C. L. STERN & T. R. G. PARKER.

SHEET LAY MECHANISM OF PRINTING AND OTHER MACHINES.

APPLICATION FILED JUNE 10, 1911.

1,002,332. **Patented Sept. 5, 1911.**

3 SHEETS—SHEET 1.

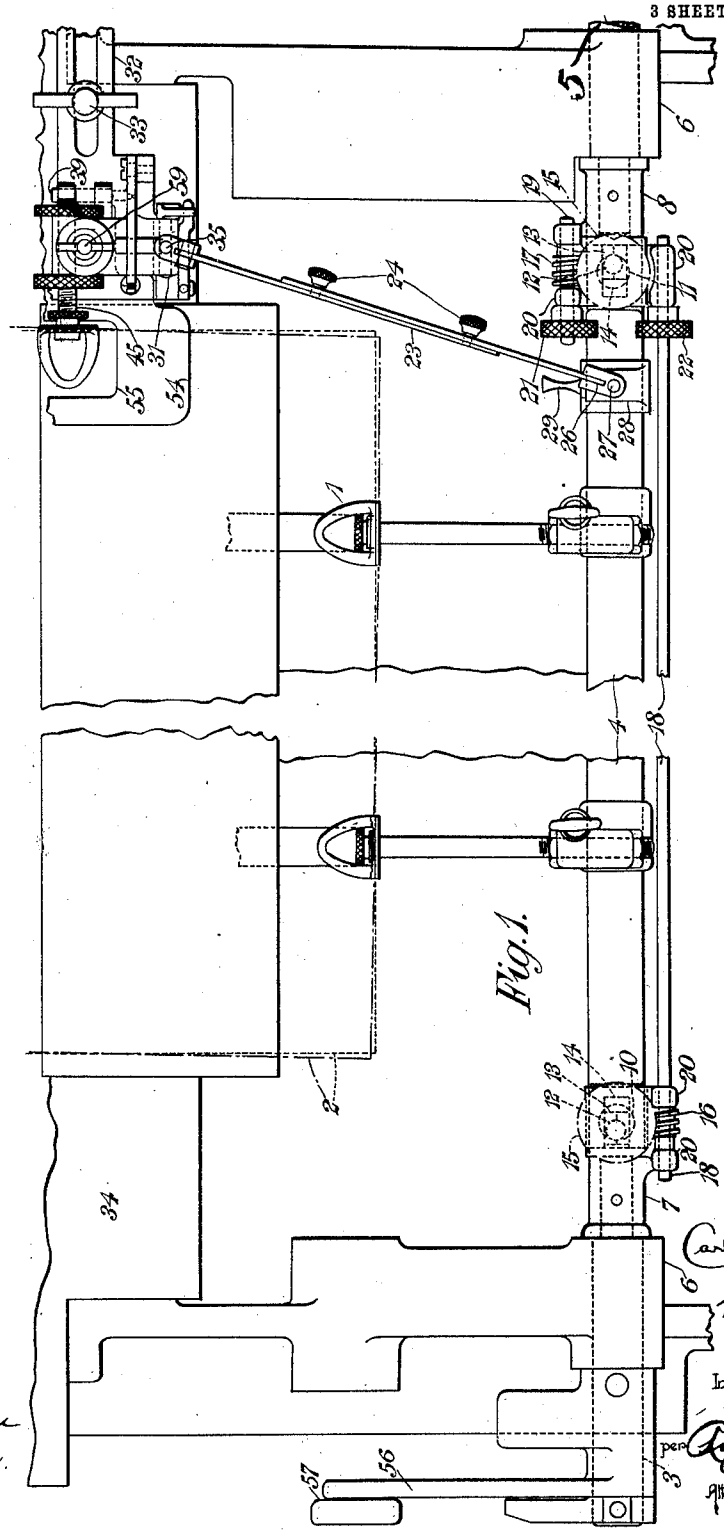

Fig. 1.

Witnesses.
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3 SHEETS—SHEET 2.

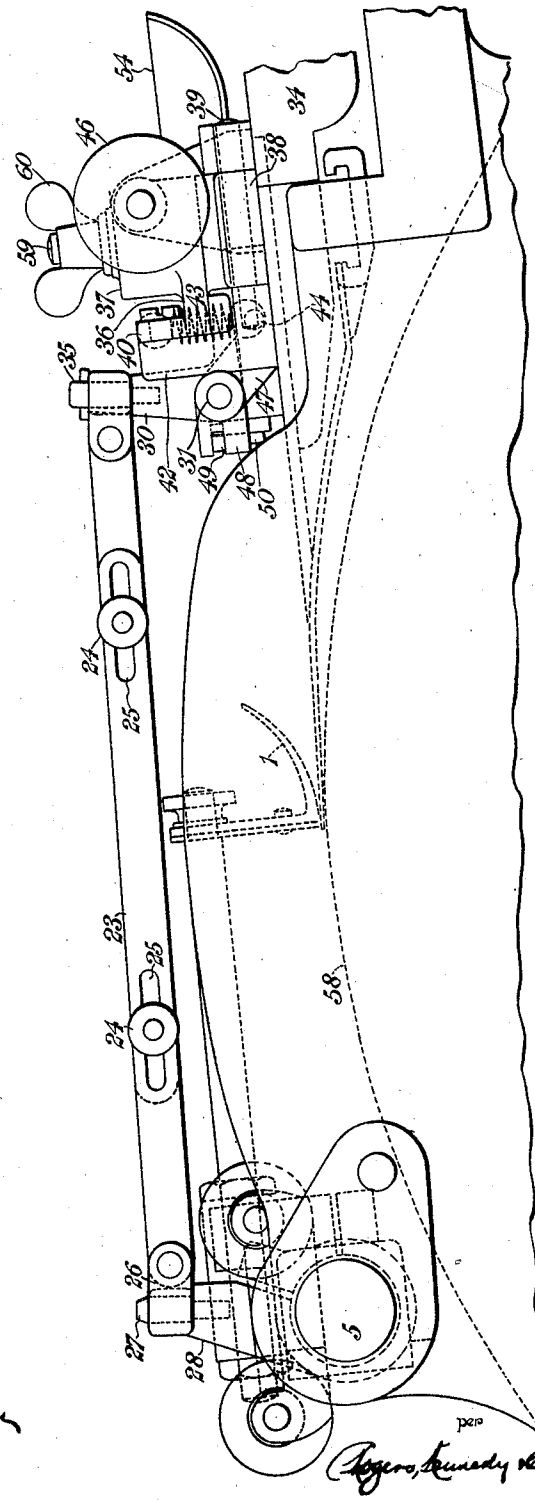

Fig. 2.

Witnesses.

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3 SHEETS—SHEET 3.

Fig. 3.

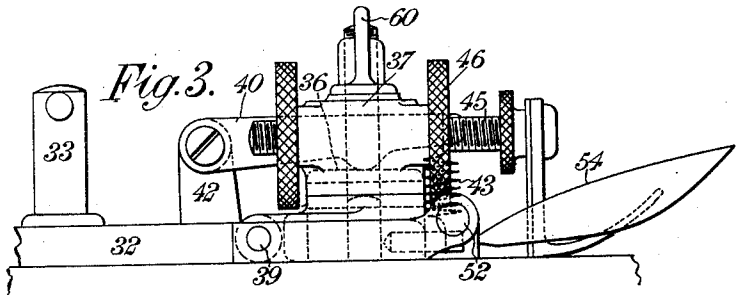

Fig. 4.

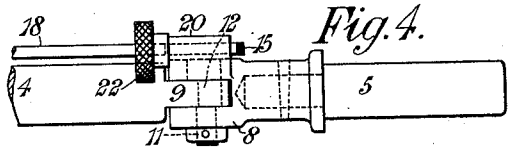

Fig. 6.

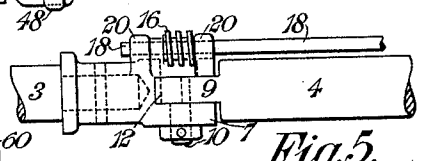

Fig. 5.

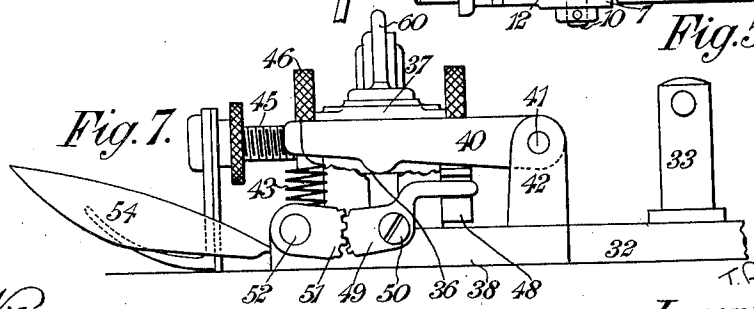

Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

CARL LOUIS STERN, OF LONDON, AND THOMAS ROBERT GILLETT PARKER, OF BROADHEATH, ENGLAND, ASSIGNORS TO LINOTYPE AND MACHINERY LIMITED, OF LONDON, ENGLAND.

SHEET-LAY MECHANISM OF PRINTING AND OTHER MACHINES.

1,002,332. Specification of Letters Patent. **Patented Sept. 5, 1911.**

Application filed June 10, 1911. Serial No. 632,335.

To all whom it may concern:

Be it known that we, CARL LOUIS STERN, a citizen of the United States of America, and resident of 188 Fleet street, in the city of London, England, and THOMAS ROBERT GILLETT PARKER, a subject of the King of the United Kingdom of Great Britain and Ireland, and resident of Linotype and Machinery Works, Broadheath, in the county of Chester, England, have invented new and useful Improvements in Sheet-Lay Mechanism of Printing and other Machines, of which the following is a specification.

This invention relates to improvements in sheet lay mechanism of printing and other machines such as folding machines, but as it is more particularly applicable for use in connection with printing machines, the following description deals with it only in that connection; it will however be understood that it may also be applied to other machines without departing from the spirit of the invention.

When heretofore, it has been necessary to adjust the front stops of a printing machine to suit sheets whose leading edges do not, or are not required to, reach the impression cylinder parallel with the axis of the latter, or, in other words, perpendicularly to the general direction of travel of such sheets through the machine, such adjustment has disturbed the alinement of the operative faces of the front stops. As a consequence of this want of alinement, the front stops have presented to the oncoming sheets, only angular surfaces against which the said sheets have been readily indented, with the result that the registration of successive impressions has been considerably disturbed. Moreover with sheets fed through the machine with their side edges at an angle to the direction of their travel lengthwise of the machine, these edges become curled up by rubbing against the side lay, and consequently those edges are rendered of little or no use for enabling subsequent registration to be obtained.

The object of the present invention is to overcome the before mentioned difficulties by arranging the front stop mechanism so that, whatever the position to which the front stops may be adjusted relatively to the general direction of travel of the sheets, the effective or stopping surfaces of such stops will always be in alinement with each other, and so that when the front stops are raised to allow the sheets to leave the feed board, the side lay or lays shall also be raised beyond the reach of the traveling sheets.

In the accompanying drawings which are to be taken as part of this specification and read therewith:—Figure 1 is a plan of the preferred construction of improved sheet lay mechanism applied, as an example, to a printing machine, only as much of the latter being shown as is sufficient for illustrating the invention; Fig. 2 is an elevation of the right-hand end of Fig. 1, as seen from the feeder side of the machine; Fig. 3 is an elevation of the side lay as seen from the right-hand side of Fig. 2; Figs. 4 and 5 are elevations of respectively the right and left-hand portions (as viewed in Fig. 1) of the front-stop shaft showing the manner in which the respective parts of that shaft are operatively connected together; Fig. 6 is a plan of the side lay fitted with the sheet depressor, and Fig. 7 is an elevation of the underside of Fig. 6, with part broken away. Figs. 1, 4 and 5 and Figs. 2, 3, 6 and 7 are drawn to respectively different scales.

Like reference numerals are used to indicate like parts or corresponding parts throughout the several figures of the drawings.

In the arrangement illustrated, the shaft by which the front stops 1 are rocked into and out of the path of the sheets 2—of which latter a part of one is shown in two different positions in respectively dot-and-dash lines and dotted lines in Fig. 1—is formed in three parts 3, 4 and 5, the two outer parts 3 and 5 being always co-axial and rocking in stationary bearings 6, and the inner or middle part 4 (hereinafter termed the adjustable shaft) being connected to the parts 3 and 5, in such manner, as hereinafter particularly described, as shall insure that, while always partaking of any rocking motion imparted to the parts 3, 5, it can also be adjusted into and out of alinement with those parts. Where, hereinafter it is found desirable to refer to the tripartite rocking shaft 3, 4, 5, as a whole, the numeral 3 only is employed for identifying it.

The middle part 4 of the rocking shaft 3

has the front stops 1 adjustably secured to it in the usual way, and, by reason of the above mentioned adjustability of the said middle part, these front stops, which, otherwise, may be of ordinary construction, need not themselves be adjustable, as has heretofore been necessary, as to their radial length. The adjustment of the shaft 4 relatively to the two parts 3, 5, can be effected in various ways, that next described being found very convenient.

The inner ends of the two parts 3, 5, have rigidly secured to them forked brackets 7, 8 respectively, with which the respective ends of the adjustable shaft 4 are engaged as by tongues 9 on the latter which are free to slide between the prongs of the brackets 7, 8 in a direction transverse to the axis of oscillation of the tripartite shaft 3. The brackets 7, 8 are each provided with a short approximately vertical shaft 10 or 11, hereinafter termed a crank shaft, carrying or having integral therewith a crank or eccentric 12 engaging, preferably through a sliding block 13, with a slot or recess 14 formed in the adjacent end of the adjustable shaft 4. On each crank shaft 10, 11 is secured a worm wheel 15 engaging with a worm or tangent screw 16 or 17 on a shaft 18 or 19 rotatable in bearings 20 on the respective brackets 7 or 8. The shaft 19 of the worm 17 is short as shown clearly in Fig. 1, and has fast thereon a milled head 21 by means of which it can be rotated for turning the crank shaft 11, and thereby, through the respective crank or eccentric 12, displacing the adjacent end of the shaft 4 relatively to the shaft 5 with which the said shaft 4 is, as above described, operatively engaged. The shaft 18 of the worm 16 extends from the gear to the feeder side of the machine, the end at the latter side being rotatable in the respective bearing 20 on the bracket 7, and having fast thereon a milled head 22 by which it can be rotated at the feeder side of the machine for adjusting the end of the shaft 4 at the gear side of the machine.

For lifting the side lay, as previously mentioned, the said side lay is in linked connection with the adjustable shaft 4, or the respectively adjacent outer part 3 or 5 of the rocking shaft 3, (it would be the part 5 in the arrangement shown in the drawings). In this said arrangement the side lay is connected with the adjustable shaft 4 and the link 23, by which such connection is effected, is telescopic so as to enable it to be lengthened or shortened to suit the different positions to which the side lay is required to be, as ordinarily, adjusted transversely of the machine. The two parts of the link 23 are retained in their relative positions of adjustment, by knurled nuts 24 which are threaded on screws passing through slots 25 formed in one or both of the said parts. One end of the link 23, by means of a short shackle or universal joint 26, is connected with a stud 27 fast to an arm 28 secured on the adjustable shaft 4, the said arm being movable along the shaft 4 and capable of being fixed thereon in any desired position by a clamping screw 29. The opposite end of the link 23 is attached to the upstanding arm of a bell-crank lever 30 pivoted by a shaft 31 to the base of the side lay, which, by means of the slotted extension 32 and the bolt 33 passing through the slot, can be adjusted to, and secured in any desired position on the feed board 34. The manner of connecting the link 23 to the arm 28 and bell-crank lever 30 is the same in both cases excepting that as regards the arm 28, the link 23 can be readily disengaged therefrom as when it is required to swing over the feed board 34 whereas the connection between the link 23 and lever 30 is secured against disturbance by a pin 35 passing through the respective arm of the said lever. The second or approximately horizontal arm of the lever 30, underlies a lug 36 integral with the body 37 of the side lay which body is pivoted to the base 38 by a pivot pin 39 extending parallel with the direction of general travel of the sheets through the machine. Over the lug 36 there extends an arm 40, of which one end is pivoted at 41 to a standard 42 fast to the base 38, and to the other end is attached the upper end of a tension spring 43 whose lower end is similarly attached to a stud 44 projecting from the base 38. The pivoted body 37 has fitted to it the side lay proper, the screwed stem 45 of the latter penetrating it and having adjustable thereon, two nuts 46, by means of which, as ordinarily, it can be adjusted to, and secured in any desired position in, the body 37, to suit the position to which the adjacent edge of the sheet 2 is required to come.

The before mentioned shaft 31 is free to oscillate in a bearing 47 in the base 38, and the bell-crank lever 30 is rigidly attached to it so that the said lever and shaft will move as one entity. The shaft 31 has fast on one end a forked lever arm 48 which engages with one end of a toothed sector lever 49 pivoted at 50 to the base 38 and, gears at its opposite end with a toothed sector 51 rigidly secured to one end of a shaft 52. This shaft is free to rock in bearings 53 integral with the base 38 and between the said bearings it has rigidly attached to it, a sheet guide or depressor 54 having an opening 55 within which the side lay proper is situated, and whose under surface is curved or convexed so that it shall present as little resistance as possible to the passage of the sheets beneath it.

The front stop shaft 3 is rocked by an arm 56 carrying an anti-friction roller 57 bearing on a cam not shown in the draw-

ings, and when, by these means, the front stops 1 are raised to allow the sheets to be fed forward to receive the impression, the side lay is at the same time, raised clear of and the depressor 54 is lowered on to the said sheet so that the respective side edge of the sheet shall not rub against the side lay as the sheet moves onward and any tendency of the sheet to buckle will be neutralized by the depressor 54. By these means, the side edge of the sheet is prevented from being curled up and consequently can safely be used again for insuring registration between subsequent impressions and that or those already printed.

When it is necessary to adjust the front stops 1 to suit sheets whose leading edges do not reach the impression cylinder 58, parallel with the axis of the latter, or in other words, sheets whose leading edges are not perpendicular to the general direction of their travel through the machine—such a sheet is represented in dot-and-dash lines in Fig. 1—one or other, or both, of the milled heads 21, 22 is or are turned so as to cant the shaft 4 in the desired direction to bring the stopping faces of both or all of the front stops 1 parallel with the above named leading edge. The side lay is then also adjusted to suit the particular width of sheet to be dealt with in the machine. To enable the side lay to be adjusted so that its guiding face or edge shall be parallel with the adjacent edge of the sheet, whether that edge be parallel, or at angle, with the general direction of the travel of the sheet through the machine, the said side lay may, in the well-known manner, be turned upon the substantially vertical stud 59 after loosening the winged nut 60, on the said stud, the nut being afterward tightened when the side lay is in the desired position.

Having described our invention we declare that what we claim and desire to secure by Letters Patent is:—

1. In a sheet lay mechanism for printing and other machines, the combination of a plurality of front stops attached to an oscillating shaft, the said oscillating shaft, the stopping faces of the said stops being all alined with each other, and means whereby the radial distances between the respective stopping faces and the axis about which they are oscillated can be simultaneously varied without disturbing the aforesaid facial alinement.

2. In a sheet lay mechanism for printing and other machines, the combination of a plurality of front stops attached to an oscillating shaft, the said oscillating shaft, the stopping faces of the said stops being all alined with each other, means whereby the radial distances between the respective stopping faces and the axis about which they are oscillated can be simultaneously varied without disturbing the aforesaid facial alinement, the said oscillating shaft being formed of a plurality of parts of which two are constantly co-axial with each other and another carrying the front stops is adjustable into and out of alinement with the said two other parts, all the parts however being arranged so as to have the same axis of oscillation.

3. In a sheet lay mechanism for printing and other machines, the combination of a plurality of front stops attached to an oscillating shaft, the said oscillating shaft, the stopping faces of the said stops being all alined with each other, means whereby the radial distances between the respective stopping faces and the axis about which they are oscillated can be simultaneously varied without disturbing the aforesaid facial alinement, and a side lay operatively connected with the said devices in such manner that the front stops and side lay will be simultaneously raised off the feed board and simultaneously lowered on to it.

4. In a sheet lay mechanism for printing and other machines, the combination of a plurality of front stops attached to an oscillating shaft, the said oscillating shaft, the stopping faces of the said stops being all alined with each other, means whereby the radial distances between the respective stopping faces and the axis about which they are oscillated can be simultaneously varied without disturbing the aforesaid facial alinement, the said oscillating shaft being formed of a plurality of parts of which two are constantly co-axial with each other and another carrying the front stops is adjustable into and out of alinement with the said two other parts, all the parts however being arranged so as to have the same axis of oscillation, and a side lay operatively connected with the said devices in such manner that the front stops and side lay will be simultaneously raised off the feed board and simultaneously lowered on to it.

5. In a sheet lay mechanism for printing and other machines, the combination of a plurality of front stops attached to an oscillating shaft, the said oscillating shaft, the stopping faces of the said stops being all alined with each other, means whereby the radial distances between the respective stopping faces and the axis about which they are oscillated can be simultaneously varied without disturbing the aforesaid facial alinement, and a combined side lay and sheet depressor operatively connected with the said devices in such manner that the front stops and side lay will be raised off the feed board simultaneously with the sheet depressor being lowered on to it and vice versa.

6. In a sheet lay mechanism for printing

and other machines, the combination of a plurality of front stops attached to an oscillating shaft, the said oscillating shaft, the stopping faces of the said stops being all alined with each other, means whereby the radial distances between the respective stopping faces and the axis about which they are oscillated can be simultaneously varied without disturbing the aforesaid facial alinement, the said oscillating shaft being formed of a plurality of parts of which two are constantly co-axial with each other and another carrying the front stops is adjustable into and out of alinement with the said two other parts, all the parts however being arranged so as to have the same axis of oscillation, and a combined side lay and sheet depressor operatively connected with the said devices in such manner that the front stops and side lay will be raised off the feed board simultaneously with the sheet depressor being lowered on to it and vice versa.

In witness whereof I, the said CARL LOUIS STERN, have set my hand in the presence of two witnesses.

CARL LOUIS STERN.

Witnesses:
WARWICK HENRY WILLIAMS,
THOMAS JAMES BLAKER.

In witness whereof I, the said THOMAS ROBERT GILLETT PARKER, have set my hand in the presence of two witnesses.

THOMAS ROBERT GILLETT PARKER.

Witnesses:
WM. E. BENNISON,
WM. GERRARD.