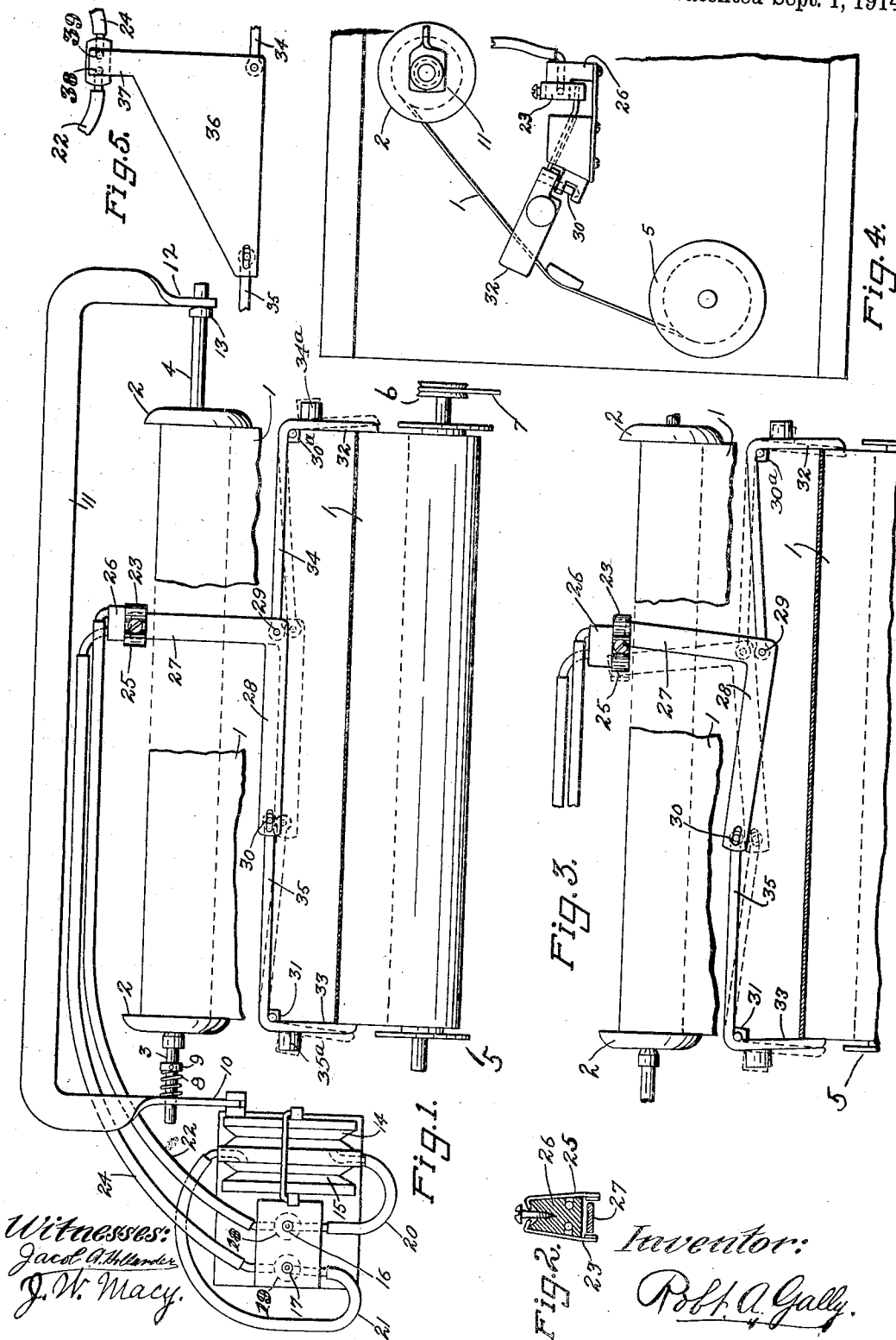


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 CENTERING MEANS FOR FEED GUIDES.
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CENTERING MEANS FOR FEED-GUIDES.

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To all whom it may concern:

Be it known that I, ROBERT A. GALLY, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Centering Means for Feed-Guides, of which the following is a specification.

Previous devices in this art have employed 10 crab lever or screw control of edge guides, and other means for direct control of guidance of travel of bars, strips or webs having sufficient strength of substance to stand up to such guidance, while for weak materials 15 such as thin paper for printing machinery or music playing apparatus, detector air tension controlling apertures, or sensitive fingers have been employed at one or both edges or margins of the web to avoid dam- 20 aging its material, the guiding shift of the web being done through secondary mechanisms of pneumatic or electric design controlled from such apertures or fingers and acting on the spool, roller, drum, spindles 25 or other means carrying and forwarding the web. With the variation of width of such bars, strips or webs, from the determined standard, especially those changes of paper caused by hygrometric variations of 30 the atmosphere, many of those devices would be unable to determine the true center except of exactly normal width material, wherefore hand adjusting means have been added to correct such errors, or a plurality 35 of detecting apertures have been positioned at two positions of the varying widths. Such hand adjusting means when alternative of the automatic adjustment, as in my Patent No. 1,093,046, of April 14, 1914, safely 40 remedy the trouble, but calls for personal attention. Any hand adjusting means altering the position of guidance of the automatic means leads to trouble when wrong setting is overlooked by the user. The plu- 45 rality of detecting apertures requires a multiplication of valve controls, etc., and unduly complicates the apparatus.

In the present invention only two detector means are employed, and if for thin material such as paper, preferably fingers of 50 the very strong yet delicate structure shown in my Patent No. 1,093,179, of April 14, 1914, said fingers being adjusted so as to contact the two edges of the bar, strip or 55 web at all times, whether the two edges are

at normal distance, or greater or less than normal. Combined with the two edge detectors is a third member of a "floating" character, having its part which controls the shifting mechanism, so disposed and connected relative to the two detectors that 60 variation of width of the material between the fingers so long as the material is traveling in its true central position will move the said controlling part in close relation to 65 the actuators but not operating the shifting means, but that when the material at any width moves to either side of its true central line of travel, the said controlling part of the "floating" member will be deflected to 70 one side or the other of its median position and cause the actuator of the shifting means to put the shifting means in operation to return the traveling material to its true central path and the controlling part of the 75 "floating" member be also brought to its normal neutral condition through the action of the restored traveling material on the two detectors.

In the drawings, Figure 1 is a plan view 80 of the invention; Fig. 2 a rear view of the controlling valve block in section; Fig. 3 a plan view showing positions of parts when momentarily out of normally centered condition; Fig. 4 an elevation from the right 85 end of the device; and Fig. 5 a modified form of the "floating" means.

The present invention is now illustrated as applied to the central guidance of a perforated music sheet of a self-playing musical 90 apparatus, although its use is to be understood as claimed for any purpose where it may be desirable.

In the structure now shown a sheet or web 1 is carried on a roll 2 supported on 95 spindles 3 and 4, the web being drawn from said roll on to a spool 5, which is revolved by a pulley 6 and belt 7 or any other suitable means. The two spindles 3 and 4 are pressed toward each other by a coil spring 100 8 acting between a collar 9 fast on spindle 3 and the left arm 10 of yoke 11, the right arm 12 of said yoke 11 standing outside of a fixed collar 13 on the spindle 4, the 105 two spindles being thus held together in axial engagement with the music roll 2, therefore any motion exerted lengthwise of the yoke 11 and the spindles 3 and 4 will serve to move the yoke, spindles and roll in common motion. The automatic control 110

of the lengthwise position of the roll 2 is attained by the action of the pneumatic motors 14 and 15, which are set in operation by suitable valves 16 and 17 and their pneumatics 18 and 19. Motor 14 is connected to valve 16 by a tube 20, and motor 15 to valve 17 by a tube 21. A tube 22 leads from the pneumatic 18 to the actuator valve 23, whereby the opening of said actuator will cause the operation of motor 14; while a tube 24 leads from the pneumatic 19 to the actuator valve 25. These two actuator valves 23 and 24 cover vent openings at the terminals of tubes 22 and 24, being preferably suspended on the slightly slanted vertical faces of the vent block 26, so that but little power is required to throw them off their seats. Lying between the lower ends of these two actuator valves is the kicker arm 27 of a floating member 28, which floating member has two center holes 29 and 30, by which center holes its position and movements are controlled, said center holes being normally approximately in a line with the two centers 30^a and 31 of the two detectors 32 and 33, the control arms 34 and 35 of said detectors lying in that same general line, and being at right angles to the detector fingers 32 and 33, and the center holes 29 and 30 of the floating member being engaged on corresponding pins at the inward ends of the control arms 34 and 35. Counterweights 34^a and 35^a lessen the pressure of the fingers 32 and 33 against the web.

With the kicker arm 27 in normal position with both valves 23 and 25 seated, the detector fingers 32 and 33 stand with their inner or contact faces at an equal distance from the true center line of travel of the web 1, and any variation in width of such web so long as it is central will only increase or decrease the distance between said contact faces and draw the entire floating member 27, 28 forward and back in a straight line so that the valves 23 and 25 are not disturbed from their seats, as shown by dotted lines in Fig. 1.

Whenever the web 1, whether wider or narrower than the normal medium, runs off the true central path of travel as in Fig. 3, the floating member 27, 28 will be slightly revolved on its two center holes 29 and 30 and its kicker arm 27 moved to one side of its normal alinement and move the corresponding valve 23 or 25 from its seat and thus set in operation the pneumatic motors 14 or 15, the action whereof will restore the web, fingers, floating member and valve to normal. So long as the travel of the web is central, both valves 23 and 25 are closed and therefore no air lost, whether the web is wide or narrow, and as the detector fingers 32 and 33 are always in contact with the edges of the web 1 and the

kicker arm 27 closely set to the valves 23 and 25, any shift of the web from central travel can be but momentary, as also the time of opening of the valves and the operation of the pneumatic motors.

In Fig. 5 is shown a modified form wherein the floating member 36 has its rear part 37 disposed as a sliding valve normally covering both ports 38 and 39 which control tubes 22 and 24, the movement of valve part 37 to either side when so disturbed from normal by deviation of the web from central travel then opening one or the other of said ports 38 or 39 and setting into operation the corresponding motors 14 or 15.

It is to be understood that the present invention is claimed not only as applied to any center guiding of a feed where same may be desirable, but that electric, mechanical or other equivalents of pneumatic valves, motors and connections may be employed in lieu of such valves, motors and connections and yet such devices be subject to my invention.

I claim as my invention:—

1. In a feed-centering device; means to cause a material to travel in the line of its greatest dimension, and means to determine said travel of said material by gaging by a second lesser and varied dimension of said material truly centered to said line of travel, said determining means comprising two opposed detector means, one at each of the two opposite extremes of said lesser and varied dimension of said material, a floating means co-acting with both said two detectors, and means controlled by said floating means and adapted to control the travel of said material centrally to said line of travel irrespective of the width of the said lesser dimension within the limits of operative movement of said detectors, said floating means having a bodily motion in similar direction to the said line of travel as the said material varies in width but remains central.

2. In a feed-centering device; means to cause a material to travel in the line of its greatest dimension, and means to determine said travel of said material by gaging by a second lesser and varied dimension of said material truly centered to said line of travel, said determining means comprising two opposed detector means, one at each of the two opposite extremes of said lesser and varied dimension of said material, a floating means co-acting with both said two detectors, and means controlled by said floating means and adapted to control the travel of said material centrally to said line of travel irrespective of the width of the said lesser dimension within the limits of operative movement of said detectors, said floating means having a bodily motion

in similar direction to the said line of travel as the said material varies in width but remains central and a controlling part of said floating means having a motion transverse to the line of travel when said material departs from said centered line of travel.

3. In a feed-centering device; means to cause a material to travel in the line of its greatest dimension, and means to determine said travel of said material by gaging by a second lesser and varied dimension of said material truly centered to said line of travel, said determining means comprising two opposed detector means, one at each of the two opposite extremes of said lesser and varied dimension of said material, a floating means co-acting with both said two detectors, and means controlled by said floating means and adapted to control the travel of said material centrally to said line of travel irrespective of the width of the said lesser dimension within the limits of operative movement of said detectors, said floating means having a bodily motion in similar direction to the said line of travel as the said material varies in width but remains central and a controlling part of said floating means having a motion transverse to the line of travel when said material departs from said centered line of travel, and a valve means at each side of said controlling part of said floating means and adapted to be moved in the direction of said transverse motion.

4. In a feed-centering device; means to cause a material to travel in the line of its greatest dimension, and means to determine said travel of said material by gaging by a second lesser and varied dimension of said material truly centered to said line of travel, said determining means comprising two opposed detector means, one at each of the two opposite extremes of said lesser and varied dimension of said material, a floating means co-acting with both said two detectors, and means controlled by said floating means and adapted to control the travel of said material centrally to said line of travel irrespective of the width of the said lesser dimension within the limits of operative movement of said detectors, said floating means having a bodily motion in similar direction to the said line of travel as the said material varies in width but remains central, and a controlling part of said floating means having a motion transverse to the line of travel when said material departs from said centered line of travel, and two control ports controlled by said controlling part of said floating means and adapted to be alternately opened by the right and left motion of said controlling part as it is moved in the direction of said transverse motion.

5. In a feed-centering device; means to cause a material to travel in the direction

of its greatest dimension, two contact fingers disposed to bear one against each extreme of a lesser dimension of said material, each said finger movable in the direction of said lesser dimension, and each said finger having an extension substantially at right angles to said finger and projecting in opposite directions and substantially in alinement with the other, said fingers and their extensions having revoluble bearings at their junctures, a floating member having a pivotal connection with the free end of each said extension, said floating member having a controlling part thereof distant from the line on which the two pivotal connections lie, means for determining the central travel of said material, and dual control elements of said center determining means, said dual control elements disposed to be alternately operated by a motion of said fingers and the controlling part of said floating means when said material and fingers are deflected from their true centralized position.

6. In a feed-centering device; means to cause a material to travel in the direction of its greatest dimension, two contact fingers, disposed to bear one against each extreme of a lesser dimension of said material, each said finger movable in the direction of said lesser dimension, and each said finger having an extension substantially at right angles to said finger and projecting in opposite directions and toward each other and substantially in alinement with the other, said fingers and their extensions having revoluble bearings at their junctures, a floating member having a pivotal connection with the free end of each said extension, said floating member lying between said extensions and having a controlling part thereof distant from the line on which the two pivotal connections lie, means for determining the central travel of said material, and dual elements of said center determining means, said dual control elements disposed to be alternately operated by a motion of said fingers and the controlling part of said floating means when said material and fingers are deflected from their true centralized position.

7. In a feed-centering device; means to cause a material to travel in the direction of its greatest dimension, two contact fingers disposed to bear one against each extreme of a lesser dimension of said material, each said finger movable in the direction of said lesser dimension, and each said finger having an extension substantially at right angles to said finger and projecting in opposite directions and substantially in alinement with the other, said fingers and their extensions having revoluble bearings at their junctures, a floating member having a pivotal connection with the free end of each said extension, said floating member having

a controlling part thereof distant from the line on which the two pivotal connections lie, means for determining the central travel of said material, and dual control elements of said center determining means, said dual control elements disposed to be alternately operated by a motion of said fingers and the controlling part of said floating means when said material and fingers are deflected from their true centralized position, said controlling part of said floating means having a motion in direction of said travel line without departing from true normal centered position to the said travel line, said dual control elements being inoperative during any such straight line action of the said controlling part.

8. In a feed-centering device; means to cause a material to travel in the direction of its greatest dimension, two contact fingers disposed to bear one against each extreme of a lesser dimension of said material, each said finger movable in the direction of said lesser dimension, and each said finger having an extension substantially at right angles to said finger and projecting in opposite directions and toward each other and substantially in alinement with the other, said fingers and their extensions having revolvable bearings at their junctures, a floating member having a pivotal connection with the free end of each said extension, said floating member lying between and having a controlling part thereof distant from the line on which the two pivotal connections lie, means for determining the central travel of said material, and dual elements of said center determining means, said dual control elements disposed to be alternately operated by a motion of said fingers and the controlling part of said floating means when said material and fingers are deflected from their true centralized position, said controlling part of said floating means having a motion in direction of said travel line when said fingers are extended or contracted without departing from true normal centered position to the said travel line, said dual control elements being inoperative during any such straight line action of the said controlling part.

9. In a feed-centering device; two detector means of bell-crank form disposed and revoluble in substantially one plane with one contact finger arm of each crank

substantially parallel to and at a distance from the similar finger of the other crank, the inner faces of the two said contact fingers being disposed to contact the two opposite edges of a web to be guided, the other arm of each said crank extending toward the similar arm of the other, these second arms standing in a common line with a distance between their movable ends, a floating member co-acting with each of said second arms at its movable end, said floating member having a controlling part thereof distant from the line on which the two pivotal connections lie, means for determining the central travel of said material, and dual control elements of said center determining means, said dual control elements disposed to be alternately operated by a motion of said fingers and the controlling part of said floating means when said material and fingers are deflected from their true centralized position.

10. In a feed-centering device; two detector means of bell-crank form disposed and revoluble in substantially one plane with one contact finger arm of each crank substantially parallel to and at a distance from the similar finger of the other crank, the inner faces of the two said contact fingers being disposed to contact the two opposite edges of a web to be guided, the other arm of each said crank extending toward the similar arm of the other, these second arms standing in a common line with a distance between their movable ends, a floating member having three acting parts positioned in triangular relation, one of said parts co-acting with the movable end of one of said second arms, and another one of said parts co-acting with the other movable end of the other of said second arms, and the third part of said floating member acting as a controlling part, means for determining the central travel of said material, and dual control elements of said center determining means, said dual control elements disposed to be alternately operated by a motion of said fingers and the controlling part of said floating means when said material and fingers are deflected from their true centralized position.

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