No. 636,558. Patented Nov. 7, 1899.

P. REICH.

LIBRARY OR PARCEL SERVITOR.

(Application filed Sept. 29, 1898.)

(No Model.) 8 Sheets—Sheet 1.

FIG. 1.

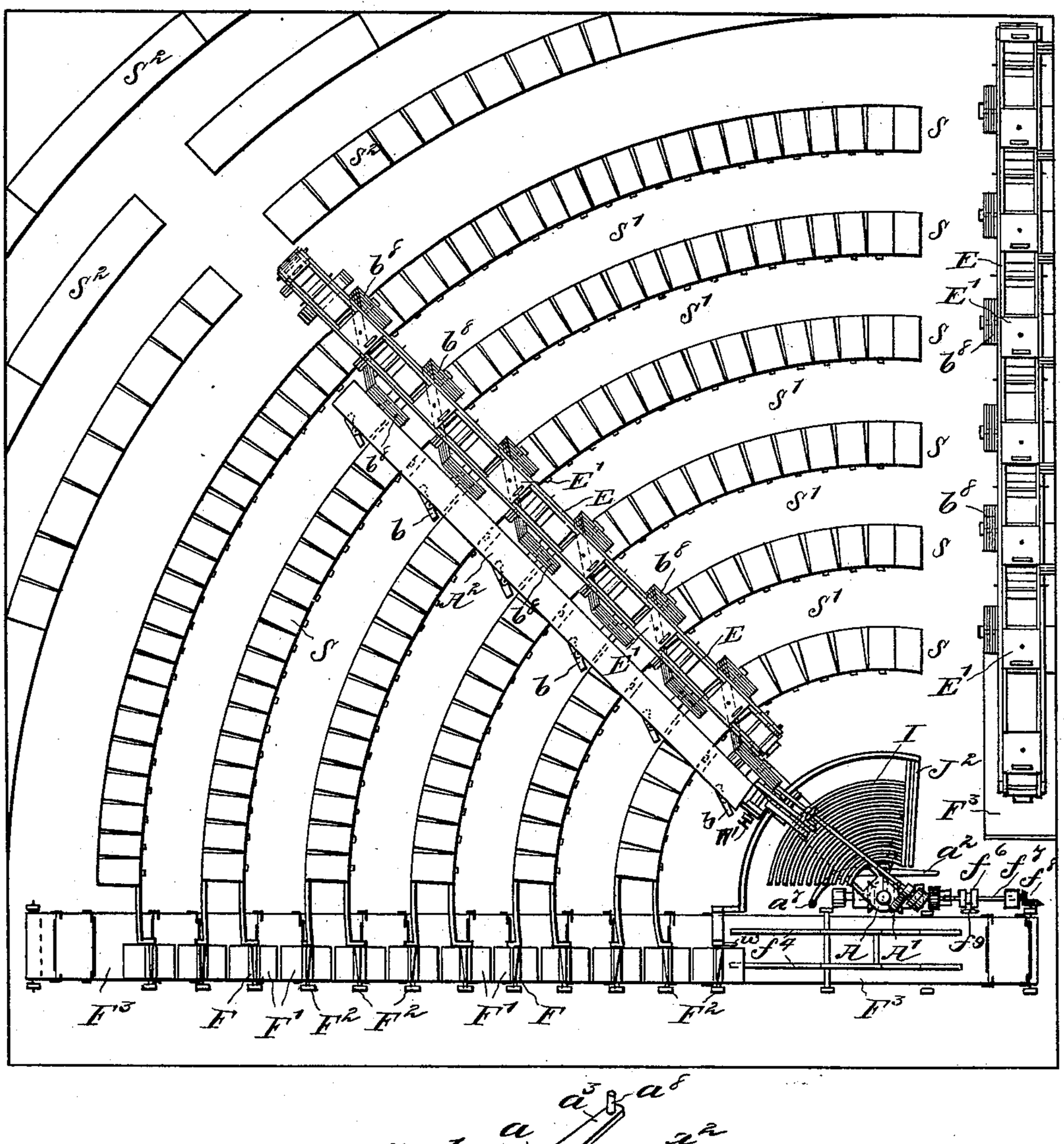
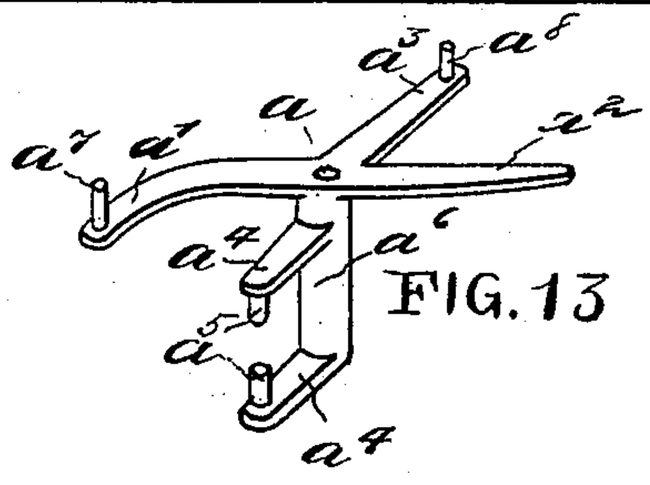


FIG. 13



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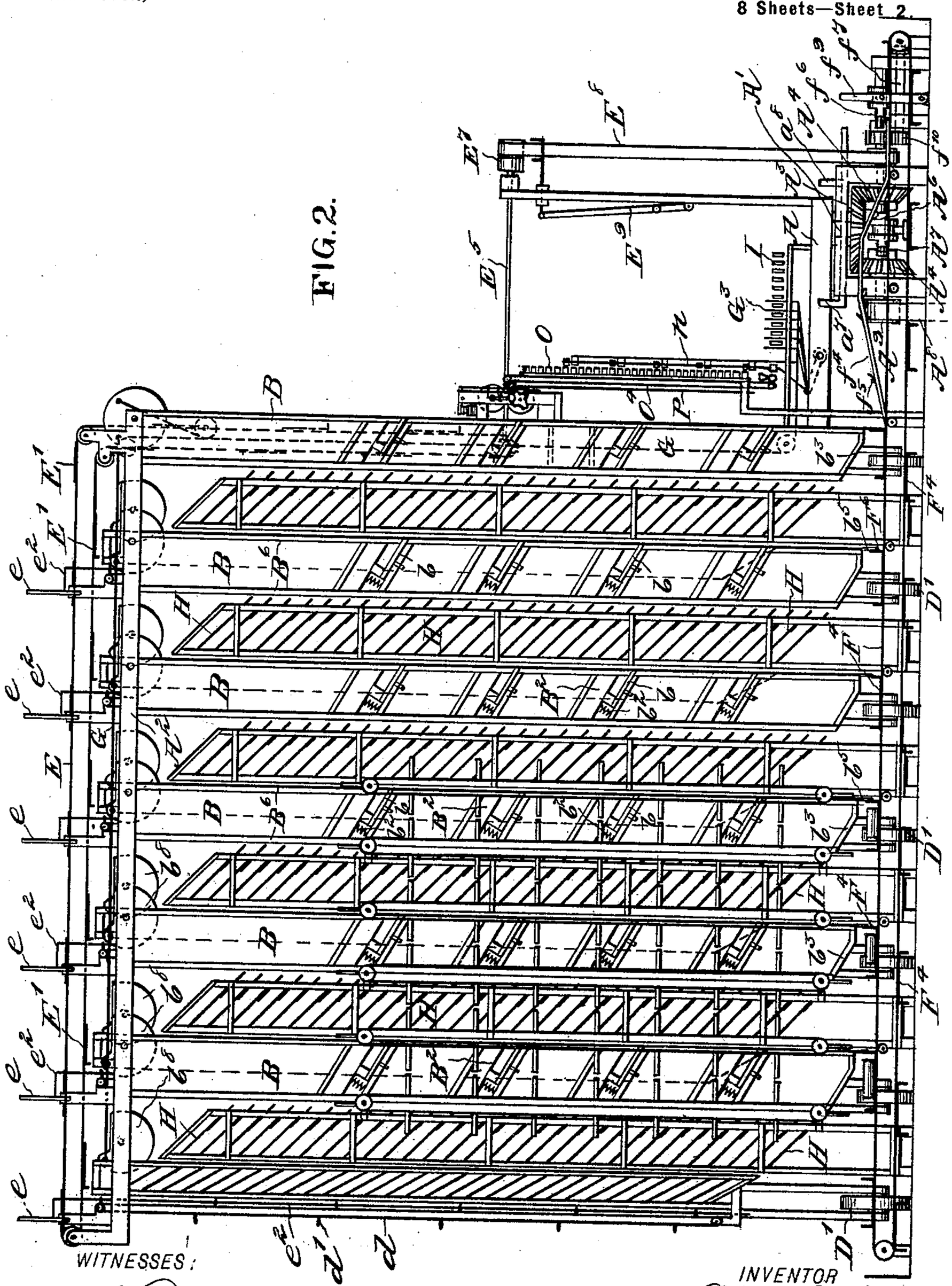
8 Sheets—Sheet 2.

FIG. 2.



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(No Model.) 8 Sheets—Sheet 3.

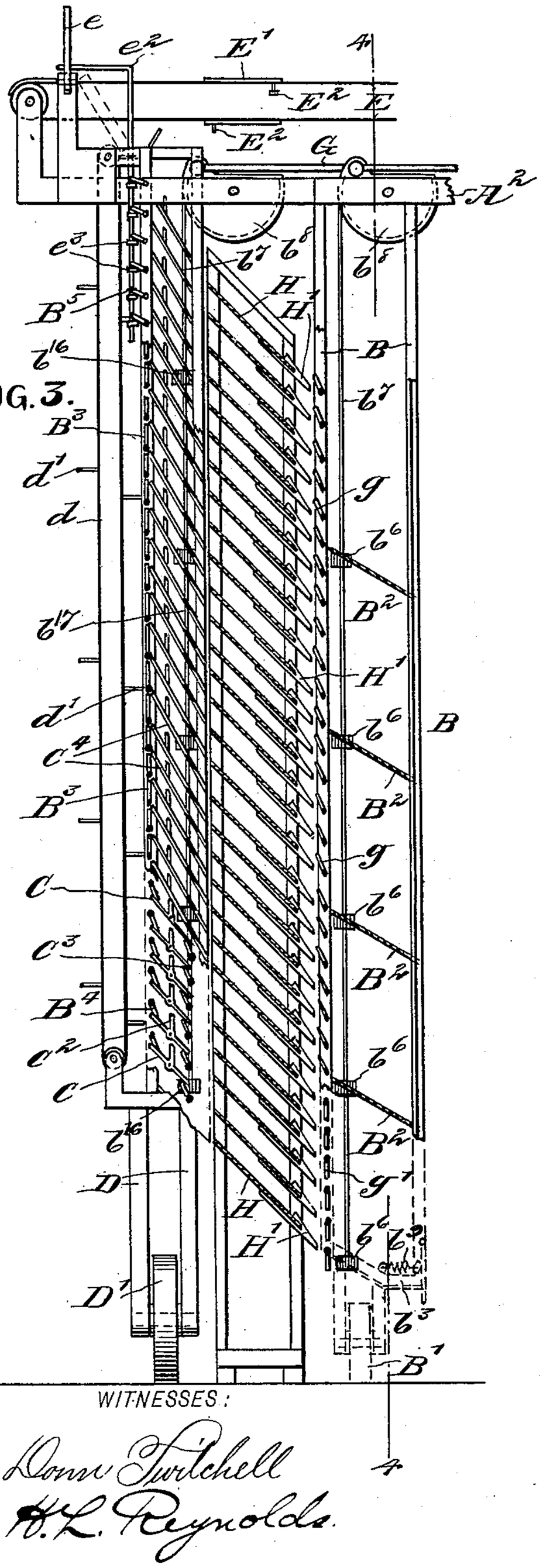

FIG. 3.

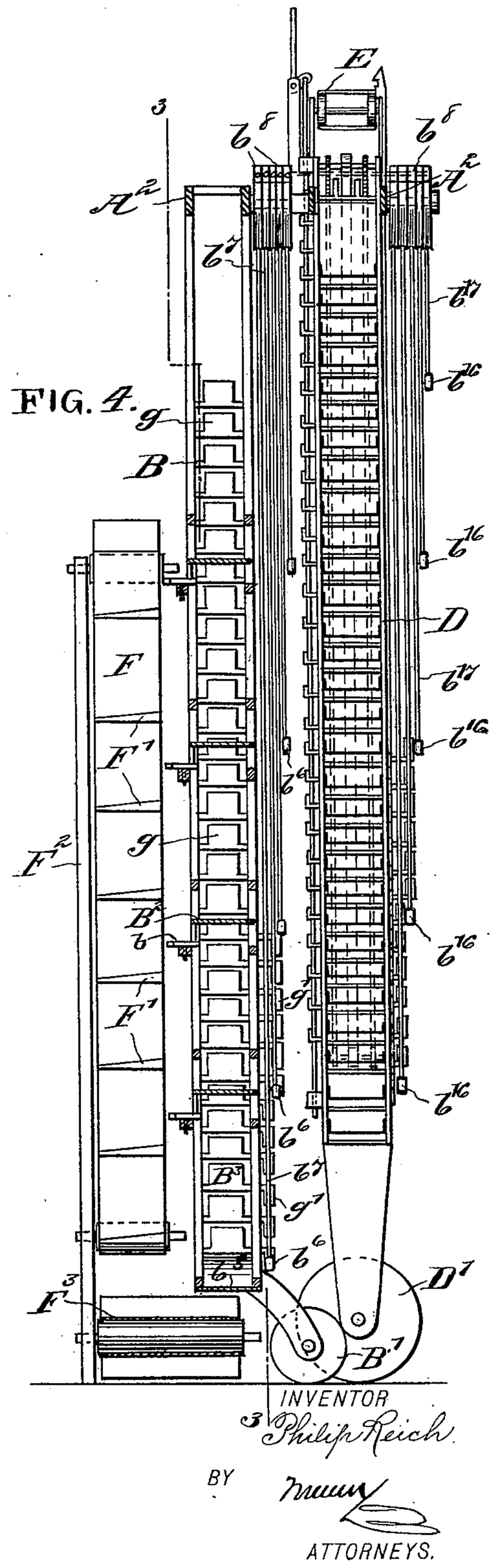

FIG. 4.

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FIG. 5.

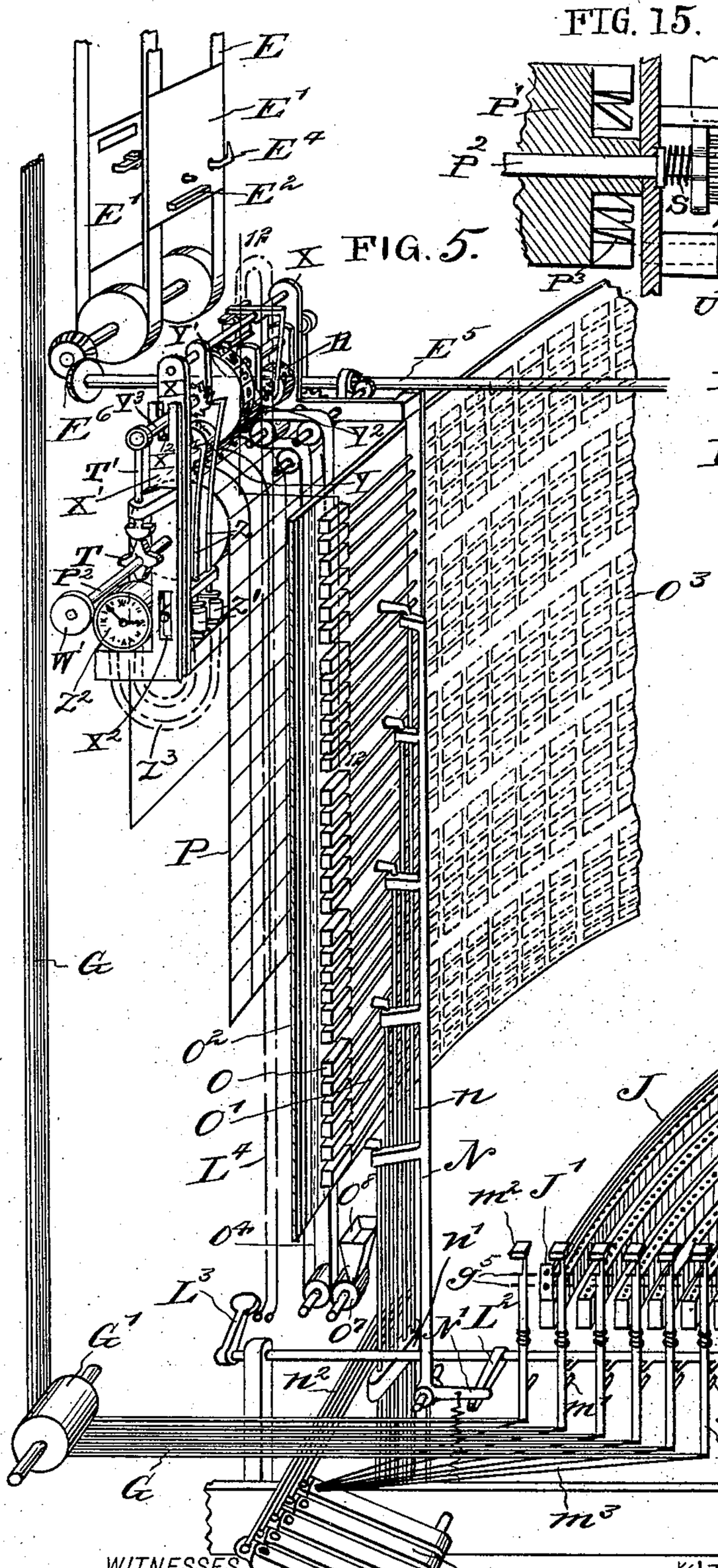

FIG. 15.

FIG. 16.

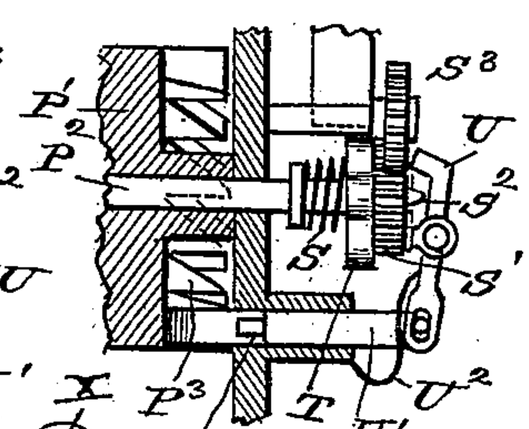

FIG. 12.

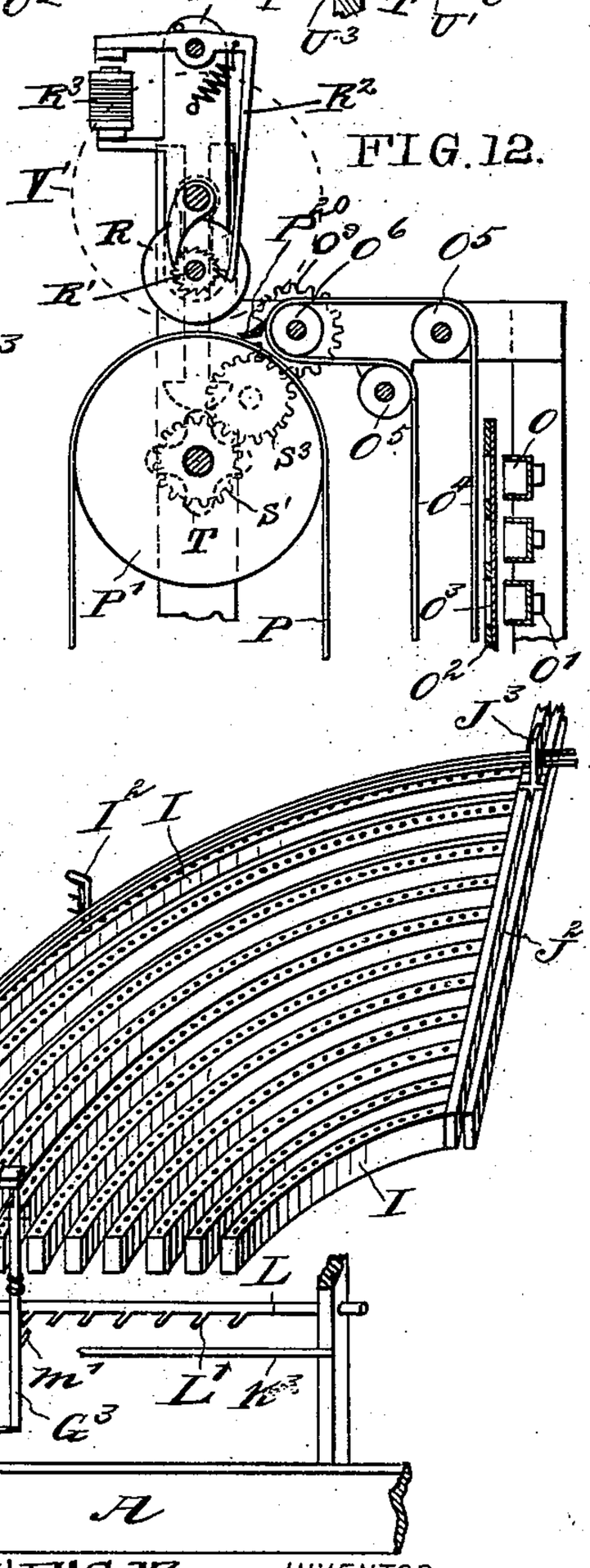

FIG. 17.

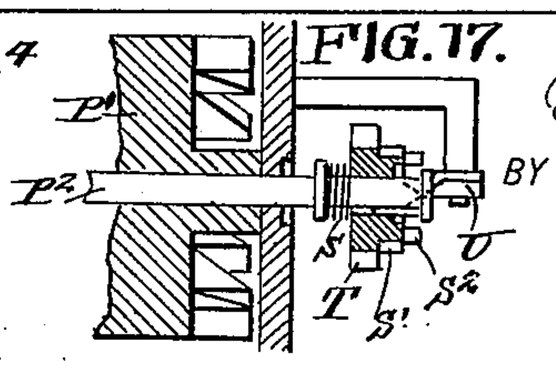

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FIG. 6.

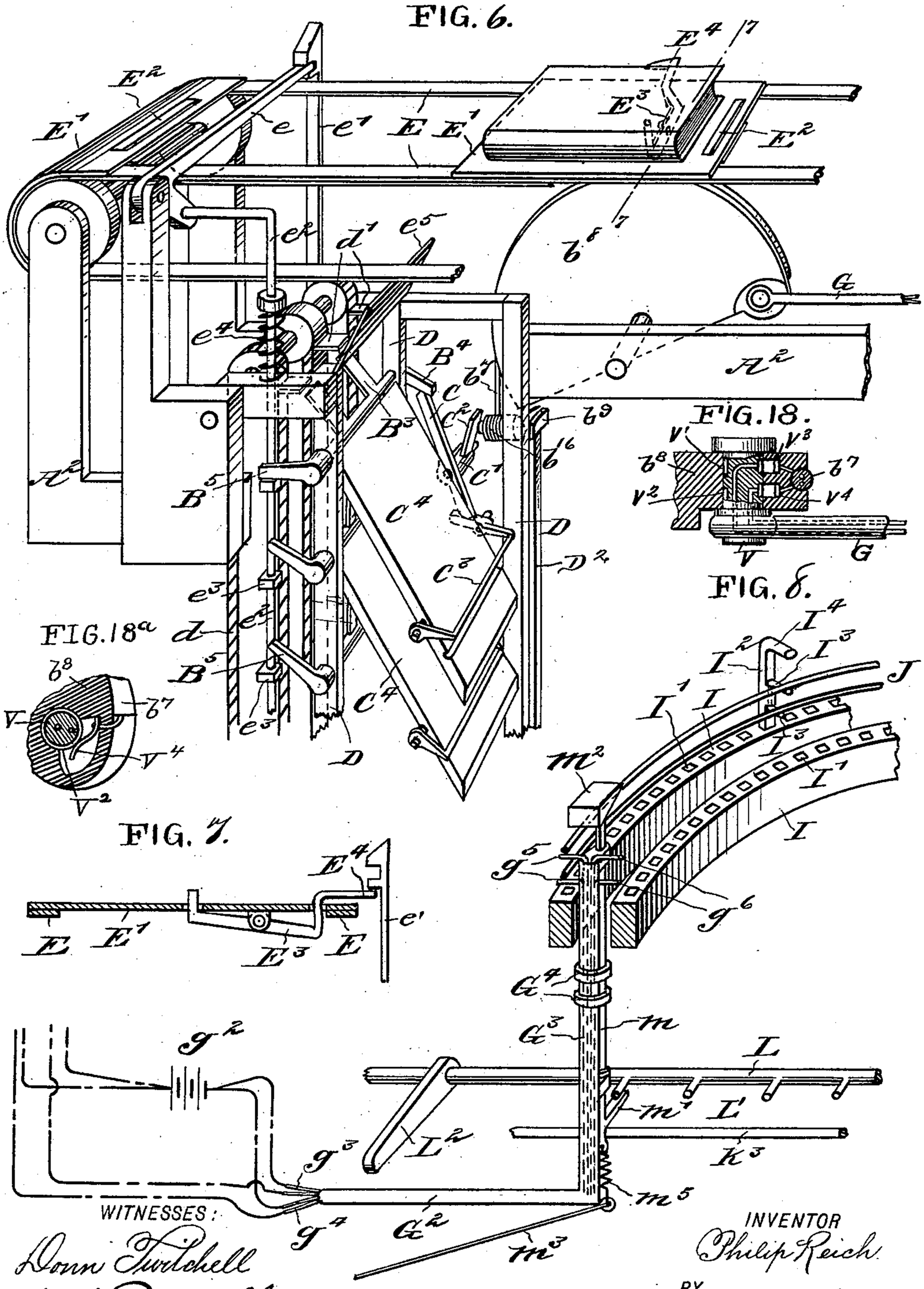

FIG. 18.

FIG. 8.

FIG. 18a

FIG. 7.

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FIG. 9.

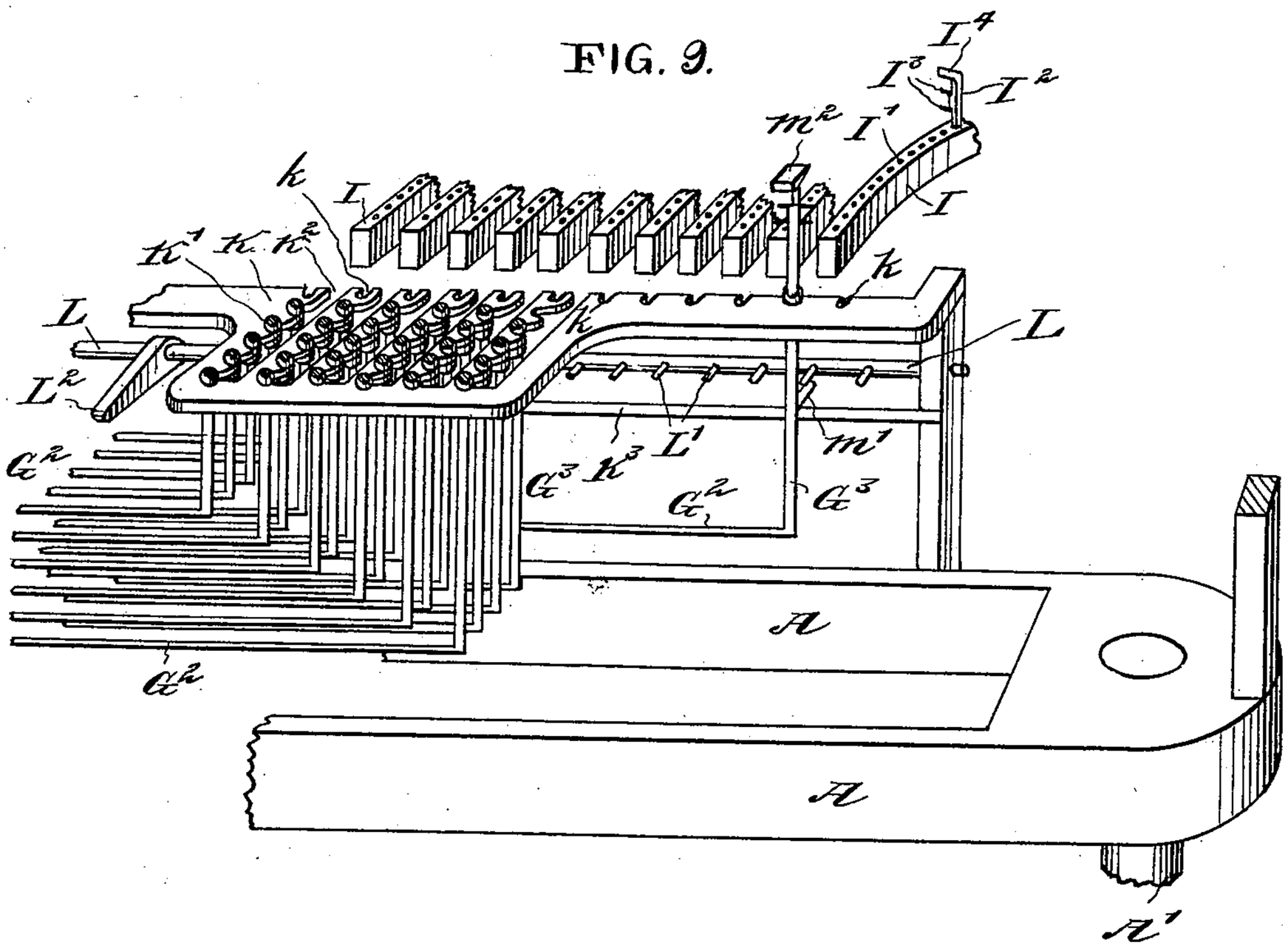
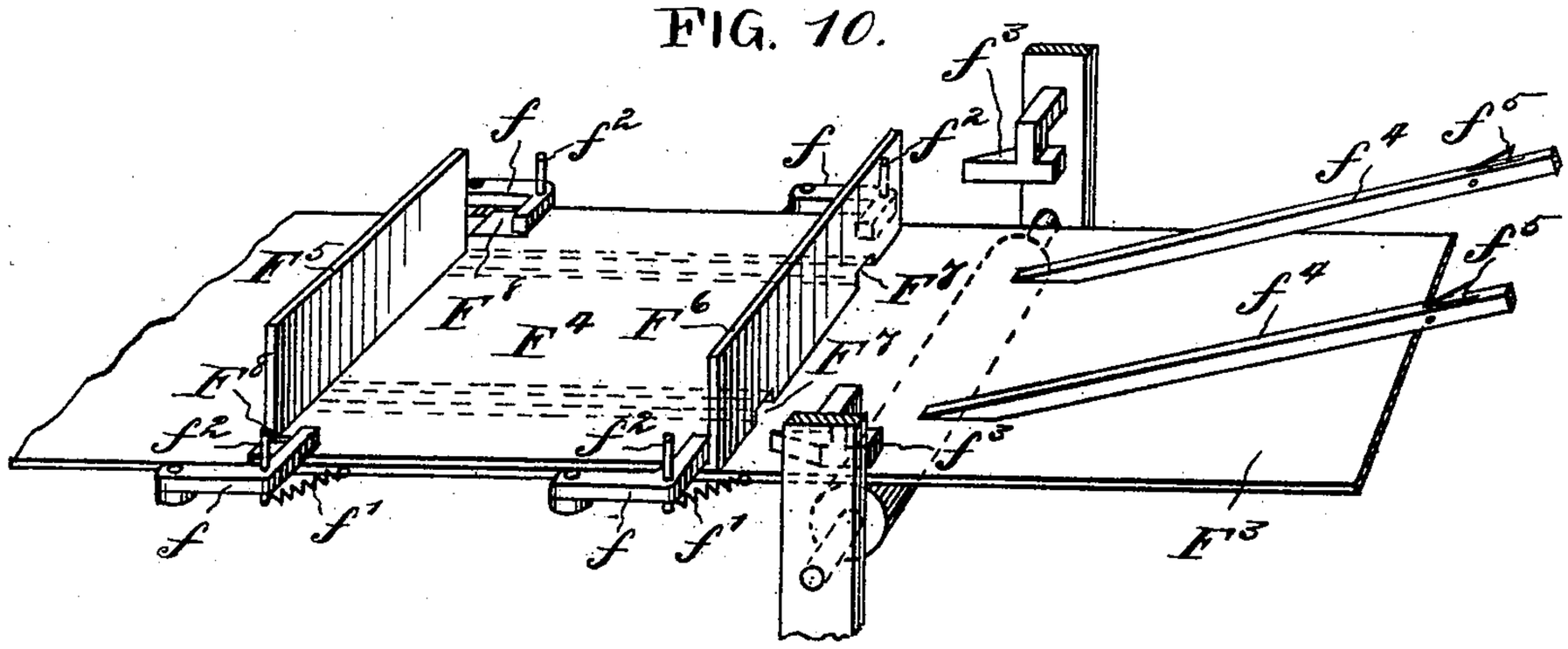


FIG. 10.



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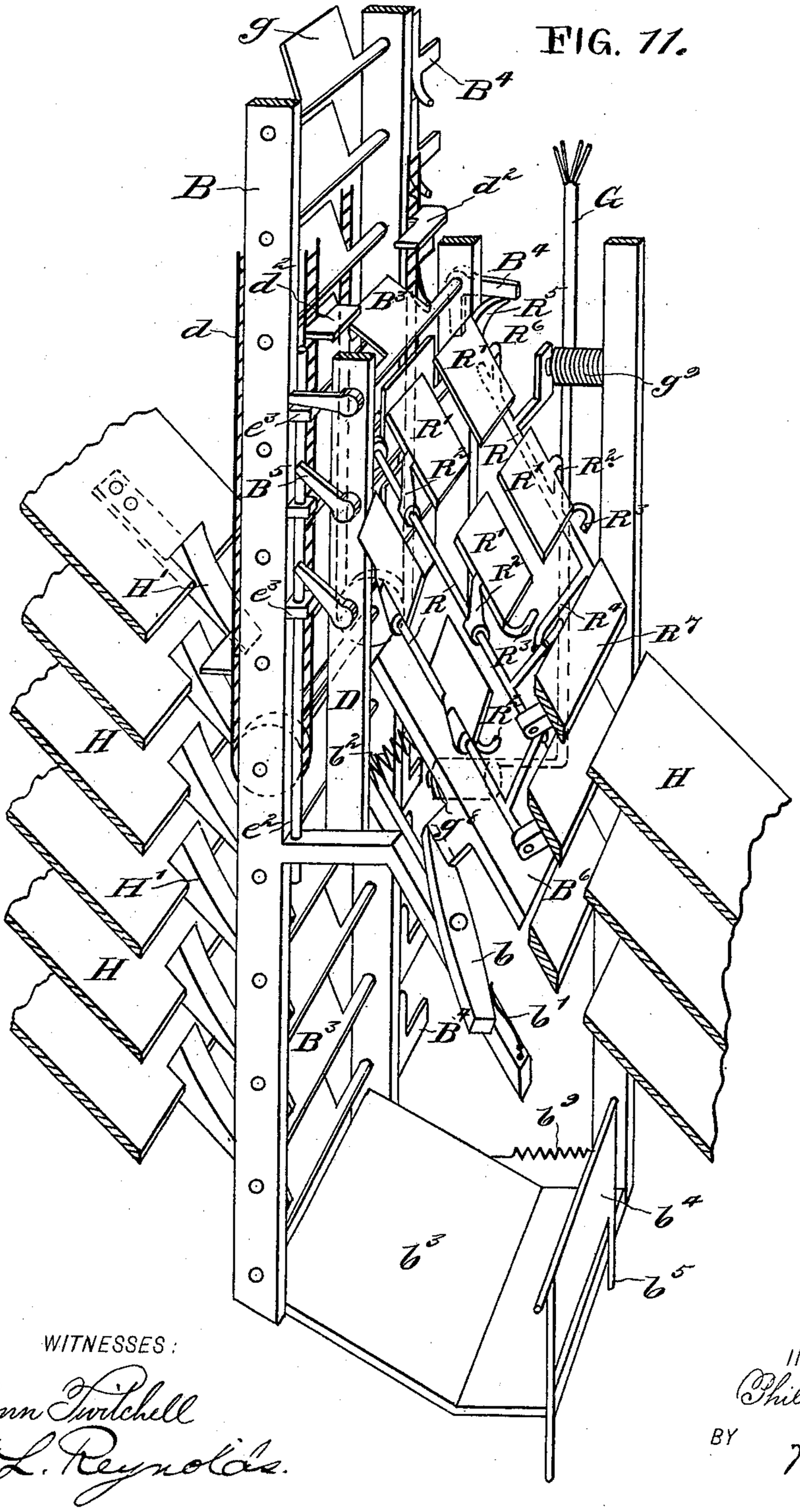
8 Sheets—Sheet 7.

FIG. 11.



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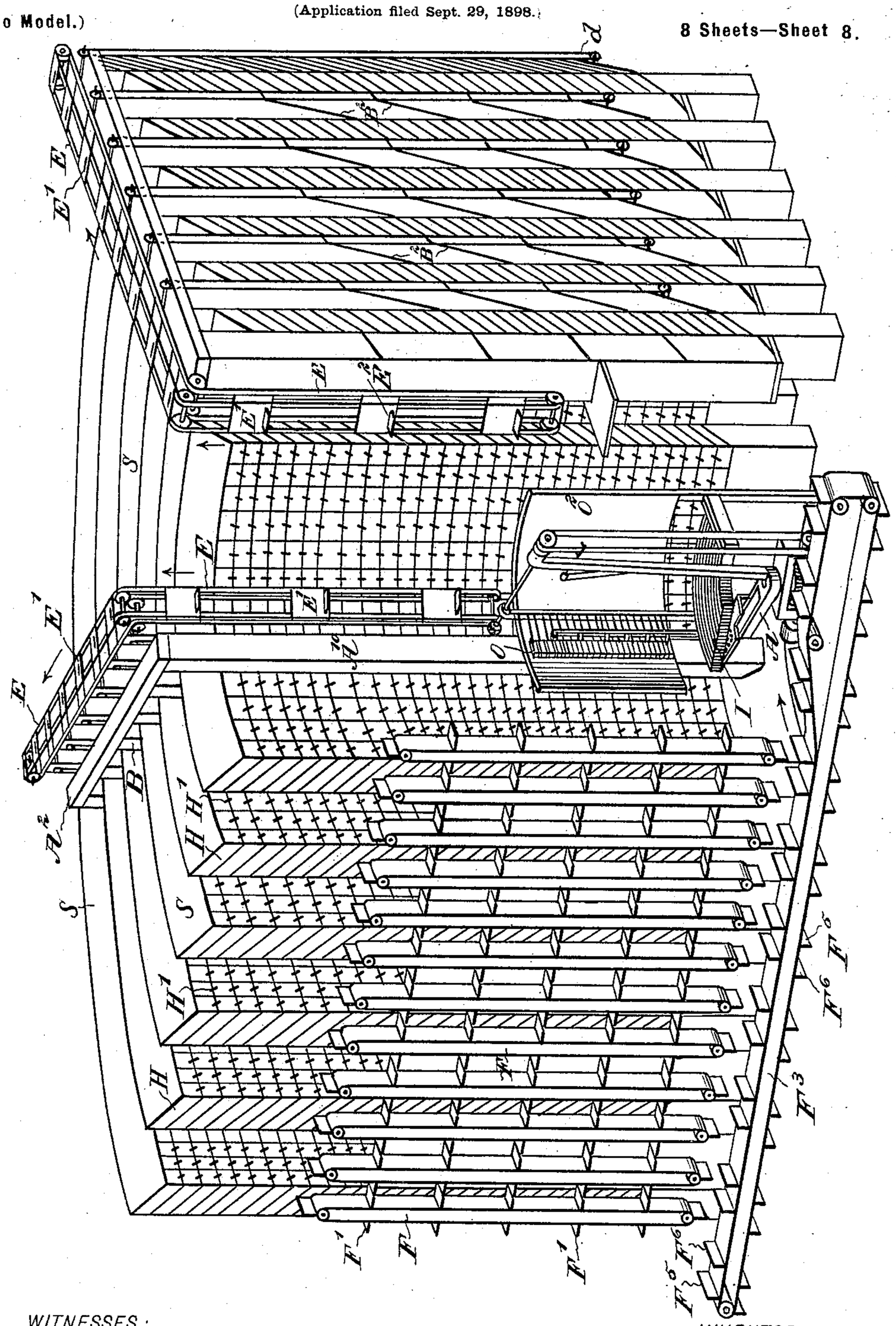
(Application filed Sept. 29, 1898.)

(No Model.) 8 Sheets—Sheet 8.

FIG. 14.



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UNITED STATES PATENT OFFICE.

PHILIP REICH, OF CINCINNATI, OHIO, ASSIGNOR TO JOHN COLDITZ, OF NEW YORK, N. Y.

LIBRARY OR PARCEL SERVITOR.

SPECIFICATION forming part of Letters Patent No. 636,558, dated November 7, 1899.

Application filed September 29, 1898. Serial No. 692,164. (No model.)

To all whom it may concern:

Be it known that I, PHILIP REICH, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and Improved Library and Parcel Servitor, of which the following is a full, clear, and exact description.

My invention relates to an improvement in devices intended particularly for use in facilitating the handling of books in libraries, and is designed to take the books from a central desk and transport them to and deposit them in their proper places in the shelves of the bookcases and also to take any book desired from its place on the shelf and deliver it to the central desk.

The invention is also adapted for use in the distribution and collection of parcels or packages from and at a central point or station.

The invention consists in the novel features of construction and combination of parts hereinafter described, and pointed out in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a top plan view of a room of a library equipped with my device. Fig. 2 is a front elevation of the same, parts being removed. Fig. 3 is an enlarged side elevation, partly in section, on the line 3 3 in Fig. 4, showing the bookcase and the withdrawing and depositing mechanism. Fig. 4 is a section of the same on the line 4 4 in Fig. 3. Fig. 5 is a perspective view of a portion of the mechanism located at the central desk and comprising the selecting and registering mechanism. Fig. 6 is a perspective view of the upper portion of a depositing-carrier and the carrier-belt which delivers the books thereto. Fig. 7 is a cross-section taken through the plate secured to the carrier-belt and upon which the book is placed, the section being upon the line 7 7 in Fig. 6. Fig. 8 is a perspective view, on an enlarged scale, of a portion of the selecting mechanism. Fig. 9 is a perspective view of a portion of the keyboard of the selecting mechanism and the swinging rack attached to the frame and carrying the terminals of the electric circuits, parts being broken away and in section. Fig. 10 is a perspective view of a portion of the delivery-belt and the book-carrier attached thereto, together with the receiving inclines, parts being in section. Fig. 11 is a perspective view of a modified form of the withdrawing and depositing carriers, the two being combined so as to operate in the same plane. Fig. 12 is an elevation, partly in section, on the line 12 12 in Fig. 5, through the registering mechanism. Fig. 13 is a perspective view of the lever operated at the central desk and by which the mechanism is thrown into and out of operation. Fig. 14 is a perspective view showing a section of bookcases and the book-handling means assembled in operative positions. Figs. 15, 16, and 17 are sectional views showing the mechanism for operating the record-chute in different positions. Fig. 18 is a detail showing in section the connection of the cables G with the segments b^8, and Fig. 18^a shows the pivot of Fig. 18 in cross-section.

The object sought to be secured by my invention is to supply a mechanism for use in libraries which will make the handling of the books as nearly automatic as possible and in which a central controlling and selecting mechanism is located in a convenient position and the books are sent by suitable carriers from the central desk out to other mechanisms which receive the book and deposit it in its proper shelf, and in connection with these mechanisms other mechanisms controlled from the same central location which will withdraw the books from the shelves and deliver them to a carrier which will take them to the central desk.

The carriers which take the books from the central desk and also deliver them to the central desk consist of endless belts which travel in radial lines. The belt which takes the books from the central desk and delivers them to the depositing mechanism is mounted upon a swinging arm, said arm also carrying the depositing and withdrawing mechanism. The bookcases used in connection with this mechanism are constructed in segmental rows, and the depositing and withdrawing mechanisms travel between successive rows.

A swinging arm A is pivoted at the central desk upon a vertical pivot A′, which is con-

centric with the rows of bookcases and may extend upward to the ceiling. After extending a short distance horizontally said arm then extends vertically, as at A^{10}, until it reaches a height greater than that of the bookcases H, and then extends horizontally over the bookcases, and this upper horizontal portion A^2 of the arm which extends over the bookcases also carries the depositing and withdrawing mechanisms. It is evident that the pivot A′ or another like it might be attached to a continuation of the horizontal portion A^2 of the arm and be supported from the ceiling or in other manner than as shown in the drawings.

The endless belt E is the one which receives the books from the central desk and conveys them outwardly to the proper depositing mechanism. This belt extends over suitable rollers or pulleys, and at its inner end, or the end toward the central desk, extends downwardly until it is in convenient reach of the attendant. The construction of this belt is shown in detail in Fig. 6, and consists of two parts separated by the plates E′, the latter carrying the books. The plates E′ are each provided with a slot at one edge within which is placed a slide E^2, which extends downwardly from the belt or at the lower side of the plate whenever the plate is in horizontal position. When the belt passes about the lower pulley and then starts upwardly, the slide E^2 projects horizontally from the belt and forms a ledge upon which the book may be placed. The book is thus carried upward by the belt until the belt turns horizontally, and then drops down to a horizontal position and is carried along by the belt until removed by the proper mechanism.

Not far from the slot containing the slide E^2, which slide acts as a shelf to support the book during its upward motion, is pivoted a lever E^3, which lever is upon the lower side of the plate, but has one end extending upward through the plate, where it will be engaged and depressed by the book. The other end of the lever passes through a slot in the plate and has a curved portion E^4 extending longitudinally of the belt and adapted to act as a cam for releasing a spring-catch. The spring-catch consists of the bar *e′*, which is provided with a notch adapted to engage the end of the rake-off lever *e*, one of these rake-off levers being provided for each of the segmental rows of bookcases, the construction of said levers being clearly shown in Fig. 6. These levers are pivoted at one side of the belt and are normally held in raised position, as indicated in Fig. 2, so that they will not engage a book carried by the belt until it reaches the proper row of bookcases, where the rake-off lever has been depressed. When depressed into the position shown in Fig. 6, the rake-off levers extend across and close to the belt, so that any book carried by the belt will be engaged by the lever and slide off of the plate E′. This is possible, because the slide E^2, which carried the book upward, drops down into the position shown in Fig. 6 as soon as the plate assumes a horizontal position, so that the upper edge of the slide is flush with the upper surface of the plate. When not depressed by a book, the outer end E^4 of the lever E^3 passes beneath the thickened upper end or head of the spring-catch *e′*, and they are thus not engaged by any lever except that one upon the plate which carries a book, which is raised to engage the head and press the catch outward, thus freeing the rake-off arm *e*.

When the book is removed from the carrier-belt, it drops into the depositing-carrier and first strikes a plate e^5, which is so located as to insure the book taking the proper course. The depositing mechanism is suspended from the arm A^2, and the frame thereof comprises the standards or vertical bars D, which have wheels D′ at their lower ends adapted to roll upon the floor. Instead of being supported upon the floor the depositing and withdrawing carriers may be supported from the bookcases or the arm A^2 or travel upon overhead rails. The manner of supporting these carriers is immaterial so long as they may move freely with the arm A^2. Supported upon the frame D is an endless belt *d*, having a series of shelves *d′* attached thereto and extending horizontally when the belt is in a vertical position. The book as it is removed from the carrier-belt is guided into position so that it is supported by one edge upon the shelves *d′*, and the book is prevented from falling off at one side by the engagement with other portions of the depositing-carrier.

Pivoted in the vertically-extending bars of the frame D are switch-plates B^3, which extend in front of the belt *d* and parallel therewith, thus preventing the book from falling away from the belt until it reaches that one of the switch-plates which is thrown over to an angular position, as indicated by the upper one of the switch-plates in Fig. 6. When a book meets a switch-plate which has been thrown over into said angular position, the book is removed from the belt *d* and delivered into the compartment or pocket formed by the plate C^4 and the catch C^3 mounted thereon, the catch C^3 being pivoted near the lower end of the compartment or pocket and normally fitting down into a groove formed in the upper face of the plate C^4. When the compartment or pocket is to receive a book, the catch is thrown up into the position shown as to the upper plate in Fig. 6, where it will engage the end of a book deposited upon the plate and hold the same until thrown down.

The shelves in the bookcases are in an inclined position, as shown at H in Fig. 3, and the shelves are at such an angle that the books if unrestrained will slide off of the same. The books are retained on the shelves by a spring-catch H′, located at the lower end of the shelf and normally held upward, so as to engage the book and hold it upon the shelf.

The central pivot A′, upon which the frame

A swings, is provided with a bevel-gear A^3, engaged by bevel-gears A^4, mounted upon a horizontal shaft A^7. These gears are loose upon the shaft and are rotated with the shaft by engagement of a clutch A^6 with either of the gears A^4. The direction of swing of the frame may thus be reversed, the swing being in one direction when the connection is with one of the gears A^4 and in the opposite direction when the connection is with the other bevel-gear. This shaft A^7 is rotated by means of a belt and pulley A^8 and A^9, deriving their power from any suitable motor.

The book when deposited in a pocket in the depositing-carrier is retained therein by the catch C^3 until the depositing-carrier has reached the proper position, and this pocket is opposite the shelf in the casing where it is desired to deposit the book. When this point is reached, the catch C^3 is automatically released, dropping down and permitting the book to slide into the proper receptacle in the bookcase. The manner of releasing this catch will be hereinafter described.

Vertical rods e^2 are mounted in guides on the frame of the depositing-carrier and extend above the upper end of the frame and are normally held up by springs e^4. The upper ends of these arms are connected with the rake-off arms e, and the springs e^4 normally hold the rake-off arms elevated, so that they will not engage a book upon the carrier-belt. Each rod e^2 is also provided with a series of tappets e^3, one for each pocket in the depositing-carrier, and corresponding also in number with the shelves in the bookcases.

The pivot upon which the switch-plates B^3 are supported extends through the frame at each end, and upon one end said pivot is provided with the arms B^5, adapted to engage the tappets e^3. At its other end said pivot is provided with arms B^4, adapted to be engaged by the lever C, which operates the switch-plates and the catch C^3. This lever C is pivoted at or near its center upon a horizontally-extending pivot C', supported by the plate C^4, one end of the lever C engaging the arm B^4 and the other end engaging the arm which carries the catch C^3. The pivot of the lever C is provided with an arm C^2, adapted to act as an armature, and which is normally in such position that it is close to and adapted to be affected by a magnet b^{16}, which magnet is supported upon a slide, so that it may be elevated to any position within certain limits. It is thus possible to make one magnet control several of the levers C. The manner of supporting and guiding these magnets is shown in Fig. 6. A vertical bar D of the frame has a second bar D^2 alongside and the magnet has a stem extending between the two and fitting therebetween so as to slide freely. The outer end of this stem has a cross-plate b^9, which engages the faces of both bars D and D^2, so as to hold the magnets in position.

When the magnet b^{16} is placed opposite the arm C^2 of the lever C and the current is turned on, it will attract the arm C^2, and thus operate the switch-plate B^3 and the catch C^3, controlled by said lever C. The switch-plate B^3, by means of the arm B^5, connected to its pivot, will depress the rod e^2, and will thus depress the rake-off arm e. When this rake-off arm is depressed, its outer end engages the sloping upper end of the spring-catch e', forcing it outward, and thus permitting the end of the arm to enter the notch in said catch, and is thus held securely in position until released by the further operation of the mechanism.

The shelves in the bookcases are divided into sections and the pockets in the depositing-carrier are divided into similar sections, each section containing a certain number of pockets and shelves. The movable magnets b^{16} are each adapted to move through a sufficient vertical distance to control any one of the pockets in its particular section, each section being provided with its separate magnet. As herein shown, there are six shelves and six pockets for each section and five sections in the withdrawing-carrier and cases. This makes thirty shelves in the bookcases and thirty pockets in the withdrawing-carrier. The number of pockets which are controlled by a single magnet need not necessarily be in conformity with that shown in the drawings, but may be more or less, as found most desirable.

The wires b^{17} leading to the magnets b^6 also form a mechanical connection, by means of which the magnets may be raised and lowered. These wires extend to the upper end of the depositing-carrier and are connected with a pivoted segment of a wheel b^8, which is carried by the portion A^2 of the arm A. The wires are carried about the outer edge of said segment b^8 and are secured thereto at one end of the circular portion by any suitable means, so as not to slide upon the segment. One form of attachment is shown in Fig. 18. In this the end of the cable G is secured to a pin V, which is journaled in the segment b^8. The wires of the cable extend into the body of the pin and contact with rings V' and V^2, of metal, extending as bands about the pin. These bands or rings are engaged by springs V^3 and V^4, carried in recesses in the segment b^8 and connected with the ends of the wires b^7, which reach to the magnets. The wires b^7 are secured to the periphery of the segment b^8 in any convenient manner. They are then carried off horizontally in the form of a cable G, which follows the course of the arm A to the central desk. These cables G extend downward along the vertical portion A^{10} of the arm and then horizontally to the central desk, as shown by the diagram in Fig. 5. By pulling upon the end of any one of the cables at the central desk the magnets carried by said cable will be raised a distance corresponding with the amount of the pull. Means are provided at the central desk by which the amount of this pull may be regulated to correspond with the pocket which is desired to be oper-

ated, and thus the book may be received in any pocket desired.

At the central desk is placed a selecting mechanism or keyboard which, as herein shown, consists of a series of arcs I, each consisting of a bar supported at one end and provided with a series of holes in its upper edge corresponding with the shelves in the bookcases. Each shelf or receptacle for a book is thus represented by a corresponding hole in the keyboard.

The mechanism of the withdrawing-carriers is controlled by magnets b^6 and wires b^7, similar in construction, function, and operation to those just described.

The complementary magnets b^6 and b^{16} upon both the withdrawing and depositing carriers have their wires b^7 and b^{17} united to form a cable, this cable G extending to the central desk, as previously described. At the central desk these cables are inclosed in a tube G^2 or similar casing, so as to form a rigid handle, which may be readily operated and held in the desired position. This tube or casing is extended upward, forming a vertical member G^3, provided with collars G^4 or other suitable devices by means of which it may be supported in a rack. Such a rack is shown in Fig. 9 and consists of a bar or plate K, which is carried by the arm A and is provided with a series of laterally-extending slots K^2, corresponding in number with the number of rows of bookcases. As herein shown, there are six rows of bookcases and a corresponding number of slots K^2 in the rack and the same number of withdrawing and depositing carriers supported upon the swinging frame. Each of these slots K^2 is provided with notches K', corresponding in number with the number of sections into which each depositing and withdrawing carrier is divided. As herein shown, there are five sections, and consequently five notches K', in each slot. Normally the ends of each set of cables or the casing inclosing the terminals is supported in its corresponding notch in the rack. This rack is also provided with a series of notches k in its outer edge, which are located at one side of the notches K' and adapted to support the ends of the cables when placed in operative position. There are twelve of these notches shown, six of them being in line with the notches K' and the others being nearer the pivot A'. There are also eleven of the curved bars or arcs I. The wires forming the circuits are carried upward through the vertical members G^3 and have their ends g^5 and g^6 extending laterally and oppositely from the upper ends of the casing. The terminals g^5 belong to the circuit leading to the depositing-carrier, while the terminals g^6 belong to the circuit leading to the withdrawing-carrier. The construction just described is shown only as one illustration of how the desired result may be obtained. It is not intended or desired to limit the device to the use of these means only for shifting the terminals. Other means will suggest themselves to a mechanic.

Two curved metal rods or wires J are adapted to be supported above the bars or arcs I and in such position as to be engaged by the terminals g^5 or g^6. At one end, being the free end of the bars I, these two rods are joined by a plate J' in such a manner as to insulate the two rods. This plate at its lower end is formed as a pin which is adapted to be inserted into a corresponding hole in the end of any one of the bars I. At the opposite end of the bars I the rods J are supported in a plate or bar J^3, which is adapted to slide radially upon guides J^2. This plate or bar J^3 is so constructed as to insulate the two rods J. By this means the rods J may be shifted to any one of the bars I. This selecting mechanism or keyboard is also provided with a pin I^2, which is provided with three laterally-extending arms I^3 and I^4, two of them, I^3, being adapted to respectively engage the upper and lower of the curved rods J. The third one, I^4, is above the rods J, but extends in the same direction as the arms I^3. The connection between the terminals is made through the arms I^3 and pin I^2. When the keyboard has been adjusted for any particular book, power is thrown onto the swinging arm, so as to cause the same to carry the depositing-carrier between the bookcases. The carrier-belt E is first set in motion by independent operating mechanism, consisting of the shaft E^5, which is rotated by means of the tight and loose pulleys E^7 and belt E^8, the same being controlled by a shifting-lever E^9. The book having been carried out and deposited in the upper end of the depositing-carrier, the swinging arm A is set in motion. The adjustment of the selecting mechanism or keyboard pulls the magnet which controls the depositing-carrier to such a position as to throw down the proper switch-plate B^3. The operation of this magnet throws down the switch-plate, throws up the catch at the lower end of the pocket, and depresses the rake-off arm. The rake-off arm is connected by means of the rod e^2 so as to be operated by any one of the magnets connected with its depositing-carrier. The book, when it reaches the rake-off arm, will be raked off into the depositing-carrier and will be received by the shelves d' upon the vertically-extending belt d and by its weight will cause said belt to move and lower the book. When the book comes in contact with the depressed switch-plate B^3, it will be discharged into the corresponding pocket in the depositing-carrier. As the depositing-carrier is carried between the bookcases the projecting ends g^5 of the electric cable slide along the rods J'. The continuity of the circuit is maintained through the pin I^2 and its arms I^3, which contact with the rods J until they reach the arms I^3 upon the pin I^2. The pin I^2 is supported in the bars I in such a manner that it may be easily turned therein. When the terminals g^5 of the vertical mem-

ber G^3 of the tube carrying said wires come in contact with the arms I^3, the pin will be swung so as to withdraw the arms I^3 from contact with the rods J, which, as the body of the pin I^2 does not touch the rods J, will break the circuit through the rods J. At the same time the terminals g^5 continue their forward motion until they have cleared the pin I^2 and the arms I^3 I^4 thereon, thus completing the break. The current will thus be turned off of the magnet b^6 and allow the catch C^3 to drop, thus releasing the book and permitting it to slide into the proper shelf.

The depositing-carrier is located upon the side of the shelves which is highest, and the withdrawing-carrier is located upon the opposite side or the side which is lowest. The withdrawing-carrier is shown clearly in Figs. 3 and 4, and consists of a framework B, having a number of partitions B^2 extending laterally thereof. By this means the withdrawing-carrier is divided into as many sections as there are in the depositing-carrier and the shelves.

A series of hinged plates g is pivoted in the vertical bars B, forming the supporting-framework, and located one opposite each of the shelves. The pivots of these plates extend through the framework and at one end are provided with arms g', which are adapted to be engaged by the magnets b^6. These magnets are similar in their construction and mounting to those described for use in connection with the depositing-carrier—that is, they are mounted on guides, so that they may be moved vertically through a certain limit, and are thus enabled to control any one of the six shelves which are in each section.

In setting the magnets for withdrawing a book the same method is employed as that described for depositing a book—that is, one of the cable-terminals is removed from its holding-notch and placed in one of the notches k, corresponding in position with the shelf from which the book is to be withdrawn. If the book is to be withdrawn from the lower shelf in its section, the cable is placed in the notch k in line with the normal position of the cable. If the book is to be withdrawn from the second shelf from the bottom, the cable is moved one notch toward the center. The number of spaces which it is moved toward the center depends upon the number of shelves from the bottom occupied by the book desired to be withdrawn. The same rule holds good for the adjustment of the cables for depositing the book, except that the adjustment of the cable is one space or notch less when withdrawing than when depositing. The reason for this is that the terminals g^6 extend to one side of the cable and the terminals g^5 extend to the opposite side, thus necessitating the movement of the cable one space in order to bring the terminals g^5, which belong to the circuit leading to the depositing-magnet, upon the proper side of the bar I.

The circuit for the depositing-carrier is closed while in use and is broken when the depositing-carrier has reached the proper place for depositing the book. The circuit for the withdrawing-carrier is normally open and is momentarily closed when the withdrawing-carrier has reached the proper place. The circuit is closed by contact of the terminals g^6 with the arms I^3 of the pin I^2.

In setting the device for withdrawing a book the pin I^2 is set with the arms I^3 extending in the opposite direction from that shown in Fig. 8, or as shown in Fig. 5. In this case the rods J are not used. When the withdrawing-carrier has reached the proper position and contact is made between the terminals g^6 and the arm I^3, the magnet is energized and attracts the arm g', and this throws down the guide or trip-plate g, which contacts with the spring-catch H′ and depresses it sufficiently to free the book, allowing it to slide out and into one of the compartments formed by the partition B^2. Each of these compartments, it will be seen, receives the books from all of the shelves in a section. The swinging arm A and the withdrawing-carriers connected therewith continue in their forward motion until they reach the side of the room or the ends of the curved bookcases. At this point opposite each of the withdrawing-carriers are placed a pair of vertically-extending endless belts F, provided with shelves F′, extending laterally therefrom. The space between the inner rims of the two belts in each pair corresponds with the space within the frame of the withdrawing-carrier. The partitions B^2 are pivoted upon pivots extending down the incline thereof, said pivot being at one side of the center, so that when one edge is freed it will drop down, and thus discharge the book to one side. This edge of the partition is returned to its normal position by a spring b^2 and is positively supported by a lever b, which is pivoted upon the framework and has one end extending under the edge of the partition. It is held in this position by a spring b'. (See Fig. 11.)

The lever b projects from the side of the withdrawing-carrier and in such position that its outer end is adapted to engage one of the belts F. This causes the other end of the lever to be withdrawn from beneath the partition B^2, and thus permits the same to fall and discharge the book. The book is thus discharged upon the shelves F′, whereupon the belt and the shelves are moved by the weight of the book, thus lowering the book and dropping it upon the endless belt F^3. This belt F^3 extends horizontally beneath the belts F and outward alongside of the central desk and is moved by a power connection and will deliver the books deposited thereon alongside of the desk. A short section of this belt and the ends of the inclined bars which remove the books therefrom are shown in perspective in Fig. 1. This belt has a series of pivoted bars or catches f secured to the edge thereof, and having one end extending over

the surface of the belt, which end is raised slightly from the belt, so as to permit the introduction of a book-carrier between the two. The catches f are also provided with pins f^2, extending upwardly therefrom and adapted to engage the cam-blocks f^3, fixedly supported alongside of the belt at the beginning of the inclines f^4. The catches f are held in locking position by springs f'.

The book-carrier consists of a plate F^4, which may be of any construction which will permit it to pass about the pulleys with the belt and has its front and rear sides provided with upwardly-extending flanges F^5 and F^6. The front flange F^6 is slightly longer than the rear one F^5, for a purpose hereinafter to be stated. The front edge of the carrier is also provided with notches F^7, adapted to receive the ends of the inclined bars f^4. The rear portion of the bottom of this carrier is also provided with recesses F^8, located upon each side thereof adjacent to the flange F^5, which recesses receive the catches f.

The means for throwing the belt F^3 into and out of operation is shown in Figs. 1 and 2, and consists of a set of gears f^{10}, one mounted loosely upon the shaft A^7, and the other upon a shaft f^7, beneath the shaft A^7. The shaft f^7 is connected by bevel-gears with the shaft which carries the supporting-pulleys for one end of the belt F^3. The loose gear upon the shaft A^7 is caused to rotate with the shaft by having attached thereto one half of a jaw-clutch f^6, which is engaged by the other half of the clutch which is mounted to rotate with and slide upon the shaft A^7, and the clutch is operated by a lever f^9.

The book is received upon the belt between the flanges F^5 and F^6, and as the belt travels toward the inclined bars f^4, which are located alongside the central desk, the pins f^2 engage the cam-blocks f^3 and pull the catches f laterally until they free the carrier F^4. The points of the inclined bars f^4 enter the notches F^7 and raise the carrier from the belt. The rear catches f being still in engagement with the carrier force the same up the inclines until the pins f^2 thereof engage the cam-blocks f^3. When the rear catches are released, the carrier and the book thereon are thus left upon the inclined bars f^4. Spring-catches f^5 may be placed upon these bars, so as to engage the bottom of the carrier and prevent any possibility of its sliding backward down the inclines.

In attaching the carrier to the belt it is carried to the opposite end of the incline, and is then placed upon the belt and momentarily held until it is engaged by the catches f. The rear flanges F^5 are short enough to pass between the catches f without engaging them. The first catches will therefore pass the rear end of the carrier without engaging the same, but will engage the forward flange F^6, as the latter is longer than the rear flange. The rear catches will also engage the recesses F^8 in the rear side of the carrier.

The lower section of the withdrawing-carrier does not have a partition B^2 constructed exactly as described, but has a partition or bottom b^3, hinged at its upper or left-hand edge, as shown in Fig. 11, and normally held in position by engaging with catches upon a swinging plate b^4, which is pivoted at its upper edge and has arms b^5 extending downwardly into position where they will be engaged by the upwardly-projecting flanges F^6 upon the carrying-belt, so as to release the plate b^3 and permit the book to slide out upon the belt. The two parts are held in locking engagement by a spring b^9.

In Fig 11 is shown a modified construction of the withdrawing and depositing carriers, in which both are combined. These may then be attached to a swinging arm, as previously described, or fixed to control a row of shelves, such as shown at the right-hand side of Figs. 1 and 14. The belts E and F^3 and their connected mechanisms for conveying the books to the depositing mechanism and from the withdrawing mechanism are duplicated. In this double construction the frame B is provided with trip-plates g, corresponding with those described and adapted to engage the catches H′ of the bookcases and thus to withdraw a book. This construction is substantially the same as that hereinbefore described. The arms g', which are secured to one end of the pivots of the plates g, are adapted to be engaged by the withdrawal-magnets g^8. The switch-plates B^3 are also of substantially the same construction as the switch-plates B^3 previously described.

The mechanism for operating the rake-off arms is identical with that previously described, except that the plates corresponding in function with the plates C^4, forming the bottom of the pockets, are differently constructed. In this modification they are formed as four independent plates R′, the two plates on one side being supported by an arm R^2, which is secured to a shaft R, journaled upon the frame and adapted when oscillated to throw the plates R′ up parallel with the side of the chute or down to a position in which all four plates are in substantially the same plane. The plates R′ are held in the normal position—that is, so that they lie substantially in vertical planes upon each side of the withdrawing-carrier. A number of partitions B^6 are employed similar to the plates B^2 described with reference to the other withdrawal-carrier and mounted in the same way and controlled by the same mechanism. The two shafts R upon each side of the withdrawal-carrier are connected with each other by two arms R^4, having a suitable connection with each other, so that when one is oscillated the other is oscillated in unison therewith. One of the shafts R is provided with an arm R^6, adapted to act as an armature-lever and to

be acted upon by the magnet g^9, so as to throw the plates down into the position shown by the upper set thereof in Fig. 11. When this happens, an arm R^5, carried thereby, engages the arm B^4, connected with the switch-plate, and throws the switch-plate down, so as to receive the book and guide it upon the receiver formed by the plates R'. The book is caught and prevented from sliding off by the arms R^3, which project above the surface of the plate. A plate R^7 is interposed between the plates R' and the shelves H, so as to smoothly guide the book into place. The magnets g^8 and g^9 are vertically movable in the manner previously described, so that they may be enabled to control any one of the several shelves.

When it is desired to operate the depositing-carrier, the proper set of plates R' is thrown down into position to receive the book and to guide it to its proper shelf. When the device is to be used as a withdrawing-carrier, these plates remain up, so as to permit the book to drop on the fixed partition B^6.

Figs. 1 and 14 show the book-handling mechanism applied to a swinging arm A, so as to cover the set of segmental bookcases, and at the right-hand side of the drawings show the same mechanisms applied in a fixed location to cover a row of cases placed alongside the wall. In this case the depositing and withdrawing carriers are combined in the manner shown in Fig. 11, the belt E being duplicated above the cases and the belt F^3 below the cases.

The record of the books handled is preserved by the registering mechanism shown in Figs. 5, 8, 12, 15, 16, and 17. Close to the keyboard is placed a vertical plate O^2, which is provided with a series of holes adapted to act as one member of a die for cutting out a slip of paper. Upon the face of this plate O^2 is secured a slip of paper O^3, having spaces corresponding with the holes in the plate and each representing a shelf of the bookcases within which a certain book is kept. Each subdivision of this sheet is printed with the proper or desired matter identifying the book which is contained in the corresponding shelf of the bookcases, so that if one is removed and secured to a record-band it will indicate a particular book. Mounted upon the swinging frame is a hammer N, which is pivoted at its lower end, and has an arm N', adapted to be engaged by an arm L^2 upon a shaft L, which is supported by the swinging frame and extends radially thereof. This shaft L has a series of arms L' so located as to be engaged by arms m', mounted upon a rod m, parallel with and sliding in guides carried by the casing or tube G^3, containing the ends of the electric cables. The upper end of the rod m carries a wedge-block m^2, so placed as to engage the arm I^4 of the pin I^2 when the pin is placed in one position. This wedge-block engages the pin when the pin is adjusted for depositing a book, and when the two are engaged the rod m is raised. The arm m' on the rod m engages one of the arms L', so as to slightly oscillate the shaft L, which causes the hammers to be thrown forward, and thus to strike one of the dies O, which is mounted on the front of the plate O^3. These dies are carried on arms O' along the front of the plate in the same way as the hammers, and thus are adapted to remove any of the subdivisions of the paper. One hammer is provided for each section into which the withdrawing-section is divided. Each hammer has its arm n extending downwardly through suitable guides n' and is connected with one end of one of a series of levers m^4 by rods n^2, each of the levers m^4 being connected by a series of wires m^3 or similar connection to all of the cables operating in the same section of the different carriers—that is, all of the cables operating the lower sections of the different carriers are connected with one lever m^4, while the cables operating the next section of the different carriers are connected with the next lever. The hammer is thus raised as many places as the magnet which is controlled by said cable. When the end of the cable reaches the pin I^2, the block m^2 is raised, and this block, by the connection described, swings the hammer so as to strike the die O, and thus cut out a section of the paper.

Back of the plate O^2 is an endless belt O^4, which extends vertically and close to said plate at its upper end, passing about pulleys O^5 and O^6, which are driven from a connection with the shaft E^5, which is in turn connected with the book hoisting and carrying mechanism. The belt at its lower end extends about a pulley in contact with another pulley O^7, the latter having a tank O^8 above the same, provided with a slow feed. This tank O^8 is filled with a liquid of any sort which will enable the belt O^4 to attract and hold the slip of paper punched from the plate. Preferably mucilage or some similar sticky material is employed, which will gum one side of the paper punched out and enable it to be carried up by the belt until it comes in contact with the scraper P^{20}. The belt previously passes about the rollers O^5 and O^6, which carry it in a horizontal direction. The scraper P^{20} will engage the slip of paper and remove it from the belt, and it will then be caught by the band or ribbon P, which extends over a cylinder P', and be secured thereto, forming a permanent record. The gearing by which the belt O^4 is driven moves it at such a speed that there will in all cases be sufficient time, even if the slip is cut by the last die, to carry the punched-out slip upward and secure it to the band P before the stamping mechanism is operated and the band advanced a space. The cylinder P' is not in continuous operation while the arm A is swinging, but is given a limited and intermittent forward motion sufficient only to move it a space corresponding somewhat to the size of ticket which is applied thereto and indicated by the spacing shown in Fig. 12. The mechanism for secur-

ing this is shown in Figs. 5, 15, 16, and 17. Upon the shaft P^2, upon which the cylinder P' is mounted to freely turn, is secured a pinion S', which is connected by an idler-pinion S^3 with the pinion O^9 upon the rollers O^6. This pinion S' is keyed to turn with the shaft, but to slide upon it, and is not in constant connection with the pinion S^3, but is connected therewith momentarily only and just long enough to be turned a quarter of a circle, when it is disengaged by means hereinafter described. The shaft P^2 is mounted to slide and turn in the cylinder P', so the pinions S' and S^3 may be thrown into and out of mesh and the turning of the cylinder be independent of the turning of the shaft. The pinion S' is held at the outer end of the shaft by a spring S; but this position is not far enough out to cause it to engage the pinion S^3 when the shaft P^2 is in its withdrawn position, as shown in Fig. 15. The opposite end of the shaft P^2 projects where a disk W', carried thereby, will engage a fixed stop *w* (shown in Fig. 1) upon the swing of the book-carrying mechanism to its extreme left position, as herein shown, thereby causing the pinions to be brought into mesh, as shown in Fig. 16.

The pinion S' has four cam-lugs S^2 upon its outer face, adapted to engage with a cam-lug upon the end of the lever U when the shaft is pushed outward, thereby swinging the lever U upon its pivot and forcing the rod U' toward the cylinder P'. The rod U' is mounted in a suitable guide and has its end next the cylinder beveled, forming a cam or wedge surface, which by engaging the same surfaces upon the teeth P^3 of the cylinder turns it the required amount, being the amount necessary to advance the belt P one space or section, and then prevents its further rotation. To insure that the end of the rod U' shall move laterally a sufficient distance to insure engagement with the right side of the next tooth, the point is hinged to the body at U^3 by a jackknife or rule-hinge, so that the point will after the rod is withdrawn swing past the point of the teeth P^3, either under the influence of gravity or a spring, and thus make certain of engaging the next tooth. The rod U' is forced back or withdrawn by a spring U^2. After the cylinder P' has been turned a single space the pinion S' engages the pinion S^3 and is thereby turned, thus turning the shaft P^2 and the cams T thereon and permitting the frame X, carrying the printing mechanism, to drop and contact with the belt P. When the pinion S' has been given a quarter-turn, one of the lugs S^2 engages the sloping end of the lever U, and the pinion is forced back and freed from the pinion S^3, the lever having been moved as far as it can be, since the point of the rod U' has been brought against the end face of the cylinder P'. The rotation of the pinion S' occurs after the rotation of the cylinder P' and by reason of the engagement of the star wheels or cams T with the lower ends of rods T', which carry the printing mechanism, causes the latter to drop and print the time and date upon the sheet P.

The printing mechanism consists of the time-stamping wheels Y and Y' and the consecutive-numbering wheel R with the mechanism for operating them. These are mounted in a frame X, which slides within bars X' of a fixed frame and is guided by having pins or shafts passing through slots X^2 in the bars X', which limit the amount of sliding. The time-stamping wheels Y and Y' are operated by means of magnets Z' through pawls Z, connected with the armatures of the magnets and engaging ratchet-wheels upon the wheels Y and Y'. These magnets are energized automatically by having their circuits Z^3 controlled by a clock Z^2, so that these wheels are regularly turned whether the registering mechanism is operated or not.

The consecutive-numbering wheel R is not operated, except by the closing of the circuit L^4 by the arm L^3—that is, when a book is deposited. This energizes the magnet R^3, which has a spring-pawl arm R^2 upon its armature-lever which engages the ratchet-wheel R' and turns the wheel one notch. The printing of the time and numbering stamps is done by the dropping of the frame X as a whole and is brought about by contact of the disk W' with the stop W, as described. The frame X also carries a roller Y^2, which engages the slip or ticket punched from the sheet O^3 and presses it down upon the recording-belt P, so as to insure firm contact therewith.

The mechanism for swinging the frame A is controlled by a lever *a*, (shown in perspective in Fig. 13,) the lever being pivoted on the central body a^6 and having two arms a^4, provided at their outer ends with pins a^5, which engage the reversing-clutch a^6. An operating-handle a^2 extends outward from the center in a convenient direction. Two other arms *a'* and a^3 are provided, carrying pins a^7 and a^8, which project into the path of the swinging frame and on opposite sides thereof. One of these pins is engaged by the frame to throw the clutch out of engagement when the frame has reached one limit of its swing and the other when the frame has reached the opposite limit of its swing. This prevents the frame from swinging to such a distance as to cause any trouble.

Although my device has been described purely as a library-servitor or device for depositing and withdrawing books, it is evident that parcels of any kind may be substituted for the books and also that each shelf in the cases may be used for more than one book or parcel and all these be withdrawn or deposited at once. I do not therefore wish to be limited to using this device solely for handling books, but to cover the device when used for handling any kind of parcels.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A mechanical servitor, comprising a distributing-carrier adapted to travel alongside of a row of shelves, said carrier having superposed compartments corresponding with the number of shelves in the cases, and means for delivering articles from said carrier to the shelves at any point in its traverse.

2. A mechanical servitor, comprising a withdrawing-carrier adapted to travel alongside of a row of shelves and having superposed compartments therein adapted to receive the articles when ejected from the shelves, means for removing articles from said shelves and depositing them in the carrier, and means for removing said articles from the carrier and depositing them at a certain point or station.

3. A mechanical library-servitor, comprising a distributing-carrier adapted to travel alongside of the rows of bookcases, and consisting of a series of superposed compartments adapted to receive the books, means thereon for ejecting the books from the compartments and into the cases, and a selecting mechanism determining the place of transfer of the book.

4. A mechanical library-servitor, comprising a distributing-carrier adapted to travel alongside of the rows of bookcases and having superposed compartments corresponding with the shelves of the cases and each adapted to discharge its contents upon its particular shelf, a carrier delivering books to the upper end of the distributing-carrier, means for directing the book into each compartment and for releasing the book from its series of compartments, and a selecting mechanism controlling said guiding and releasing mechanisms.

5. A mechanical library-servitor, comprising a depositing-carrier adapted to travel alongside of the rows of bookcases and having superposed compartments corresponding with the shelves of the cases, a vertically-extending belt upon said depositing-carrier, book-supporting shelves attached to the belt, switch-plates adapted to remove the books from the belt to the pockets, and magnets for controlling the switch-plates.

6. A mechanical library-servitor, comprising a depositing-carrier adapted to travel alongside of the bookcases and having superposed compartments corresponding with the shelves of the cases, a vertically-extending belt, book-supporting shelves attached to the belt, switch-plates adapted to remove the books from the belt to the compartments, magnets mounted to be adjusted vertically, and armatures controlled by said magnets and operating the switch-plates.

7. A mechanical library-servitor, comprising a depositing-carrier adapted to travel alongside of the rows of bookcases and having superposed compartments corresponding with the shelves of the cases, a vertically-extending belt, book-supporting shelves attached thereto, switch-plates adapted to remove the books from the belt to the compartments, retaining-catches holding the books in the compartments, and magnets mounted to slide on vertical guides, armatures controlled by said magnets and operating the switch-plates and the retaining-catches.

8. A mechanical library-servitor, comprising a depositing-carrier adapted to travel alongside of the rows of bookcases and having superposed compartments corresponding with the shelves of the cases, catches for holding the books in the compartments, and electrically-controlled tripping means for said catches.

9. A mechanical library-servitor, comprising a depositing-carrier adapted to travel alongside of the rows of bookcases and having superposed compartments corresponding with the shelves of the cases, catches for holding the books in the compartments and normally in releasing position, magnets adapted to act upon the catches, and an adjustable circuit-breaking device adapted to break the magnet-circuits by the travel of the depositing mechanism and thereby to deposit the book at the desired point.

10. A mechanical library-servitor, comprising a depositing-carrier adapted to travel alongside of the rows of bookcases and having superposed compartments corresponding with the shelves of the cases, catches for holding the books in the compartments and normally in releasing position, magnets movable vertically to correspond with the different compartments and adapted to control any one of several catches, and an adjustable circuit-breaking device adapted to break the magnet-circuits by the travel of the depositing mechanism and thereby to deposit the book at the desired point.

11. A mechanical library-servitor, comprising a depositing-carrier having superposed compartments corresponding with the shelves of the cases, catches for holding a book in the compartment and normally in releasing position, levers connected with the catches to control them, magnets adapted to act upon the levers to raise the catches, and an adjustable circuit-breaking device adapted to break the magnet-circuits by the travel of the depositing mechanism, and thereby to deposit the book at the desired point.

12. A mechanical library-servitor, comprising a depositing-carrier adapted to travel alongside of the rows of bookcases and having superposed compartments corresponding with the shelves of the cases, a carrier delivering books to the upper end of the depositing-carrier, means for directing the book into each compartment, catches adapted to hold the books in the pockets, magnets controlling the catches, and circuit-controlling means operated by the travel of the depositing mechanism to release the catches.

13. A mechanical library-servitor, comprising a depositing-carrier adapted to travel alongside of the rows of bookcases and hav-

ing superposed compartments corresponding with the shelves of the cases, a carrier delivering books to the upper end of the depositing-carrier, means for directing the book into each compartment, catches adapted to hold the books in the pockets, magnets operative when energized to hold the catches raised, and an adjustable circuit-breaking mechanism operated by the travel of the depositing mechanism and adapted to release and deposit the book at any desired point.

14. A bookcase having inclined compartments for the books, catches at the lower ends of the compartments adapted to hold the books in place, and a withdrawing-carrier mounted to travel in front of the cases and having means for releasing the catches.

15. A bookcase having inclined compartments for the books, catches at the lower ends of the compartments adapted to hold the books in place, a withdrawing-carrier mounted to travel in front of the cases, levers on the withdrawing-chute adapted to engage and release the catches, magnets actuating said levers, and means actuated by the travel of the withdrawing-carrier for closing the magnet-circuits.

16. A bookcase having inclined compartments for the books, catches at the lower ends of the compartments adapted to hold the books in place, a withdrawing-carrier mounted to travel in front of the cases, levers on the withdrawing-carrier adapted to engage and release the catches, adjustable magnets actuating said levers, means for moving the magnets vertically opposite the levers, and means actuated by the travel of the withdrawing-carrier for closing the magnet-circuits.

17. A mechanical library-servitor, having a withdrawal device, comprising a frame adapted to travel in front of the bookcases and to receive the books therefrom, said frame having partitions dividing it into superposed sections or pockets, and means for discharging the books from said sections at one end of the travel of the frame.

18. A mechanical library-servitor having a withdrawal device, comprising a frame adapted to travel in front of the bookcases and to receive the books therefrom, said frame having partitions dividing it into superposed sections or pockets, means for discharging the books from said sections at one end of the travel of the frame, and a carrier-belt receiving the book when discharged from the withdrawal device.

19. A mechanical library-servitor, having a withdrawal device comprising a frame adapted to travel in front of the bookcases and to receive the books therefrom, a book-support consisting of a pivoted plate, and means for tilting said plate to discharge the book at the end of the travel of the frame.

20. A device for delivering books from cases, comprising a book-receiver adapted to travel in front of the cases and to receive the books therefrom, a book-support consisting of a pivoted plate, a spring-held catch normally holding one side of the plate up, a spring serving to raise said side of the empty plate, and means for tripping the supporting-catch at the end of travel of the receiver, whereby the book is discharged to one side.

21. A device for delivering books from cases, comprising a book-receiver adapted to travel in front of the cases and to receive the books therefrom, means for discharging the book at the end of the travel of the receiver, a vertically-extending belt having shelves thereon adapted to receive a book from the traveling receiver and to lower it, and a horizontally-extending carrier-belt beneath the said lowering-belt.

22. A device for delivering books from cases, comprising a book-receiver adapted to travel in front of the cases and to receive the books therefrom, a vertically-extending belt having shelves thereon adapted to receive a book from the traveling receiver and to lower it, a horizontally-extending carrier-belt beneath the said lowering-belt, and a trip-lever on the traveling receiver adapted to engage the lowering-belt and to discharge the book thereon.

23. A device for delivering books from cases, comprising a book-receiver adapted to travel in front of the cases and to receive the books therefrom, a book-support consisting of a pivoted plate, a spring-held catch normally holding one side of said plate up, a spring serving to raise said side of the empty plate, and a vertically-extending lowering-belt having shelves thereon and adapted to engage the catch, to discharge a book from the traveling carrier upon the shelves of the belt.

24. A book-depositing mechanism for libraries, comprising a carrier-belt adapted to receive the books and carry them over the cases, means for discharging the books from the belt and carriers receiving the books from said belt and conveying them to the cases, said belt and carriers being movable laterally.

25. A book-depositing mechanism for libraries, comprising a swinging frame pivoted at one end and swinging over the cases, a carrier-belt supported thereon and adapted to receive the books and carry them over the cases, means for discharging the books from the belt and depositing-carriers supported from the swinging frame receiving the books from said belt and conveying them into the cases.

26. A book-depositing mechanism for libraries, comprising a carrier-belt adapted to receive the books and carry them over the cases, rake-off arms adapted to be set to engage and remove the books from the belt, connections from said arms to a central place by which they may be controlled, and depositing-carriers receiving the books from said belt and conveying them into the cases, said belt and carriers being movable laterally.

27. A book-depositing mechanism for libraries, comprising a carrier-belt adapted to re-

ceive the books and carry them over the cases, rake-off arms adapted to be set to engage and remove the books from the belt, connections from said arms to a central place by which they may be controlled, a lowering-belt having shelves thereon adapted to receive the books from the carrier-belt, and switch-plates adapted to be set to engage and remove the book from the lowering-belt to the corresponding compartment in the bookcase.

28. A book-depositing mechanism for libraries, comprising a carrier-belt formed as two bands having connecting-plates and adapted to receive books and carry them over the cases, rake-off arms pivoted to one side of the belt, catches for holding the arms when swung down, said arms when down engaging and removing the books from the belt, levers on the belt held by the books into position to engage and trip said catches, and carriers receiving the books from the belt and conveying them into the cases, said belt and carriers being movable laterally.

29. A book-depositing mechanism for libraries, comprising a carrier-belt formed as two bands having connecting-plates adapted to receive the books and carry them over the cases, rake-off arms pivoted at one side of the belt, catches for holding the arms when swung down, said arms when down engaging and removing the books from the belt, levers on the belt held by the books into position to engage and trip said catches, carriers receiving the books from the belt, means for detaining the book in the carrier, means for moving the belt and carrier laterally, and an electrically-actuated releasing mechanism for the carriers, controlled by the lateral movement of the carriers.

30. A mechanical library-servitor, comprising a frame pivoted at one end and having connections by which it is swung horizontally upon said pivot, said frame supporting a carrier-belt adapted to convey books from the center outwardly over the cases, and depositing-carriers attached to said frame and adapted to receive the books from the said carrier-belt and to deliver them to the proper shelf upon the cases.

31. A mechanical library-servitor, comprising a frame pivoted at one end and having connections by which it is swung horizontally upon said pivot, said frame supporting a carrier-belt adapted to convey the books from the center outwardly over the cases, depositing-carriers attached to said frame and adapted to receive the books from the carrier-belt, the depositing-carriers having switches for guiding the books into the various shelves, and mechanically-movable magnets controlling the switches.

32. A mechanical library-servitor, comprising a frame pivoted at one end and having connections by which it is swung horizontally upon said pivot, said frame supporting a carrier-belt adapted to convey books from the center outwardly over the cases, depositing-carriers attached to said frame and adapted to receive the books from the said carrier-belt, each depositing-carrier having a switch for each vertical row of shelves in the cases, a pocket receiving the book from the switch, and means operated by the lateral travel of the carriers for releasing the book from the pocket.

33. A mechanical library-servitor, comprising a frame pivoted at one end and extending over the bookcases, means for swinging the frame laterally, a carrier-belt supported on said frame and adapted to convey books from the center outwardly over the cases, depositing-carriers attached to said frame and adapted to receive the books from the carrier-belt, a switch upon said carrier for each vertical row of shelves in the cases, each carrier having pockets receiving the book from its switches, catches retaining the books in the pockets, levers adapted to engage both switch and catch, and a magnet operating said lever.

34. A mechanical library-servitor, comprising a frame pivoted at one end, means by which the frame may be swung horizontally upon said pivot, a carrier-belt supported upon said frame and adapted to convey books from the center outwardly over the cases, rake-off levers adapted to be moved into position to engage and remove the books from the belt, and depositing-carriers attached to said frame and adapted to receive the books from the carrier-belt and deliver them to the proper shelf upon the cases.

35. A mechanical library-servitor, comprising a frame pivoted at one end and extending over the bookcases, means by which said frame may be swung laterally upon its pivot, a carrier-belt supported on said frame and adapted to convey books from the center outwardly over the cases, rake-off levers adapted to be moved into position to engage and remove the books from the belt, depositing-carriers attached to said frame and adapted to receive the books from the carrier-belt, each of said carriers having a switch corresponding with each vertical row of shelves in its cases, and pockets receiving the book from the switches, catches retaining the book in the pockets, levers adapted to engage the switches and the catches, common connections from all of the switches to the rake-off levers, and a magnet operating said lever and thereby control the rake-off levers, the switch and the catch.

36. A mechanical library-servitor, comprising a frame pivoted at one end and extending over the cases, means by which said frame is swung horizontally upon its pivot, a carrier-belt supported on said frame and adapted to convey books from the center outwardly over the cases, rake-off levers adapted to be moved into position to engage and remove a book from the belt, depositing-carriers attached to said frame and adapted to receive the books from the carrier-belt, each of said

carriers having a switch for each vertical row of shelves in its cases, and pockets receiving the books from the switches, catches retaining the books in the pockets, levers adapted to engage both the switch and the catch, common connections from all of the switches to the rake-off arms, and magnets mounted to slide on vertical guides and adapted to operate any one of a series of said levers and thereby control the rake-off levers, the switch and the catch.

37. A carrier-belt, having spring-catches thereon, a book-carrier adapted to be clamped to the belt by said catches, an incline adapted to enter between the belt and said carrier, and fixed stops adapted to engage the catches, to release the carrier as it strikes the incline.

38. A carrier-belt, having spring-held bars pivoted to its edges and swinging laterally, the inner ends of said bars extending over the edges of the belt and at a short distance therefrom, pins projecting from the arms, a carrier engageable by said arms and held to the belt, a book-receiving incline adapted to enter between the carrier and belt, and fixed cam-stops adapted to engage the pins on the arms to free the carrier as it reaches the incline.

39. A carrier-belt having spring-held bars pivoted to its edges and swinging laterally, the inner ends of said bars extending over the edges of said belt and adapted to lock a carrier thereto, pins projecting from the arms, a carrier comprising a bottom plate and front and rear flanges, and having its bottom plate engageable by said arms at both front and rear edges, the front flange extending closer to the edge of the belt than the rear one, and the bottom plate having recesses at the ends of the rear flange adapted to receive the rear catches, a book-receiving incline adapted to enter between the carrier and belt, and fixed cam-stops adapted to engage the pins on the arms, to free the carrier as it reaches the incline.

40. In a library-servitor, the combination with a centrally-pivoted swinging frame carrying book conveying and handling mechanism, of selecting or controlling mechanisms comprising a stationary keyboard having curved rows of holes therein corresponding to the shelves in the cases, controlling-circuits extending from the keyboard out over the swinging frame and adjustable relatively to the keyboard, and an adjustable pin for the keyboard adapted to form a part of any one of the circuits.

41. In a library-servitor, the combination with a centrally-pivoted swinging frame carrying book conveying and handling mechanisms, of selecting or controlling mechanisms, comprising a stationary keyboard having curved rows of holes therein corresponding to the shelves in the cases, controlling-circuits extending from the keyboard out over the swinging frame and adjustable relatively to the keyboard, movable controlling-magnets in the circuits and mechanically moved by the adjustment of the circuits relatively to the keyboard, and an adjustable pin for the keyboard adapted to form a part of any one of the circuits.

42. In a library-servitor, the combination with a centrally-pivoted swinging frame carrying book conveying and handling mechanism comprising magnets adjustable in position, of selecting or controlling mechanisms comprising a stationary keyboard having curved rows of holes therein corresponding to the shelves in the cases, electric circuits extending from the keyboard out over the swinging frame having their ends adjustable relatively to the keyboard, the wires forming said circuits being slidable and forming mechanical connection with the magnets, whereby they may be adjusted in position by the adjustment of the circuit relatively to the keyboard, and a pin adjustable on the keyboard and controlling the continuity of the circuits.

43. In a library-servitor, the combination of a centrally-pivoted swinging frame carrying book conveying and handling mechanisms, and comprising withdrawing and depositing carriers, magnets adjustable in position in said carriers and operating the mechanism thereof, a central keyboard, wires slidable on said frame and connected with the magnets forming the electrical circuits therefor, mechanical connections by which they may be adjusted in position, the ends of the wires forming the circuits from corresponding magnets in withdrawing and depositing carriers being secured in juxtaposition, means by which said ends may be secured to swing over the keyboard, and circuit-closing means adjustable upon said keyboard and engaging the ends of the wires.

44. A selecting mechanism for a library-servitor, comprising a fixed series of segmental bars supported from one end and forming a keyboard, a series of conductors forming electric circuits adjustable for different bars and moving in corresponding arcs in conformity with the movements of the servitor, and adjustable means carried by said arcs for controlling the continuity of the circuits.

45. A selecting mechanism for a library-servitor, comprising a fixed series of segmental arcs forming a keyboard, a series of conductors forming complementary electric circuits, the terminals of the conductors forming complementary circuits being secured together by a case and with ends projecting oppositely and adjacent to the arcs, means for shifting said cases to the spaces between the arcs and securing them so that the conductor ends project over the arcs, contact-wires adjustable on the arcs and adapted to engage said conductor ends, the cases and conductor ends being mounted to swing between the arcs and in correspondence with the servitor, and

a circuit-closing pin adjustable on the arcs and adapted to be engaged by the conductor ends in their swing.

46. A selecting mechanism for a library-servitor, comprising a fixed series of segmental arcs forming a keyboard, a series of wires forming complementary electric circuits, the ends of wires forming complementary circuits being secured together by a case and with ends oppositely projecting and adjacent the arcs, means for shifting said cases to the spaces between the arcs and securing them so that the wire ends project over the arcs, a rack adapted to normally hold said wire ends and swinging with the servitor, contact-wires adjustable on the arcs and adapted to engage said wire ends, means by which said wire ends may be mounted to swing between the arcs and in correspondence with the servitor, and a circuit-closing pin adjustable on the arcs and adapted to be engaged by the wire ends in their swing.

47. A keyboard for library-servitors, having segmental series of holes, two curved wires adapted to be supported above the end series, a connecting-pin insertible in said holes and having two arms each supporting one of said curved wires, and circuit-wire terminals adapted to swing in correspondence with the servitor and to engage said curved wires and the pin, and by contact with the pin to swing it clear of the curved wires and thus to break the circuit.

48. A keyboard for library-servitors, having segmental series of holes, two curved wires having an insulated connection at one end adapted to be secured at one end of the segmental series of holes, guides extending radially along the other end of the series of holes, a slide thereon having an insulating-support for the curved wires, a connecting-pin insertible in said holes and adapted to electrically connect the wires, and circuit-wire terminals adapted to swing in correspondence with the servitor and to break the circuit upon contact with the pins.

49. A keyboard for library-servitors, having segmental series of holes, two curved wires having an insulated connection at one end adapted to be secured at one end of the segmental series of holes, guides extending radially along the other ends of the series of holes, a slide thereon having insulating-support for the curved wires, a connecting-pin insertible in said holes and having two arms each supporting one of said wires, and circuit-wire terminals adapted to swing in correspondence with the servitor and to engage said wires and the pin, and by contact with the pin to swing it clear of the wires and thus to break the circuit.

50. A withdrawing mechanism for a library-servitor, comprising a carrier traveling before the bookcases and having magnets thereon, book-retaining catches upon the bookcases adapted to be released by the energizing of the proper magnet, circuit-wires extending from the magnets to a selecting or key board and normally open, a selecting or key board having holes representing each book position in the cases, and a pin insertible in said holes and adapted to engage the wire-terminals of the circuits, said terminals being connected to travel with the carrier.

51. In a library and parcel servitor, the combination of a traveling book-handling mechanism, with a frame carrying stamping mechanisms and a registering-sheet, and moving with the book-handling mechanism, and a fixed stop engaging the stamping mechanisms to throw them into operation, substantially as described.

52. In a library and parcel servitor, the combination of a traveling book-handling mechanism, with a frame carrying stamping mechanisms and a registering-sheet, and moving with the book-handling mechanism, a constantly-moving power connection, and a fixed stop temporarily engaging the stamping mechanisms with said power connection, substantially as described.

53. The combination with storage-compartments, a traveling servitor adapted to receive parcels from and deposit them in said compartments, and a fixed index-sheet divided into sections representing the storage-compartments, of registering means traveling with the servitor and comprising means for removing a section of said sheet, a registering-sheet and means for securing said section to the registering-sheet, substantially as specified.

54. The combination with storage-compartments, a traveling servitor adapted to receive parcels from and deposit them in said compartments, and a fixed sheet divided into sections representing the storage-compartments, of registering means traveling with the servitor and comprising means for removing a section of said sheet, a registering-sheet, means for securing said section to the registering-sheet, and means for stamping the registering-sheet with consecutive numbers, substantially as described.

55. The combination with storage-compartments, a traveling servitor adapted to receive parcels from and deposit them in said compartments, and a fixed sheet divided into sections representing the storage-compartments, of registering means traveling with the servitor and comprising means for removing a section of said sheet, a registering-sheet, a time-controlled stamp and a numbering-stamp, and means for pressing said stamps upon the registering-sheet controlled by the travel of the servitor, substantially as described.

56. The combination with storage-compartments, a traveling servitor adapted to receive parcels from and deposit them in said compartments, and a fixed sheet divided into sections representing the storage-compartments, of registering means traveling with the servitor, and comprising means for removing a section of said sheet, a registering-sheet, means

for securing said section to the registering-sheet, a time-stamp having an automatic clock-setting connection, a numbering-stamp shifted by the handling of the parcel, and means actuated by the travel of the servitor to throw the stamping mechanisms into operation to print the registering-sheet, substantially as described.

57. The combination with storage-compartments, a traveling servitor adapted to receive parcels from and deposit them in said compartments, and a fixed sheet divided into sections representing the storage-compartments, of registering means traveling with the servitor, and comprising means for removing a section of said sheet, a registering-sheet, means for securing said section to the registering-sheet, a time-stamp having an automatic clock-setting connection, a numbering-stamp shifted by the handling of the parcel, means actuated by the travel of the servitor to throw the stamping mechanisms into operation to print the registering-sheet, and means for automatically advancing the registering-sheet one space, substantially as described.

58. A parcel-servitor and means for operating it in combination with a registering mechanism, comprising a sheet and carrying and feeding mechanisms therefor, a frame movable toward and from said sheet, clock-controlled time-stamps and a consecutive-numbering stamp carried by said frame, and means for automatically moving the frame to print the registering-sheet when a parcel is handled by the servitor, substantially as described.

59. A parcel-servitor and means for operating it in combination with a registering mechanism, comprising a sheet and carrying and feeding mechanisms therefor, a frame movable toward and from said sheet, clock-controlled time-stamps and a consecutive-numbering stamp carried by said frame, means for automatically advancing the numbering-stamp by the deposit of the parcel, and means for moving the frame to print the registering-sheet actuated by the travel of the servitor, substantially as described.

60. A parcel-servitor and means for operating it in combination with a registering mechanism, comprising a sheet and carrying and feeding mechanisms therefor, a frame movable toward and from said sheet, clock-controlled time-stamps and a consecutive-numbering stamp carried by said frame, cams or star-wheels mounted to turn and normally supporting the frame in elevated position, a constantly-turning member, and means for automatically and temporarily engaging said parts to turn the cams and cause the frame to drop and then to be raised, substantially as described.

61. The combination with a traveling servitor, having means for handling parcels to and from receptacles, of a registering mechanism carried by the servitor and comprising a sheet and carrying and feeding mechanisms therefor, a frame movable toward and from said sheet, clock-controlled time-stamps, and a consecutive-numbering stamp carried by said frame, cams or star-wheels mounted to turn and normally supporting the frame in elevated position, a constantly-turning member, means for temporarily connecting said cams and said turning member, and a fixed stop adapted to actuate said means to connect said cams and said turning member, substantially as described.

62. The combination with a traveling servitor, having means for handling parcels to and from receptacles, of a registering mechanism carried by the servitor and comprising a sheet and carrying and feeding mechanisms therefor, a frame movable toward and from said sheet, clock-controlled time-stamps and a consecutive-numbering stamp carried by said frame, cams or star-wheels mounted to turn and normally supporting the frame in elevated position, a constantly-turning member, means for temporarily connecting said cam and said turning member, a fixed stop adapted to actuate said means to connect said cams and said turning member and disengaging means therefor operated by rotation of the cams, substantially as described.

63. The combination with a traveling servitor, having means for handling parcels to and from receptacles, of a registering mechanism carried by the servitor and comprising a sheet and carrying and feeding mechanisms therefor, a frame movable toward and from said sheet, clock-controlled time stamps and a consecutive-numbering stamp carried by said frame, cams or star-wheels mounted to turn and normally supporting the frame in elevated position, a constantly-turning member, means for temporarily connecting said cams and said turning member, a sheet-feed-actuating mechanism, a fixed stop adapted to actuate said means to connect said cams and said turning member, and disengaging means therefor operated by rotation of the cams, substantially as described.

PHILIP REICH.

Witnesses:
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S. LAZARUS,
PHINEAS PHILLIPS.