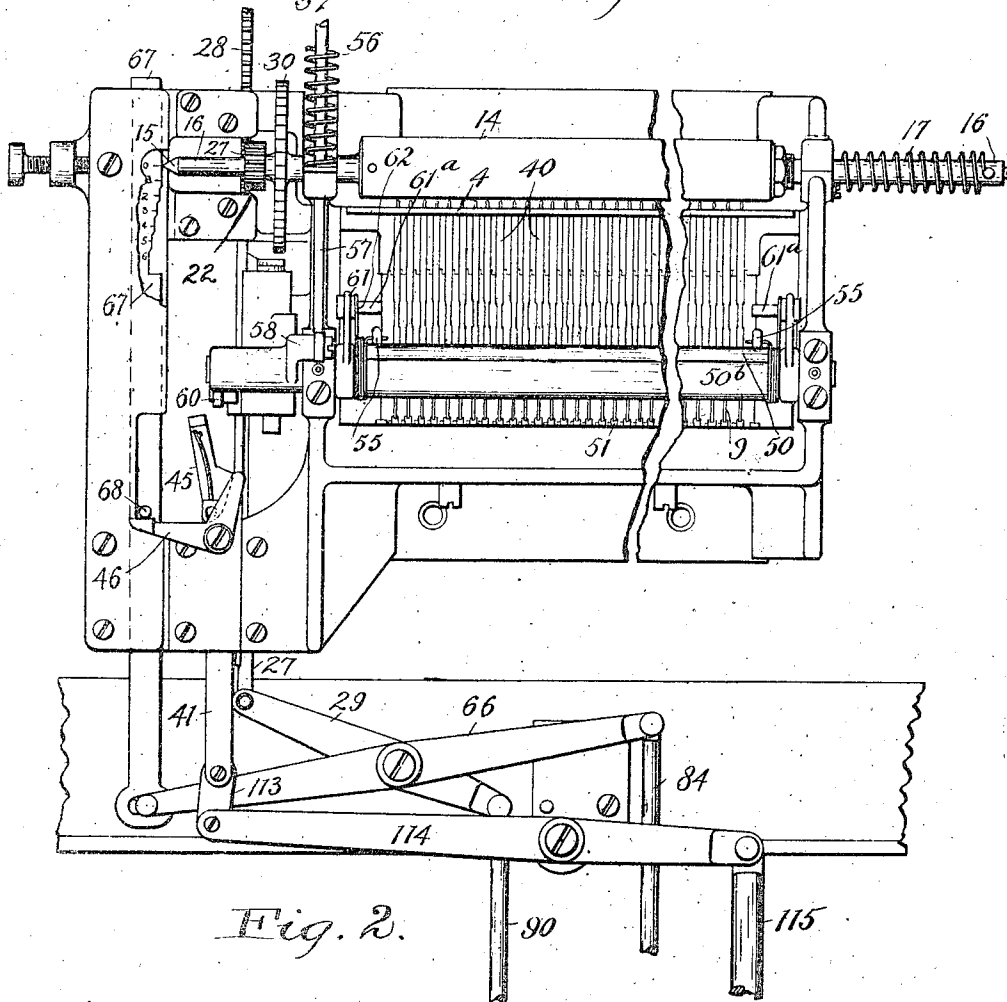
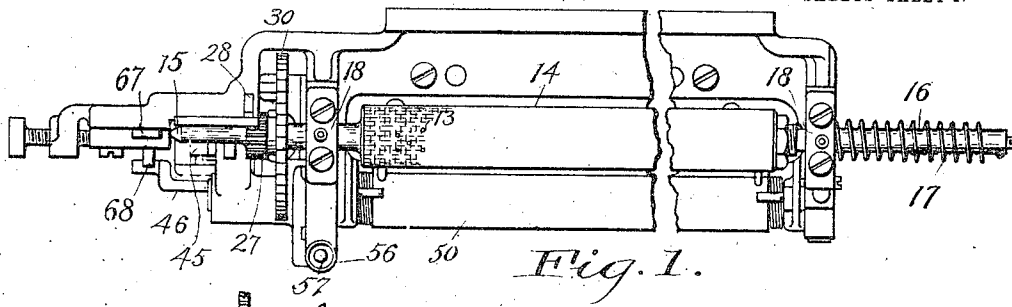


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 SPACER SELECTING AND RELEASING MECHANISM.  
 APPLICATION FILED JULY 16, 1909.

1,060,580.

Patented May 6, 1913.

2 SHEETS—SHEET 1.



Witnesses.  
 E. B. F. Christ  
 H. B. Sullivan

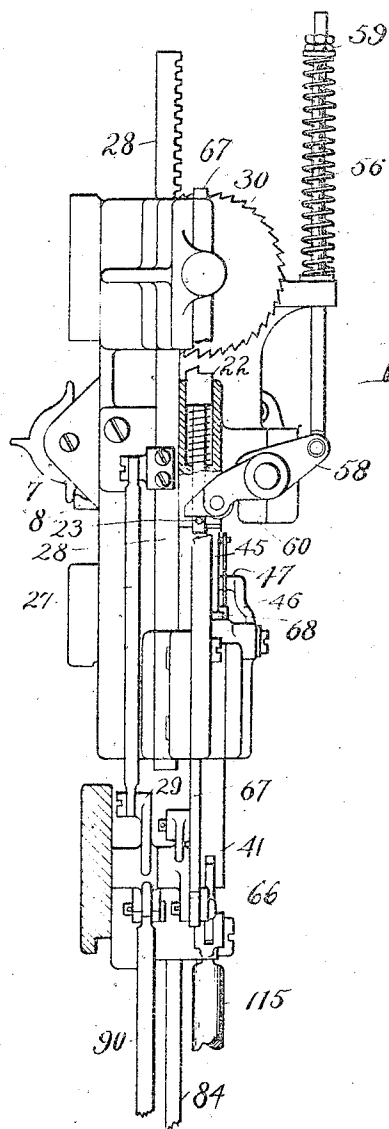
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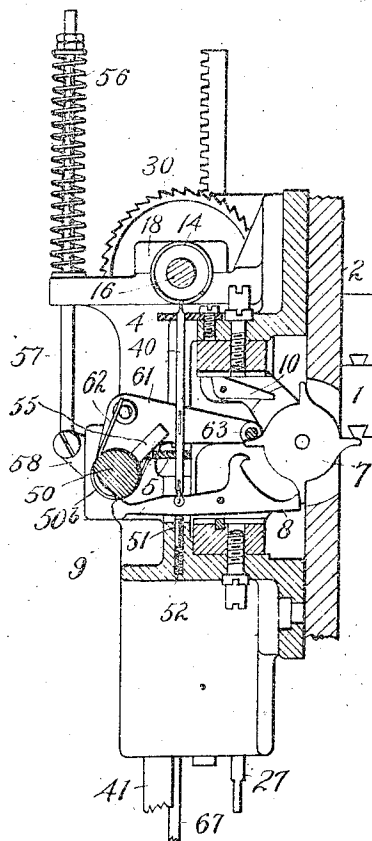
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2 SHEETS-SHEET 2.



*Fig. 3.*



*Fig. 4.*

Witnesses.

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# UNITED STATES PATENT OFFICE.

BENJAMIN F. BELLOWES, OF CLEVELAND, OHIO, ASSIGNOR TO ELECTRIC COMPOSITOR COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## SPACER SELECTING AND RELEASING MECHANISM.

1,060,580.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed July 16, 1909. Serial No. 507,918.

*To all whom it may concern:*

Be it known that I, BENJAMIN F. BELLOWES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Spacer Selecting and Releasing Mechanism, of which the following is a full, clear, and exact description.

10 This invention is intended to be used as a part of justifying mechanism similar to that which forms the subject matter of the Bellows Patent No. 797,549.

It relates particularly to the mechanism 15 for selecting and releasing the justifying spacers, and may, with very slight modifications of the associated mechanism, be substituted for the spacer selecting and releasing mechanism of that patent. It is, however, more particularly an improvement in the spacer selecting and releasing mechanism which forms the subject matter of the Bellows Patent No. 895,231.

As described and shown in the first named 25 patent, the spacers to be selected and released are stored in vertical channels. These channels are arranged in groups constituting magazines, and each magazine has a single discharge mouth, through which 30 spacers released from any of its channels are delivered into a tube by which the spacers are conveyed and delivered into an assembled line of matrices. In that patent three vertically movable rods are shown. 35 One rod is moved vertically a definite distance every time a temporary spacer is added to the line. Another vertically movable rod is the one, which, after an assembled line has reached justifiable length is 40 given a vertical movement every time a matrix is added to the line, which is proportionate to the width of the matrix so added. The third vertically movable rod is that 45 which is given a vertical movement after the other two rods have been moved as required, and the line has been completed, whereby the spacer releasing mechanism is caused to operate so as to release the selected 50 permanent spacers—that is to say, we space from each magazine whose corresponding tube has been put into the assembling line, the aggregate width of the spacers so released being equal to the line shortage. If the mechanism constituting the 55 present invention is to be usefully employed

as a part of a machine for justifying lines of matrices or type, (and that is the purpose for which it is intended) it must be associated with mechanism having the same functions and substantially the same mode of operation as the three vertically movable 60 rods referred to, wherefore the upper ends of said rods are shown in the drawings and are designated respectively 84, 90 and 115. It is to be understood, however, that the 65 mechanism constituting the present invention will select and release from their magazine channels a great variety of combinations of spacers, irrespective of the means employed for moving the parts which control the position of the selecting cylinder. 70

The present invention will now be described, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of the present invention. Fig. 2 is a rear elevation thereof. 75 Fig. 3 is an end elevation on the left side of Figs. 1 and 2; and Fig. 4 is a vertical sectional view in the plane indicated by line 4—4 on Fig. 2. 80

The selecting cylinder 14 is secured to a shaft 16 which is mounted in suitable bearings 18 so as to be capable of rotation and of moving endwise in said bearings. In the surface of said cylinder are formed a number of holes 13, which are placed at the intersections of imaginary longitudinal lines and circumferential lines on the surface of said cylinder, as indicated by dotted lines in Fig. 1. The number of longitudinal rows of 85 holes is equal to the number of teeth in a ratchet wheel 30 fixed to the said shaft; and this, when this mechanism is used in connection with such justifying mechanism as is shown in the patent referred to, is equal 90 to the number of units of shortage which can be filled out in the line by the various combinations of spacers which can be released from the spacer channels. These 95 holes will also be arranged in a great number of circumferential rows. If, for example, the spacer channels are grouped in six magazines, the number of circumferential rows of holes upon the cylinder will be six times the number of spacer channels employed. Only a few of these holes are 100 shown: and no attempt has been made to show the precise location of those which are shown. The holes may be disposed upon the surface of this cylinder in precisely the same 110

arrangement as are the projections on the spacer selecting and releasing cylinder shown and described in the Bellows Patent No. 895,231.

5 A spring 17 surrounds one projecting end of the shaft 16 and is under such tension that it exerts a force tending to move said shaft to the left as shown in Figs. 1 and 2 and to also turn it. The endwise movement of this shaft is limited by the engagement  
10 of the pointed end 15 thereof with a vertically movable stepped wedge 67, which is shown partly in dotted lines, and is connected by the rocker 66 with the vertically  
15 movable rod 84. Whenever this wedge is moved upward a distance equal to the length of a step thereon, the shaft 16 may be moved by the spring 17 to the left so as to maintain the engagement of the shaft end with said  
20 stepped wedge. This movement is equal to the distance between two adjacent circumferential rows of holes on the cylinder. On the shaft 16 is a pinion 27 engaging with a vertically movable rack 28, the lower end of  
25 which is connected by means of a link 27 and a rocker 29 with the vertically movable rod 90. Assuming that suitable mechanism is employed for moving the rod 90, such, for example, as is shown in said prior patent,  
30 have been so moved that its position, and, consequently, the position of the cylinder, is such as corresponds to the existing shortage of the line being composed. These two  
35 movements of the cylinder will bring different combinations of holes in the cylinder into operative position, so as to control the release of different combinations of spaces through the mechanism now to be described.  
40 Associated with each spacer channel 2 is a star wheel 7 having four arms, one of which projects through a slot in the rear side of the channel into the same and beneath the column of permanent spacers in  
45 said channel. Associated with each star wheel is a pallet lever 8, one jaw of which normally engages with an arm of the star wheel and prevents it from turning as it would otherwise do, because of the weight of  
50 the column of spacers engaging with the front horizontal arm of said star wheel. Connected with the tail piece 9 of each of these pallet levers is a vertically movable  
55 rod 40—these rods passing through suitable guide-ways as holes in fixed plates, and having pointed upper ends which lie directly beneath the cylinder and in a row length-  
wise thereof. Preferably, the lower end of each rod is slotted and made ball shaped so  
60 that it will be sprung into a suitable recess in the pallet lever. The distance between the ends of adjacent rods is six times as great as the distance between adjacent circumferential rows of holes on the cylinder.  
65 The tails of all of these pallet levers lie be-

neath and normally engage with the surface of a single long cam 50 which is rotatably mounted in the frame work of the machine. This cam has a depressed surface 50<sup>b</sup> extending from end to end, and therefore when the  
70 cam is turned so as to bring this depressed surface over the tail ends of the pallet levers, the upward movement of these tail ends is no longer restrained by the cam. Each of these pallet levers is under the influence of  
75 a plunger 51 actuated by a spring 52 tending to push it up, and those pallet levers will be pushed up whose associated rods 40 are directly beneath holes in the cylinder. The upward movement of the other rods  
80 and consequent movement of the associated pallet levers will be prevented by the engagement of said rods with the unperforated surface of the cylinder. This cam 50 is normally held in the position shown in Fig.  
85 4, (in which position it prevents the swinging of the pallet levers) by means of a spring 56 embracing a rod 57 which is pivotally connected with an arm 58 fixed to the shaft  
90 of the cam 50, said spring being compressed between a fixed part of the frame work and a nut 59 upon said rod. Another arm 60 secured to the cam shaft is that through which the cam is turned in opposition to the spring.

85 There is a vertically movable bar 41 having at its upper end a spring pawl 45, which pawl is adapted, under conditions to be stated, to swing under the end of this arm  
100 60 so that as said bar 41 is moved upward, said pawl, by engaging with said arm 60, will turn the cam 50 into its releasing position. A bell crank lever 46 is pivoted to the frame work and has a finger 47 engaging  
105 with this spring pawl, while the other end of said lever is engaged by a pin 68 on the stepped wedge 67. When the stepped wedge is in the position it occupies before a temporary space enters the line, this pin acts  
110 upon the lever 46 and swings it, and the lever acts upon the spring pawl and pushes it out of alinement with said arm 60; but when the stepped wedge has moved up one step, it releases this lever 46 and allows the  
115 pawl 45 to be swung by its own spring into operative position beneath the arm 60. When now, after the cylinder has moved endwise and has been turned so that it occupies the position it should occupy, the rod  
120 41 is moved upward. This movement is produced by the downward movement of the bar 115, which is connected to the rod 41 by the rocker 114 and link 113. One of the first effects of the upward movement of the bar  
125 41 is, to allow a spring plunger 22 having a wedge shaped upper end to move up and engage with the ratchet 30 fixed to the cylinder shaft 16. This upward movement had previously been prevented by the engagement of a pin 23 attached to this plunger,  
130

with the lever 60. The engagement of the plunger with the ratchet very accurately brings the cylinder into the correct position, provided it was only a little removed from that position. The cam 50 will be turned into the releasing position by the action of pawl 45 on arm 60. The selected pallet levers, that is to say, those whose rods 40 are beneath holes in the cylinder, will be then severally operated by their spring plungers 51 and one space 1 will be released from each associated channel 2.

By reversing the direction of movement of the rods 84, 90 and 115 all of the parts will be returned to their normal positions—that is to say, rod 41 will be drawn down, and thereby the cam is permitted to rock backward and is so rocked by the action of spring 56, thereby drawing down the elevated tail pieces of the pallet levers. Its backward rocking motion is limited by the engagement of an arm 55 thereon with the bar 5. The plunger 22 is simultaneously drawn downward by the action of arm 66 on pin 23; the stepped wedge 67 is moved downward, and thereby, since the steps thereon join each other by each inclines, the shaft 16 is moved endwise to its initial position. The rack 28 is moved upward, and thereby shaft 16 is turned back to its normal position.

Two adjunctive features of construction are shown. One is for the purpose of securing the alinement of all of the star wheels. This consists of a frame comprising two levers 61, which are loosely hung on the cam shaft, and a bar 63 which extends between and is connected with said levers, and normally lies over and in contact with a horizontal arm on each star wheel, the frame being normally held in this position by springs 62. These springs are of the ratchet variety, and one end of each spring engages with a radial arm 55 fixed to the cam, and the other end engages with a pin 61<sup>a</sup> secured to arm 61. When the cam is in its normal position, these springs are put under such tension that the arms 61 will be swung so that the rod 63 will engage with and apply a light but sufficient force to the arms on each of the star wheels so as to hold said arms in alinement. When the cam is turned to the releasing position, the arms 55 will engage the pin 61<sup>a</sup> and slightly rock the arms 61 in a reverse direction whereby the rod 63 will be moved so far away from the star wheel arms, that the star wheels may turn. When the cam rocks to its releasing position, these levers are rocked, and this rod withdrawn so as to permit the star wheels to turn, but when the cam returns to its normal position the bar 63, engaging with the arms on the star wheels brings said star wheels to correct position.

Another feature consists of a plurality of

weighted pawls 10, one associated with each star wheel. One end of each pawl lies in the path of the arms on the star wheel. When the star wheel is turning in the direction to release a spacer, an arm lifts the pawl and passes it readily, but, if by chance the star wheel be turned in the reverse direction, this pawl by engaging with an arm of the star wheel limits the extent of such movement so that no harm will be done.

I claim—

1. In spacer selecting and releasing mechanism, the combination of a selecting member adapted to be moved in two directions relatively transverse to each other and having in its surface a plurality of holes, a row of pins arranged opposite the perforated surface of said selecting member, said pins being adapted to enter such holes in the selecting member as are brought into alinement with them whereby relative movement is permissible as between said selecting member and those pins which are alined with holes therein, but is not permissible as between said selecting member and those pins which are not alined with holes therein, and escapement mechanism severally connected with said pins.

2. In spacer selecting and releasing mechanism, the combination of a selecting member adapted to be moved in two directions relatively transverse to each other, having in its surface a plurality of holes which are arranged in two relatively transverse rows corresponding in direction to the direction in which the member moves; spring operated escapement controlling mechanisms, and pins severally connected with said escapement controlling mechanisms and arranged with their ends opposed to the perforated surface of said selecting member, and means normally restraining the operation of said escapement device.

3. In spacer selecting and releasing mechanism, the combination of a rotatable and endwise movable cylinder having in its surface a plurality of holes, a plurality of spacer controlling escapement mechanisms, pins severally connected with said escapement mechanisms and arranged with their ends opposed to the surface of said cylinder, the ends of said pins being of such size that they may enter any holes on the cylinder brought into alinement with them.

4. In a spacer selecting and releasing mechanism, the combination of a rotatable and endwise movable cylinder having in its surface a plurality of holes, a plurality of spacer controlling escapement mechanisms, pins severally connected with said escapement mechanisms and arranged with their ends opposed to the surface of said cylinder, the ends of said pins being of such size that they may enter any holes on the

cylinder brought into alinement with them, spring actuated mechanisms for severally operating the escapement controlling mechanisms, means normally restraining the operation of said escapement controlling mechanisms, and means withdrawing said restraining means.

5. In spacer selecting and releasing mechanisms, the combination of a rotatable and endwise movable cylinder having in its surface a plurality of holes, a plurality of escapement controlling levers, pins severally connected with said levers and arranged with their ends opposed to the surface of the cylinder, the ends of said pins being of such size that they may enter any holes on the cylinder brought into alinement with them, a cam normally restraining the spacer releasing movements of said levers, and spring actuated mechanisms for moving said levers when their movement is permitted by said cam.

6. In spacer selecting and releasing mechanism, the combination of a rotatable and endwise movable cylinder having in its surface a plurality of holes, a plurality of escapement controlling levers, pins severally connected with said levers and arranged with their ends opposed to the surface of the cylinder, the ends of said pins being of such size that they may enter any holes on the cylinder brought into alinement with them, a cam engaging with and normally restraining the spacer releasing movements of said levers, spring-actuated mechanisms for moving said levers when their movement is permitted by said cam, and mechanism for moving said cam from and back to its normal position.

7. In spacer releasing mechanism, the combination of an escapement star wheel, a spring-actuated pallet lever cooperating with said star wheel, a spring-actuated rocking frame having a rod adapted to engage with an arm of said star wheel to hold it in a desired position, a cam normally restraining the spring induced movement of said pallet lever, and means movable synchronously with said cam for rocking said frame in opposition to its spring whereby the rod carried by said frame is withdrawn from the path of the arms of said star wheel.

8. In spacer selecting and releasing mechanism, the combination of a rotatable and endwise movable cylinder having in its surface a plurality of holes, a ratchet wheel movable only with said cylinder, a taper ended spring plunger adapted to engage with said ratchet wheel, a plurality of spring actuated escapement controlling levers, pins severally connected with said levers and having their ends adjacent to said cylinder and of such size as to be adapted to enter the holes therein, a cam engaging with said levers and normally preventing their operation, lever arms secured to said cam, a projection on said spring plunger engaged by one of said lever arms, spring operated mechanism connected with one of the lever arms, and a vertically movable push rod adapted to engage with one of said arms.

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

BENJAMIN F. BELLOWS.

Witnesses:

E. L. THURSTON,  
H. R. SULLIVAN.