

D. Baldwin. Sheet 1. 2 Sheets.
Feeder for Printing Press.
N^o 16,168. Patented Dec. 9, 1856.

Fig 2.

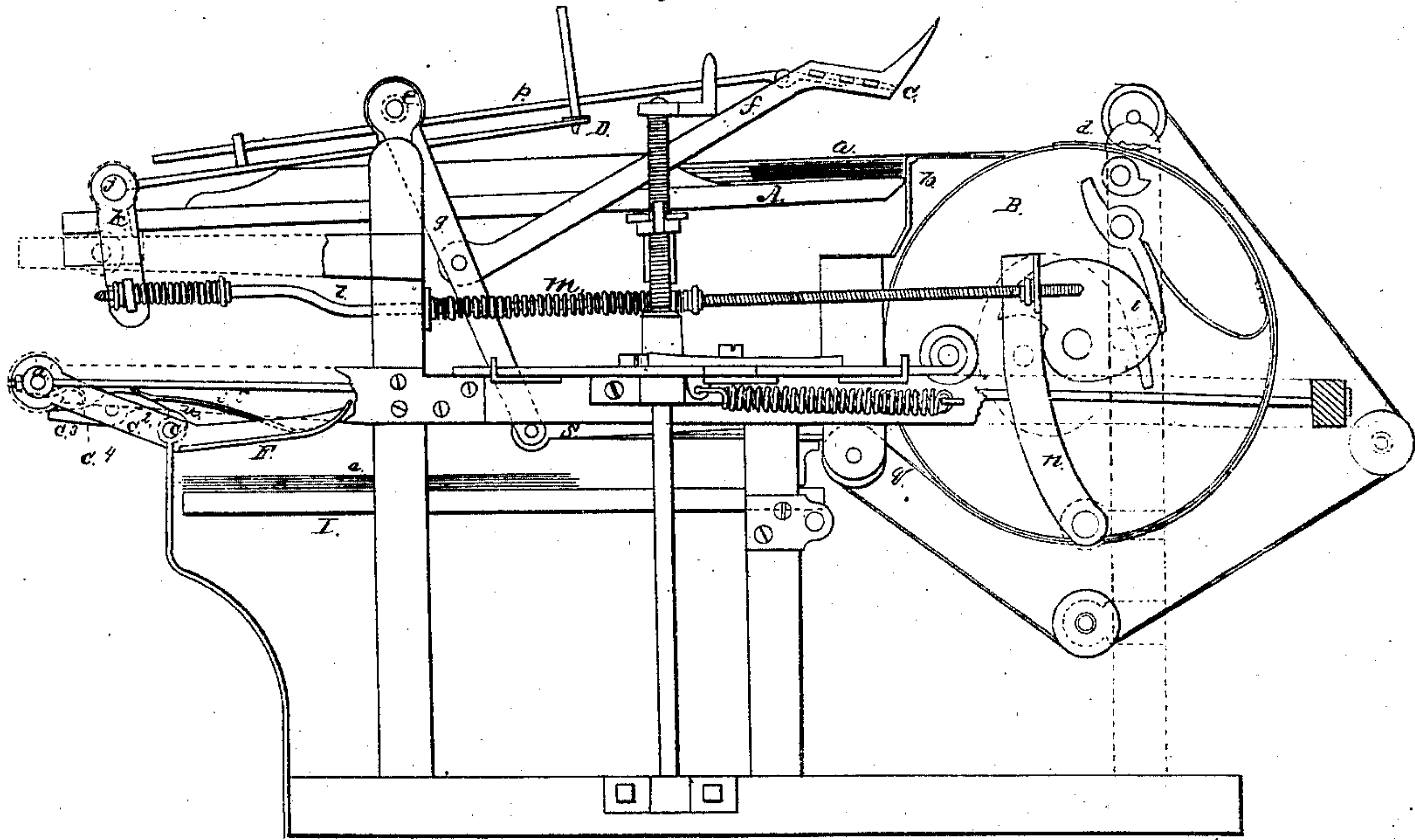
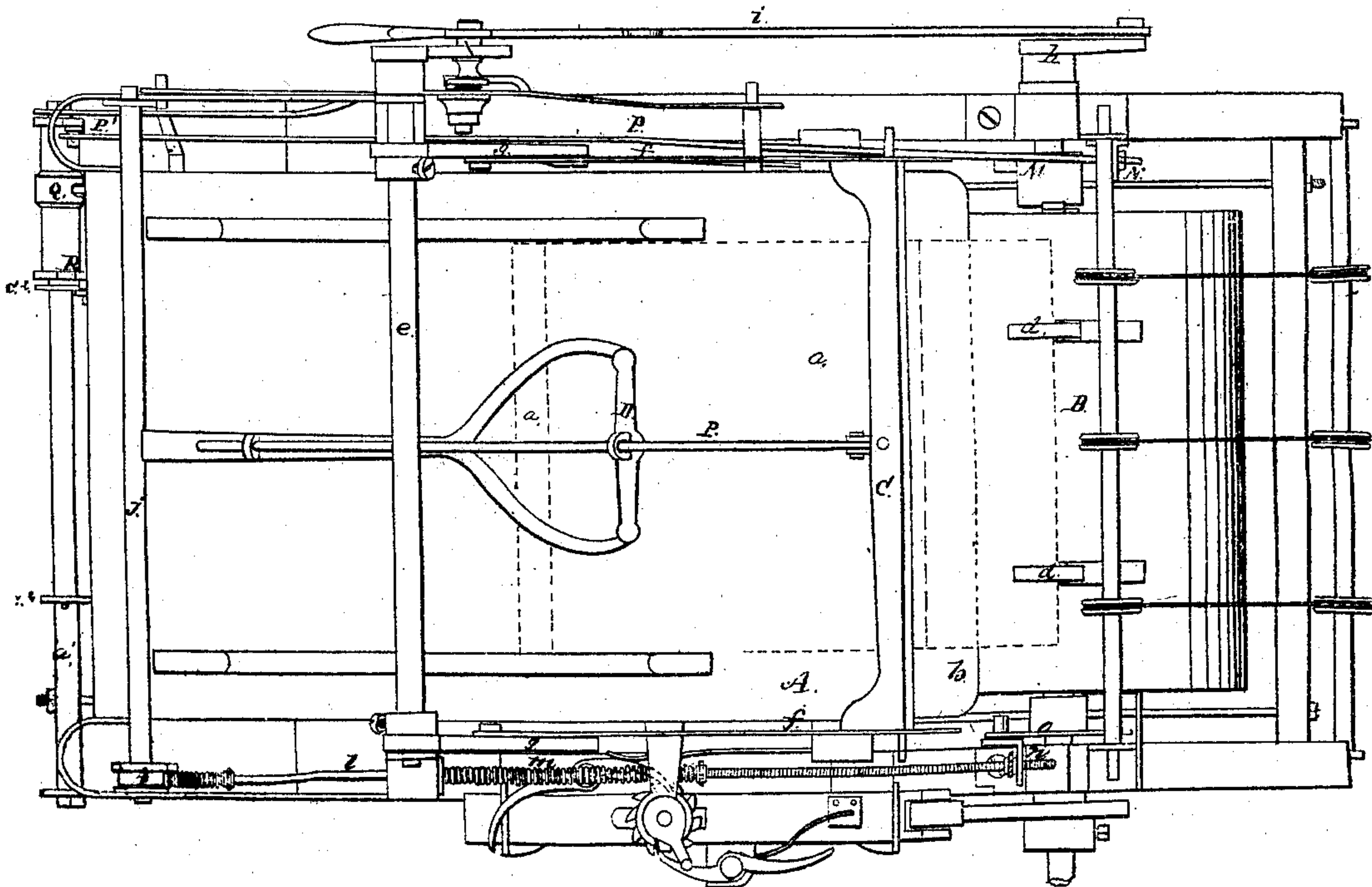
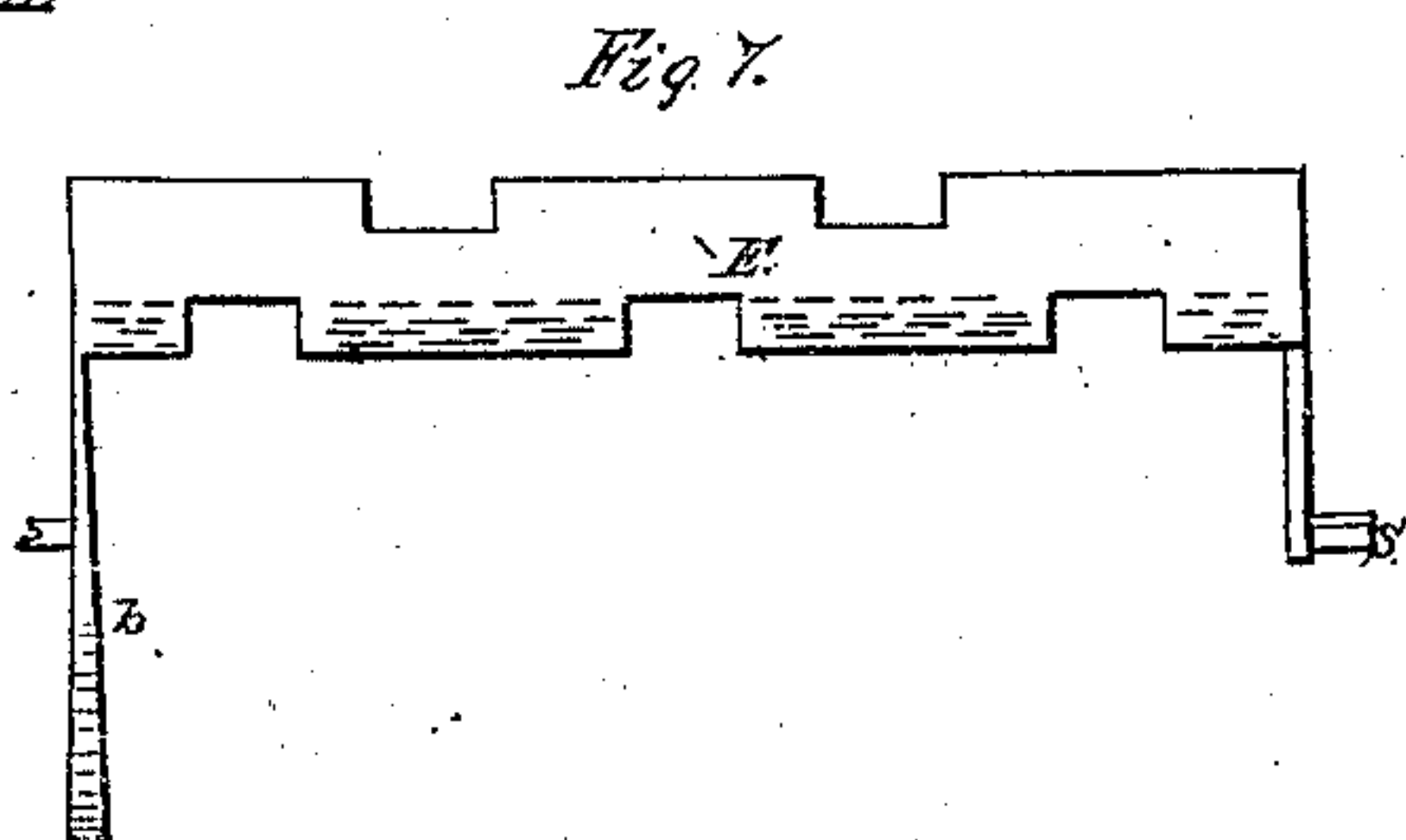
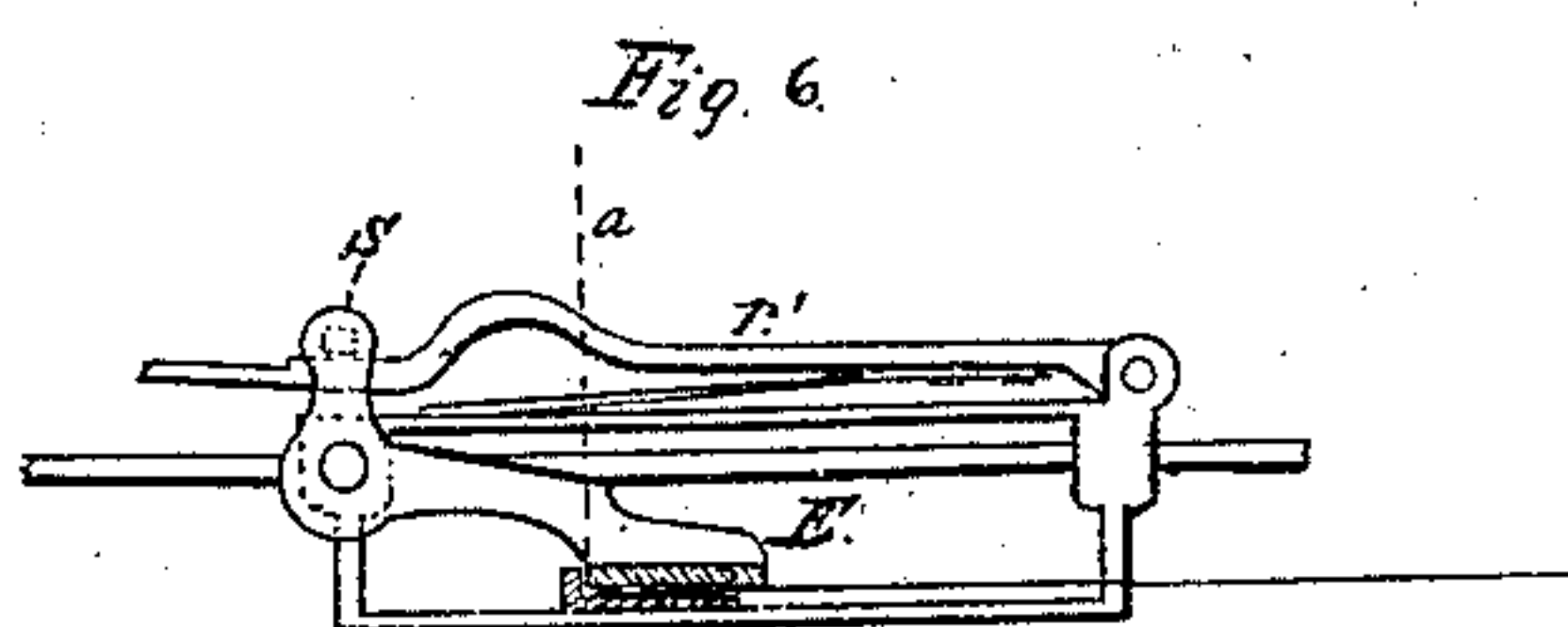
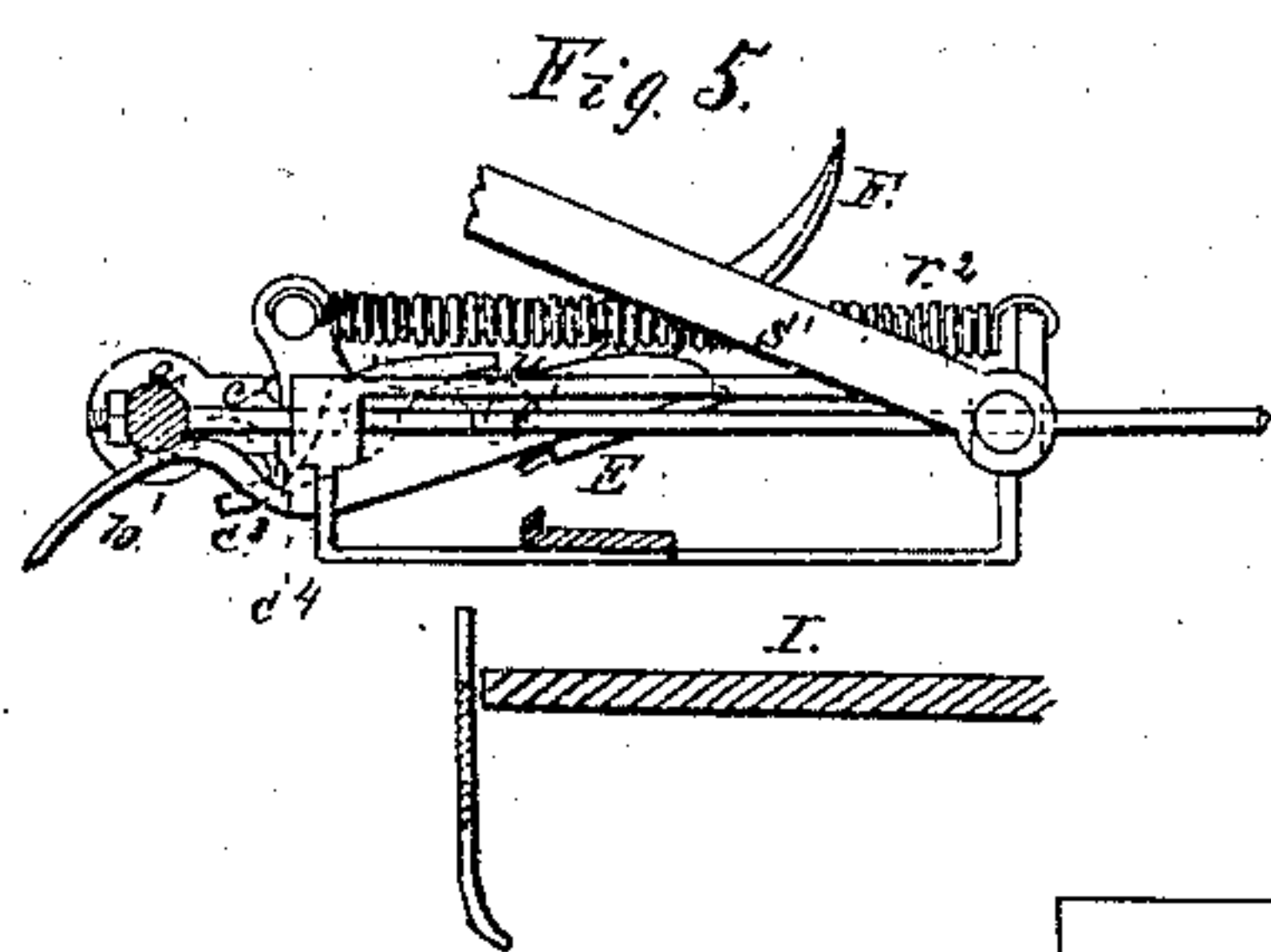
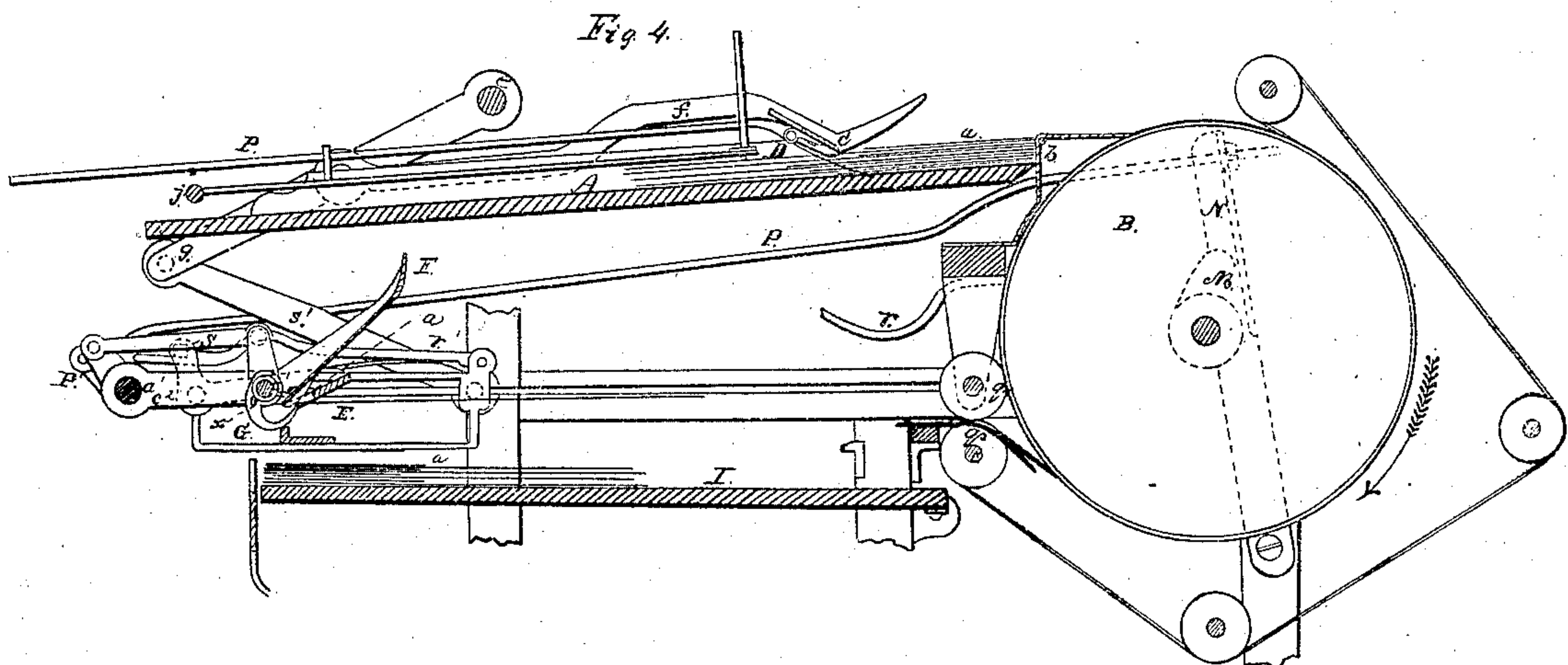
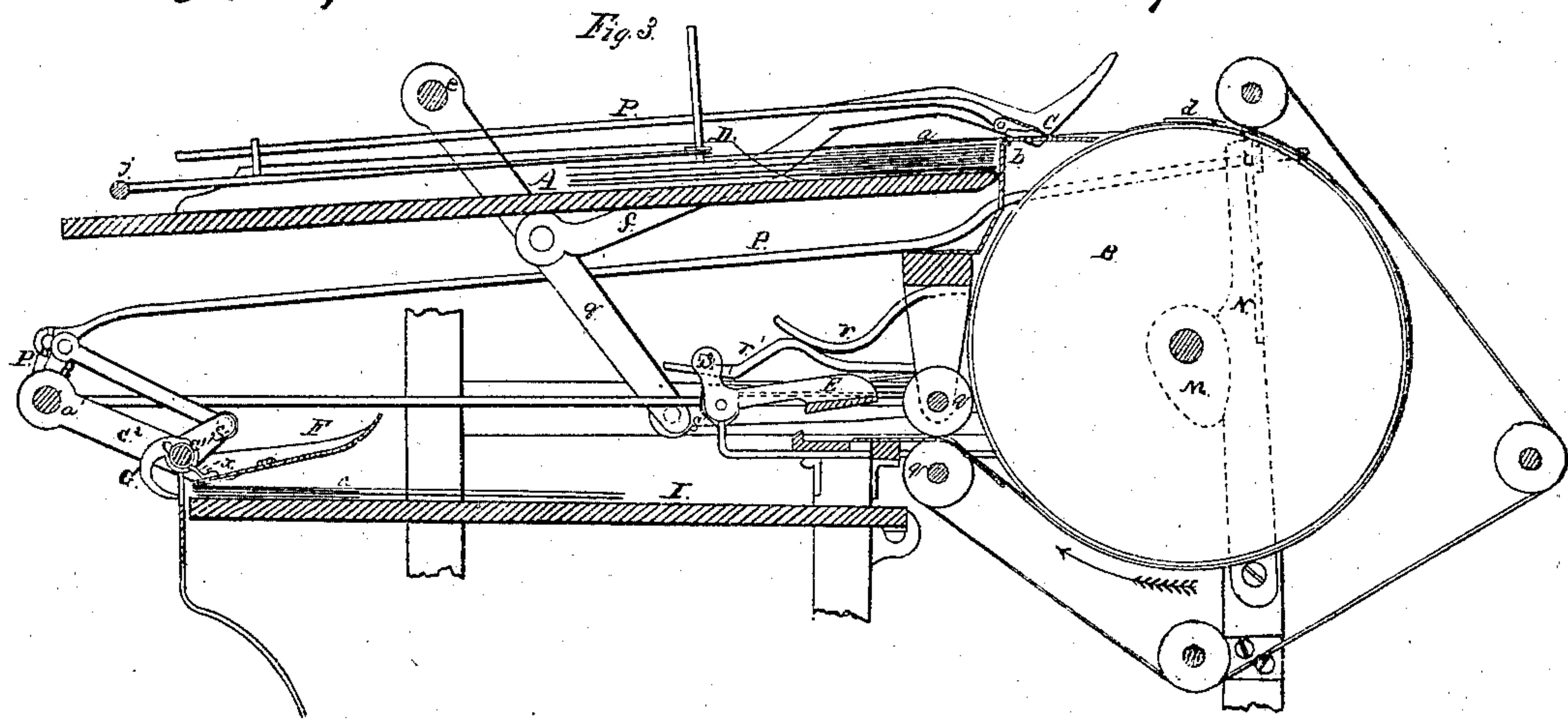


Fig 1.



D. Baldwin. Sheet 2. 2 Sheets.
Feeder for Printing Press.
N^o 16,168. Patented Dec. 9, 1850.



UNITED STATES PATENT OFFICE.

DAVID BALDWIN, OF GODWINVILLE, NEW JERSEY.

MACHINE FOR FEEDING PAPER TO PRINTING-PRESSES.

Specification of Letters Patent No. 16,168, dated December 9, 1856.

To all whom it may concern:

Be it known that I, DAVID BALDWIN, of Godwinville, in the county of Bergen and State of New Jersey, have invented a certain new and useful Improvement in Feeding Paper or other Material to be Printed to and from or through Printing Presses or Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1 represents a top view or plan of a paper folding and feeding apparatus in connection with a cylinder printing press or rather the cylinder portion thereof: Fig. 2, a side elevation of the same, a portion of the frame being removed: Fig. 3 a longitudinal vertical section thereof in part; and Fig. 4 a similar view of the same but showing the feeding and folding devices in different positions: Fig. 5 a side elevation of certain folding mechanism in its open position, detached; and Fig. 6 a similar view of the same, closed: Fig. 7 an inverted plan of an upper folding jaw, detached.

Numerous difficulties have presented themselves in feeding automatically thin sheets of paper to printing presses separately or one at a time from a pile of sheets; such as in the slipping of the sheet out of register during the feed, the sticking of two or more sheets together and so forth.

My improvement has for its object the removal of these difficulties and the obtaining of a more easy, certain, regular and perfect feed than has yet been accomplished, and here it may be observed that as my improvement involves a new method or process of feeding by the employment of what may be termed "lap-folded" paper, a general description in this will only be given of many of the details or mechanism shown in the accompanying drawings as the construction, arrangement and operation of these will be self evident to every mechanic and they may be almost infinitely varied without departing from the character or distinguishing features of my invention, and as I do not restrict myself to these, to more elaborately describe them would appear both injudicious and produce unnecessary confusion.

To elucidate my invention by reference to the accompanying drawings, suppose a

pile of sheets (a) of paper to be arranged on a feeding table (A) ready to be fed to a cylinder (B) of a printing press. These sheets, contrary to previous custom, are not straight or flattened out throughout all their length or width, but, by my method of operation, before being fed to be printed it is absolutely essential that each sheet should be what I term lap-folded, that is when fed by the mechanical feeder or its equivalent as will be hereinafter described, otherwise a single or the first feed of the sheets (designed to be printed on both sides or fed twice) may be done without the fold, by hand or in any convenient manner and the fold given each sheet for its second passage only as will be apparent from the after description. If the paper is intended for printing at the time of its manufacture or being cut into sheets, I propose the attachment to the machinery used in such manufacture of it, of lap folding apparatus whereby the first feeding by hand may be dispensed with. Where the sheets are not designed to pass more than once through the printing press, the paper should be lap-folded before being brought to the feeder and no lap folding apparatus in immediate connection and for joint operation with the feeder is requisite but such lap folding may be done by hand or in any desired manner, previously, as just stated. But where the paper is required to be fed twice through the press, then it is necessary that the feeding and a lap-folding apparatus should be arranged to work in immediate connection, substantially as in the arrangement represented in the accompanying drawings which is designed for working sheets to be fed twice through the press, and I have selected this arrangement to elucidate my invention as in showing the action of the double feed it necessarily includes a single one, the lap-fold being similar in both for action by the feeder.

The lap-fold given the sheet may be somewhat varied, confined to the corners of the sheet or be only made partially across it, but, to illustrate,—and without the fold the feeder is inoperative—supposing the sheets to be first lap folded for their first passage through the press by doubling or turning what may be called the advance edge of the sheet for a given width over or on the main surface of the sheet, I arrange these folded

sheets one upon the other on the table (A),
 the fold or lap of one sheet being under
 the fold or lap of its next upper sheet and
 so on, the opening portion of the lap being
 5 toward the back, and what forms the hinge
 or closed portion of the lap being forward,
 and the whole resting on the feed table,
 with the hinge portion of the several folds,
 for the several sheets, being made to butt
 10 up or rest against a register strip (*b*) in
 front or adjoining the cylinder of the press.
 The pile of sheets being thus arranged on
 the feed table (A), as represented in Fig. 4,
 the feed of the top sheet of the pile to the
 15 pressure cylinder (B) is produced by open-
 ing or spreading the lap or fold of said top
 sheet and thereby causing it to project be-
 yond the succeeding or under sheets when
 it may be gripped and fed without any lia-
 20 bility of its taking up or carrying along with
 it any of the under sheets, as shown in Figs.
 1, 2 and 3. The top sheet may thus be spread
 out by a cylinder-brush or other revolving
 device or it may be done by a different ac-
 25 tion an instance of which is shown in the
 drawings wherein a spreading bar (C) ex-
 tending across the pile and situated above it
 is brought down to bear upon the paper as
 shown in Fig. 4 and is moved forward as
 30 represented in Fig. 3, spreading out and
 unfolding the lap in the sheet over the top
 of the front register strip (*b*) and carrying
 it on to the pressure cylinder (A) when it is
 gripped by clamps (*d*)—see Fig. 3—con-
 35 nected with said cylinder to be carried around
 with it as well understood in the action of
 cylinder presses. The spreader (C), after
 having spread out the sheet, rises and retires
 in such raised position, (see Fig. 2) so as
 40 not to strain on or carry the sheet back
 with it, and said spreader thus lowers and
 advances, rises and retires at suitable in-
 tervals to feed each sheet in succession to the
 cylinder. This spreader may be thus oper-
 45 ated by a rock shaft (*e*) through arms (*f*)
 and levers (*g*) driven by crank (*h*) and con-
 necting rod (*i*), to give the spreader its re-
 ciprocating action, while a spring appliance
 connected with a retention bar, operating to-
 50 gether with the spreader, insures to the
 spreader its appropriate rise and fall and
 pressure on the sheet when advancing. It is
 originally intended that the retention bar
 shall hold the sheet in position until the
 55 spreader shall enter the lap up to the line
 of fold and then release the sheet until the
 spreader shall carry the sheet to a given
 point by means of the fold when the reten-
 tion bar shall again stop the sheet while the
 60 spreader moves on and straightens out the
 lap; by which double action the sheets are
 squared or registered; but assuming the
 sheets to lie in register position the action
 of the retention bar may be less frequent
 65 and only as so operating it will here be mi-

nutely described. The retention bar (D)
 holds the sheet in position by bearing down
 on the pile while the spreader advances as
 specified and, if required, while a metal
 blade or other device passes between the
 70 sheets to separate them. In Fig. 2, the re-
 tention bar (D) is shown in its raised posi-
 tion, and in Figs. 3 and 4 in its lowered po-
 sition bearing down with a spring pressure
 on the paper; it is shown as connected with
 75 a back rock shaft (*j*) which carries an arm
 (*k*) that by means of a rod (*l*) and spring
 (*m*) connected with it and an arm (*n*)
 against which an irregular cam (*o*) on the
 pressure cylinder shaft operates, causes the
 80 retention bar (D) to be borne down on the
 pile while or before the spreader begins to
 operate and to abruptly rise and fly up from
 pressure on the paper after the spreader has
 performed its work, the retention bar in
 85 rising carrying up the spreader along with
 it, a rod (*p*) connecting the spreader with
 the retention bar to insure their joint oper-
 ation as specified and giving a certain
 amount of spring pressure to the spreader
 90 on the paper. This retention bar however
 may be arranged to work separately from
 the spreader and many equivalents for it
 may be adopted, and here it is surmised that
 this description has been sufficiently explicit
 95 to explain the novel manner in which the
 paper is fed to the press by means of flap
 folded paper and it is only requisite now
 to refer generally to an arrangement for
 giving the fold, or folds, to the sheet, as the
 100 case may be, after the sheet has been printed
 say on the one side and is required to be
 passed again through the press for printing
 on the opposite side, the arrangement of
 apparatus shown in the drawings being
 105 adapted to this.

The sheet after being carried around with
 the pressure cylinder (B), and guided and
 kept in place thereon, is finally delivered
 between two or more pairs of rollers (*q*)
 110 driven by the cylinder, and, as the sheet
 passes out between these rollers, a pair of
 lapping jaws (E) advance and striking a
 stop (*r*), as shown in Fig. 3 are made to
 close at the proper moment and crimp and
 115 hold the sheet by a spring pressure as repre-
 sented in Fig. 6. This crimping or upset-
 ting is preparatory to the sheet being again
 lap-folded, and the action of the jaws, as
 shown, is such as to insure the crimping of
 120 the sheet at or near the crease of its first
 fold and in a reverse direction to said first
 fold in order to prepare the sheet with a
 lap fold to be fed as before to the cylinder
 to receive the impression of the form upon
 125 its opposite side. To effect this, the jaws
 (E), which are mounted upon a carriage
 that has an alternate advance and receding
 motion upon horizontal parallel ways, is, as
 just described, caused to advance to the de- 130

livery rollers (*g*) in an open position (see Fig. 3) as the sheet is passing between said rollers, the advancing end of the sheet being borne up by a table so as to insure its passage between the jaws. While the jaws (*E*) are thus advancing and the sheet also between them until the latter has protruded beyond the jaws the required distance (which is about equal to the lap-fold), a fixed arm or stop (*r*) on the frame depresses a spring dog (*r'*) which releases a pin (*s*) on the end of the upper jaw and allows it to be forced down by a spring (*r''*) one end of which is attached to the opposite end of the jaw and the other to the carriage as shown in Fig. 5. The sheet is thus clamped between the jaws with its end crimped or upset between the vertical back of the lower and the rear edge of the upper jaw, as shown in Fig. 6. The motion of the carriage and jaws is then reversed, carrying the crimped sheet with them, the rocking arm (*g*) which operates the feeder giving, by a rod or rods (*s'*), the jaw carriage its proper relative reciprocating action to or with the feeder, thus insuring the timely action of the two. As the jaws approach the limit of their receding motion they pass under a depresser (*F*) and gradually raise it to depress the sheet till standing at an angle over the upper jaw as seen in Fig. 4. This depresser (*F*) is mounted by arms upon a horizontal rod (*a'*) so as to rise and fall with a hinge movement. Simultaneously with this motion of the depresser, as the jaws approach the limit of their receding motion, the top jaw is caused to open and rise up by means of a curved arm (*b'*) on one end of the jaw striking against the horizontal rod (*a'*) which bearing said arm down turns the jaw on its bearings and thus elevates it and the depresser (*F*) of necessity, as described, rises with it. The motion of the depresser and jaw rising upward while the latter is passing beneath the former, it will be seen, causes the depresser to bend the upset end of the sheet over the jaw and thus the sheet is brought up with the rising motion of the jaw. While this combined action is going on, the jaw in rising causes the catch or pin (*s*) on its end to move over the spring dog (*r'*) until it drops into its notch, as represented in Fig. 4, and thus the jaw is held open ready to advance to receive another sheet. Simultaneously with the rising of the jaws and depresser, and before the jaws again advance, the depresser in rising releases a pair of nippers (*G*) which spring around and grip the sheet as it comes within their reach and catch and hold the lapped end of the sheet against the under side of the depresser, when the jaws advance in their open position for another sheet, leaving the one thus held by the nippers behind. The nippers

(*G*) are hung on or attached to a shaft (*c'*) carried by the arms (*c''*) which connect the depresser with its shaft (*a'*). On the nipper shaft (*c'*) is a locking eccentric stop (*u*) into which gears or locks the one arm of a double dog (*c''*), as shown in Fig. 2; a stop or hook (*c'''*) attached to the depresser shaft (*a'*) holding or bearing down on the other arm of the double dog (*c''*) and a spring (*c''''*) attached to the depresser bearing down on the other arm of the dog to keep the latter in gear with the cam stop (*u*). A spring (*x*), coiled around the nipper shaft and attached at one end to it and at the other end to the depresser, gives to the nippers their elastic grip when holding the sheet and springs them to their bite of it as represented in Fig. 4.

The nippers (*G*) are released, at the proper time as specified, to effect the grip, by the depresser in rising causing the double dog (*c''*) to be tripped or unlocked from gear with the cam or eccentric stop (*u*) by the back arm of the double dog bearing as it rises against the stop (*c'''*) attached to the depresser shaft which shaft (*a'*) is stationary the arms that carry the depresser being loosely hung thereon. As the double dog is thus unlocked from the eccentric stop (*u*) by the turning of said dog on its own axis, the nipper shaft, by the action of the spring (*x*) springs around and with it the nippers (*G*) to grip the sheet, as in Fig. 4, the jaw being notched to admit of the nippers working through it. Upon the sheet being thus grasped by the nippers against the depresser, the jaws as before stated, advance to fetch another sheet and the depresser, being left unsupported by the jaws and freely hung on its shaft so as to drop of its own weight, falls carrying the sheet along with it and deposits the sheet in register order with the lap-fold given it on a receiving table (*I*) beneath, and so on for each sheet in succession, until forming a pile if desired, with the suitable fold given them to receive the impression on their opposite sides on transferring them to the feed table above. The nippers (*G*) are withdrawn from their grip, as the depresser lowers or presses down the lapped sheet on to the receiving table, by a cam (*M*) on the pressure cylinder shaft acting against a lever (*N*) which by a rod (*P*) and arm (*P'*) rocks or moves, at the required time, a tubular shaft (*Q*) on or surrounding freely the depresser shaft, this tubular shaft carrying another arm (*R*) which by rod is connected with an arm (*S*) on the nipper shaft and fast to it, and so the nipper shaft is turned back and the nippers released from their grip on the sheet; and as the nipper shaft is thus turned back, its eccentric stop (*u*) is turned with it and the double dog (*c''*) shot into gear or lock, by its spring

(c⁵) with said stop (u), and thus the nippers held open until the rising of the depresser, on the jaws transferring another sheet to the latter, again releases said nippers and causes them to close on the sheet in manner described. The depresser continues to bear down on the folded sheet, to keep it in place and press the lap, until the jaws return, in their back action, to raise the depresser.

To this particular description of lap-folding apparatus I do not confine myself, and it, as well as the feeding devices, admit of various modifications, as preference may suggest or the character of the work require, without departing from the character of my invention, also the driving or operating gear may be similarly varied, but the importance of attaching a suitable lap folding apparatus to work in connection with the feeding apparatus in such machines as require the sheet to be fed a second time, will be apparent, and a sufficiently minute description of details has here been given to enable mechanics engaged in the construction of similar machinery to make and use my invention.

The construction, arrangement and operation, mode of hanging and so forth of the feed and receiving tables to provide for the varying height of the pile of sheets and to meet other requirements, as well as other matter or detail represented in the accompanying drawings, being, at least many of them or their equivalents, common to other feeding arrangements or being distinct from what I here claim, I shall not particularly or more minutely now refer to them.

What I here claim as new and useful, and desire to secure by Letters Patent, is—

1. The method herein described of feeding paper or other flexible material to printing presses and other machines which require the feed of a single sheet at a time or separate feed of the sheets from a pile or number of sheets, by giving to or forming the sheet or sheets with a lap or fold or folds and establishing the feed of said sheets by means of a drawing or spreading out bar, or its equivalent, acting within or against the fold or folds of the sheets to effect their separation and extension with certainty and despatch essentially as set forth.

2. And I further claim the employment of "lap folded" paper or other material in sheets, in such machines, when the fold or folds are made the means, by any suitable mechanical appliances, of effecting the ready separation and feed of the sheets.

3. I likewise claim, when combined for operation together with an automatic feed of the lap folded sheets, a lap folding apparatus operating in manner described, or any other equivalent way, to fold the sheet, after its delivery from the first feed or passage through the machine, for a second passage therethrough by said feed acting against the fold or lap, substantially as shown and described.

In testimony whereof, I have hereunto subscribed my name.

DAVID BALDWIN.

Witnesses:

JOSEPH BALDWIN,
JAMES BARTOW.