

APPARATUS FOR SEALING NEWSPAPERS AND FOR SIMILAR PURPOSES.

Patented May 30, 1911.

4 SHEETS—SHEET 1.

Fig. 1

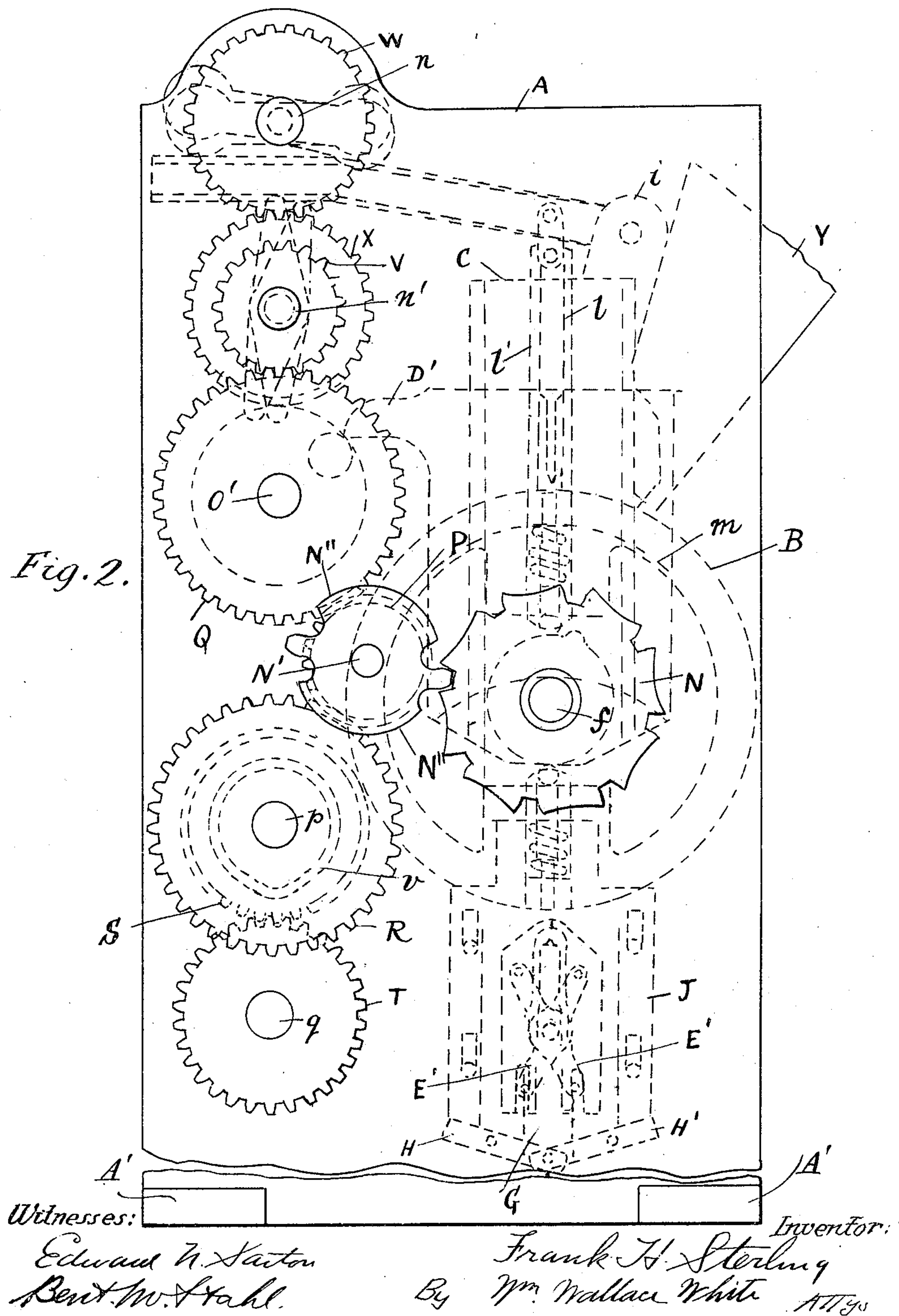
Inventor.  
Frank. H. Sterling.  
By Wm. Wallace White ATTS

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4 SHEETS—SHEET 2.

*Fig. 2.*



F. H. STERLING.

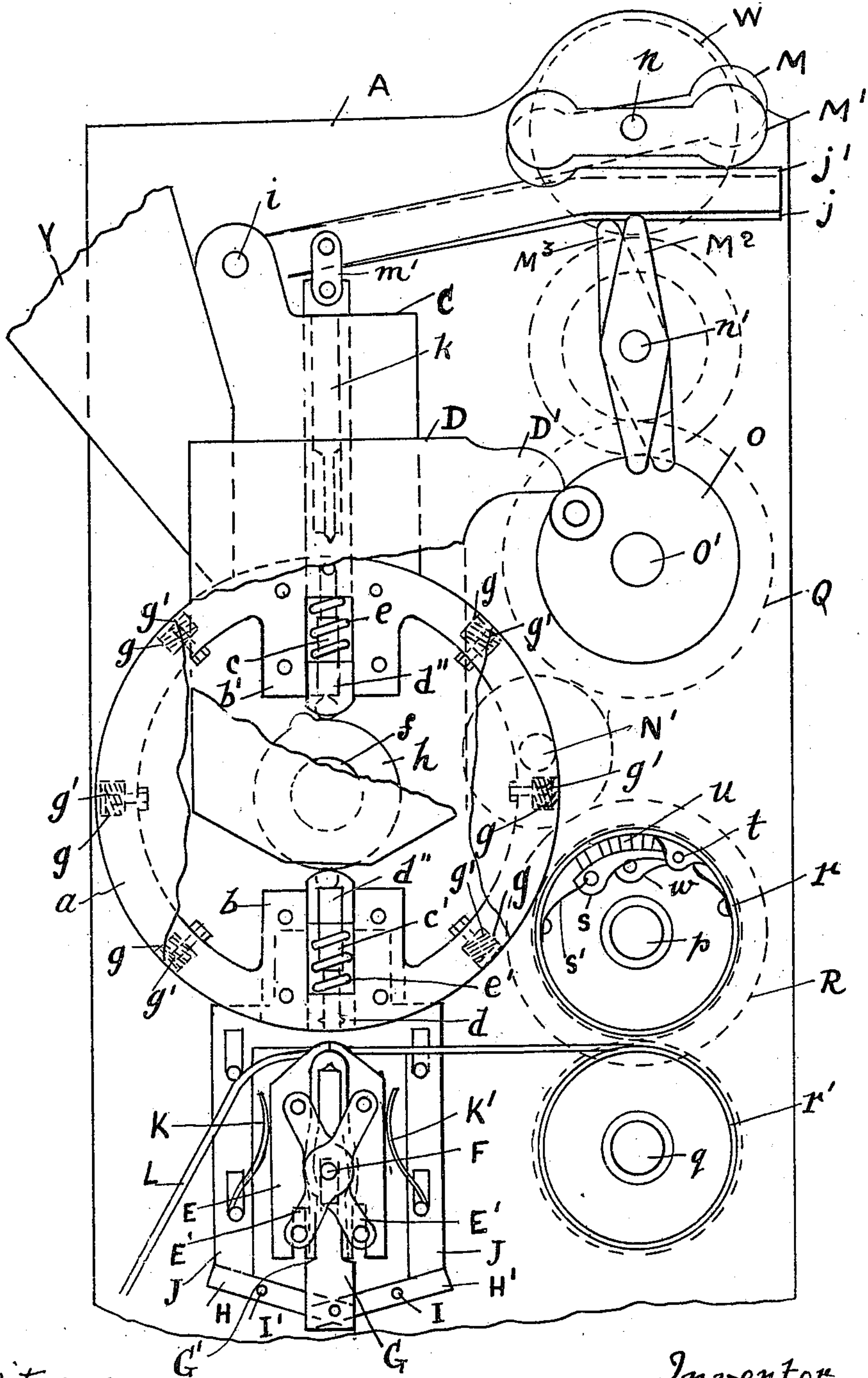
APPARATUS FOR SEALING NEWSPAPERS AND FOR SIMILAR PURPOSES.

APPLICATION FILED JULY 26, 1909.

Patented May 30, 1911.

993,468.

4 SHEETS—SHEET 3.



Witnesses  
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Bent W. Stahl

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Fig. 3. Frank H. Sterling  
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4 SHEETS—SHEET 4.

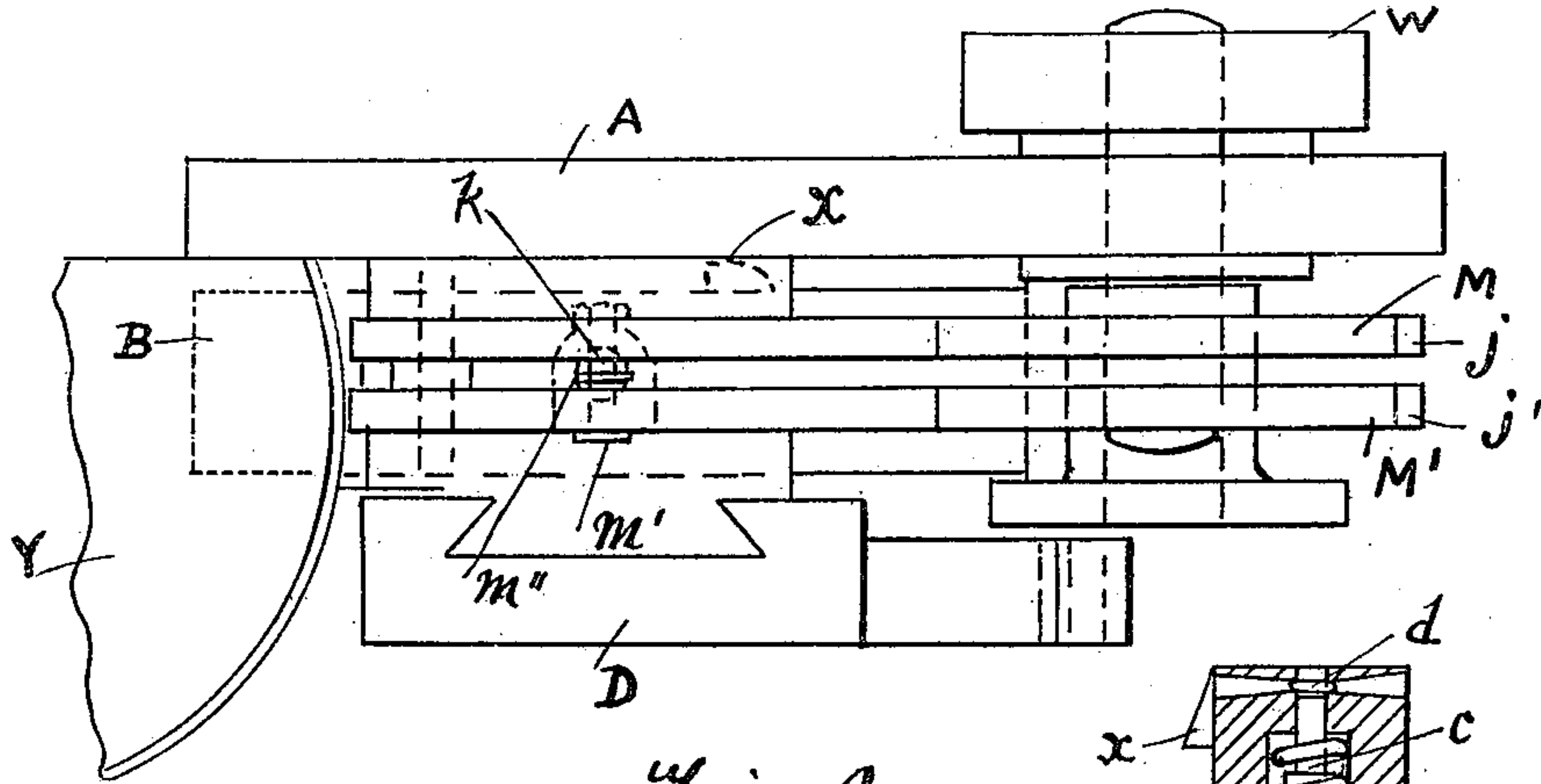


Fig. 4.

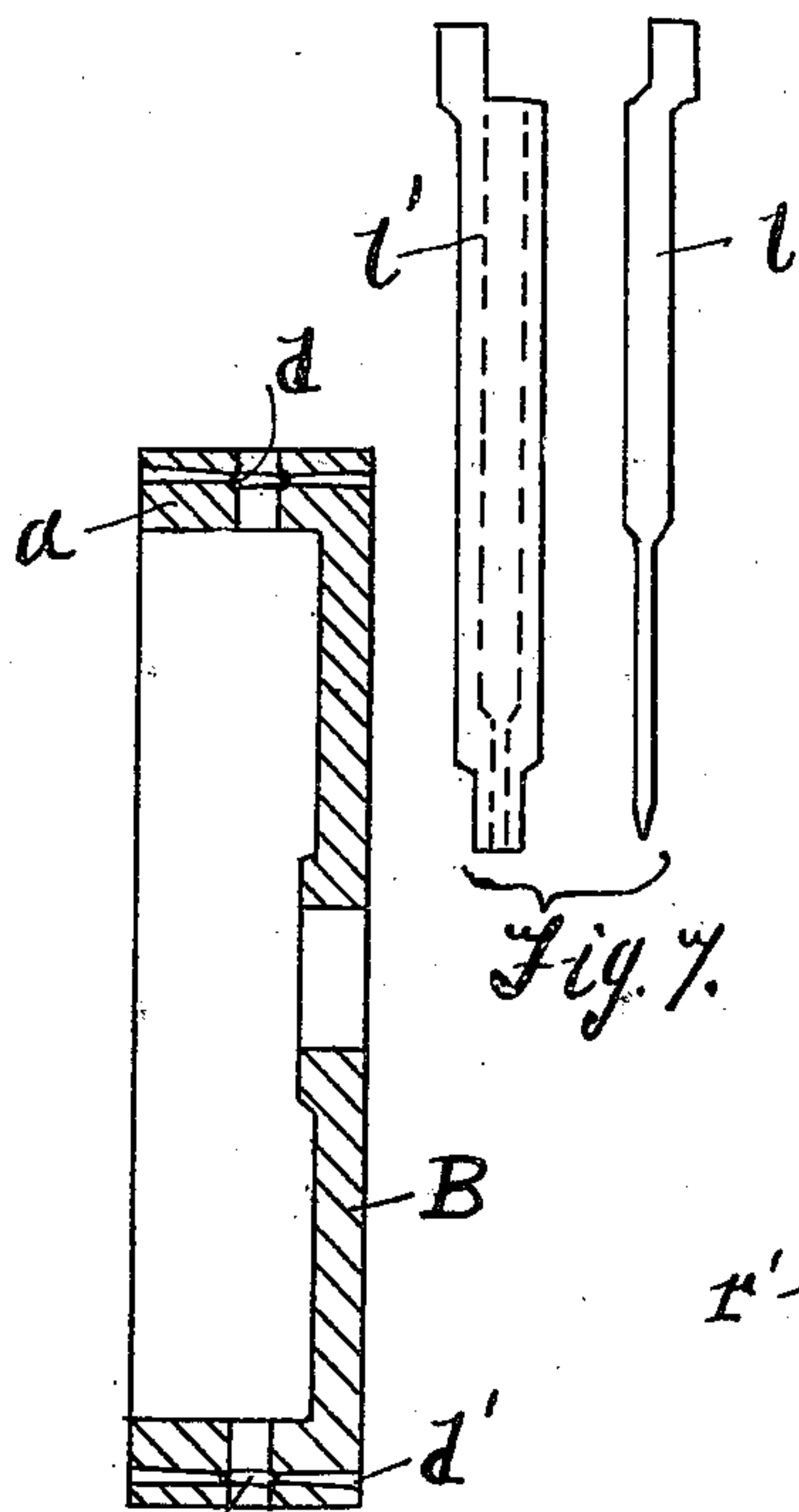


Fig. 8

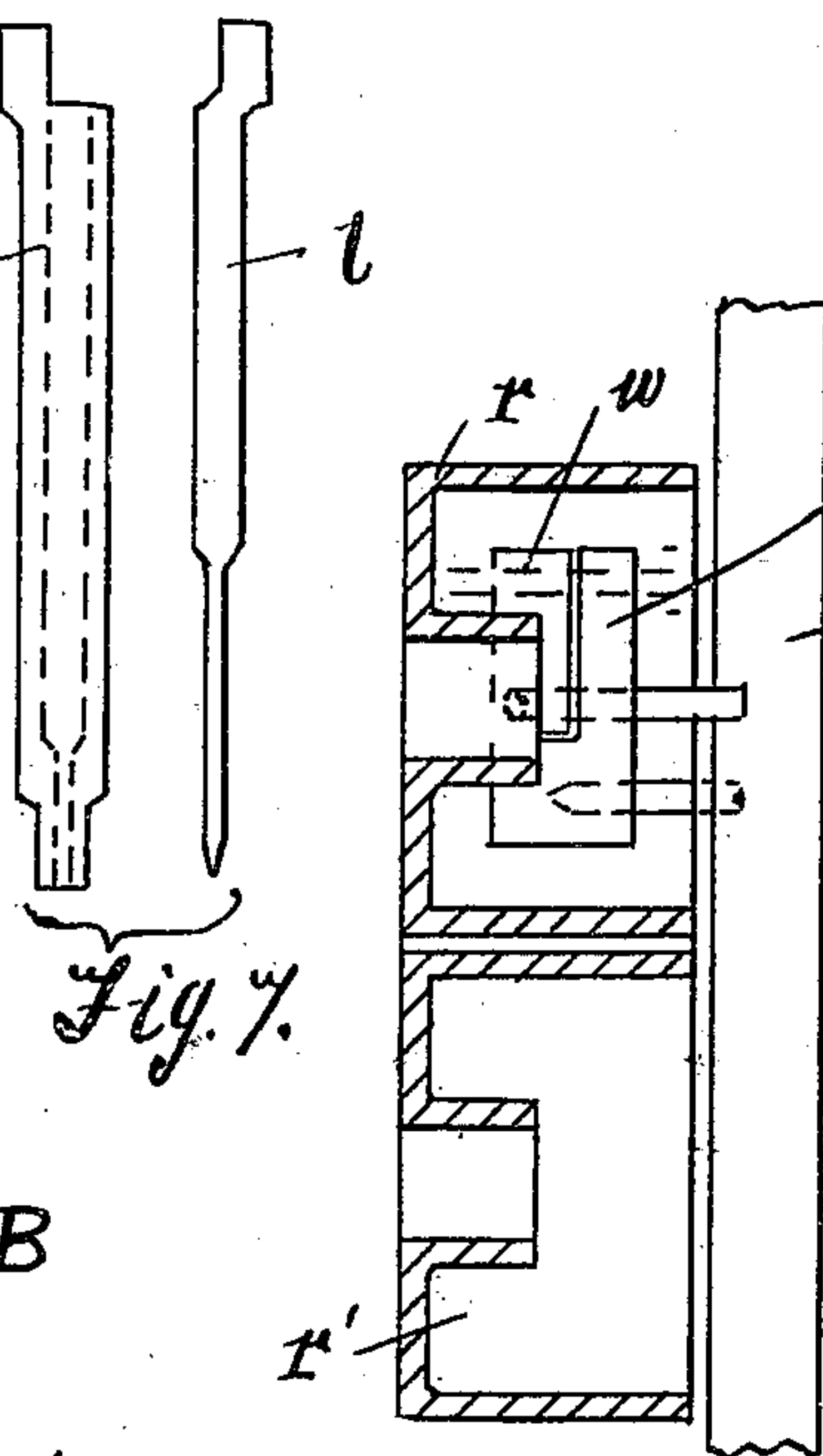


Fig. 6.

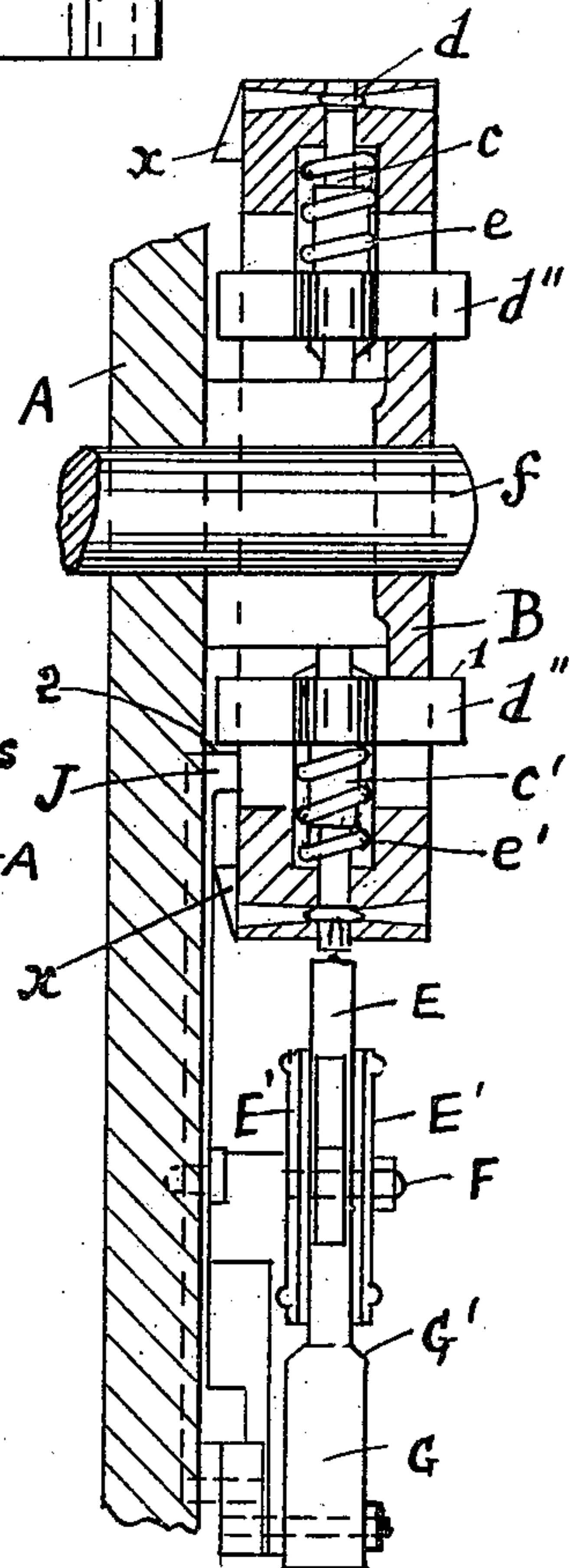


Fig. 5.

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# UNITED STATES PATENT OFFICE.

FRANK HENRY STERLING, OF LONDON, ENGLAND.

APPARATUS FOR SEALING NEWSPAPERS AND FOR SIMILAR PURPOSES.

993,468.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed July 26, 1909. Serial No. 509,648.

*To all whom it may concern:*

Be it known that I, FRANK HENRY STERLING, a subject of the King of Great Britain, residing at London, England, have invented  
5 a new and useful Apparatus for Sealing Newspapers and for Similar Purposes, of which the following is a specification.

My invention relates to a machine for securing together the pages of newspapers, loose sheets of paper, documents and the like  
10 and for securing articles of various kinds by means of rivets or seals in such a manner that they cannot be tampered with without detection, for example to prevent newspapers which are sent out on sale or return  
15 from being read and then returned to the publishers as unused, by securing the edges of the folded papers by means of a rivet or seal made of lead, an alloy of lead and anti-  
20 mony or of any other suitable soft metal, in such a manner that the papers cannot be unfolded for reading without breaking the seal or tearing the pages, thus showing at a glance whether or no the paper has been  
25 opened for reading.

The objects of my invention are:—first, a device for making the rivets or seals; secondly, means for perforating the paper and placing the rivet or seal in the perforation,  
30 and, thirdly, means for closing the rivet or seal on to the folded papers or loose sheets of paper as the case may be all of which are comprised in a single machine which may be attached to the folding mechanism of a  
35 printing machine or which may be independent thereof, for example when used for attaching together loose sheets of typed or other paper other than newspapers. I attain these objects by the mechanism illus-  
40 trated in the accompanying drawings in which:—

Figure 1 is a side elevation of an apparatus constructed according to this invention. Fig. 2 is back elevation of same showing  
45 modified weighted slide. Fig. 3 is front elevation of said apparatus, portion of the rotary disk and weighted slide being cut away. Fig. 4 is plan view of same. Fig. 5 is side view of the rotating disk and jaws with  
50 lower plunger or closing die. Fig. 6 is sectional view of the guiding and perforating rollers. Fig. 7 is detail view of duplex punch. Fig. 8 is sectional elevation of rotating disk.

The same letters of reference denote the 55 same parts throughout the figures.

A is a metal plate preferably of iron and forms the support for the whole of the mechanism of my apparatus. The said plate is preferably of such dimensions in cross section as to enable the supporting of suffi-  
60 ciently wide bearings for the various shafts which it has to carry and such plate is provided with perforated "feet" A' for the securing of the apparatus to a table or other  
65 support.

B is a disk preferably of steel, such disk being formed with a flange at its periphery as shown at *a* Fig. 3 and at Fig. 8. As will be seen the disk is provided with the parts  
70 *b b'* which together with the flange are bored to receive the plungers *c c'*. The parts *b b'* may be formed integral with the disk or for greater convenience of inserting the plungers each of such parts may be formed in halves  
75 and the outer halves of such parts secured by means of screws to the integral portions of such parts. A groove *d* is formed in the apertures receiving the plungers *c* and *c'* in order that when the rivet or seal is formed a  
80 fin of metal is forced into such groove and holds the rivet or seal in the aperture during the rotation of the disk: holes are, as shown at *d'*, also provided through which any residue of metal finds an exit. The disk  
85 (together with the pieces *b b'*) is slotted to permit the ends of the projection *d''* formed on each of the plungers *c c'* to protrude beyond the disk, as shown.

The plungers *c c'* are provided with  
90 springs *e e'* to normally hold such plungers below the circumference of the disk. The plungers are provided at their inner ends with anti-friction rollers which bear on the cam *h*. The disk is bored centrally to receive  
95 the shaft *f* to which it is secured in any suitable way. The flange of the disk is perforated at *g g g g g g* to receive the spring pistons *g' g' g' g' g' g'* with the object hereinafter referred to. The cam *h* may be formed  
100 on the plate A or affixed thereto and the cam and plate are bored in order to permit the shaft *f* to pass through them. When the disk and shaft are in position in the plate A the cam occupies the position shown within  
105 the flange of the disk it being understood that the open or hollow side of the disk is toward the plate A. The anti-friction roll-



ers with which the plungers above referred to are provided are maintained in contact with the cam by means of the springs  $e$   $e'$  and travel around the cam on the rotation of such disk the cam being stationary. The function of the cam is to raise the plungers in order to decrease the depth of the apertures which receive the shot or other sphere to be formed into a rivet or seal in order to guard against more than one shot or sphere leaving the hopper at one time.

Formed integral with or fixed to the plate A at a point to locate the same above the disk B as shown, is the part C, said part being provided with the lug  $i$  to which are hinged the levers  $j$   $j'$ . The said part C is bored vertically to receive the duplex punch  $k$ . The vertical edges of the said part C are beveled as shown by Fig. 4 to form a guide on which freely moves the weighted slide D which is formed to fit the said guide. The slide D is grooved as shown at  $m$  to allow it to move without interfering with the upper plunger and the rotation of the disk. One side of the slide is provided with the projection  $D'$  which forms the means through which such slide is raised as hereinafter referred to. Fig. 7 shows separately the two punches which constitute the duplex punch above referred to. The part  $l$  is adapted to work freely within and independently of the part  $l'$  and one such portion ( $l'$ ) is connected by means of links  $m'$   $m''$  to the lever  $j'$  and the other portion thereof ( $l$ ) is similarly connected to the lever  $j$ . Below the disk are the jaws E. In order to admit of the jaws being opened parallel such jaws are linked together on either side thereof by the cross links  $E'$  which cross links are pivoted at F by means of a pin to the plate A. The upper part of the jaws at their opening portion is provided with an aperture the object of which is to receive the shank of the rivet or seal and thus act as a punch bolster. Within the jaws is the closing plunger G having a shoulder formed thereon at  $G'$ . The closing plunger is formed as shown and is adapted to enter at its upper part the shank of the rivet or seal for the purpose of closing the said rivet or seal as hereinafter referred to. The closing plunger G is slotted toward its upper portion in order that it may have free movement despite the pin F. The lower end of the closing plunger G is pivoted to the links H H' which are fulcrumed at I I' by means of pins to the plate A.

J is a frame the downward movement of which operates the closing plunger G and jaws. The side limbs of the frame J rest on the outer ends of the links H H' which limbs are movably secured by means of studs to the plate A which studs pass through slots in the frame J to permit of its vertical movement. The closing plunger G is re-

turned to its normal position by gravity (or if necessary a spring may be provided for such purpose) and on its downward movement raises the frame J by means of the links H H'. The jaws are returned from their open position by means of the springs K K'.

L is a table provided with an aperture through which the rivet shank reaches the jaws and the closing plunger rises to enable the closing of the rivet or seal.

M M' are cams secured to the shaft  $n$ .

M<sup>2</sup> M<sup>3</sup> are cams secured to the shaft  $n'$ .

$o$  is a wiper secured to the shaft  $o'$  to raise the weighted slide D by means of the projection  $D'$ .

$r$   $r'$  are rollers secured respectively to the shafts  $p$  and  $q$  by means of which the newspaper or the like is fed or guided to the disk B.

The several shafts above referred to are supported by and rotate in the plate A.

Should it be desired to punch the hole for the rivet or seal independently of the rivet, *i. e.* instead of making the rivet or seal punch its own hole through the papers I provide the roller  $r$  at its interior with a lever  $s$  pivoted to the lug  $t$  the lever carrying the punch  $u$ , such punch being adapted to be depressed through an aperture in the periphery of the roller  $r$  and to pass through a corresponding hole in the roller  $r'$  on each revolution of the rollers, the punch  $u$  being held in its normal position by means of the spring  $s'$ . The lever  $s$  is provided with a tail piece which projects through the roller  $r$  as shown at Fig. 6 and moves in a groove formed in the plate A as shown at  $v$  Fig. 2. In this way the punch is projected and withdrawn at each revolution of the rollers. Should it be desired to close the roller  $r$  at its inner side the tail piece would pass through a slot formed in the cover of such roller  $r$ . Similarly should it be desired to form perforations around the rivet or seal in order to detach the sealed portion of the newspaper or the like I provide a second lever  $w$  and furnish the same and also the lever  $s$  with additional punches and form a corresponding number of perforations in the roller  $r'$ . It being necessary to interrupt the rotation of the disk B during the period when one rivet is being formed and the other rivet is being inserted or punched through the newspaper or the like I prefer to employ with this object the star wheel N which is secured to the shaft  $f$ , such wheel meshing with and actuated by the club wheel N'' carried by the shaft N'. The shaft N' also carries the spur wheel P which meshes with the spur wheel Q secured to the shaft  $o'$  and also with the spur wheel R secured to the shaft  $p$ . The spur wheel T is secured to the shaft  $q$ . The spur wheel S is also secured to the shaft  $p$  and meshes with the



spur wheel T. The spur wheel Q meshes with the spur wheel V secured to the shaft  $n'$  and the spur wheel W secured to the shaft  $n$  meshes with the spur wheel X secured to the shaft  $n'$ .

Motion may be imparted to the apparatus through any convenient part of the gearing above described but I prefer that such motion be introduced from the source of motion, such as from a printing machine, through the spur wheel R. The gearing of the various parts is such as to give for every four revolutions of the club wheel one complete revolution of the disk B, two revolutions of the shafts  $q$   $p$   $o'$  and four revolutions of the shafts  $n$   $n'$ .

I provide a hopper Y to hold a supply of buckshot or other similar spheres of lead or a suitable alloy of lead and antimony or any other suitable soft material or metals or alloys from which the rivets or seals are to be formed. The said shot or spheres are fed to the disk B and in order that the required feeding of such shot or spheres may be made certain I provide the hopper with means whereby the feeding of the shot or spheres is regulated to one shot or sphere at a time. This regulating means consists of a perforated bar  $y$  secured in the frame A as shown in Fig. 1 and is adapted to be moved in one direction by means of the wipers  $x$  on the disk B contracting with the piece  $x'$  on the bar and in the other direction by the spiral spring  $x''$ . Inasmuch as in the case of sealing newspapers for example some interval of time occurs in the travel of such papers through the printing machine to which my apparatus may be geared before the papers reach my apparatus I provide means for cutting off the supply of shot or spheres in such interval and at same time for arresting the movement of the weighted slide. This may be effected by means of the bar  $z$  being made to penetrate a perforation formed in the weighted slide as shown. In the position indicated the supply regulating bar and weighted slide are free to normally operate. By thrusting the lever Z toward the plate A the bar  $z$  enters the perforation in the sliding weight and its motion is thus arrested and at the same time the bar  $y$  is drawn outward and thus the part  $x'$  is moved out of the path of the wipers  $x$  and simultaneously the perforation of the bar  $y$  is held out of coincidence with the outlet orifice of the hopper.

The weighted slide D is extended at D'' in order to increase its weight in those cases where a seal of some harder metal than lead may be employed I preferring to load the weight at the position shown. I may also form a slot in the weighted slide in order to permit the passage of the disk shaft therethrough should it be desired to additionally support such shaft.

If the apparatus is employed for other purposes than the sealing of newspapers the papers or articles to be sealed may be fed to my apparatus by means of a suitable conveyer or by any other means; but in some cases newspapers also may be fed to my apparatus by a conveyer or other means.

The action of the apparatus is as follows:—As the disk B revolves a shot or similar sphere enters the aperture in the periphery of the said disk above the plunger  $c$  and which is moving toward the top of the disk, the plunger being at this instant in such a position that only one shot or sphere can enter the aperture. As soon as the aperture has cleared the hopper the plunger  $c$  is lowered to admit the duplex punch and when the plungers  $c$   $c'$  are vertical (the disk B then being stationary and locked by means of the Geneva stop) the plunger  $c$  being maintained by the cam  $h$  now acts as a lower die and rigidly supports the shot or sphere. While the shot or sphere is in this position the outer punch  $l'$  is forced, by means of the lever  $j'$  being depressed by the cam  $M'$ , into the aperture in which the shot or sphere is located and forms a solid rivet, the head of which rests on the plunger  $c$ , the shank being uppermost. The inner punch  $l$  instantly follows, being depressed by the lever  $j$  and cam M and forms a hollow in the shank of the rivet. The punch  $l$  is then withdrawn by the raising of the lever  $j$  by means of the cam  $M^3$  and after that the punch  $l'$  is withdrawn by the raising of the lever  $j'$  by means of the cam  $M^2$ . On the withdrawal of the punches the disk B again rotates (in the same direction as before) and the already formed rivet is ultimately carried to a position in line with and above the closing plunger G. At this juncture the weighted slide is released and striking the projection on the lower plunger  $c'$  at 1 forces the rivet through the paper into the aperture in the jaws, the closing plunger G instantly rises consequent upon the frame J being forced downward on to the links H H' by the projection  $d''$  at 2. The jaws are simultaneously forced open by the part G' of the closing plunger in its upward movement contacting with the toes on the side members of the jaws. The upper part of the closing plunger enters the hollow shank of the rivet and closes the rivet and seals the paper or the like. The disk B then makes another half revolution when another rivet or seal is formed and another paper or the like which follows the previous paper or the like is sealed and so on.

The object of the spring pistons  $g'$  at the periphery of the disk B is to enable the duplex punch to enter the disk at points other than those at which the plungers  $c$  and  $c'$  are located as the reciprocating movement



of the duplex punch synchronizes with the Geneva stop, thus rendering it necessary to provide means whereby the said duplex punch sustains no injury and at the same time to additionally insure the shots or spheres do not enter apertures other than those intended for their reception.

It is obvious that I may increase the number of plungers such as *c* and *c'* according to the number of stops effected by the Geneva stop in which case the movement of the weighted slide and feeding rolls would be synchronized with the movement of the disk.

The object in causing the duplex punch to reciprocate more often than would appear to be necessary when the disk B is provided with two plungers only is to obtain an increase in the velocity of the reciprocation of the duplex punch as in practice I have found that more satisfactory rivets or seals can be made, *i. e.* with less metal (which for most purposes is greatly to be desired) as the result of rapid formation thereof as compared with their formation under a slower movement of the duplex punch.

When the apparatus is used for sealing newspapers the rotation of the disk B is synchronized with the folding mechanism of the printing machine so that each newspaper is delivered from the folding mechanism properly sealed.

I claim—

1. In an apparatus for sealing newspapers and for similar purposes, the combination of a plate to support the mechanism with a hopper to receive spheres of soft metal, a rotating disk having apertures therein to receive the said spheres, two punches one of which moves inside the other to form the seals from the said spheres, plungers moving in the apertures in the disk, means for operating the said punches and plungers and for rotating the disk all substantially as specified.

2. In an apparatus for sealing newspapers and for similar purposes, the combination of a plate to support the mechanism with a hopper to receive spheres of soft metal, a rotating disk having apertures therein to receive the said spheres, two punches, one of which moves inside the other to form the seals from the said spheres, the said disk having grooves formed therein within the said apertures to receive the fin formed on the head of the seal, plungers moving in the apertures in the disk, a cam attached to or formed integral with the plate to operate the said plungers, springs to return the said plungers to their normal position, rotating cams to raise and depress the said punches and gearing to rotate the said disk and cams

operating the punches, all substantially as specified.

3. In an apparatus for sealing newspapers and for similar purposes, the combination of a plate to support the mechanism with a hopper to receive spheres of soft metal, a rotating disk having apertures therein to receive the said spheres, two punches, one of which moves inside the other, to form the seals from the said spheres, the said disk having grooves formed therein within the said apertures to receive the fin formed on the head of the seal, plungers moving in said apertures in the disk, a cam attached to or formed integral with the plate to operate the said plungers, springs to return the said plungers to their normal position, rotating cams to raise and depress the said punches, a weighted slide to force the plungers outward when the seal has to be passed through the papers and the like, moving jaws below the said disk, a slotted closing plunger below the said jaws, links attached to the said jaws at their upper ends and having pins at their lower ends which engage with slots in the said jaws, a pin in center of the said links passing through the slot in the closing plunger, links connecting the closing plunger with a frame moving vertically on the said plate, rolls for guiding and perforating the article to be sealed, a cam for raising the weighted slide, a stop motion for holding the disk stationary while a seal is being made and another closed, gearing to operate the mechanism and a table over which the articles to be sealed pass all substantially as specified.

4. In an apparatus for sealing newspapers and for similar purposes, the combination of a rotating disk having apertures therein, said apertures having fin-receiving grooves, the said disk having also holes formed therein communicating with the said grooves with plungers moving in the said apertures radially in relation to the said disk, for the purpose stated.

5. In an apparatus for sealing newspapers and for similar purposes, the combination of a rotating disk, plungers moving radially therein, projections on the said plungers and a weighted slide, said disk being provided with slots, said projections moving in said slots, the said weighted slide on its downward travel coacting with the projections on the plungers when in their lower position by contact therewith, as specified for the purpose stated.

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