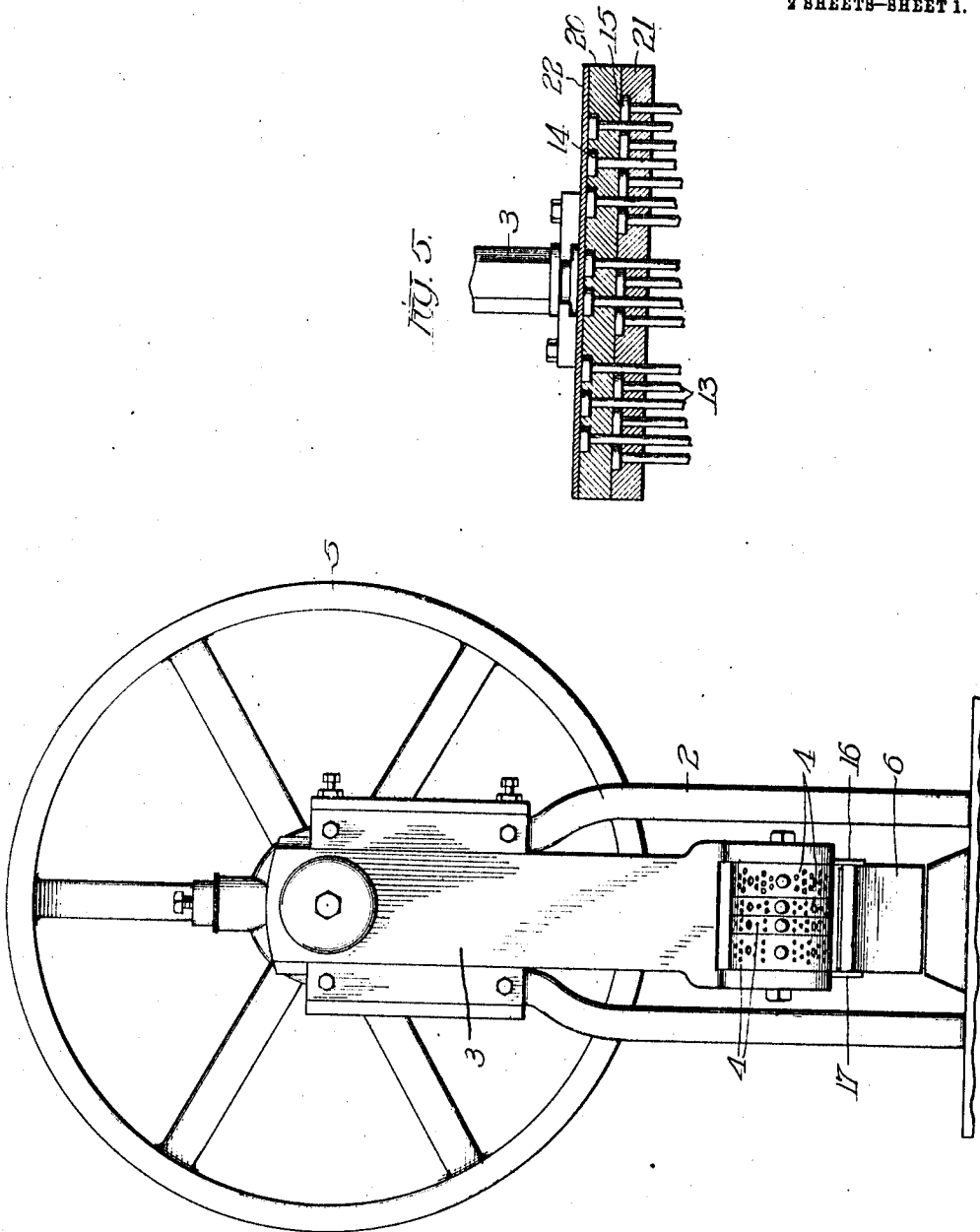


1,003,993.

A. L. DAY.  
PERFORATOR.  
APPLICATION FILED JUNE 26, 1911.

Patented Sept. 26, 1911.  
2 SHEETS—SHEET 1.



Witnesses:  
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*Fig. 1.*  
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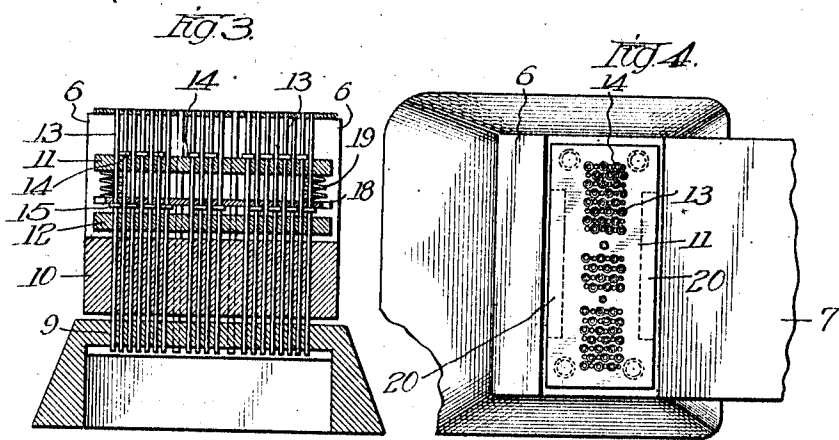
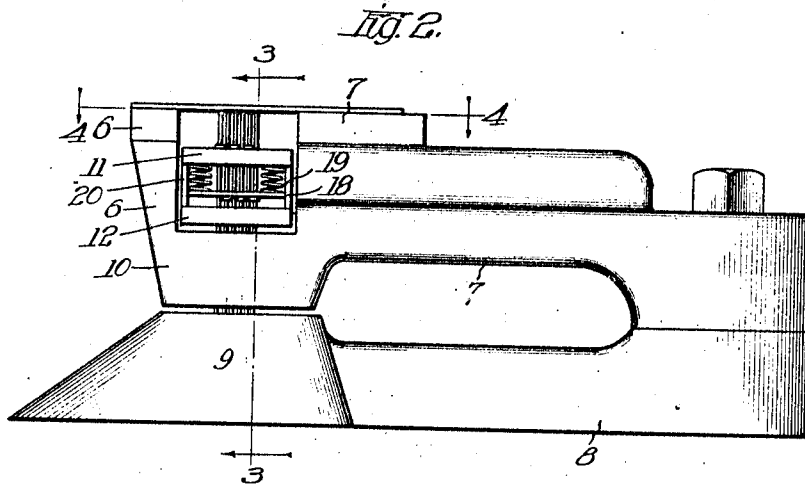
A. L. DAY.  
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2 SHEETS-SHEET 2.



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# UNITED STATES PATENT OFFICE.

ALFRED L. DAY, OF CHICAGO, ILLINOIS.

PERFORATOR.

1,003,993.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed June 26, 1911. Serial No. 635,375.

*To all whom it may concern:*

Be it known that I, ALFRED L. DAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Perforators, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in perforators, and particularly to that class of perforators employing a large number of small punches for perforating dates, numerals, etc., in various articles, such as labels, checks and the like.

One of the objects of my invention is to improve the construction of the perforators whereby the character punched by the same may be made much smaller than has heretofore been possible.

To this end my improvement relates to the construction and arrangement of the various punches for forming the character or characters so that they may be more compactly arranged.

Another object of my invention is to provide a means whereby the characters punched may be made as small as possible and at the same time the punch have a right line movement.

For the purpose of disclosing my invention I have illustrated certain embodiments thereof in the accompanying drawing.

In the said drawing—Figure 1 is a front elevation of a punching machine embodying my invention; Fig. 2 is a side elevation of the punch and die member; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2; Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2; Fig. 5 is a detailed sectional view of modified form of my invention.

In the embodiment illustrated I provide a punching machine comprising a frame member 2 the front end of which is adapted to carry a reciprocating plunger 3 having secured at its lower end the usual punch controlling wheels 4. These wheels have formed therein groups of idle holes in which the punches not intended for operation for punching the intended character project when the wheels descend. The plunger 3 is moved up and down in suitable guide members and is operated from an eccentric on a shaft driven by the wheel 5.

Arranged beneath the die wheels is the

punch case 6 which is preferably formed on an arm 7 secured at its rear end to the base 8, the front end of which base is provided with a platen or female die 9 having perforations thereon corresponding to the punches mounted in the punch case 6. The punch case 6 has a punch guiding portion 10 perforated to accommodate the punch and above this punch guiding portion the case is recessed to receive the punch lifting plates 11 and 12. These plates are likewise perforated to receive the punches and in order that the punches may be lifted by the plates after the suitable character has been punched, I provide on the various punches 13 shoulders, 14 and 15. It will be noted that the shoulders on the alternate punches are arranged in different planes, the shoulders of every other punch being above the shoulder on the punch beside it. By this arrangement I am enabled to compactly arrange the punches whereby they will take up much less space than has heretofore been possible so that the sizes of the characters punched will be much smaller. By this arrangement, while I am enabled to decrease the size of the characters punched, the punches still have a right line movement. In order that the punches may be properly lifted I provide the two lifting plates 11 and 12. These plates are connected by jaws 16 and 17 with the reciprocating head 3 so that as the head 3 rises, the lifting plates 11 and 12 will rise. The shoulders on the punches being arranged above the lifting plates will be engaged by said lifting plates and the punches raised to their proper position after a character has been punched. In Fig. 3 I have illustrated the lifting plates and all the punches as being depressed. In order that the punches having the shoulders 15 thereon will not stick in the openings through which they pass in the lifting plate 11 and be raised by this plate too far, I arrange above the shoulders 15 a small depressing plate 18 which is held separate from the top plate 11 by means of coiled springs 19 interposed between the top of the plate 18 and the bottom of the plate 11. It will be understood, of course, that the plates 11 and 12 are connected together by the side connector members 20 so that the two plates 11 and 12 will move together. The advantages of this staggered arrangement of the lifting shoulders on the punches are numerous. For one thing, as before stated, they permit the punches to be more compactly arranged than

as heretofore. When the shoulders on the punches are all arranged in the same plane the punches must be separated the distance of two shoulders, which naturally increases the size of the characters punched. Frequently, however, in order to decrease the size of the characters punched the punches have been inclined inwardly toward their bottom. This arrangement, however, is objectionable in that the punches do not have a right line movement and as the punching operating mechanism has a right line movement and as the openings or holes in the female die are vertically arranged, the result is that the punches are frequently bent and sprung and if not bent, soon have the sides worn out on their punching ends. Furthermore, this angular engagement with the side walls of the openings in the female die wears out the female die to such an extent that a clean cut perforation is not made after the machine has been in use for some length of time. By my arrangement of placing the lifting shoulders of the alternate punches in different planes I am enabled to obtain a very compact arrangement of the punches, resulting in a much smaller character, without sacrificing the much to be desired right line movement of the punches.

In Fig. 5 I have illustrated a different form of punch member. In Figs. 1 to 4 I have illustrated the punches for that class of machines wherein the characters made by the machine may be varied. In Fig. 5 I have illustrated a punch carrying member for that class of machines wherein the same character is always punched. The reciprocating plunger 3 which in Fig. 5 is shown as being slightly different in construction from that shown in Fig. 1 has secured to its lower end the punch supporting plates 20 and 21. In this instance, the ends of the punches are provided with shoulders which fit in countersinks formed in the upper surface of the supporting plates 20 and 21. The lower supporting plate 21 is not only perforated to permit the passage therethrough of the punches carried thereby, but is also perforated to permit the passage of the punches carried by the plate 20. The plate 20 fits over the top of the plate 21 and serves to maintain in position the punches carried in the plate 21. The plate 20 is likewise countersunk in its top to receive the shoulders formed on the punches carried by it and is also perforated to permit the punches carried by it to extend therethrough. The punches carried by the plate 20 are held in position by top or covering plate 22 which may be securely fastened over the top of the heads of the punches. It will be noted that these punches have the same character-

istic of punches of the machine heretofore described, namely, the supporting or raising shoulders for the alternate punches being in different planes so that the punches may be more compactly arranged.

Having thus described my invention what I claim is new and desire to secure by Letters Patent is:

1. A perforating machine provided with a plurality of punches having lifting shoulders formed thereon arranged in different planes.

2. In a machine of the character described, the combination with a plurality of punches, of plurality of lifting plates for said punches, one arranged above the other, some of said punches having shoulders formed thereon arranged to be engaged by one of said lifting plates and others of said punches having shoulders formed thereon arranged to be engaged by the other of said plates.

3. A perforating machine having a plurality of punches provided with lifting shoulders, the lifting shoulders of alternate punches being arranged in a different plane from the shoulders of the other punches.

4. In a machine of the character described, the combination with a plurality of individual vertically movable punches having lifting shoulders thereon, the shoulders of a portion of said punches being in a different plane from shoulders of the remaining punches and lifting plates for engaging said shoulders.

5. In a machine of the character described, the combination with a plurality of punches of a female die having vertically arranged openings in which said punches are adapted to pass, said punches having a right line movement with respect to said female die and having lifting shoulders thereon, the lifting shoulders of some of said punches being arranged in a different horizontal plane from the lifting shoulders of the remaining punches and lifting plates for engaging said shoulders.

6. In a machine of the character described the combination with a plurality of independently movable punches having lifting shoulders formed thereon the lifting shoulders of some of said punches being arranged in a different plane from the lifting shoulders of the remaining punches and lifting plates connected together to move in unison, for engaging said shoulders.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

ALFRED L. DAY.

Witnesses:

W. PERRY HAHN,  
MABEL REYNOLDS.