary perforating-machines comprising a pair of annular disks adapted to be bolted together, annular channels formed on the meeting faces of said disks forming an annular chamber, a supplemental
80 channel in the upper side wall of said chamber, perforating-needles having angularly-disposed ends adapted to play in said supplemental channel, segmental plates located in the annular chamber, and set-screws carried
85 by the disk for adjusting the said segmental plates, substantially as described.

7. The combination of a two-part die, an annular chamber formed therein, perforating-needles having angularly-disposed ends resting in said chamber, a series of segmental
95 plates in said chamber, set-screws engaging the said segmental plates carried by the disk, and slotted bearings for said screws to allow of their lateral adjustment, substantially as described.

8. The combination of a two-part die, an annular chamber formed therein, perforating-needles having bent ends resting in said chamber, a channel formed in the upper side
100 wall of said chamber, a series of segmental plates in said chamber, beveled edges formed on said plates adapted to engage the perforating-needles, and set-screws carried by the disk for adjusting the said segmental plates transversely in the chamber, substantially as
105 described.

9. The combination of a two-part die, channels formed on the meeting faces of said die forming an annular chamber, perforating-needles loosely held between the two parts of
115 the die, angularly-disposed ends for said needles resting in the annular chamber, a series of segmental plates having beveled edges, set-screws carried by the die engaging said segmental plates, slotted openings for said
120 set-screws, rigid collars carried by the set-screws on the outside of the die and a slotted retaining-plate adapted to embrace the said collars secured to the said die, substantially as described.

In witness whereof I have hereunto set my hand this 2d day of June, A. D. 1898.

HARRY S. GRIFFIN.

Witnesses:

HARRY E. CARVER,
HOWARD I. HEWSTON.