E. CHESHIRE.

PAPER FEEDING AND HANDLING DEVICE.

APPLICATION FILED MAR. 6, 1914.

1,145,405.

Patented July 6, 1915.

12 SHEETS—SHEET 1

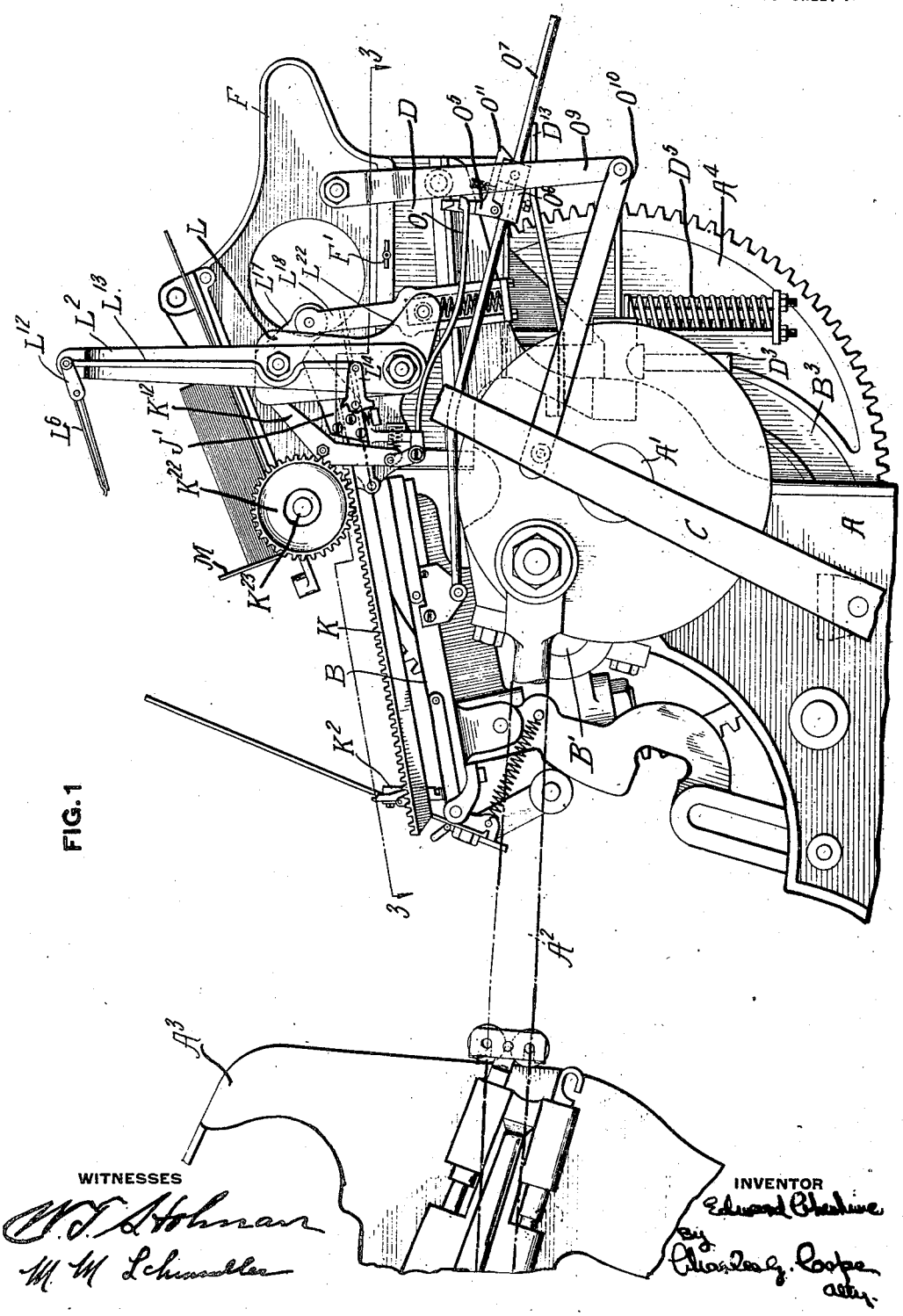

FIG. 1

WITNESSES

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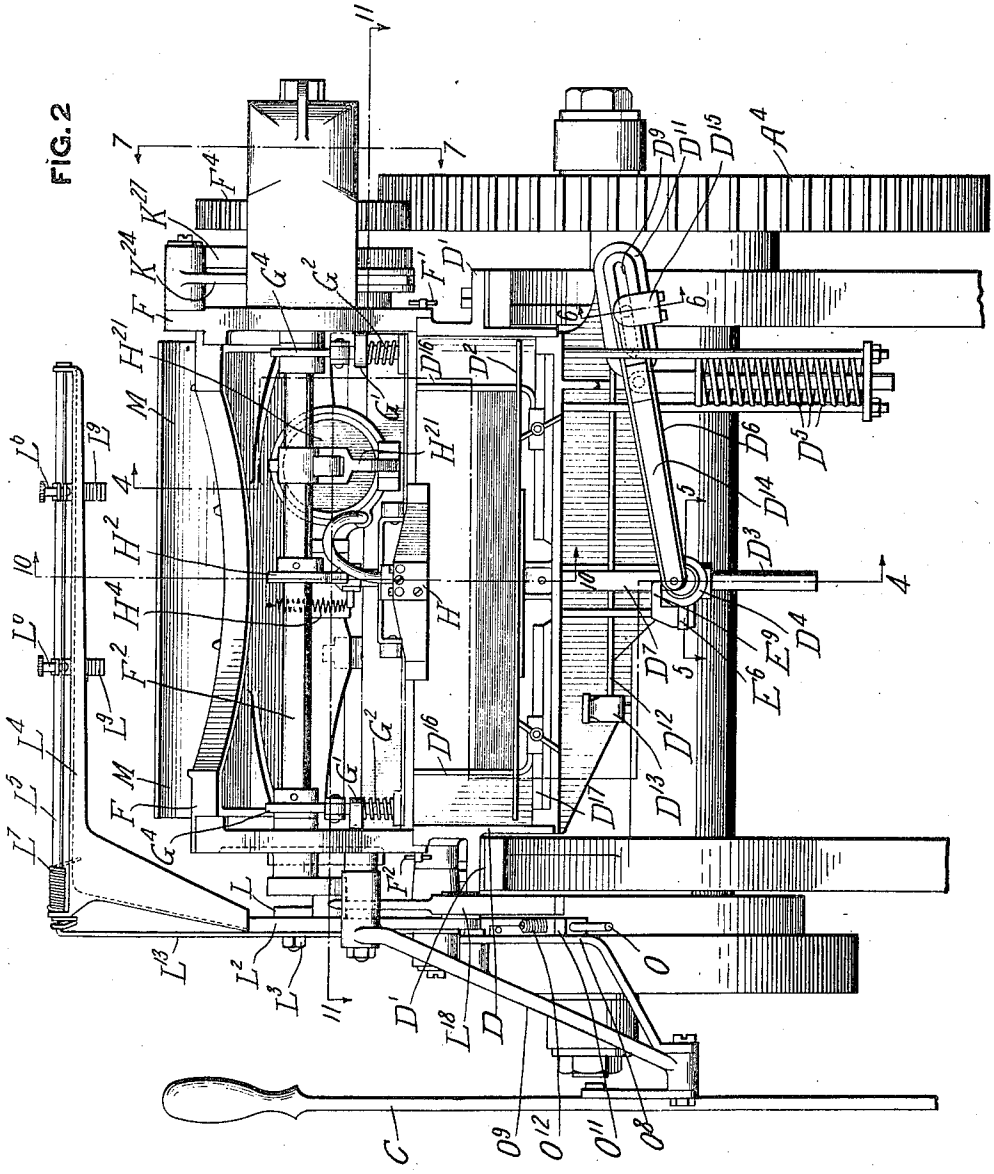
12 SHEETS—SHEET 2.

FIG. 2



WITNESSES

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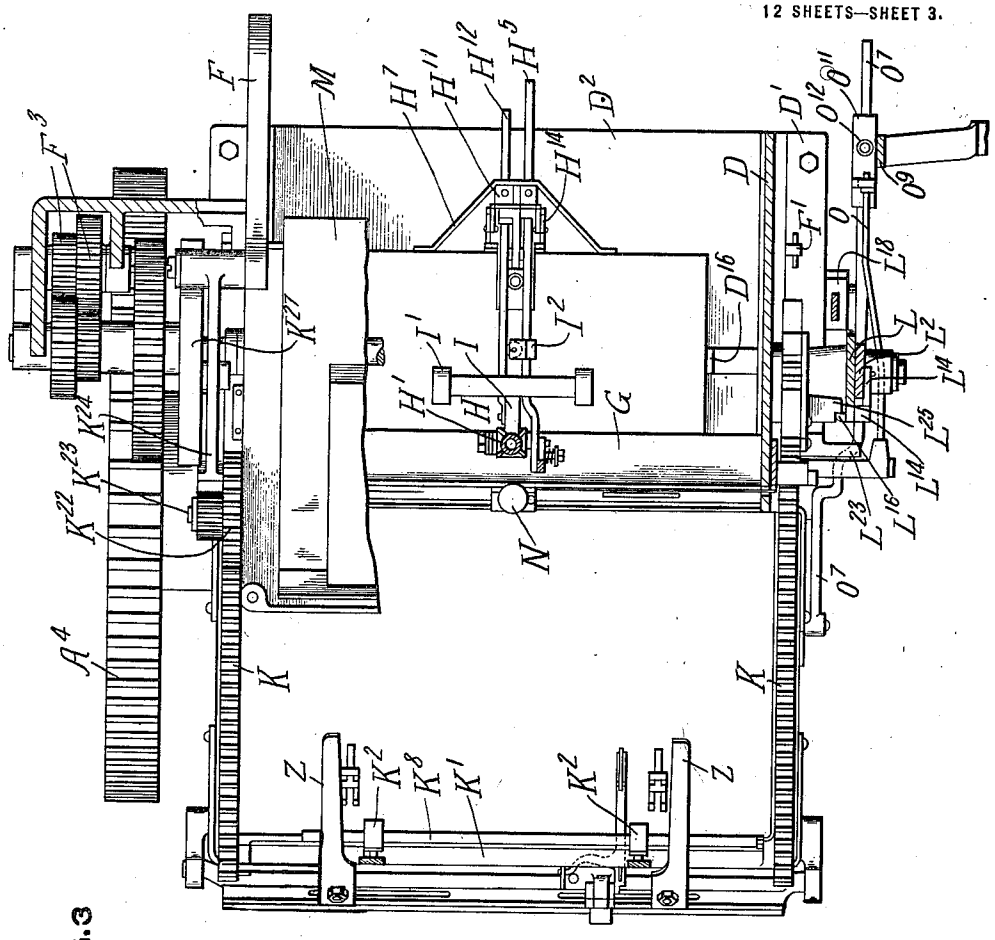
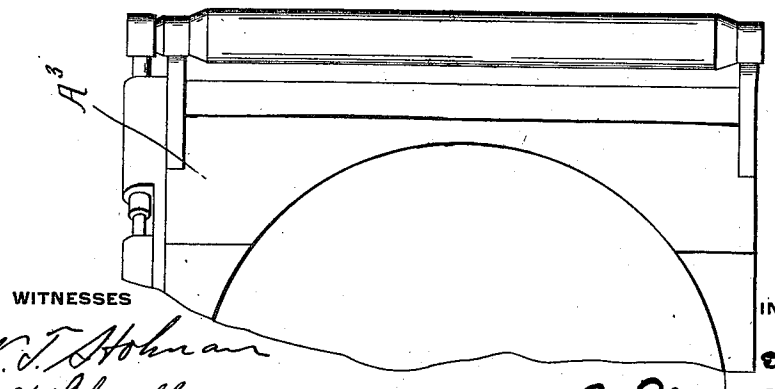


FIG. 3



WITNESSES

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12 SHEETS—SHEET 4.

FIG. 4

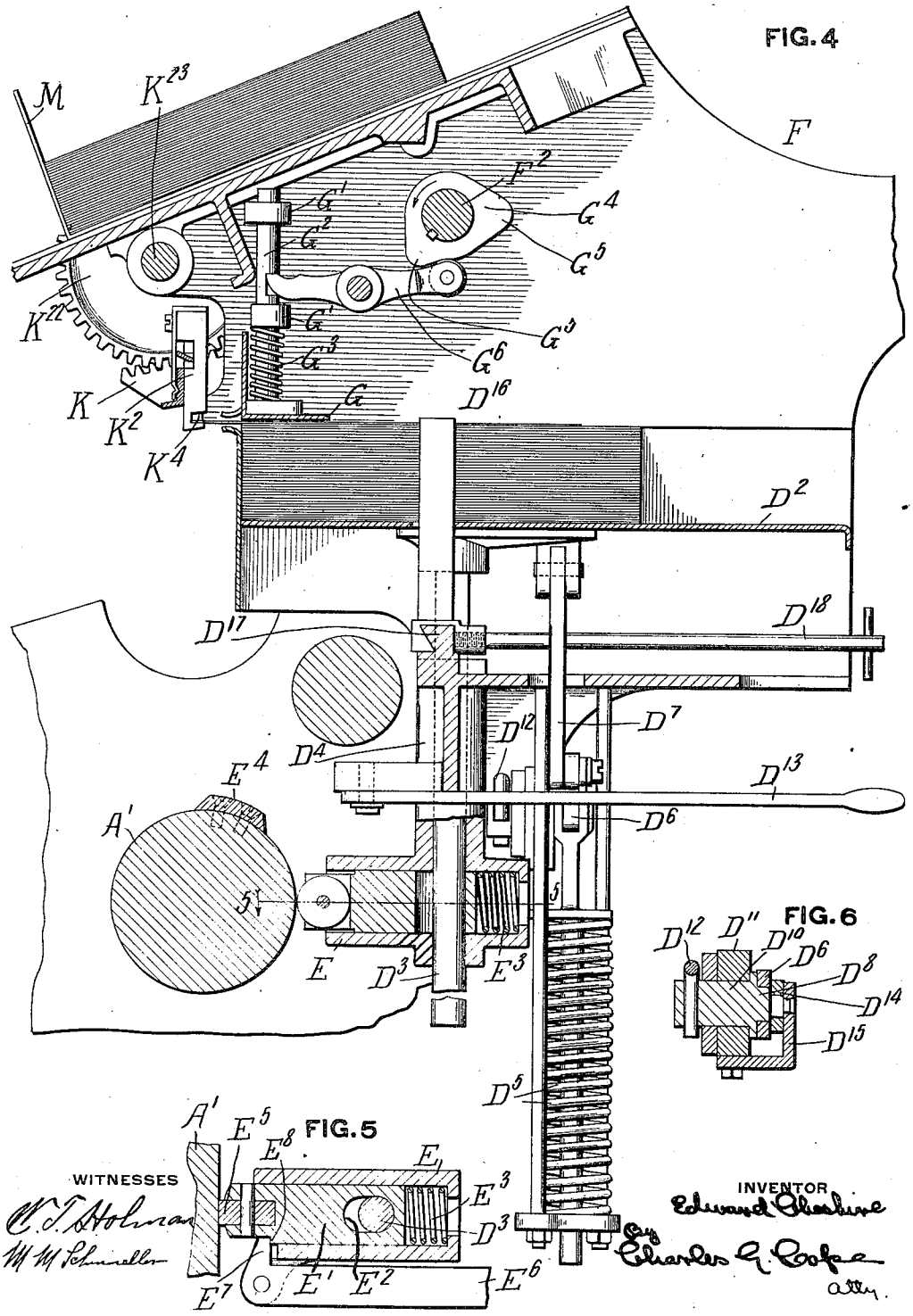

FIG. 6

FIG. 5

WITNESSES

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12 SHEETS—SHEET 5.

FIG. 7

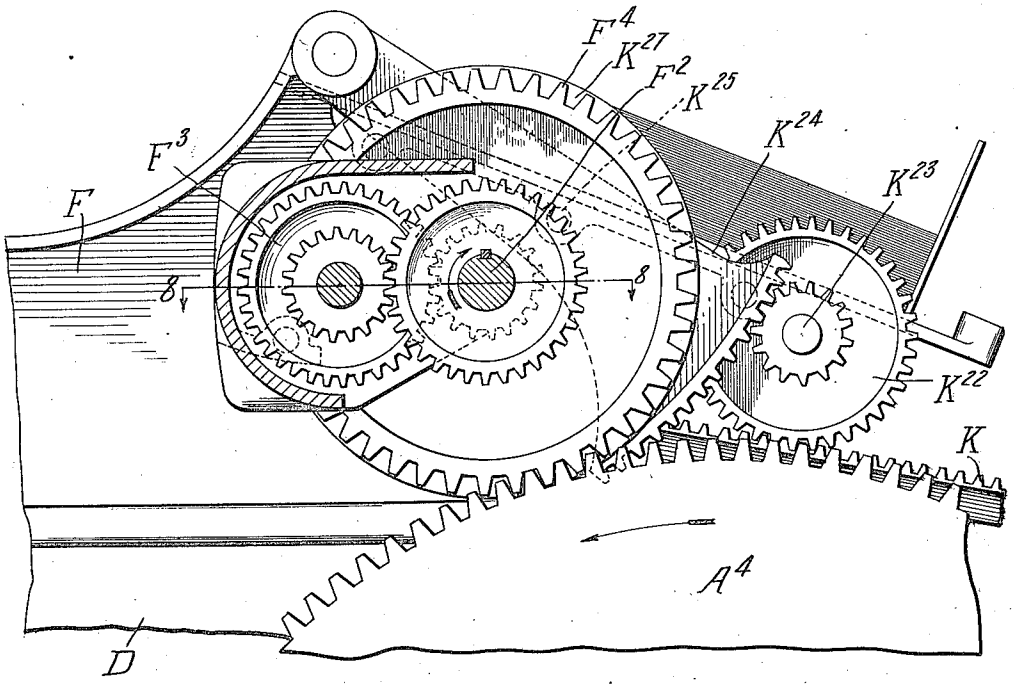


FIG. 8

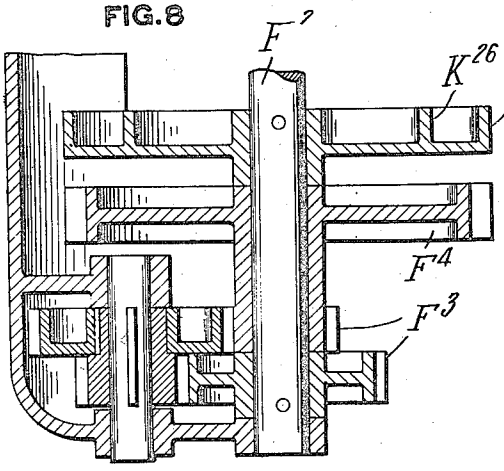
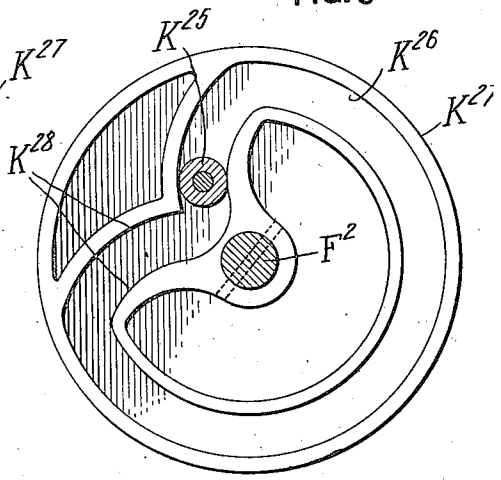


FIG. 9



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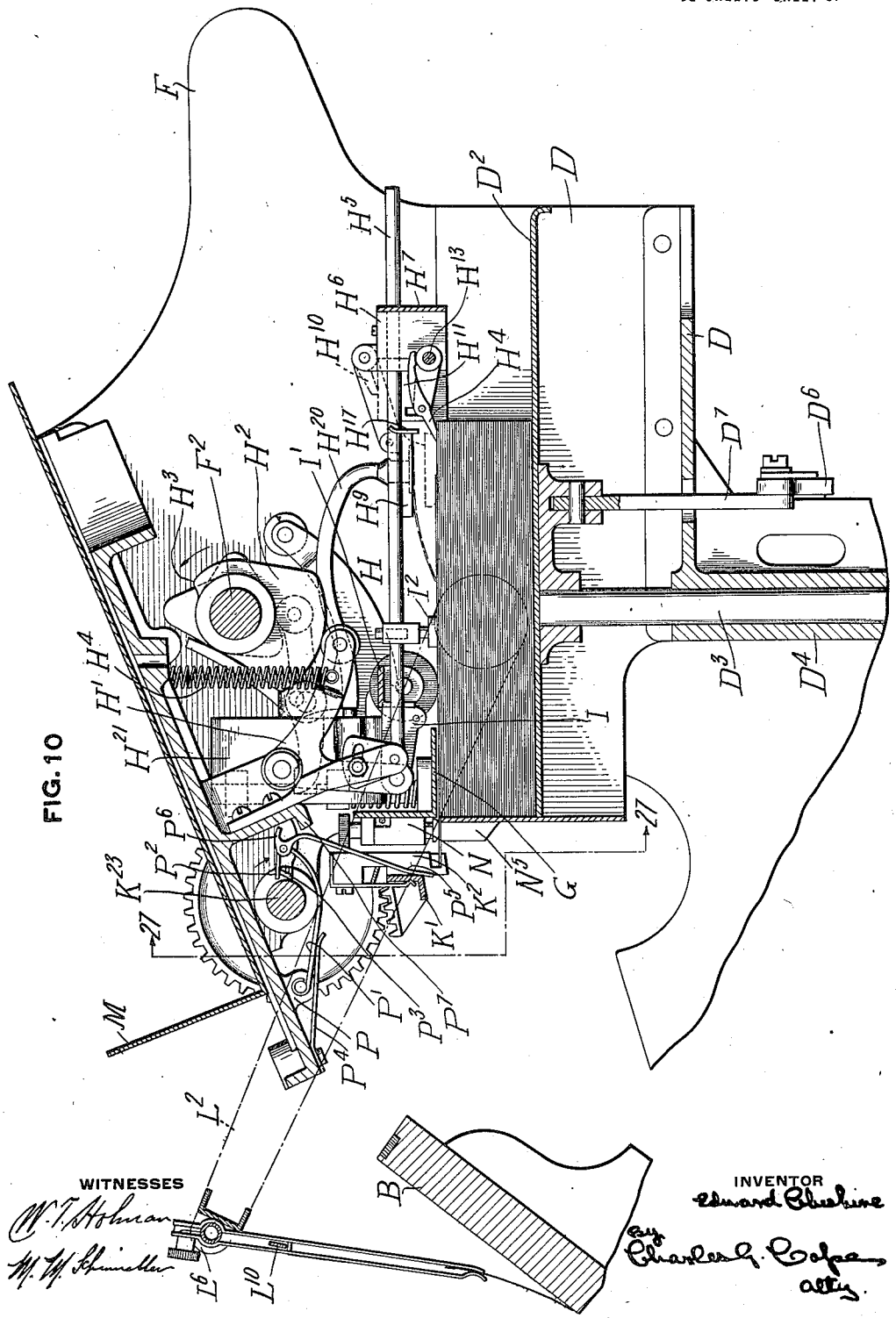

FIG. 10

WITNESSES

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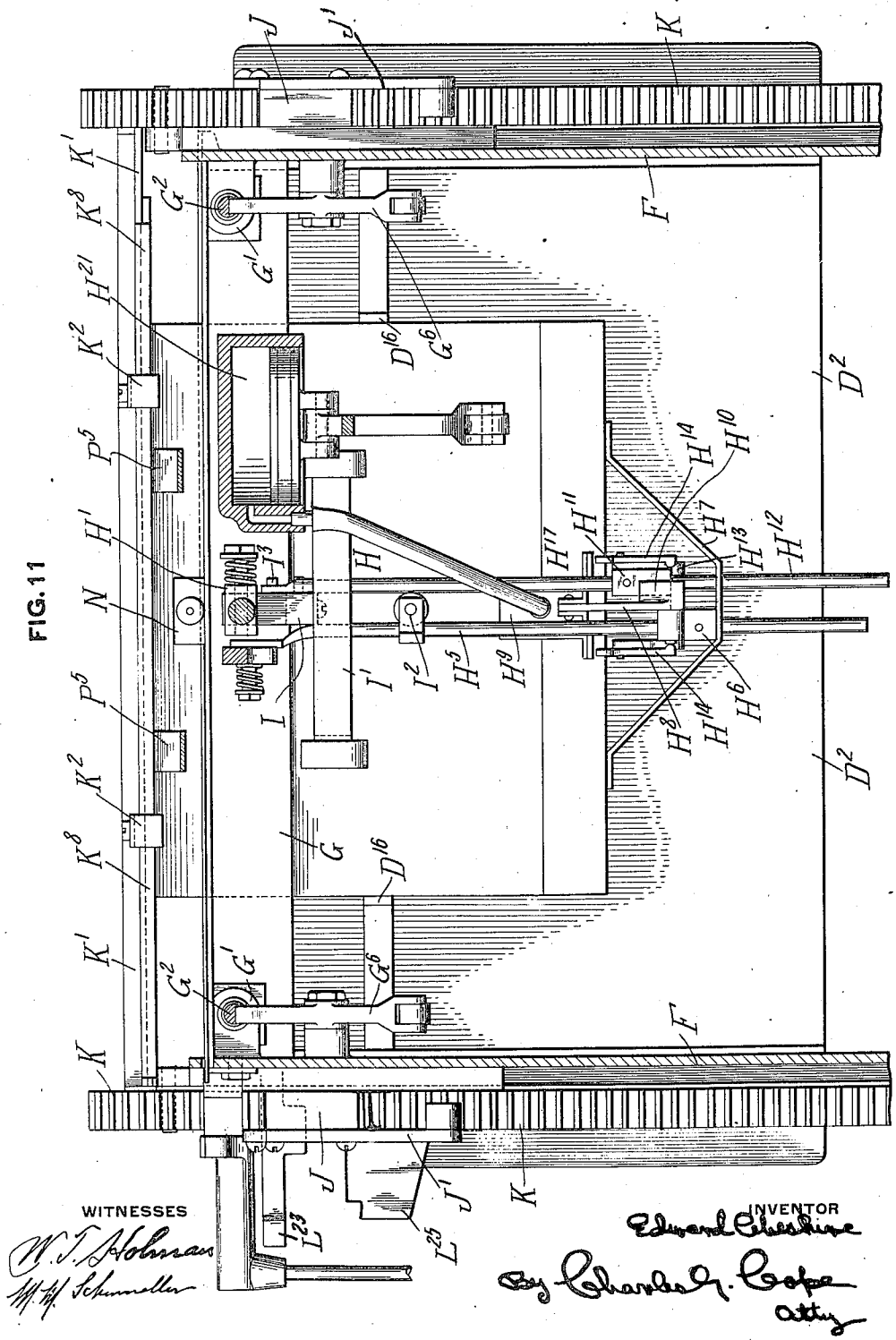
12 SHEETS—SHEET 7.

FIG. 11



WITNESSES

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12 SHEETS—SHEET 8.

FIG. 12

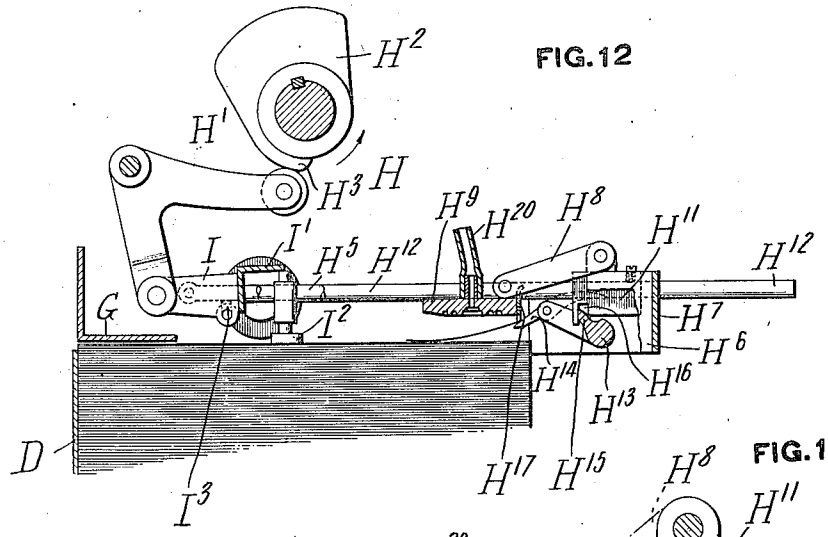


FIG. 13

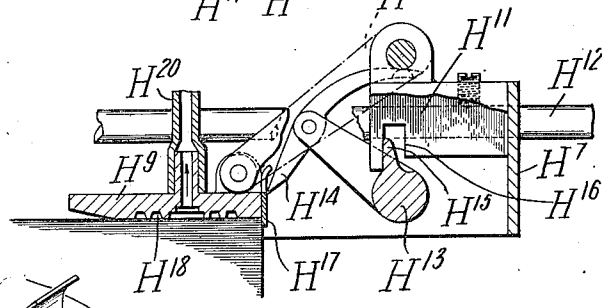


FIG. 15

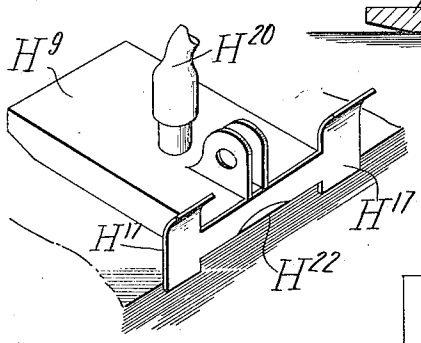
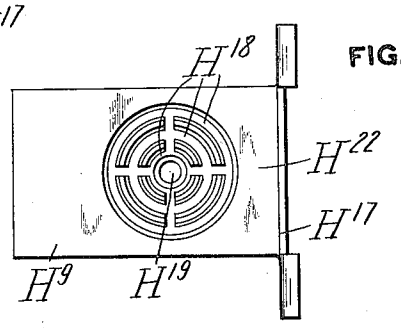


FIG. 14



WITNESSES

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12 SHEETS—SHEET 9.

FIG. 16

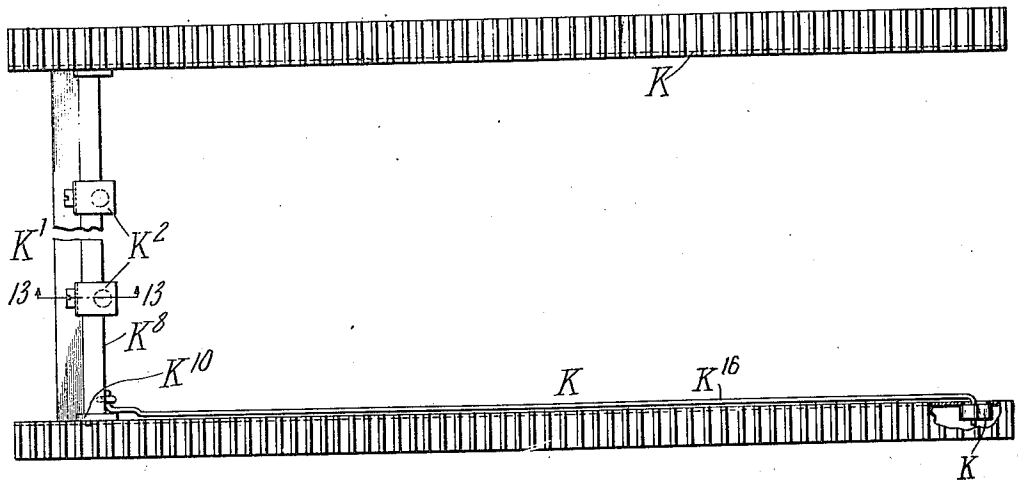


FIG. 17

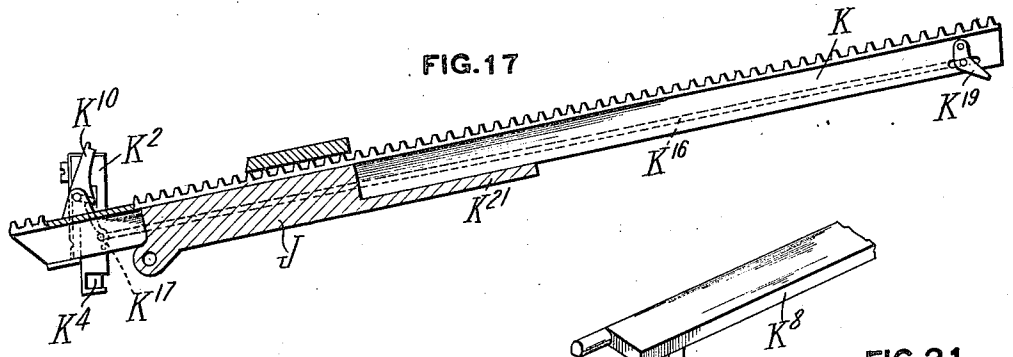


FIG. 19

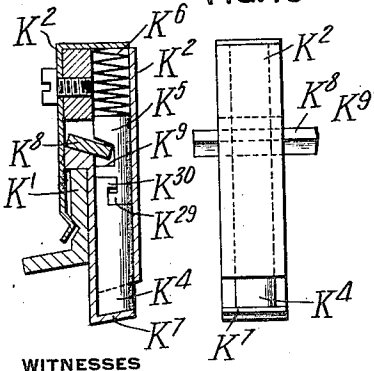


FIG. 18

FIG. 20

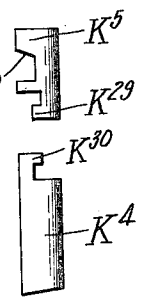
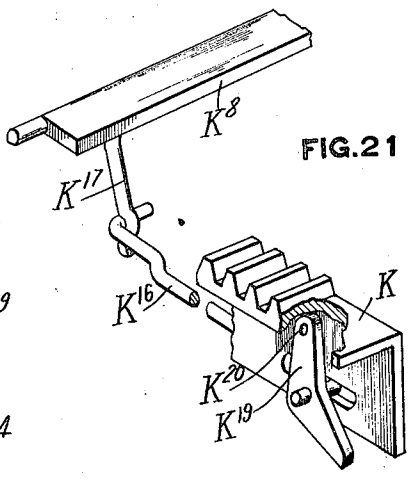


FIG. 21



WITNESSES

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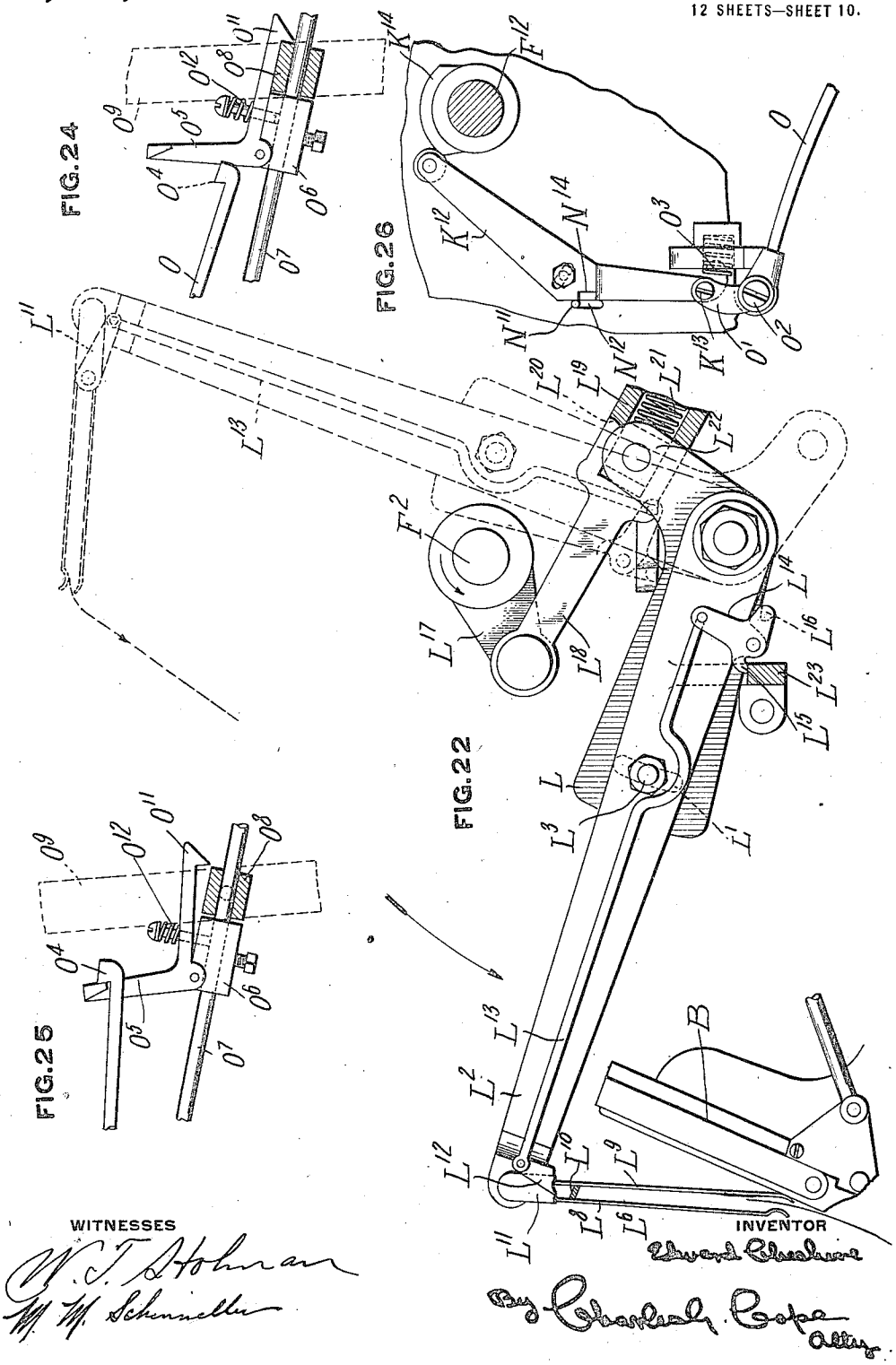
12 SHEETS—SHEET 10.



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12 SHEETS—SHEET 11.

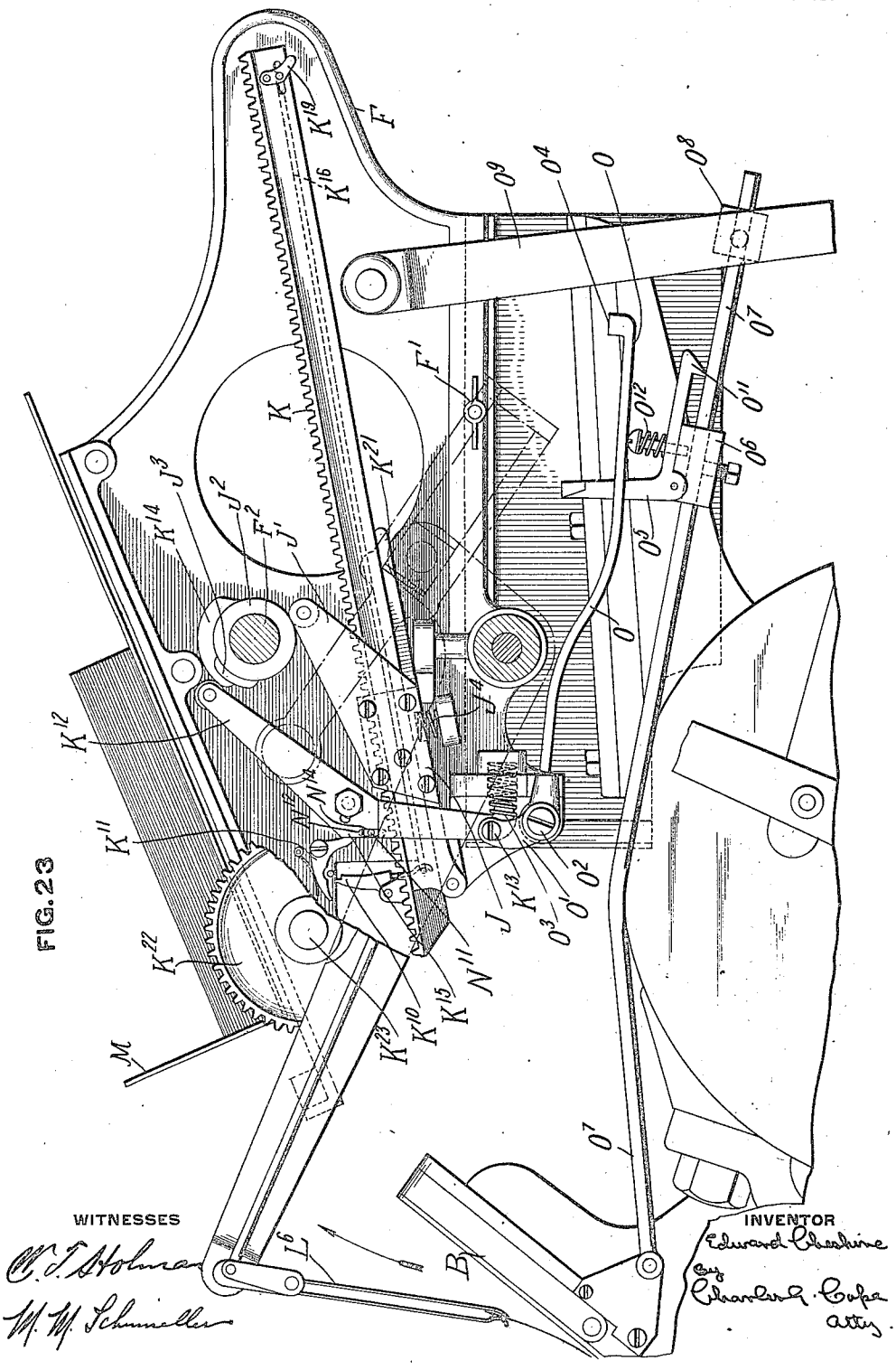

FIG. 23

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12 SHEETS—SHEET 12.

FIG. 27

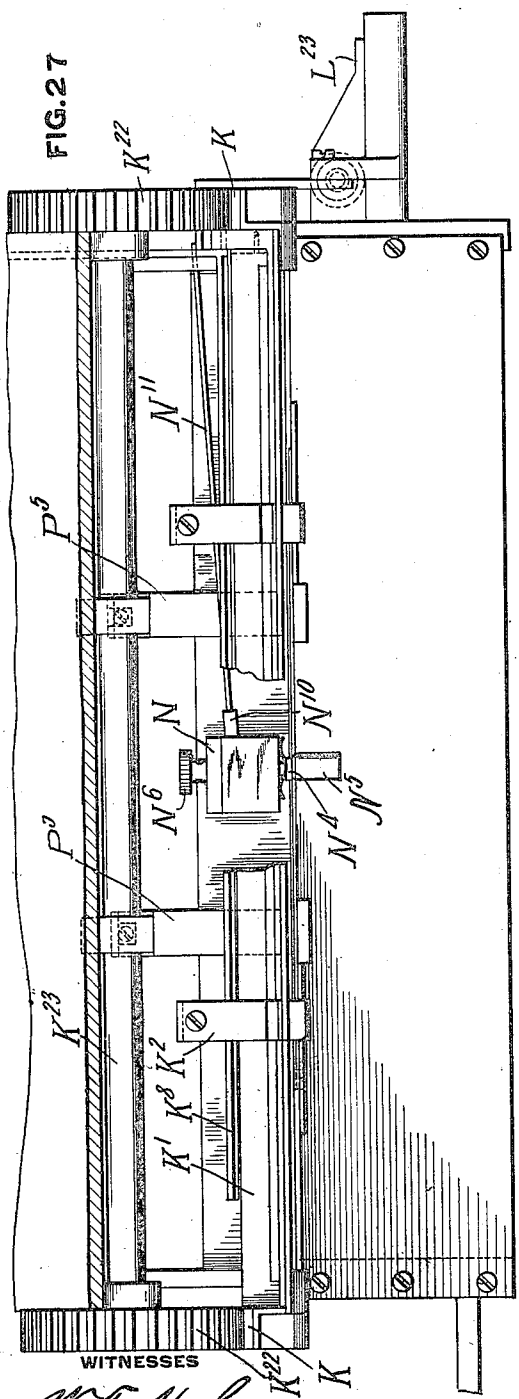


FIG. 28

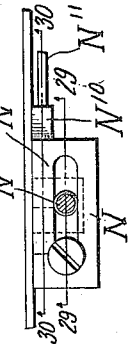


FIG. 30

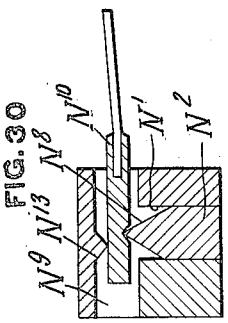
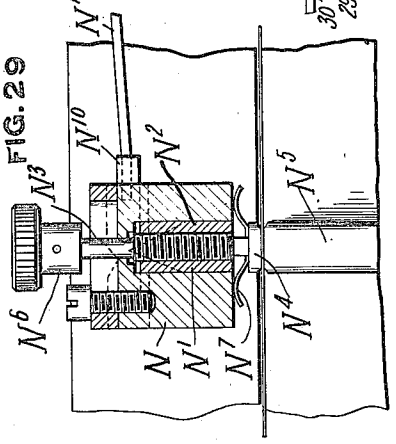


FIG. 29



WITNESSES

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UNITED STATES PATENT OFFICE.

EDWARD CHESHIRE, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO MILLER SAW-TRIMMER COMPANY OF MICHIGAN, OF ALMA, MICHIGAN, A CORPORATION OF MICHIGAN.

PAPER FEEDING AND HANDLING DEVICE.

1,145,405. Specification of Letters Patent. Patented July 6, 1915.

Continuation of application Serial No. 503,896, filed July 22, 1909. This application filed March 6, 1914. Serial No. 823,024.

To all whom it may concern:

Be it known that I, EDWARD CHESHIRE, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Paper Feeding and Handling Devices, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention pertains to paper feeding and handling devices, and particularly relates to paper feeders for printing presses, more especially those of the Gordon and similar types.

It is an object of my invention to provide an efficient device for automatically feeding sheets to a printing press of the Gordon type, which will be simple of construction and not liable to get out of order during use, and which will require a minimum of mechanical skill to operate it.

It is another object of my invention to provide a feeding device which may readily be attached to a press without the necessity of radical changes being made in the latter.

It is a further object to produce a device which will be certain in its operation, and which will position the sheets properly on the platen. And other and further objects of the invention will appear from the following description, taken in connection with the appended claims.

By way of example, a press feeding device constructed in accordance with my invention is described in the following specification and shown in the accompanying drawings. It is to be understood, however, that the invention may be embodied in other forms, and that changes may be made in the form described and shown, without exceeding the scope thereof as defined in the appended claims.

In the drawings: Figure 1 is a side elevation of the feeder as applied to a press of the Gordon type, part of the press being illustrated; Fig. 2 is a rear elevation of the feeder; Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1; Fig. 4 is an enlarged vertical section taken on the line 4—4 of Fig. 2, showing the means for releasably locking the floating bottom of the feed box; Fig. 5 is a horizontal section taken on the line 5—5 of Figs. 2 and 4; Fig. 6 is an enlarged cross section on the line 6—6 of Fig. 2 and shows details of the actuating lever for the floating bottom of the feed box; Fig. 7 is an enlarged vertical section on the line 7—7 of Fig. 2, illustrating the driving gears for the feeder operating cam shaft; Fig. 8 is a horizontal section taken on the line 8—8 of Fig. 7; Fig. 9 is a detail view of the cam disk for effecting the movement of the frame which supports the feed grippers; Fig. 10 is a vertical section on the line 10—10 of Fig. 2 and shows the means for separating the sheets singly from the stock and pushing them forward to be taken by the feed grippers; Fig. 11 is an enlarged partly sectional plan showing the same parts, the section being taken on the line 11—11 of Fig. 2; Fig. 12 is a detached view of the sheet-separating device showing the same in another position; Fig. 13 is a partly sectional detached view drawn to an enlarged scale, illustrating the sheet lifting shoe and related parts in still another position; Figs. 14 and 15 are an inverted plan and a perspective view respectively, illustrating the form and operation of the sheet-lifting shoe; Fig. 16 is a plan of gripper frame, the frame being shown as detached from the remainder of the device; Fig. 17 is a detail side elevation of the gripper frame and the guide therefor, the guide being shown in section; Figs. 18 and 19 are a front view and a vertical section respectively of one of the feed grippers; Fig. 20 shows two of the gripper members detached from the rest of the device; Fig. 21 is a fragmentary perspective view showing the gripper operating bar and the trip lever for actuating the same to remove the spring pressure from the gripper members; Fig. 22 is a fragmental view illustrating the operation of the delivery grippers; Fig. 23 is a side view of the feeder, certain portions being shown in dotted lines to reveal the gripper frame and the mechanism for causing the press to be thrown out when more than one, or less than one, sheet is moved forward to the feed grippers; Figs. 24 and 25 are detached views illustrating the operating of the coupling lever of the throwing out mechanism; Fig. 26 is a detached view showing the throwing out lever in a position different from that shown in Fig. 23; Fig.

27 is a sectional front elevation, the section being taken on the line 27—27 of Fig. 10; Fig. 28 is a plan of the testing gage; and Figs. 29 and 30 are vertical sections taken on the line 29—29 and 30—30 respectively of Fig. 28.

Like characters of reference refer to like parts throughout the following specification and the several figures of the drawings.

As has been stated above, the feeder is illustrated as applied to a press of the Gordon type. Such a press consists of a main frame or body A provided with suitable bearings in which is supported a driving shaft A^1 carrying upon one end a crank disk, which actuates, by means of a connecting rod A^2, a form-receiving bed A^3 which is pivoted to the frame A in such a manner that the reciprocating movements of the connecting rod A^2 will cause a forward and backward movement of the bed. Such a press also comprises a platen B pivotally supported upon trunnions B^1 carried in suitable bearings on the frame A. The platen B is intermittently moved into and out of parallelism with the bed A^3 by the agency of a cam groove B^3 formed in a gear wheel A^4 carried by the end of the driving shaft A^1 opposite to that which carries the crank disk, the form of the cam groove B^3 being such that the platen is allowed to remain stationary between each of its intermittent movements for a sufficient time to enable the paper printed to be removed and a fresh sheet to be placed thereon. The ordinary Gordon press is also provided with a hand lever C by means of which the operator may alter the operative length of the connecting rod A^2 and thus prevent the bed A^3 from moving forward a sufficient distance to make a printing impression, the press, however, being allowed to continue running.

The construction of feeder illustrated in the drawings consists of a feed box of such form that it may be attached to the rear of the frame of an ordinary press near the position usually occupied by the feed table, and a hood detachably connected to the feed box. This hood carries a device for separating the sheets of paper one by one from the pile or stack carried by the feed box and pushing them forward to the feed grippers; which device will be termed the sheet separating mechanism throughout this specification. The hood also supports a frame which is adapted to be moved to and fro across the platen during the period in which the latter is stationary and carries grippers which receive the sheets of paper from the sheet separating device and deposit them upon the platen. This frame and the parts related thereto will be hereinafter termed the feed mechanism. The hood also carries a device for grasping the paper after a printing impression has been made thereon and conveying it to the delivery box, which device will be hereinafter termed the delivery mechanism. The hood also carries a device by means of which the bed and platen of the presses are thrown out of operative relation when either more or less than one sheet is moved forward by the sheet separating mechanism, the device also operating to prevent the feed mechanism from seizing the sheets when more than one is moved forward by the sheet separating mechanism. This device will be hereinafter termed the throwing out mechanism. It may here be mentioned that the connection between the hood and the feed box is such that the former, together with the sheet separating mechanism, feed mechanism, delivery mechanism and throwing out mechanism carried thereby, may be readily removed in case of accident to any of these parts, the press being then in such condition that the paper may be fed thereto by hand from the feed box. Moreover, the method of attachment of the feed box to the frame of the press is such that the former may be readily removed if desired, leaving the press in its original position for feeding by hand. These features render it possible to use the feeder in connection with an already existing press, which is a great advantage, commercially.

The feed box.—The connection between the feed box D and the frame A is effected by means of side flanges D^1 (Figs. 2 and 3) with which the box D is provided. The flanges D^1 are bolted to the frame A in a position near that usually occupied by the feed table, so that by removing the bolts the feed box and the parts carried thereby may be immediately taken off the press. The feed box D (Figs. 1–6) is provided with a floating bottom D^2, upon which a pile of stock is adapted to be supported. The floating bottom D^2 is carried by a stem D^3 slidably mounted in a guide D^4 which extends downwardly from the base of the feed box. A spring D^5 is provided for retaining the floating bottom D^2 in its uppermost position, this spring being connected with the floating bottom by means of a lever D^6, to which the upper end of the spring is attached and a link D^7. The operative length of the lever D^6 determines, of course, the upward pressure applied by the spring to the floating bottom, and, as it is desirable that this upward pressure be regulated according to the weight of the particular size and kind of stock used, provision is made to vary the operative length of this lever in accordance with the particular variety of stock employed. To this end the pivot D^8 (Figs. 2, 4 and 6) of the lever D^6 is made movable in a slot D^9 formed in the end thereof. The pivot D^8 is carried by a block D^{10} slidable in a guide D^{11} which is secured to the feed

box, and this block is hitched, by means of a rod D^{12} to a pivoted hand lever D^{13}. In order that the relative positions of the lever D^6 and the link D^7 may be accurately defined a spacing link D^{14} is pivoted to the link D^7 coaxially with the lever D^6 and has its other end pivotally supported in a lug D^{15} secured to the guide D^{11}.

In order to adjust the floating bottom D^2 for a particular variety of stock it is only necessary to release the stem D^3, which, as will be described below, is normally locked against movement except at predetermined periods, when the hand lever D^{13} may be moved either to the left or to the right (Fig. 2) according as it is desired to shorten the operative length of the lever D^6 for light stock or lengthen the operative length of the lever D^6 for heavy stock. The nature of the spring D^5 is such that its pressure will be gradually reduced, as the floating bottom rises, approximately in proportion to the reduction of weight of the stock owing to the removal of the paper sheet by sheet.

As was stated in the preceding paragraph, the floating bottom D^2 is normally locked against upward movement by the action of the spring D^5. This is effected by means of a clutch E (Figs. 4 and 5) which operates upon the lower end of the stem D^3. The clutch E consists of a block E^1 slidably mounted in a hollow boss, situated at the lower end of the guide D^4, and having a slot E^2 therein through which the stem D^3 passes. A coiled spring E^3 abuts against the end of the block E^1 and normally forces the end surface of the slot E^2 into engagement with the stem D^3 whereby the stem is held against movement. The clutch is intermittently released by means of a cam projection E^4 which is secured to the driving shaft A^1 of the press. The cam projection E^4 at each revolution of the shaft A^1 engages a roller E^5 carried by the block E^1 and thus forces the block inward against the action of the spring E^3, whereby the stem D^3 is released and the floating bottom D^2 allowed to be moved upward by the action of the spring D^5. The cam projection E^4 is placed in such position upon the shaft A^1 that the clutch will be released and the floating bottom allowed to move upward shortly after a sheet has been separated from the pile and removed to the platen by means of the sheet separating mechanism and feed mechanism to be hereinafter described.

In order that the floating bottom D^2 may be moved downward to receive a new pile of stock and in order to enable the operator to adjust the height of the floating bottom manually when desired, a clutch actuating lever E^6 (Figs. 2 and 5) is pivoted to the casing of the clutch E in such position as to engage, by means of its bent over end E^7, a shoulder E^8 formed upon the clutch block E^1. By moving the clutch operating lever E^6 to the left, its end E^7 is forced against the shoulder E^8 and the clutch block E^1 is thereby forced inwardly against the action of the spring E^3, the stem D^3 being thus released. When the stem D^3 has been released the floating bottom may be manually pressed down against the action of the spring D^5 to any extent desired.

In order that the floating bottom D^2 may be locked in its lowermost position, if desired, during the operation of the press, the outer end of the hand lever E^6 is provided with a hook E^9 which may be made to engage over the end of the lever D^6, whereby the floating bottom is securely retained in the lowermost position. This is the condition of the parts shown in Fig. 2.

The floating bottom D^2 is formed with transverse slots through which project side stops D^{16} (Figs. 2, 3 and 4) between which the pile of stock is placed upon the floating bottom. These stops are laterally adjustable for different widths of paper and are similar to one another, so that a description of one of them will suffice. Each of the stops D^{16} is slidably mounted upon a transverse guide bar D^{17} carried by the box D beneath the floating bottom, and is provided with a screw hole into which is threaded the end of a rod D^{18} which extends to the rear of this feed box. The end of the rod D^{18} is arranged to bear against the guide bar D^{17} and thus lock the stop D^{16} against movement. However, when it is desired to adjust the stop, this may be done by turning the rod D^{18} so as to release its end from engagement with the guide D^{17} when the stop may be manually moved to the right or left by means of the rod D^{18}.

The mechanism for raising the floating bottom D^2 does not, in itself, form part of the present invention, but is the subject-matter of my co-pending application Serial No. 790,524, filed September 18, 1913.

The hood.—The hood F (Figs. 1, 2, 3, 7 and 8) is mounted upon the upper edges of the sides of the feed box D and is secured thereupon by means of removable pins F^1. When the pins F^1 are removed, the hood, together with the devices which it carries (sheet separating mechanism, feed mechanism, delivering mechanism, and throwing out mechanism) can be bodily removed from the feed box, thus leaving the press in condition for feeding by hand.

Mounted in suitable bearings in the hood F is the counter shaft F^2 which carries a number of cams and other devices for actuating the various parts of the feeder. The counter shaft F^2 is driven, by means of toothed gearing F^3, from the gear wheel A^4 of the press, the arrangement of the gearing F^3 being such that the counter shaft F^2 rotates at the same speed as the driving shaft

A[1] of the press. The upper side of the hood slopes forward downwardly and provides a table upon which the delivery box M may be supported.

The sheet separating mechanism.—The construction of the sheet separating mechanism is as follows: Slidably mounted in lugs G[1] (Figs. 2, 3, 4 and 11) extending inwardly from the sides of the hood F are a pair of pins G[2] which are carried by a presser bar G, compression springs G[3] (Fig. 4) being inserted between the presser bar and the lugs G[1], which springs tend to hold the presser bar in its lowermost position against stops formed by the upper edges of the side walls of the box D. When the presser bar G is in its lowermost position and a pile of stock is in place upon the feed box the presser bar G firmly presses down upon its stops and compresses the paper along the front edge thereof, the pile of stock being intermittently moved upward against the presser bar G by the action of the spring D[5]. Cams G[4], mounted on the counter shaft F[2] (Figs. 2, 4 and 11) are provided for intermittently raising the presser bar and allowing one of the sheets of paper upon the pile to be moved forward. These cams each have two projections G[5] thereon which alternately engage the rollers of cam levers G[6] which are pivoted to the hood, and the ends of which engage in notches in the pins G[2]. As the cam G[4] revolves, therefore, the lever G[6] is operated to raise the presser bar and allow the paper to be moved beneath it, this raising operation occurring twice during each revolution of the counter shaft F[2], once in order to enable the testing gage to operate, and a second time to enable the sheet to be withdrawn by the feed grippers.

The sheet separating mechanism proper H (Figs. 10–15) is actuated by means of a bell crank H[1] rockably supported in the hood F adjacent the center of the front end thereof. Movement is imparted to the bell crank lever H[1] by means of a cam H[2] secured to the counter shaft F[2]. The cam H[2] is formed with a small starting hump H[3] and the configuration of the remainder of the cam is such that a slight forward movement is imparted to the bell crank lever by the hump H[3], and, after the bell crank lever has remained stationary for a short time, a considerable further forward movement is effected. The bell crank lever then remains stationary for a period and is afterward allowed by the cam to return to its original position, such return being effected by a spring H[4]. The slight preliminary movement caused by the hump H[3] causes the sheet lifting shoe to operate.

Suitably secured to the hood is a horizontal rod H[5] carrying on its outer end a block H[6] which carries the sheet lifting device. The block H[6] is adjustably mounted upon the rod H[5] so as to provide for the use of various sizes of sheets of paper and carries an end stop H[7], which is shown as being formed of bent sheet metal. The block H[6] is adjusted upon the rod H[5] so that the end stop H[7] presses lightly against the rear of the pile of paper. Pivoted to the upper part of the block H[6] is a link H[8] carrying at its outer end the pneumatic lifting shoe H[9]. The link H[8] is provided with a projection H[10] arranged to be engaged and moved by a block H[11] secured to a movable rod H[12] which derives its movement from the bell crank lever H[1]. Rockably supported in the block H[6] is a spindle H[13] carrying at each end a lever to which is secured a paper separating dog H[14]. The spindle H[13] is formed with a projection H[15] thereon which engages in a recess H[16] formed in the lower side of the block H[11] so that the latter, in its forward and backward movements will intermittently rock the spindle H[13] to raise and lower the dogs H[14]. The lifting shoe H[9] is provided with a rear plate H[17] the ends of which extend slightly downward (Fig. 15) and behind which the dogs H[14] engage when they are raised. As the block H[11] is moved forward by reason of the bell crank lever H[1] being moved by the hump H[3] of the cam H[2] and the rod H[12] being consequently pulled forward, it engages the projection H[10] and thus raises the lifting shoe H[9] to lift a sheet of paper. Practically at the same time the rear face of the recess H[16] engages against the projection H[15] of the spindle H[13] and effects a downward rocking movement thereof to lower the dogs H[14], the result being that these dogs slip downwardly and forwardly from the rear plate H[17] and enter beneath the lifting shoe before the sheet of paper lifted thereby has had time to fall. Fig. 13 shows the position of these parts just before the lifting shoe H[9] rises. Fig. 12 illustrates the position of the dogs as they are being forced downward by the block H[11], the dogs being shown as just entering beneath the shoe H[9] to catch a sheet of paper.

In order that the shoe H[9] may be enabled to perform the above described lifting operation its lower face is formed with a plurality of concentric connected circular grooves H[18] (Fig. 14) and with a central hole H[19] communicating by means of a hose H[20] with a pump H[21] actuated by a cam on the counter shaft F[2]. Just as the shoe H[9] is being lifted, the pump is actuated by its cam to create a suction in the hole H[19] and concentric grooves H[18], so that, as the shoe is raised, a sheet of paper will be pneumatically gripped thereby and raised with it. Immediately after the sheet has been raised the move-

ment of the pump is reversed and consequently the sheet falls. Before, however, the sheet has had time to reach the pile again the dogs H^{14} have entered beneath the lifting shoe and the sheet of paper consequently falls with its rear edge resting upon the points of these dogs whereby it is separated from the remainder of the pile. The dogs H^{14} press upon the pile of stock sufficiently hard to prevent the removal of any other sheets of paper when the separated sheet is withdrawn.

In order to prevent the lifting foot H^9 from raising two sheets at once owing to the paper being drawn into the concentric grooves H^{18} and thereby creating a suction upon the second sheet of paper in the pile, I form a slight depression H^{22} (Figs. 14 and 15) between the rear edge of the lifting shoe and the circular grooves H^{18}. The effect of this is clearly shown on Fig. 15. When the top sheet is sucked against the shoe it adapts itself to the configuration of the lower surface thereof and therefore creates a small passage between itself and the next sheet, whereby air is admitted between the two sheets and the chance of more than one being raised by the lifting shoe is minimized.

All of the above described operations occur during the slight movement of the rod H^{12} due to the hump H^3 effecting the preliminary movement of the bell crank lever H^1.

While the above operations have been going on the sheet pushing device has begun its movement. The sheet pushing device is constructed as follows: An arm I is attached to the free end of the bell crank lever H^1 by means of a friction joint and carries at its end a cross bar I^1 to which are attached friction disks arranged to engage the top sheet of paper and move it forward. When the bell crank lever is in its upper and rearmost position the cross bar I^1 is situated somewhat above and slightly to the rear of a spacing pin I^2 mounted upon the rod H^5, the lifting rod H^9 being then in a position shown in full lines in Fig. 13 and in dotted lines in Fig. 10. The distance between the under face of the cross bar I^1 and the top of the spacing pin I^2 will always be the same, regardless of any buckling of the paper, when the parts are in position, this being due to the provision of a pin I^3 upon the lever I which slidably engages beneath the rod H^{12} when the lever I has been moved through part of its rearward movement. As soon as the pin I^3 engages against the rod H^{12} the lever I ceases to move as a part of the bell crank lever H^1 and begins to rock about its frictional pivot. When a hump H^3 begins to press upon the roller of the bell crank lever H^1 the lever I is moved downward until its end presses upon the top of the spacing pin I^2 and remains in that position until the cam H^2 begins to move the bell crank lever H^1 again, when the cross bar I^1 will slip off the spacing pin I^2 and move downward to engage, by means of the friction disks, the top sheet of paper and move it forward into the position shown in Fig. 10, it being remembered that before the cross bar I^1 moves from above the spacing pin, the lifting shoe and dogs will have separated a sheet in the manner described above. The spacing pin I^2 exactly determines the time at which the friction disks will strike the paper and the distance forward through which it will be moved, regardless of any buckling of the paper which may occur.

Just before the above operations take place one of the pairs of cam projections G^5 will have operated the cam lever G^6 to raise the pin G^2 and therefore the pressure bar G to enable the sheet to be pushed out in front. As the cam projections G^5 pass away from the rollers of the cam levers the presser bar is allowed to fall in order that the testing gage to be described below may perform its operation. The sheet is then ready to be seized by the grippers and transferred to the platen of the press as soon as the grippers are operated and the presser bar G raised for the second time.

The above described sheet-separating mechanism does not, in itself, form part of the present invention but forms the subject-matter of my co-pending application Serial No. 527,004, filed November 9, 1909.

The feed mechanism.—The feed mechanism is constituted as follows: Pivoted to the hood are a pair of guides J (Figs. 11 and 23) in which the gripper frame is mounted. These guides are similar in form and a description of one of them, therefore, will be sufficient. Each guide is provided with an upwardly extending arm J^1 bearing a roller which runs upon the periphery of a cam J^2 which is mounted on the counter shaft F^2 and has a cam projection J^3 thereupon. The roller of the arm J^1 is held in engagement with the cam J^2 by means of a compression spring J^4, the result being that, when the projection J^3 strikes the roller of the arm J^1, the latter will be rocked about its pivot. Slidably mounted in the guide J^1 is the longitudinal tooth racks K of the gripper frame (Figs. 3, 16–21 and 23). These racks are connected at their front end by the gripper supporting cross bar K^1. A pair of grippers K^2 are mounted upon the cross bar K^1 in such manner as to be capable of lateral adjustment thereupon. The grippers K^2 are of similar construction, each being provided with a central bore in which the gripper members K^4 and K^5 and the spring K^6 are contained. The gripper members K^4 and K^5 are formed with interengaging hooks K^{29}

and K^{30} (Figs. 18, 19 and 20) a slight clearance being left between the hooks in order that a lost motion effect may be obtained. The spring K^6 normally presses the gripper member K^5, and therefore the member K^4, downwardly against a jaw K^7 with which the gripper is provided. The gripper member K^5 may, however, be lifted a sufficient distance to raise the member K^4 away from the jaw K^7 in order to permit the insertion of the sheet of paper, while it also may be partially lifted so as to remove the spring pressure from the member K^4 and, due to the clearance between the hooks K^{29} and K^{30}, enable the gripper member K^4 to engage the jaw K^7 by means of its weight alone. This entire and partial raising of the gripper member K^5 is effected by means of a flat bar K^8 which extends through both grippers and into a recess K^9 of each of the gripper members K^5. The bar has a seat in each of the grippers, and it will be readily understood that when it is rocked about its seat the gripper members K^5 will be raised, a slight rocking movement of the bar effecting a partial raising of the members K^5, whereby the gripper members K^4 engage the jaws K^7 by gravity, and a greater rocking movement of the bar effecting the entire lifting of the gripper members K^5 whereby the members K^4 are also raised and the grippers placed into condition for receiving a sheet of paper.

The bar K^8 is pivoted at its ends in ears which extend upwardly from the racks K of the gripper frame near the end of the cross bar K^1, and is provided with an upwardly extending ear K^{10} which effects the complete tilting movement of the bar K^8. The upper end of the ear K^{10} engages, when the gripper frame approaches the position in which a sheet of paper is to be taken, a trip lever K^{11}, whereby it is moved backward and the bar K^8 is tilted to completely open the grippers to receive the sheet of paper.

The closing of the grippers upon the sheet of paper is effected by means of a lever K^{12} (Fig. 23). This lever is pivoted at K^{13} and has at its ends a cam roller which engages a cam K^{14} whereby the shoulder K^{15} of the lever is moved forward to engage the end of the trip lever K^{11} and move it out of engagement with the ear K^{10}. When the trip lever K^{11} has thus been moved away from the ear K^{10} the springs K^6 of the grippers force the bar K^8 downward and the gripper members K^4 against the jaws K^7, whereby a sheet of paper is seized. The platen B has now returned from the previous printing operation and has reached the position shown in Fig. 1 and the gripper frame is now moved forward to deposit the sheet of paper thereupon. This is effected by bringing the front edge of the paper into engagement with stops Z which are provided upon the platen for that purpose. In order, therefore, that, when the edge of the paper engages the stops, the sheet may be withdrawn from the grippers without any injury being done to the paper, it is desirable to provide means whereby the grasp of grippers is lightened before the sheet is removed.

The lightening of the grippers is effected by slightly tilting the bar K^8 whereby the paper is left held in the grippers by reason of the weight of the gripper members K^4 alone. This slight tilting of the bar K^8 is effected by means of a link K^{16} (Figs. 17, 21 and 23) attached at one end to a projection K^{17} which extends downwardly from the bar K^8, and at the other end to a trip lever K^{19} which is pivoted at K^{20} to one of the racks K. The trip lever K^{19} is normally held forward by the action of the springs K^6 of the grippers, but is arranged to be moved rearwardly by engagement with a backwardly extending strip K^{21} which is formed upon one of the guides J. The length of this strip is such that the trip lever K^{19} is operated some time before the grippers have completed their travel over the surface of the platen. This provides for the proper operation of the grippers regardless of the size of the paper used.

An adjustable sheet register is provided upon the platen for automatically moving the sheet fed into the proper printing position if the sheet was not fed to the correct position in the first case. This automatic register forms the subject matter of my Letters Patent No. 964,756, issued July 19, 1910, and will not therefore be specifically described here.

The forward and backward movement of the gripper frame is effected by means of toothed wheels K^{22} (Figs. 1, 2, 3, 7, 8 and 9) mounted upon a spindle K^{23} extending transversely of the hood F. A to and fro rotating movement is imparted to the shaft K^{23} by means of a pivoted tooth segment K^{24} engaging a pinion upon the shaft K^{23}. The segment K^{24} is provided with a cam roller K^{25} which enters a cam groove K^{26} in a disk K^{27} carried by the counter shaft F^2. The cam groove K^{26} has an inwardly and outwardly extending portion K^{28} which effects the required upward and downward movement of the segment K^{24}. The cam disk K^{27} is mounted upon the shaft K^2 in such position that the portion K^{28} will come into operation during the time that the platen is held in its stationary position in order that the operation of the grippers may be carried on during the time that the platen is in its stationary position, that is, in the position shown in Fig. 1.

Briefly stated, the operation of the feed mechanism is as follows: Starting from the actuation, by the lever K^{12}, of the trip lever K^{11}: The trip lever K^{11} having been moved

so as to release the ear K^{10}, the grippers are shut, by the action of their springs K^6, upon the sheet of paper which has been fed forward by the separating mechanism. Just at that moment the portion K^{28} of the cam groove K^{26} begins to operate upon the roller K^{25} of the segment K^{24} whereby the segment is moved downwardly and the gripper frame is consequently moved forward over the platen, the presser bar G having been raised previously by the second pair of cam projections G^5 to enable the sheet of paper to be removed. Somewhat after the grippers have passed the center of the platen the trip lever K^{19} strikes the end of the strip K^{21} and is thereby moved rearwardly thus pulling upon the link K^{16} and effecting a slight tilting movement of the bar K^8. The slight tilting movement of the bar K^8 lifts the gripper members K^5 a little but not enough to cause them to raise the members K^4, the results being that the paper is held by the grippers solely by reason of the weight of the members K^4, so that when the paper strikes the stops on the platen it can easily slide out of the grippers without chance of injury. The paper having thus left the grippers, the gripper frame passes on to its outermost position. Just as it reaches this position the projection J^3 of the cams J^2 strike the rollers on the arms J^1 of the guides J and slightly tilt these arms downward with the effect that the end of the gripper frame is moved upward so that during the return movement thereof the grippers will not strike and derange the paper. Just about this time the cam roller J^{25} has passed the center of the actuating portion K^{28} of the cam portion K^{26}, the parts then being in the position shown in Fig. 27. The segment K^{24} then begins to move upward and the gripper frame therefore to be moved inward until the ear K^{10} strikes the trip lever K^{11} and effects the opening of the grippers. The grippers then remain open until the paper has been pushed out between them and they are again closed by the action of the lever K^{12}.

The delivery mechanism.—The delivery mechanism effects the removal of the sheet of paper after printing and the placing of it into the delivery box; it is constituted as follows: Rockably mounted upon the hood F is segmental arm L (Figs. 1, 2 and 22) having an arc-shaped slot L^1 therein. Coaxially mounted with the segmental arm L is the delivery arm L^2, the arm L^2 being radially movable relative to the segmental arm L and being connected thereto by means of a bolt L^3 passing through the slot L^1 so that the position of the delivery arm may be adjusted for various sizes of paper. The outer end of the arm L^2 is bent over at right angles to form a horizontal support member L^4 (Fig. 2) in which is rockably supported a rod L^5 upon which the delivery grippers L^6 are mounted in such manner as to be capable of lateral adjustment for various widths of paper. A spring L^7 is wound about the rod L^5 and tends to hold the delivery grippers L^6 against the front edge of the horizontal member L^4.

The delivery grippers each consist of an upper spring finger L^8 having a lip formed at its end and a lower spring finger L^9 having a knife edge at its end so that as the platen moves relatively to the grippers the finger L^9 will slide over the surface of the platen and beneath the sheet of paper carried thereby. For opening the delivery grippers a flat bar L^{10} is provided, the tilting of which effects the opening of the grippers. The bar L^{10} is rockably mounted at its end in a crank L^{11} extending forwardly from the end of the rod L^5 and is provided with a lever L^{12}, to the end of which is connected a link L^{13}, the opposite side of the link being pivoted to a trigger L^{14} having an actuating projection L^{15} and a second, rearwardly extending, actuating projection L^{16} (Fig. 22). The delivery arm rocks from a position shown in full lines in Fig. 22, in which the delivery grippers are in contact with the platen, to the position shown in dotted line in the same figure, in which the delivery grippers are above the delivery box and have dropped the printed sheet therein.

In order that the most efficient results may be obtained I have found it desirable to arrange the delivery arm and grippers so that the grippers will be moved in contact with the tympan upon the platen just about the time when the printing operation is taking place, the points of the delivery gripper L^6 striking the tympan first and forcing the rod L^5 to rotate against the action of the spring L^7, while the delivery arm concludes its forward movement, the result being that the delivery grippers are held firmly against the sheet which has been fed to the platen and forced to slide closely against the surface thereof. During the latter part of this movement the grippers are opened. The arm is then allowed to remain stationary until the platen begins to move backward after the printing operation, in doing which it brings the sheet just printed between the fingers L^8 and L^9 of the delivery grippers (Fig. 22). Just after this the delivery arm L^2 begins to move again, the grippers closing at the same time upon the sheet. The arm L^2 then rocks back into the position shown in dotted lines in Fig. 22 when the fingers are opened again to allow the sheet carried thereby to fall into the delivery box M.

In order that the above results may be obtained the counter shaft F^2 is provided with a crank arm L^{17} to the end of which is pivoted a connecting rod L^{18} having a slide-

way L^{19} in its outer end. In the slideway L^{19} is mounted a slide block L^{20} (Fig. 22) and a powerful spring L^{21} which tends to force the slide block L^{20} against the upper end of the slideway L^{19}. A lug L^{22} which is formed upon the segmental arm L is connected to the slide block L^{20}. The effect of this would ordinarily be, of course, that the rotation of the crank L^{17} would effect a continuous reciprocating movement of the lug L^{22} and therefore of the delivery arm L^2. In order to effect the above described dwell of the delivery arm just before the paper is seized, however, a suitable stop L^{23} is provided upon the hood F (Figs. 3 and 22). The segmental arm L strikes the stop L^{23} just as the delivery grippers reach the required position between the platen and the bed, (see full lines Fig. 22) and is thereby prevented from further downward movement. As the crank L^{17} continues to rotate the slide block L^{20} is forcibly pushed downward against the action of the spring L^{21} until the crank passes its dead center, when the block returns to its original position against the end of the slideway L^{19}, whereupon the upward movement of the delivery arm starts.

Just before the delivery arm L^2 strikes the stop L^{23} the projection L^{15} of the trigger L^{14} strikes the same stop and causes the trigger L^{14} to rock about its pivot and effect a pull upon link L^{13} whereby the bar L^{10} is rocked and the delivery grippers opened. As the arm L^2 leaves the stop L^{23} at the beginning of its upward movement after the sheet has been pushed by the platen between the fingers L^8 and L^9, the projection L^{15} leaves the stop L^{23}, whereupon the resiliency of the fingers L^8 and L^9 forces the bar L^{10} back into its flat position and the delivery grippers thus close upon the paper. Just as the delivery arm L^2 reaches the position shown in dotted lines in Fig. 22, the projection L^{16} strikes a second stop L^{25} (Fig. 3) upon the hood F and the trigger L^{14} is again rocked to cause the opening of the delivery grippers whereby the sheet is allowed to fall into the delivery box M.

The throwing out mechanism.—The throwing out mechanism is actuated by means of a testing gage N (Figs. 27, 28, 29 and 30) mounted upon the front of the presser bar G near the center thereof. The gage is formed with a vertical slot N^1 in which is slidably mounted a block N^2 which has threaded therein a gage pin N^3 having at its lower end a foot N^4 arranged to engage an anvil N^5 carried by the front of the feed box and having at its upper end a thumb nut N^6, a spring N^7 being inserted between the body of the gage and the foot N^4 tending to hold the foot in its downward position. The block N^2 is extended rearwardly to form a knife edge N^8 which projects upward into a horizontal chamber N^9 with which the gage is provided. Fulcrumed on the knife edge N^8 and extending into the chamber N^9 is the end N^{10} of the stop lever N^{11} which extends along the front of the presser bar G through an elongated slot N^{12} formed on the side of hood (Figs. 23 and 26). The gage is provided with a downwardly extending projection N^{13} situated above and slightly to the rear of the knife edge N^8, against which projection the rear part of the end N^{10} of the stop lever abuts. By this arrangement a very slight movement of the block N^2 will, by the upward and downward shifting of the knife edge N^8, create a considerable movement of the outer end of the stop lever N^{11}, this being due to the great difference in length of the arms of the lever.

The operation of the testing gage is as follows: By manually moving the thumb nut N^6 of the threaded gage pin N^3, the height of the block N^2 in the slot N^1 is adjusted so that, when, after the downward movement of the presser bar subsequent to the moving forward of the sheet of paper by the sheet separating mechanism, the foot N^4 presses the sheet between itself and the anvil N^5, the knife edge N^8 of the block N^2 will be in such a position that the outer end of the stop lever N^{11} will be located in the center of the slot N^{12} (Fig. 23). With such an adjustment it will be evident that, should, for any reason, two sheets of paper be pushed by the sheet separating mechanism forward over the anvil N^5, the block N^2 will be moved upward a greater distance than ordinarily owing to the extra thickness between the foot N^4 and the anvil N^5, the result being that the knife edge N^8 of the block N^2 causes the stop lever N^{11} to be moved upward so that its outer end becomes located in the top part of the slot N^{12}. The failure of the sheet separating mechanism to push a sheet forward has the effect that, owing to the absence of the paper between the foot N^4 and the anvil N^5, the block N^2 will not be moved upward sufficiently for its knife edge N^8 to cause the outer end of the stop lever N^{11} to assume its normal position in the center of the slot N^{12}, the result being that the end of the stop lever N^{11} remains in the lower end of the slot N^{12}. Briefly stated, then, when one sheet is fed forward by the sheet separating mechanism the end of the stop lever N^{11} is located at the center of the slot N^{12}, when two or more sheets are fed forward the end of the stop lever N^{11} is located at the top of the slot N^{12}, and when no sheet is fed forward the end of the stop lever is located at the bottom of the slot N^{12}. The presence of the slot lever N^{11} in the lower end of the slot N^{12} throws the bed and platen out of operative relation, the presence of the stop lever N^{11} in the upper end of the slot N^{12} has a similar effect and prevents the

feed grippers from seizing the two or more sheets of paper which will have been fed, while the stop lever N^{11} is located at the center of the slot N^{12} the press and the various mechanisms of the feeder are allowed to perform continuously their functions.

In order that the effects described at the close of the preceding paragraph may be obtained the lever K^{12} (Figs. 23 and 26), which, it will be remembered, effects the operation of the trip lever K^{11} to cause the closing of the feed grippers, is provided with a short recess N^{14} in its shoulder K^{15}, this recess being disposed opposite to the slot N^{12} at the center thereof when the lever K^{12} has been moved forward by the cam projections K^{14}. Therefore, when the end of the stop lever N^{11} is located at the center of the slot N^{12}, it will enter the recess N^{14} of the lever K^{12} and will consequently have no effect upon the operation of that lever.

The lever K^{12} is pivoted at K^{13} to the bent over end O^1 of a lever O which is pivoted at O^2 to the hood F, a spring O^3 being inserted between the lower end of the lever K^{12} and a suitable boss upon the hood. The strength of the spring O^3 is such as to insure the lever K^{12} always rocking about a pivot K^{13} when there is no obstruction to its doing so. The rear end of the lever O is formed with a stop O^4 arranged to engage normally the upper end of a coupling lever O^5 (Figs. 1, 23, 24, 25 and 26) which is pivoted to a block O^6 mounted upon a reciprocating rod O^7. The rod O^7 is pivoted at one end to the platen and is guided at its other end in a square block O^8 carried by a link O^9 pivoted at its upper end to the hood F and connected at its lower end, by means of a second link O^{10}, to the throwing out lever of the press. The rod O^7 moves to and fro with the platen and the result of effecting a connection between this rod and the link O^9 will be that, as the rod moves forward with the platen, the throwing out lever C will move forward also and move the bed out of operative relation with the platen at every circle of the press. Such a connection is effected by means of the coupling lever O^5 whenever either more or less than one sheet is pushed forward by the sheet separating mechanism.

The coupling lever O^5 has its horizontal arm formed with a hook O^{11} arranged to engage over the block O^8 (Figs. 1 and 24) when the rod O^7 is moved rearwardly, a spring O^{12} being provided which enables the hook O^{11} to ride over the block O^8 during the rearward movement of the rod O^7. When such engagement between the hook O^{11} and the block O^8 has taken place the link O^9 is coupled to the rod O^7 and will participate in its movement, whereby the lever C is operated to throw the bed out of operative relation with the platen when the latter together with the rod O^7 next moves forward.

The above described coupling of the rod O^7 with the link O^9 and the consequent throwing out of the press would occur at each cycle were it not for the action of the lever O, the stop O^4 of which normally is located in the path of the coupling lever O^5 and strikes the latter at the end of its backward movement, thus tripping the coupling lever and preventing it from hooking over the block O^8 and effecting the coupling of the rod O^7 with the link O^9 (Fig. 25). The lever O is in the above position when the end of the stop lever N^{11} is located in the center of the slot N^{12} and the action of the coupling lever O^5 is therefore prevented when the stop lever N^{11} is in this position. When, however, the end of the stop lever N^{11} is located either in the upper or lower end of the slot N^{12} the lever O is moved downward so as to be out of the path of the coupling lever O^5, the coupling lever being thereby allowed to effect a coupling between the rod O^7 and the block O^8 of the link O^9 and thus cause the press to be thrown out. This movement of the lever O is due to the fact that the end of the stop lever N^{11} being away from the center of the slot N^{12} it cannot enter the recess N^{14} of the lever K^{12} when the latter is moved forward, the effect being that, as the lever K^{12} is moved forward by the cam projection K^{14} its shoulder K^{15} strikes the stop lever N^{11} (either above or below the recess N^{14} according to the position of the stop lever N^{11} in the slot N^{12}), and is therefore prevented from moving farther about its pivot K^{13}. The lever K^{12} being thus prevented from rocking about its pivot K^{13}, and being still forced forward by the action of the cam projection K^{14}, it is made to pivot about the end of the stop lever N^{11} as a fulcrum, its lower end being moved rearwardly against the action of the spring O^3 (Fig. 26). This backward movement of the lower end of the lever K^{12} causes a corresponding movement of the end O^1 of the lever O, the stop O^4 of this lever thus being moved downwardly. The effect of the downward movement of the stop O^4 is, which has been stated above, that the coupling lever O^5 is allowed to effect a coupling between the rod O^7 and the block O^8 of the link O^9, whereby the lever C is operated and the press thrown out.

The coupling lever O^5 will remain coupled with the block O^8 so long as, either by reason of the non feeding of a sheet or the feeding of more than one sheet, the end of the stop lever N^{11} remains away from the center of the slot N^{12}, so that the press will continue to run but the hand lever C will be moved forward at each cycle to prevent the printing operation. As soon, however, as the sheet separating mechanism again be-

gins to feed the sheets forward one at a time, the stop lever N^{11} will return to the center of the slot N^{12} and the stop O^4 will be returned into the path of coupling lever O^5, preventing the operation of the latter and allowing the press to perform the printing operations.

The presence of the stop lever N^{11} in the upper or lower end of the slot N^{12} has the further effect that the lever K^{12} being prevented thereby from moving forward about its pivot K^{13}, the shoulder K^{15} of this lever is prevented from striking the trip lever K^{11} and thereby effecting the closing of the feed grippers. The feed grippers will therefore move forward over the platen without being closed in time to seize the two or more sheets of paper which may have been fed forward by the sheet separating mechanism. It will thus be seen that when one sheet is fed forward by the sheet separating mechanism that sheet is grasped by the grippers and deposited under the platen, when two sheets are fed forward the press is thrown out and the grippers are prevented from seizing the sheets, while when no sheet is fed forward the press is thrown out so that the printing of an impression upon the tympan is prevented.

Since the press operates continuously it is desirable that means to be provided for returning to the pile of stock any sheets which may have been fed forward by the sheet separating mechanism but not taken by the grippers of the feed mechanism, and I provide a device which effects this result. A pair of lugs P (Fig. 10) are formed upon the underneath face of the front end of the hood. These lugs and the members carried thereby are of similar nature, and construction and a description of one will suffice. To each lug P is attached a spring strip P^1 extending rearwardly beneath the shaft K^{23} from which the gripper frame derives its movement, this spring strip being pushed normally upward by the action of the spring P^4. The spring strip P^1 extends upwardly at the rear of the shaft K^{23} and is bent over at its end to form a stop P^2 arranged to be engaged from above by a set screw P^3 carried by the shaft K^{23}. Pivoted to the strip P^1 is a tapper arm (Figs. 10 and 11) P^5 extending downwardly to a slight distance above the level of the top of the pile of stock. The tapper arm P^5 is formed with a hook P^6 arranged when the tapper arm is moved downward, to engage a corresponding projection P^7 formed upon the hood F.

The position of the set screw P^3 upon the shaft K^{23} is such that it will engage upon the top of the stop P^2 of the spring strip P^1 just as the feeder frame arrives at its outermost position over the platen, the shaft K^{23} having then moved through nearly 360° from the position shown in Fig. 10. When the set screw P^3 engages the stop P^2, the tapper arm P^5 is moved first downwardly in front of any paper which may have been fed forward and not taken by the grippers. The hook P^6 then engages the corresponding projection P^7 and, as the spring strip P^1 is moved farther downward the tapper arm P^5 swings about its pivot, the lower end of the tapper arm moving inwardly and thereby returning any sheets which may have been fed forward and not taken by the grippers to their original position upon the pile of stock. Just after this the presser bar G closes and, somewhat later, the cam projection E^4 releases the clutch E and allows D^2 to rise a distance equal to the thickness of a sheet of paper.

It will be understood from the above that the press and the various mechanisms of the feeder operate continuously, regardless of whether the feed grippers carry a sheet out over the platen or not. When the sheet separating mechanism pushes forward more than one sheet, the grippers are prevented from operating and the frame therefore goes forward empty, the unfed sheet being returned to the pile ready for the next operation of the sheet separating mechanism when the latter will probably perform its operation properly. When more or less than one of the sheets is fed forward, the bed and platen are thrown out of operative relations, but the press continues to run. By reason of these provisions and the various other devices, the feeder will carry on the above described operations continuously, observing its own mistakes and rectifying them. The feeder may be supplied with a pile of stock, started, and then left to itself, when it will continue to insert the sheets into and remove them from the press until the pile is exhausted.

I have thus described a feeder embodying the features of my invention, but I do not limit myself to the particular devices, arrangements and combinations of parts described, nor do I limit myself to the use of such devices, arrangements, and combinations of parts in the connection in which they are described, since these may be varied without exceeding the scope of the appended claims. In these claims, where the lower edge of the platen is referred to, the edge which is at the bottom during the printing operation, is intended. By the upper edge, is meant the edge opposite the lower.

What I claim is:—

1. The combination with a press comprising a bed, a platen having a stop thereon, and means for moving the platen into and out of printing position with respect to the bed, of a member adapted to be moved forward and back across the face of the said platen, when the latter is out of its printing

position, a paper gripper carried by said member and having coöperating jaws adapted to receive between them paper from a source of supply and retain said paper impositively during a portion of the movement of said member, and means for effecting the movement of said member forward across the face of said platen to bring the paper into engagement with said stop, and leave it in engagement therewith.

2. The combination with a press comprising a bed, a platen having a stop thereon, and means for effecting a relative rocking movement between the platen and the bed, of a member adapted to be moved forward and back across the face of said platen, a paper gripper carried by said member and having coöperating jaws adapted to receive between them paper from a source of supply and retain the paper impositively during a portion of the movement of said member, means for effecting the movement of said member forward across the face of said platen, to bring the paper into engagement with said stop, and leave it in engagement therewith, and for effecting the backward movement of said member, and means for effecting a movement of said gripper away from the platen during the backward movement of said member, to enable said gripper to clear the paper which has been deposited upon the platen.

3. The combination with a press comprising a bed, a platen having a paper-positioning abutment, and means for moving the platen into and out of printing position with respect to the bed, of a stock table, a frame for receiving paper from said table, and adapted to be moved from a position clear of the upper edge of the platen forwardly across the platen, and back to its original position during the time when the platen is out of printing position, a paper gripper carried by said frame and having coöperating gripping members adapted to seize between them the front parts of sheets from said stock table, means, coöperating with said abutment, for enabling the paper to be removed from said paper gripper when the same has moved out over the platen, and means for imparting said movement to said frame, whereby said frame deposits a sheet of paper upon the platen and recedes from the platen leaving the paper thereon.

4. The combination with a press, comprising a bed, a platen, and means for moving the platen into parallelism with the bed to effect the printing operation, and thence into a position out of parallelism with the bed, for receiving paper, of means located above the platen for grasping a sheet of paper and moving it, by its front edge, downward across the platen and depositing it thereon, when the platen is in receiving position, and means for grasping the opposite edge of the sheet to that grasped by said last named means and removing the sheet upward and away from the platen, during the movement of the platen after the printing operation has been performed.

5. In a paper feeding device, a frame arranged to be moved forward and backward over, and in proximity to, the surface to which the paper is to be fed, a paper gripper carried thereby and including coöperating gripping members for receiving the paper between them, means for effecting such movement of said frame, means for removing the paper from said gripper when the frame has moved forward, whereby the paper is deposited upon the surface, and means for raising that portion of said frame which is adjacent said gripper during the backward movement of said frame, so that the gripper may clear the paper during such backward movement.

6. In a paper feeding device, a guide, a gripper frame slidably supported in said guide, a paper gripper carried by said gripper frame, means for moving said gripper frame longitudinally in said guide whereby said gripper is moved over, and in proximity to, the surface to which the paper is to be fed and then returned to its original position, means for removing the paper from said gripper when the frame has moved forward whereby the paper is deposited on the surface, and means for periodically tilting said guide whereby said gripper is raised to enable it to clear the paper during such return movement.

7. In a paper feeding device, a stop arranged upon the surface to which the paper is to be fed, a gripper-supporting member adapted to be moved across the surface toward and away from the stop, a gripper carried by said member and including cooperating jaws adapted to impositively grasp between them a sheet of paper during a portion of the movement of said member, whereby the sheet of paper is brought against said stop and left in engagement therewith during the movement of said member toward the stop, means for effecting the movements of said member, and means for raising said gripper during the movement of said member away from the stop, whereby said gripper is enabled to clear the sheet of paper which has been deposited upon the surface.

8. The combination with a printing press comprising a bed, a platen, and means for moving said platen into and out of parallelism with said bed and retaining said platen stationary at intermittent periods when it is out of parallelism with the bed, of a feeder for said press comprising means, adapted to be moved forwardly

over said platen, and rearwardly away from said platen, when said platen is substantially in its stationary condition, for supporting a gripper, means for imparting said movements to said gripper-supporting means, a gripper carried by said supporting means, means for opening and closing said gripper when the gripper-supporting means is in its rear position thereby to seize a sheet, means for enabling the sheet to be withdrawn from said gripper when the latter is substantially in its extreme forward position above the platen, whereby said gripper carries a sheet onto the platen, and recedes from the platen leaving the sheet thereon, and means, other than said gripper, for removing the sheet deposited on the platen by said gripper, after the printing operation has been performed.

9. The combination with a printing press comprising a form-receiving bed, a platen, and means for moving the platen into and out of parallelism with said bed, of a paper feeding device for said press comprising a guide, a gripper frame slidably supported in said guide, a paper gripper carried by said gripper frame, means for moving said gripper frame longitudinally in said guide whereby said gripper is moved over, and in proximity to, the platen when the latter is out of parallelism with the bed, and then returned to its original position, means for removing the paper from said gripper when the frame has moved forward whereby the paper is deposited on the surface, and means for periodically tilting said guide whereby said gripper is raised to enable it to clear the paper during such return movement.

10. The combination with a printing press comprising a form-receiving bed, a platen, and means for effecting a relative movement between the platen and the bed, to effect the printing operation of a paper feeding device comprising a frame, a paper gripper carried thereby and including coöperating paper receiving jaws, means for moving said gripper frame over, and in proximity to, the platen and then returning it to its original position, means for removing the paper from said gripper when the frame has moved forward whereby the paper is deposited on the surface and means for tilting said gripper frame during its return movement so that the gripper may clear the paper which has been deposited upon the platen.

11. The combination with feeding grippers having engaging jaws, of means for causing said jaws to engage the paper during the first portion of the feeding movement with a relatively heavy pressure, and means for causing the jaws to engage the paper during the latter portion of the movement with a relatively light pressure, so that the sheet may be withdrawn from between the jaws without the latter being opened.

12. The combination with feeding grippers having engaging jaws and means for causing said jaws to engage the paper during the first portion of the feeding movement with a spring pressure, and means for causing said jaws to engage the paper during the latter portion of their movements by gravity pressure.

13. The combination with feeding grippers having relatively stationary under jaws and relatively movable upper jaws, means for holding the upper jaws in engagement with the paper, and means for releasing said holding means to permit said jaws to engage the paper by gravity alone as the paper moves toward and engages the stop pins of the press.

14. In a gripper, the combination with a relatively stationary jaw of an upper movable member slidably connected to said jaw, a lower movable member slidably connected to said jaw, and arranged to engage therewith, said lower member having a lost motion connection with said upper member, a spring engaging said upper member to normally hold said lower member in close engagement with the stationary jaw, means for raising said upper and lower members to permit the gripper to grasp a sheet of paper, and means for raising said upper member alone whereby said lower member engages said stationary jaw by gravity.

15. The combination with a printing press comprising a form-receiving bed, a platen, and means for moving said platen into and out of parallelism with said bed, said platen having a stop thereon, of a paper feeding device for said press, comprising a paper gripper having interengaging jaws, means for causing pressure between said jaws, means for moving said gripper forwardly over said platen, when the latter is out of parallelism with the bed, and then returning it to its original position, and means for diminishing the pressure between said jaws before the end of the forward movement, whereby the paper carried by said gripper may be removed therefrom by engagement with the stop on said platen, without the jaws of the gripper being opened.

16. The combination with a printing press comprising a form-receiving bed, a platen, and means for moving said platen into and out of parallelism with said bed, said platen having a stop thereon, of a paper feeding device for said press comprising a frame, a paper gripper carried thereby having interengaging jaws, means for creating pressure between said jaws, means for moving said frame forwardly over said platen when the latter is out of parallelism with said

bed, and then returning it to its original position, means for diminishing the pressure between said jaws before the end of the forward movement, whereby the paper carried by said gripper may be removed therefrom by engagement with the stop on the platen without said jaws being opened, and means for tilting said frame and returning it on a higher plane so that the gripper may clear the paper during such return movement.

17. In a paper feeding device, a paper gripper including a stationary gripping member, a vertically movable gripping member, coöperating with said stationary gripping member, and means for normally holding said gripping member firmly in its closed position, means for moving said gripper over the surface to which the paper is to be fed, and means for releasing said holding means before the end of said movement so that the paper thereafter may be held by the weight of the gripper member alone.

18. The combination with a printing press comprising a form-receiving bed, a platen, and means for moving said platen into and out of parallelism with said bed, said platen having a stop thereon, of a paper feeding device for said press comprising a paper gripper provided with a vertically movable gripping member and means for holding said gripping member firmly in its closed position, means for moving said gripper forwardly over said platen when the latter is out of parallelism with said bed and then returning it to its original position, and means for releasing said holding means before the end of said movement so that the paper thereafter may be held by the weight of the gripping member alone and may be removed from said gripper by engagement with the stop of said platen.

19. A paper gripper comprising a jaw, a gripping member, means for moving said gripping member away from, and toward said jaw to permit a sheet to be seized, means for holding said gripping member firmly against said jaw, whereby a sheet may be firmly retained in said gripper, and means for partly releasing said holding means, whereby said sheet is impositively retained in said gripper.

20. In a paper feeder, means for depositing paper in predetermined quantities upon the surface to which the paper is to be fed, means for separating paper from a pile, a gripper carried by said depositing means and adapted to close upon the paper after it has been separated by said separating means, means for effecting the closing of said gripper and means, coöperating directly with said gripper closing means for preventing said gripper-closing-means from operating when either more or less than the predetermined quantity of paper has been separated by said separating means.

21. A paper gripper comprising a jaw, a gripping member, a spring for holding said gripping member firmly against said jaw, and means for preventing the effect of said spring, whereby the gripping member is left to engage said jaw by gravity.

22. A paper gripper comprising a jaw, a gripper member, a spring for holding said gripper member firmly against said jaw, means for preventing the effect of said spring, whereby the gripping member is left to engage said jaw by gravity, and means for moving said gripping member away from said jaw.

23. The combination with a printing press comprising a bed, a platen having a paper positioning abutment, and means for imparting to the platen a cycle of movement during the former part of which the platen is in printing position and during the latter part of which the platen is in sheet-receiving position, of means for feeding paper against said abutment, said feeding means comprising a body, guiding means carried by said body, a frame coöperatively associated with said guiding means, said guiding means and frame being so arranged that said frame is capable of movement in a line extending substantially lengthwise of the platen when the latter is in sheet-receiving position, grippers carried by said frame, and means for imparting a reciprocating movement to said frame whereby the latter is moved to and fro across the platen during the latter part of the platen cycle.

24. The combination with a printing press comprising a form receiving bed, a platen, a main shaft, and means operated by said main shaft for moving said platen into and out of parallelism with said bed, of a paper feeding device comprising a rotatable member, a cam for imparting an intermittent to and fro rotating movement to said rotatable member, said cam being geared to said main shaft so as to rotate at an equal speed therewith, a guide, a gripper frame, slidably mounted in said guide, operative connection between said gripper frame and said rotatable member whereby the gripper frame is intermittently moved to and fro over said platen, and means for tilting said guide during its return movement.

25. The combination with a press, of feeding grippers therefor, means for removing the sheets one at a time into a position to be engaged by said gripper, automatic means for preventing the gripper from engaging the sheets in the event more than one sheet at a time is moved to the engaging position, and means for automatically returning the sheets to the pile, in the event they are not engaged by the gripper.

26. In a paper feeding device, means for separating predetermined quantities of paper from a pile, means for feeding said quantities of paper forward, a gripper for taking said quantities of paper from said feeding means and depositing them upon a paper receiving surface, means for preventing the operation, of said gripper when a larger quantity of paper is fed than that determined, and means for returning to the pile paper not taken by the gripper.

27. The combination with a printing press comprising a form receiving bed and a platen coöperating with said bed to form an impression upon the paper carried by said platen, of means for separating sheets of paper one by one from a pile, means for feeding sheets of paper forward one by one, a gripper for taking said sheets of paper from said feeding means and depositing them upon the platen, means for automatically preventing the operation of said gripper when more than one sheet is fed, and means for returning to the pile paper not taken by said gripper.

28. The combination with a printing press comprising a form-receiving bed, a platen coöperating with said bed to form an impression upon the paper carried by said platen and means for throwing said bed and platen out of operative relation without stopping the press, of means for separating sheets of paper from a pile one by one, means for feeding said sheets of paper forward one by one, a gripper for taking said sheets of paper from said feeding means and depositing them upon the platen, means for automatically preventing the operation of said gripper when more than one sheet is fed, means for returning to the pile paper not taken by the gripper, and means for automatically operating said throwing-out means when more than one sheet is fed.

29. In a paper feeding device means for feeding sheets of paper forward one by one, a gripper for receiving sheets of paper from said feeding means and depositing them upon the paper receiving surface, means for opening said gripper as the latter moves to take a sheet, means for effecting the closing of said gripper upon the sheet, and means for preventing the operation of said closure effecting means in the event that more than one sheet is fed forward.

30. In a paper feeding device, mechanism for removing sheets of paper forward one by one from a pile, a gripper for receiving the sheets of paper and removing them to the surface to which they are to be fed, a testing gage comprising an anvil, a gage pin between which and said anvil the paper passes when moved forward, means for moving the gage pin toward the anvil, and means operated by the gage pin for temporarily preventing the closing of said gripper when other than one sheet is moved forward.

31. In a paper feeding device, a testing gage comprising an anvil, a gage pin, means for moving sheets of paper forward one by one between said gage pin and said anvil, a stop lever pivoted to said gage pin, means for moving the gage pin toward the anvil, whereby said lever is rocked more or less about the pivot according as a greater or less thickness of paper is present between the gage pin and the anvil, and means for temporarily arresting the operation of the paper feeding device when other than one sheet is moved between said gage pin and said anvil.

32. In a paper feeding device, a testing gage comprising an anvil, a gage pin between which and said anvil the paper passes, a block adjustably mounted upon said gage pin, an indicating lever pivoted to said block, and means for moving the gage pin toward the anvil, whereby said lever is rocked more or less about its pivot, according as a greater or less thickness of paper is present upon the anvil.

33. In a paper feeding device means for feeding sheets of paper forward one by one, a gripper arranged to receive said sheet from said feeding means, means for effecting the closing of said gripper, a testing gage, a stop arranged to be moved out of its normal position by said testing gage when more than one sheet is fed to the gripper, and a lever arranged to operate said closing means when said stop is in its normal position, but to engage said stop, and thereby be prevented from operating said closing means when the stop has been moved out of its normal position by the testing gage.

34. The combination with a printing press comprising a bed, a platen and means for moving said parts into and out of operative relation, of a feeder for said press comprising means for feeding sheets of paper forward one by one, a gripper arranged to receive said sheets from said feeding means, a testing gage, a stop arranged to be moved out of its normal position by said testing gage when other than one sheet is fed to the gripper, means for throwing the platen and bed out of operative position without stopping the press, a lever arranged to engage said stop when the latter has been moved out of its normal position by said testing gage, a second lever pivoted to said lever, a coupling lever actuated by said second lever and a block to be engaged by said coupling lever to operate said throwing out means without stopping press or feeder.

35. The combination with a printing press comprising a bed, and platen, and means for moving the platen into and out of par-

allelism with the bed, of means for feeding the paper to the platen, delivering grippers for removing the paper from the platen, said delivering grippers being arranged to remain relatively stationary during a portion of the return movement of the platen to permit the platen to move the paper between the grippers, means for moving the grippers to a delivering position, and means for closing the grippers before they move to their delivering position.

36. The combination with a printing press comprising a bed, a platen, and means for moving the platen into and out of parallelism with the bed, of means for feeding the paper to the platen, delivery grippers for removing the paper from the platen, said delivery grippers being arranged to remain relatively stationary during a portion of the return movement of the platen to permit the platen to move the paper between the grippers, and means operated by the movement of the grippers to their delivering position for closing the grippers.

37. The combination with a printing press comprising a bed, a platen, and means for moving the platen into and out of parallelism with the bed, of means for feeding the paper to the platen, delivery grippers for removing the paper from the platen, said delivery grippers being provided with opposite jaws and being arranged to remain relatively stationary during a portion of the return movement of the platen to permit the platen to move the paper between the jaws thereof, the bottom gripper jaw having a knife edge to permit the paper to readily slide thereon when moved between the jaws.

38. The combination with a printing press comprising a bed, a platen having a stop thereon, and means for moving said platen into and out of parallelism with said bed and retaining the platen stationary when it is out of parallelism with the bed, of means for depositing paper sheet by sheet upon said platen comprising a gripper including coöperating sheet receiving jaws and adapted to be moved over said platen toward and away from the stop, and means for effecting the said movement of said gripper during the time when said platen substantially is in its stationary condition, whereby, at each reciprocating movement of said gripper, a sheet is brought on to said platen against the stop and left in engagement with the stop.

39. The combination with a printing press comprising a bed, a platen, and means for moving the platen into and out of parallelism with the bed, of means for feeding paper to the platen, delivering grippers for removing the paper from the platen, said delivering grippers being arranged to be brought into engagement with said platen substantially when the latter is in printing position and being arranged to remain stationary during a portion of the movement of said platen out of parallelism with said bed, whereby the platen is caused to move the paper between the grippers and means for imparting the said movements to the said grippers.

40. The combination with a printing press comprising a bed, a platen, means for moving the platen into and out of parallelism with the bed, and a stop upon the platen, of means for feeding paper to the platen, delivering grippers for removing the paper from the platen, said delivering grippers being arranged to be brought into engagement with said platen substantially when the latter is in printing position and being arranged to remain stationary during a portion of the movement of said platen out of parallelism with said bed, whereby the stop upon the platen is caused to move the paper between the grippers, and means for imparting the said movements to said grippers.

41. In a paper feeder, a gripper adapted to close upon predetermined quantities of paper and carry such paper to the surface to which the paper is to be fed, means for separating paper from a pile, and means, operable without stopping the feeder, for preventing said gripper from closing upon the paper when more than the predetermined quantity is separated.

42. In a paper feeder, a gripper adapted to close upon predetermined quantity of paper and carry such paper to the surface to which the paper is to be fed, means for separating paper from a pile, and means, operable without stopping the feeder, for preventing said gripper from closing upon the paper when less than the predetermined quantity is separated.

43. In a paper feeding device the combination with means for feeding paper forward in predetermined quantities, of means for returning the paper to the pile, when a quantity less than the predetermined quantity is fed forward.

44. The combination with a printing press of means for feeding sheets of paper to the press in predetermined quantities, means for separating paper from a pile, means for preventing the operation of the press when more than the predetermined quantity is separated, and means for returning the paper to the pile when more than the predetermined quantity is separated.

45. In a paper feeding device, in combination, means for depositing paper in predetermined quantities upon the surface to which the paper is to be fed, means for separating paper from a pile, and means, operable without stopping the feeder for automatically preventing either more or less

than the predetermined quantity of paper from being deposited upon the paper receiving surface.

46. In a paper feeding device, in combination, means for depositing paper in predetermined quantities upon the surface to which the paper is to be fed, means for separating paper from a pile, and means, operable without stopping the feeder, for automatically preventing less than the predetermined quantity of paper from being deposited upon the paper receiving surface.

47. The combination with a press comprising a bed, a platen, and means for effecting a relative movement between the bed and platen to effect the printing operation, of a gripper for receiving paper in predetermined quantities and depositing it on the platen, means for separating paper from a pile, a throw-out device for throwing the bed and platen out of operative relation with each other at each cycle of the press, means for closing said gripper upon the paper when the determined quantity is separated by said separating means, and mechanism, interlocking with said last named means, for rendering said throw-out device inoperative when said gripper is closed upon the determined quantity of paper.

48. The combination with a press, comprising a bed, a platen, and means for effecting a relative movement between the bed and platen to effect the printing operation, of a gripper for receiving paper in predetermined quantities and depositing it on the platen, means for separating paper from a pile, means for causing said gripper to close upon the paper, means for preventing said gripper-closing-means from operating when other than the determined quantity is separated by said separating means, and a device, interlocking with said last named means, for throwing the bed and platen out of operative relation when said gripper is prevented from being closed.

49. The combination with a printing press including a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part of which the platen is in a sheet-receiving position, of means, coöperating with said abutment for feeding sheets thereagainst, said feeding means including a sheet gripper including coöperating sheet receiving jaws, said gripper being movable over the platen toward the lower edge thereof from a position clear of the upper edge thereof and back again, and means for effecting such movement of said gripper during the latter part of the platen cycle.

50. The combination with a printing press including a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part of which the platen is in a sheet-receiving position, of means for feeding sheets against said abutment, said feeding means including a sheet gripper including coöperating sheet receiving jaws, said gripper being movable over the platen toward the lower edge thereof from a position clear of the upper edge thereof and back again, and means for operating said gripper, said operating means maintaining the gripper stationary during the former part of the platen cycle, and effecting the said movement of the gripper during the latter part of the platen cycle.

51. The combination with a printing press including a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part of which the platen is in a sheet-receiving position, of means for separating sheets, means for moving the separated sheets forward, and means for feeding the separated sheets against said abutment, said feeding means including a gripper for receiving the forwardly moved sheets, said gripper being movable from a position clear of the upper edge of the platen over the platen toward the lower edge thereof, and back again, and means for effecting such movement of said gripper during the latter part of the cycle of the platen.

52. The combination with a printing press including a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part of which the platen is in a sheet-receiving position, of stock-supporting means mounted in proximity to the upper edge of the platen when the latter is in sheet-receiving position, means, associated with said stock-supporting means, for separating sheets, means for moving the separated sheets forward, and means for feeding the separated sheets against said abutment, said feeding means including a gripper having coöperating jaws for receiving between them the forwardly moved sheets, said gripper being movable from a position clear of the upper edge of the platen over the platen toward the lower edge thereof and back again, and means for effecting such movement of said gripper during the latter part of the cycle of the platen.

53. The combination with a printing press including a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part

of which the platen is in a sheet-receiving position, means for feeding sheets against said abutment, said feeding means including a gripper having relatively movable jaws and movable, from a position clear of the upper edge of the platen and in which said jaws receive the front edge of a sheet, over the platen toward the lower edge thereof and back again, and means for effecting such movement during the latter part of the cycle of the platen.

54. The combination with a printing press including a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position, and during the latter part of which the platen is in a sheet-receiving position, of means for separating sheets, means for moving the separated sheets forward, and means for feeding the separated sheets against said abutment, said feeding means including a gripper having relatively movable jaws and movable from a position clear of the upper edge of the platen and in which said jaws receive the front edge of the forwardly-moved sheets, over the platen toward the lower edge thereof and back again, and means for operating said gripper, said operating means maintaining the gripper stationary during the former part of the cycle of the platen and effecting the said movement of the gripper during the latter part of such cycle.

55. The combination with a printing press including a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position, and during the latter part of which the platen is in a sheet-receiving position, of means for feeding sheets against said abutment, said feeding means including a gripper having relatively movable jaws and movable from a position clear of the upper edge of the platen over the platen toward the lower edge thereof and back again, means for operating said gripper, said operating means maintaining the gripper stationary during the former part of the cycle of the platen and effecting the said movement of the gripper during the latter part of such cycle, and means for closing the gripper on the sheets and subsequently releasing it to permit the sheets to be moved out therefrom.

56. The combination with a printing press including a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part of which the platen is in a sheet-receiving position, of stock-supporting means mounted in proximity to the upper edge of the platen when the latter is in sheet-receiving position, means, associated with said stock-supporting means, for separating sheets, means for moving the separated sheets forward, and means for feeding the separated sheets against said abutment, said feeding means including a gripper having relatively movable jaws for receiving the forwardly-moved sheets, said gripper being movable from a position clear of the upper edge of the platen over the platen toward the lower edge thereof and back again, means for operating said gripper, said operating means maintaining the gripper stationary during the former part of the cycle of the platen and effecting the said movement of the gripper during the latter part of such cycle, and means for closing the gripper on the sheets and subsequently releasing it to permit the sheets to be moved out therefrom.

57. The combination with a printing press including a bed, a platen, and means for imparting to the platen a cycle of movement during the former part of which the platen is in a printing position, and during the latter part of which the platen is in a sheet-receiving position, of means for feeding sheets to the platen including a gripper-supporting frame a rack associated with said member, a pinion meshing with said rack, a rockable segment for driving said pinion first in one direction and then in the other, whereby said frame is moved over the platen toward the lower edge thereof and back again when the segment is rocked, and a cam for operating said segment, said cam being arranged to maintain the segment stationary during the former part of the platen cycle, and effect the rocking movement of the segment during the latter part of the platen cycle.

58. The combination with a printing press including a bed, a platen, and means for imparting to the platen a cycle of movement during the former part of which the platen is in a printing position, and during the latter part of which the platen is in a sheet-receiving position, of means for feeding sheets to the platen including a frame mounted at the rear of the platen, a guide at each side of said frame, longitudinally movable racks associated with said guides, sheet-gripping means associated with said racks, connected pinions meshing with said racks, a rockable segment associated with one of said pinions, for driving it first in one direction and then in the other, whereby said sheet-gripping means is moved over the platen toward the lower edge thereof and back again when the segment is rocked, and a cam for operating said segment, said cam being arranged to maintain the segment stationary during the former part of the platen cycle, and effect the rocking movement of

the segment during the latter part of the platen cycle.

59. The combination with a printing press including a bed, a platen, means for imparting to the platen a cycle of movement during the former part of which the platen is in a printing position, and during the latter part of which the platen is in a sheet-receiving position, and a drive shaft having a gear wheel thereon, of a feeding device including a frame adapted for attachment to said press at the rear of the platen, a guide at each side of said frame, longitudinally movable racks associated with said guides, sheet-gripping means associated with said racks, connected pinions meshing with said racks, a rockable segment associated with one of said pinions for driving it first in one direction and then in the other, whereby said sheet-gripping means is moved over the platen toward the lower edge thereof and back again when the segment is rocked, a cam for operating said segment, said cam being arranged to maintain the segment stationary during the former part of the platen cycle, and effect the rocking movement of the segment during the latter part of the platen cycle, and gearing between said cam and the gear wheel on the drive shaft of the press.

60. The combination with a printing press comprising a bed, a platen, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part of which the platen is in a sheet-receiving position, of a sheet-feeding device including means for separating sheets, means for moving the separated sheets forward, a gripper having relatively movable jaws for receiving the forwardly-moved sheets, a supporting device for said gripper movable, from a position clear of the upper edge of the platen over the platen toward the lower edge thereof and back again, a rockably mounted segment for imparting the said movement to said supporting device, and a cam for operating said segment during the latter part of the platen cycle.

61. The combination with a printing press comprising a bed, a platen, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part of which the platen is in a sheet-receiving position, of a sheet-feeding device including a gripper having relatively movable jaws, a supporting device for said gripper movable, from a position clear of the upper edge of the platen over the platen toward the lower edge of the latter and back again, a rockably mounted segment for imparting the said movement to said supporting device, a cam for operating said segment during the latter part of the platen cycle, gripper-operating members carried by said supporting device and abutments for actuating said gripper-operating members and disposed to be engaged by the latter during their movements.

62. The combination with a printing press comprising a bed, a platen having an abutment thereon, and means for imparting to said platen a cycle of movement during the former part of which the platen is in a printing position and during the latter part of which the platen is in a sheet-receiving position, of means for separating sheets one-by-one from a plurality of sheets, and means for feeding the separated sheets against said abutment, said feeding means comprising a pair of guides extending longitudinally of the press on each side thereof, grippers having relatively movable jaws, a pair of racks for operating said grippers and associated with said guides, connected pinions for actuating said racks, a rockable segment for rotating said pinions first in one direction and then in the other, thereby to move said grippers, from a position clear of the upper edge of the platen over the platen toward the lower edge thereof and back again, and a cam for operating said segment during the latter part of the platen cycle.

63. The combination with a press including a bed, a platen, and means for imparting to the platen a cycle of movement during the former part of which the platen is in printing position and during the latter part of which the platen is in sheet receiving-position, of means for properly positioning sheets on the platen, and means, coöperating with said positioning means, for feeding sheets to the platen, said feeding means including a gripper having coöperating sheet receiving jaws, said gripper being movable from a position clear of the upper edge of the platen over the platen toward the lower edge thereof and back again, means for effecting such movement of said gripper during the latter part of the platen cycle and mechanism for separating sheets from a pile and pushing the separated sheets forward into said gripper.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

EDWARD CHESHIRE.

Witnesses:
W. T. HOLMAN,
EMMA LEA MONTGOMERY.