No. 684,861. Patented Oct. 22, 1901.

G. M. PETERS.

APPARATUS FOR PACKING CARTRIDGES IN BOXES.

(Application filed Jan. 5, 1899.)

(No Model.) 6 Sheets—Sheet 1.

Fig. 1.

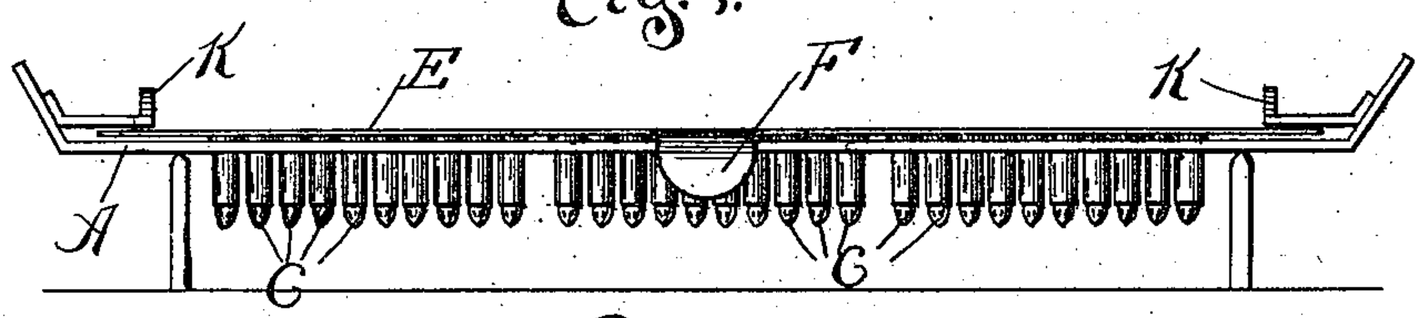


Fig. 2.

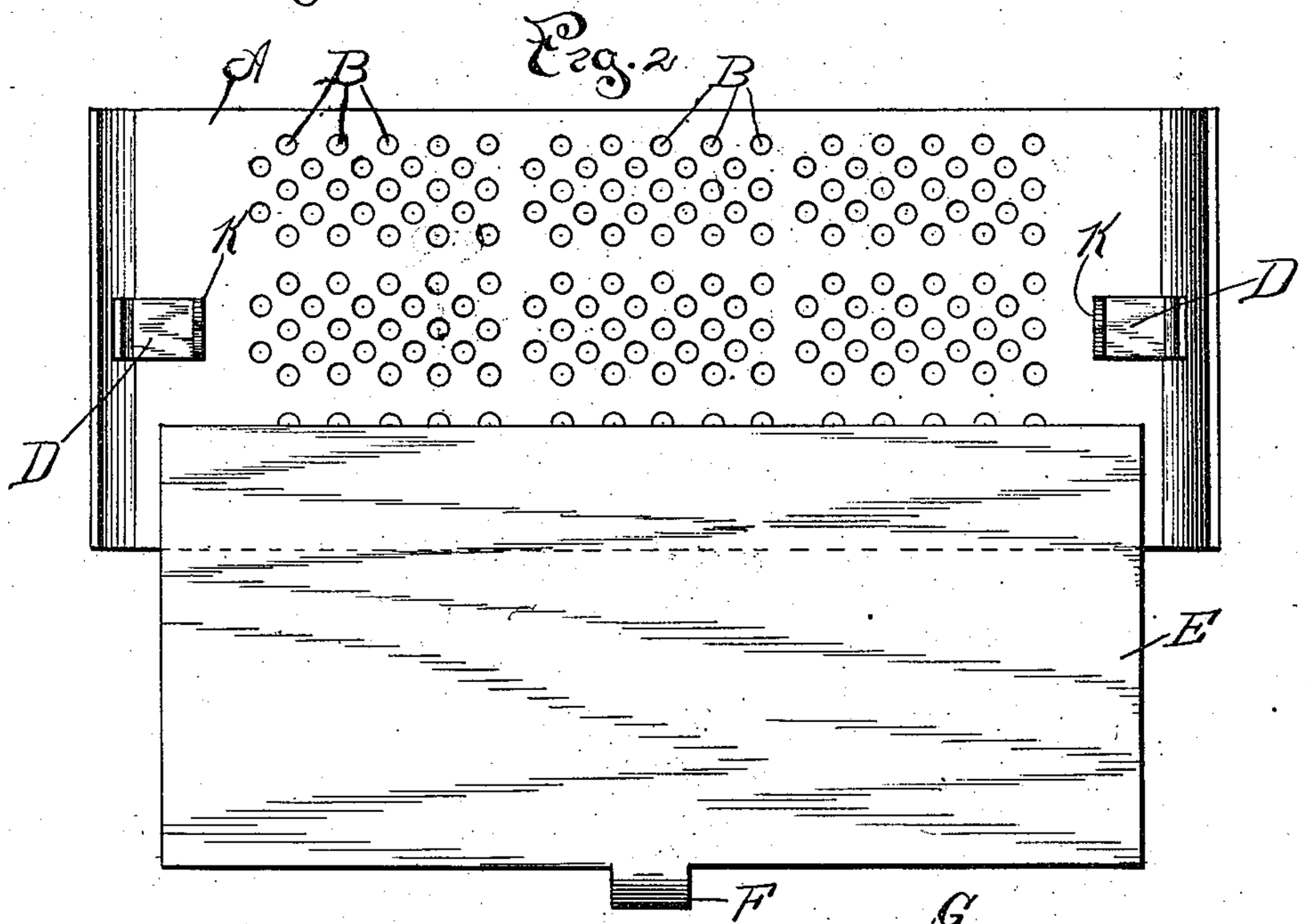


Fig. 14.

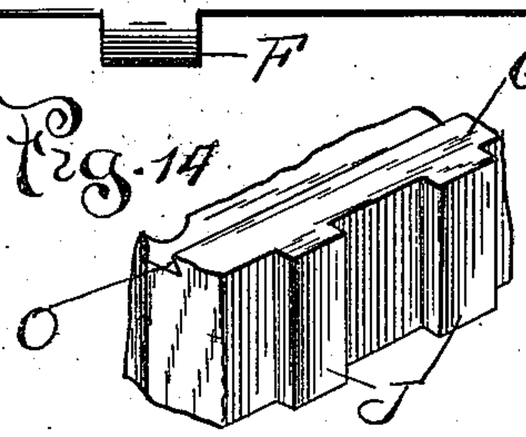
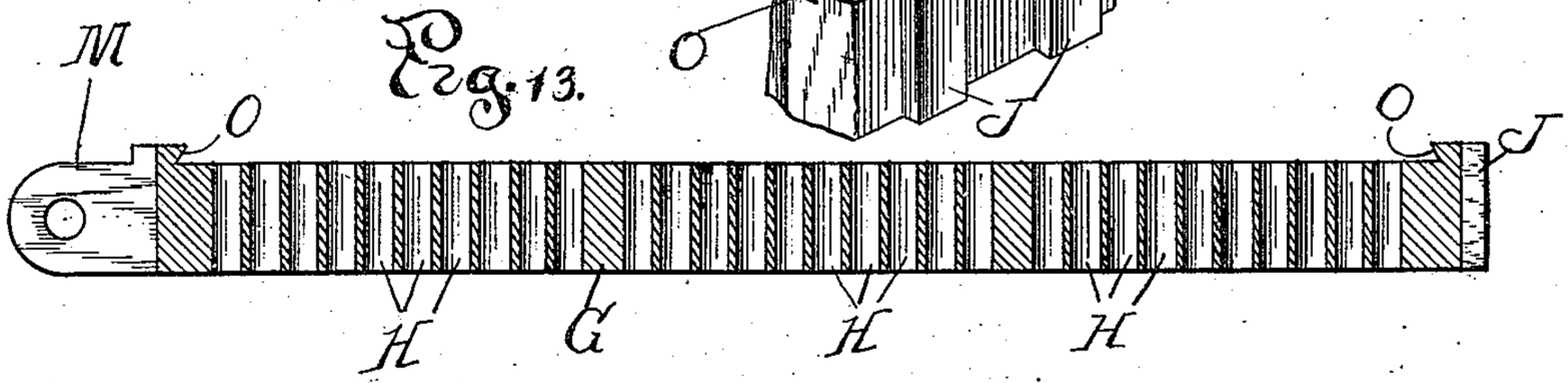


Fig. 13.



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No. 684,861. Patented Oct. 22, 1901.

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(No Model.) 6 Sheets—Sheet 2.

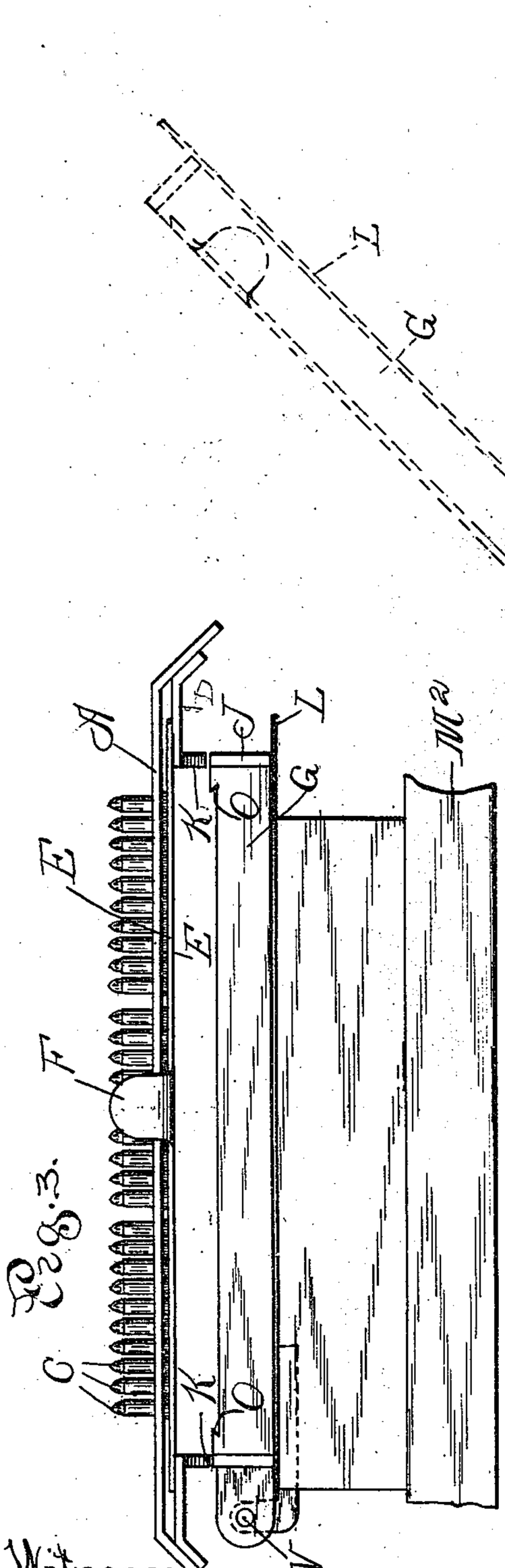

Fig. 3.

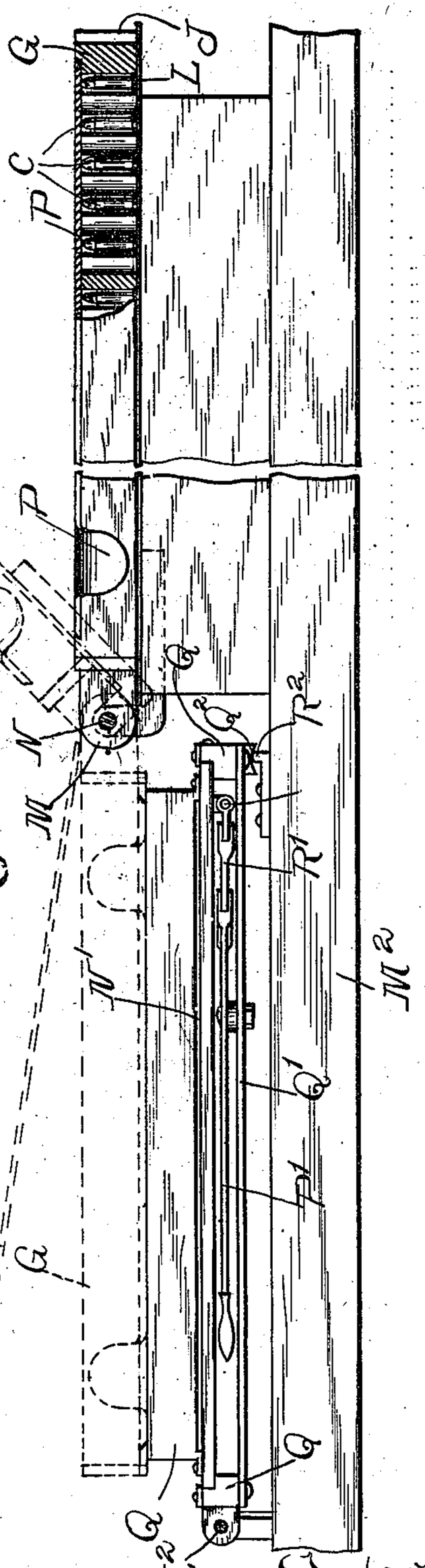

Fig. 4.

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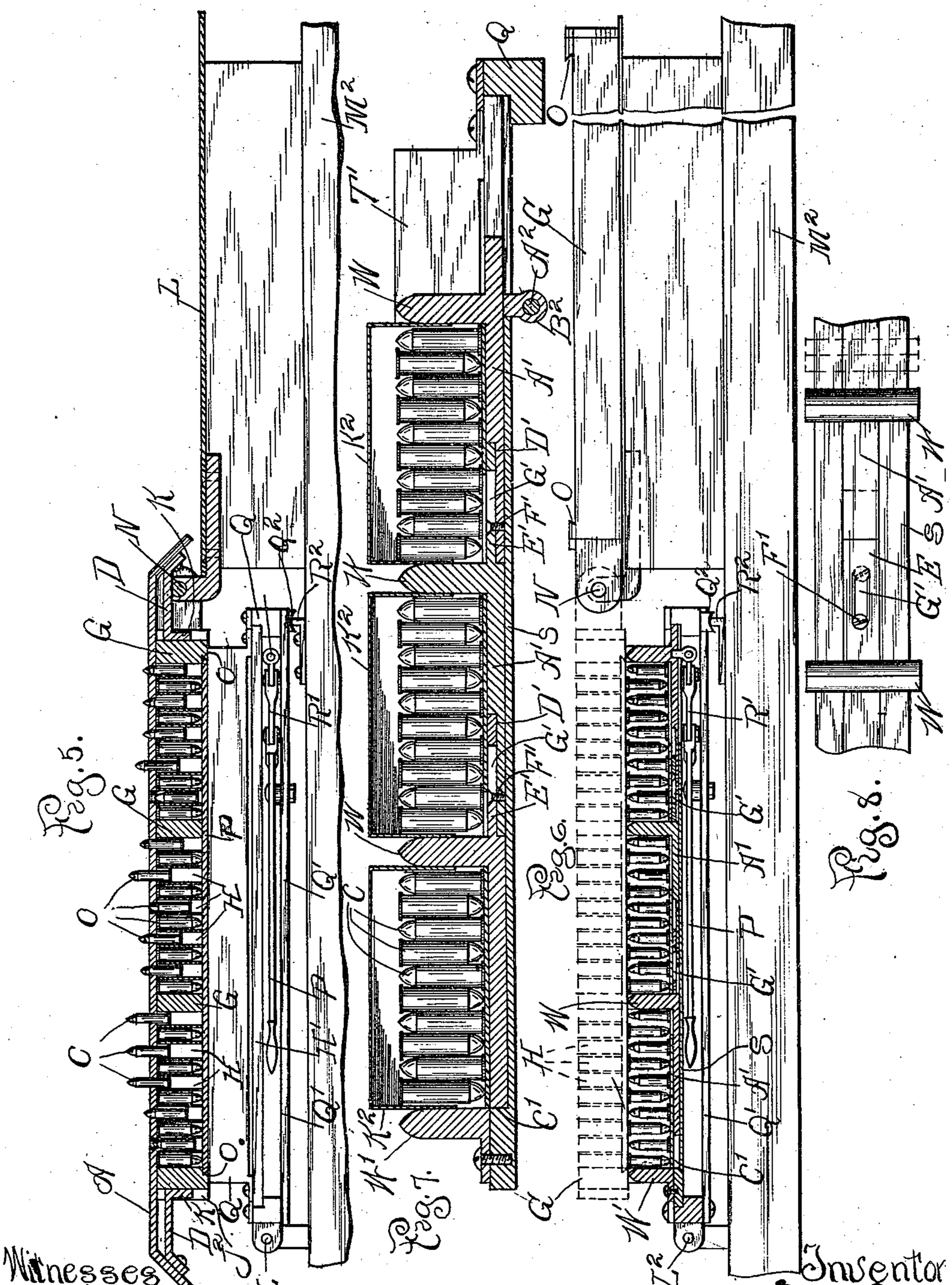
(No Model.) 6 Sheets—Sheet 3.



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APPARATUS FOR PACKING CARTRIDGES IN BOXES.

(Application filed Jan. 5, 1899.)

(No Model.) 6 Sheets--Sheet 4.

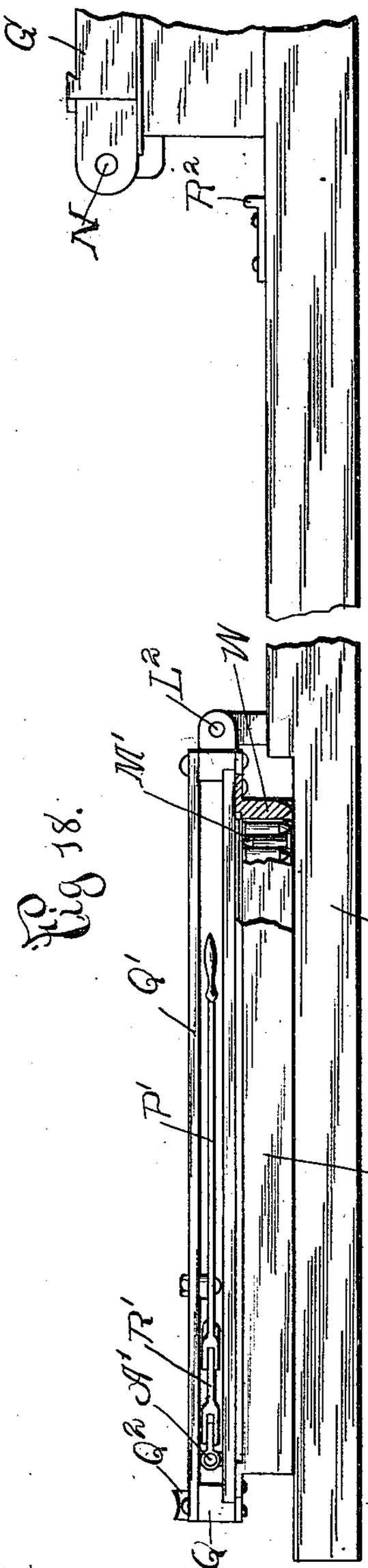

Fig 18.

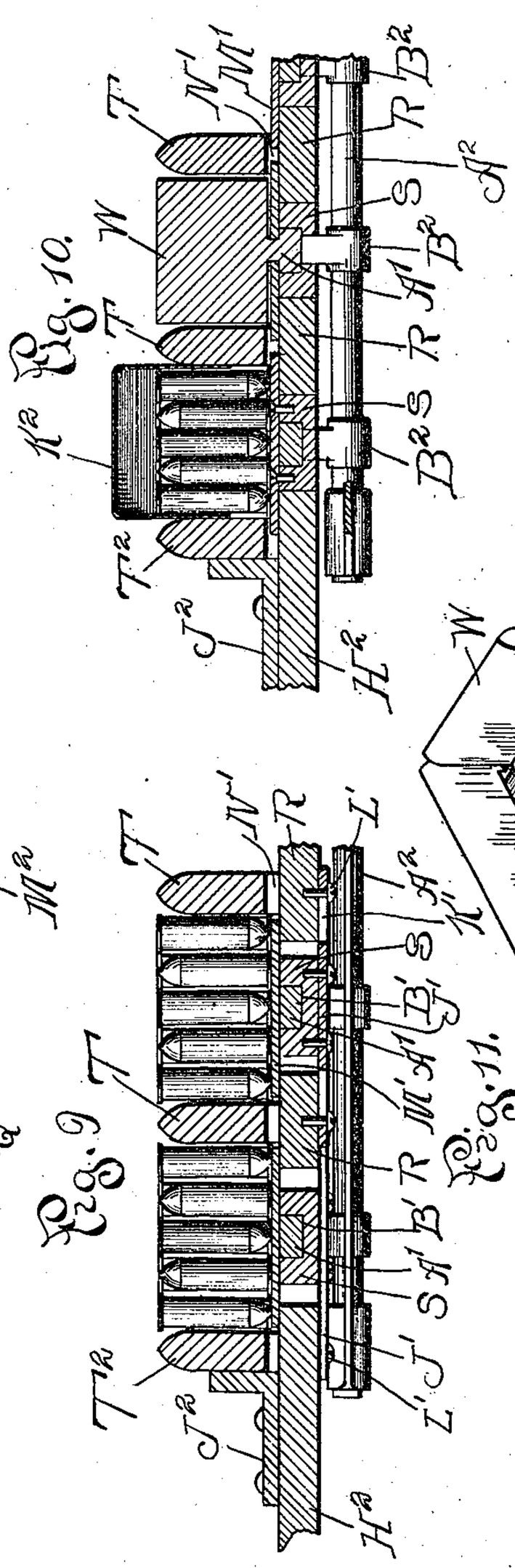

Fig 10.

Fig 9.

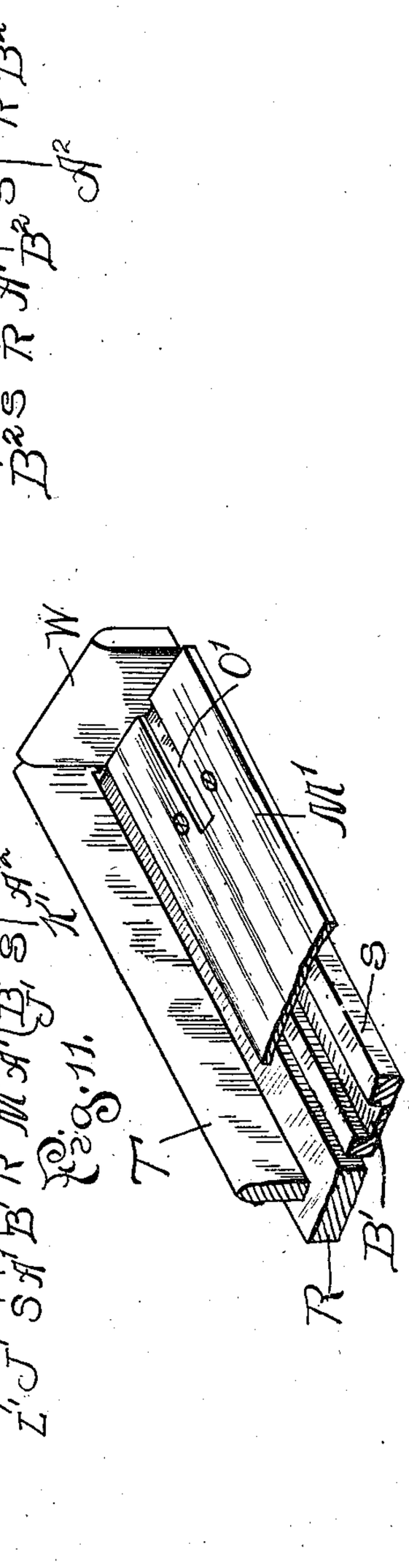

Fig 11.

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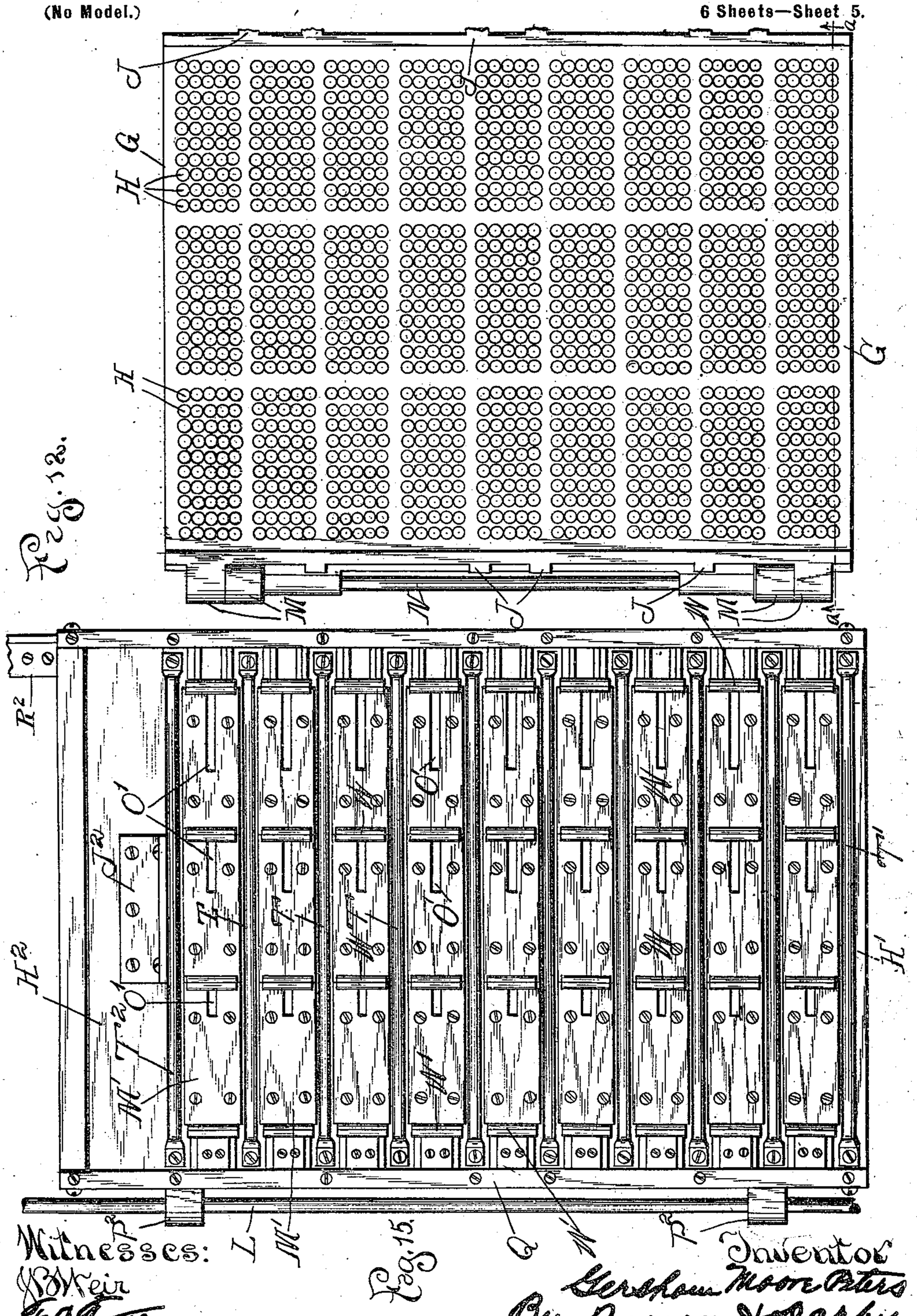
(No Model.) 6 Sheets—Sheet 5.



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No. 684,861. Patented Oct. 22, 1901.

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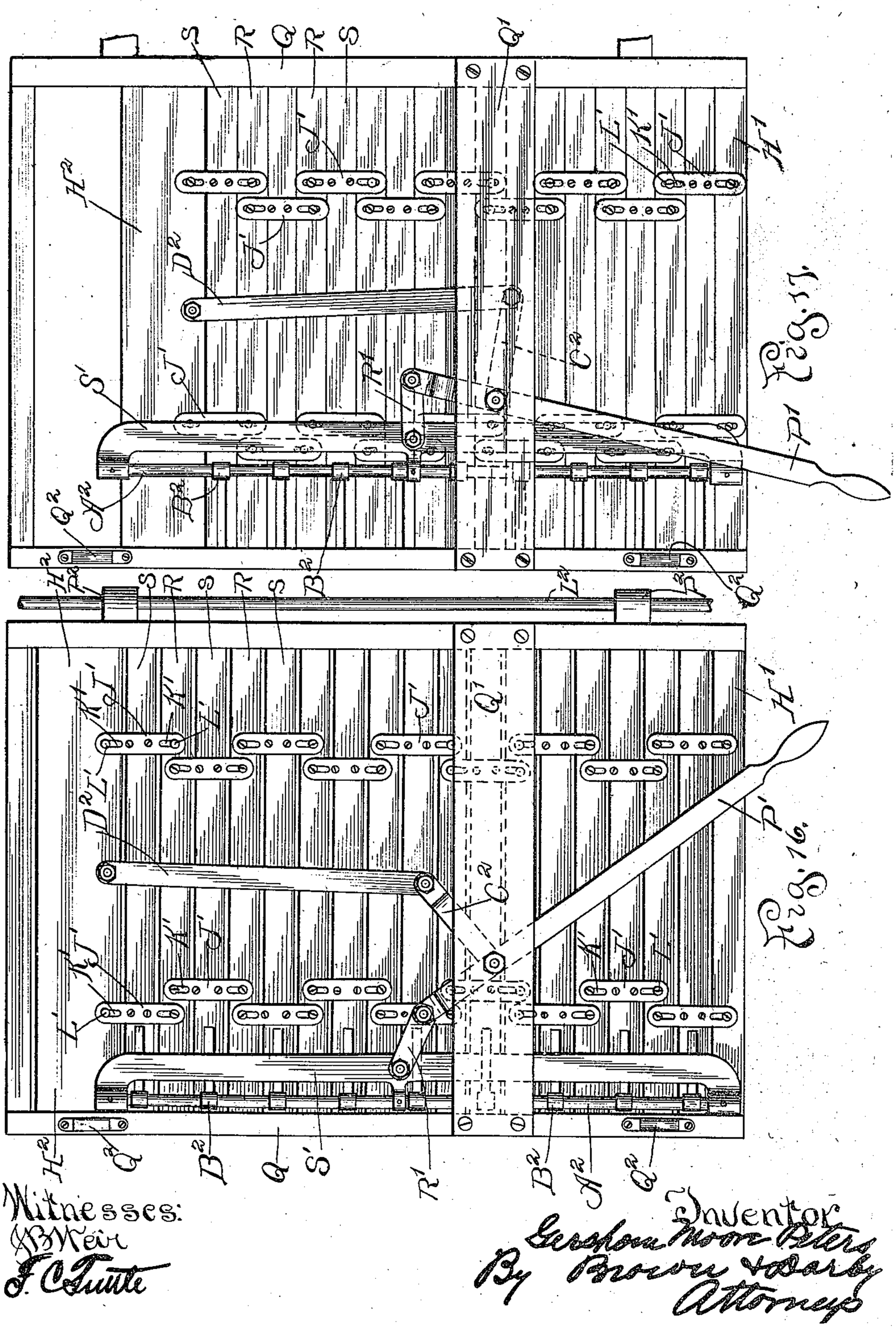
APPARATUS FOR PACKING CARTRIDGES IN BOXES.

(Application filed Jan. 5, 1899.)

(No Model.) 6 Sheets—Sheet 6.



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UNITED STATES PATENT OFFICE.

GERSHOM MOORE PETERS, OF CINCINNATI, OHIO.

APPARATUS FOR PACKING CARTRIDGES IN BOXES.

SPECIFICATION forming part of Letters Patent No. 684,861, dated October 22, 1901.

Application filed January 5, 1899. Serial No. 701,203. (No model.)

To all whom it may concern:

Be it known that I, GERSHOM MOORE PETERS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Apparatus for Packing Cartridges in Boxes, of which the following is a specification.

This invention relates to apparatus for packing cartridges in boxes.

The object of the invention is to provide an apparatus of simple construction whereby metallic cartridges may be rapidly arranged in proper relation and assembled for being received in packing-boxes suitable for storing and shipping the same.

The invention consists, substantially, in the construction, combination, arrangement, and location of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally specifically pointed out in the appended claims.

Refering to the accompanying drawings and to the various views and reference-signs appearing thereon, Figure 1 is a side elevation of the greasing-plate, showing the arrangement of cartridges therein while being greased. Fig. 2 is a top plan view of the construction shown in Fig. 1, the cartridge-retaining plate being shown in partially-withdrawn position. Fig. 3 is a view similar to Fig. 1, showing the greasing-plate in position to be placed upon the forming-plate in order to deliver the cartridges into the forming-plate. Fig. 4 is a broken end elevation, parts in vertical transverse section, showing in full lines the relative arrangement of the forming-plate and condenser, the cartridges being shown in the forming-plate after the first application of the greasing-plate, the dotted lines illustrating the manner of delivering the cartridges from the forming-plate to the condenser. Fig. 5 is a transverse sectional view of the apparatus, illustrating the manner of applying the greasing-plate with a load of cartridges to the forming-plate after the latter has been reversed. Fig. 6 is a similar view showing the cartridges deposited in proper relation into the condenser with the forming-plate returned to its initial position. Fig. 7 is a transverse sectional view of the condenser, showing the cartridges condensed therein and the packing-box inserted ready to receive the condensed cartridges. Fig. 8 is a broken detail view in top plan, illustrating the manner of closing the end walls of the condenser-compartments upon each other. Fig. 9 is an enlarged broken sectional view, the plane of section being transverse of the length of the condenser-compartments, showing the cartridges properly arranged therein before condensation. Fig. 10 is a similar view of the same, showing the side walls of the condenser-compartments in their contracted condition to condense the cartridges and showing the packing-box inserted. Fig. 11 is a broken detail view in perspective of a compartment of the condenser. Fig. 12 is a top plan view of the forming-plate. Fig. 13 is a transverse section of the same on the line *a a*, Fig. 12, looking in the direction of the arrow. Fig. 14 is a broken detail view in perspective, showing the lugs on the forming-plate for properly centering the greasing-plate when applied thereto in proper registering relation. Fig. 15 is a top plan view of the condenser, showing the side and end walls of the compartments thereof in their retracted or expanded position. Fig. 16 is a bottom plan view of the same with the side and end walls of the compartments in their expanded or separated position. Fig. 17 is a view similar to Fig. 16, showing the arrangement of parts with the side and end walls of the condenser-compartments contracted or closed upon each other. Fig. 18 is a broken end elevation, parts broken out and in section, of the condenser in position for delivering the packing-boxes filled with the cartridges.

The same part is designated by the same reference-sign wherever it occurs throughout the several views.

In the packing of cartridges in boxes for storing or shipping it is usually customary to pack the cartridges fifty to a box and to arrange the cartridges in a perpendicular manner in the box with each alternate cartridge oppositely presented—that is, with the butts or cap ends of every other cartridge presented downwardly and with the points or bullet ends of the intermediate cartridges presented downwardly—in order that the packages or boxes may be solid and occupy the least possible space. This work of packing the boxes has heretofore been generally ac-

complished by hand. It is the purpose of the present invention to provide an apparatus whereby the same results may be accomplished mechanically, thus greatly assisting and facilitating the packing and enabling this work to be done more rapidly than heretofore and at less expense.

In carrying out my invention I provide a plate A, which I will hereinafter designate the "greasing-plate," and I divide said plate into divisions on lines as indicated most clearly in Fig. 2, each division containing a series of holes or perforations corresponding in number to one-half the number of cartridges to be packed in a single box, the said perforations or openings in each division being arranged with respect to each other to correspond to the position in the box when finally packed of the cartridges which present their butt or cap ends all the same way—that is, separated from each other a distance corresponding to the distance in the completed or packed box between each alternate cartridge. The series of perforations or openings indicated at B, Fig. 2, are of just sufficient diameter to permit the bodies of the cartridges C to readily and easily pass therethrough, but not of sufficient diameter to permit the butt or cap ends of the cartridges to pass through. The cartridges are shaken or otherwise placed with their bodies projecting through the holes B of plate A, being suspended by their butt or cap ends, as clearly shown in Fig. 1. When all the holes or openings in the plate A are thus filled, the bullet ends of the cartridges may be dipped in the usual manner into heated grease. In the particular form shown, to which, however, the invention is not limited, the greasing-plate A is divided into divisions, each of which contains twenty-five openings or holes B, thus adapting the plate for use in packing boxes containing fifty cartridges, as will be more fully explained hereinafter. It is obvious, however, that each division of the greasing-plate may contain any desired number of perforations or openings, according to the number of cartridges which it is desired to pack in each box. At each edge the greasing-plate A is provided with a flange D, forming a way to receive the edges of a retaining-plate E, whereby by sliding said retaining-plate underneath the flanges D and between such flanges and the surface of plate A the cartridges suspended in the greasing-plate may be retained therein while the greasing-plate A is being handled or its position reversed, the retaining-plate E, if desired, being provided with a handhold F in order to enable it to be readily inserted or withdrawn, as will be readily understood. After the cartridges, supported or suspended, as above described, in or by the greasing-plate, have been sufficiently drained of any surplus grease after being dipped, in case the usual custom of dipping or greasing the cartridges is pursued, the cartridges contained in or carried by the greasing-plate are delivered therefrom into what I shall hereinafter designate the "forming-plate" G. This forming-plate, as clearly shown in Fig. 12, is divided into divisions similar to the divisions above described with reference to the greasing-plate, and said forming-plate is provided with openings or perforations H therethrough of a length corresponding to or slightly greater than the length of the cartridges and of a diameter corresponding to the diameter of the cap or butt ends of the cartridges, thus enabling the cartridges to be received wholly within said openings or perforations. In practice I prefer to arrange the perforations H as close together as possible, while permitting adjacent cartridges to just move past each other. While I have provided each division of the greasing-plate with a series of holes or openings B, corresponding to one-half the number of cartridges to be packed in a single box in the forming-plate, on the contrary I provide in each division a series of passages or openings H, corresponding in number to the entire number of cartridges to be packed in a single box. In the operation of transferring or delivering the cartridges from the greasing-plate to the forming-plate I place the greasing-plate, with the cartridges supported therein, upon or over the forming-plate, as clearly shown in Fig. 3, in a position for the cartridges supported by the greasing-plate to register with alternate passages or openings H in the forming-plate. It is desirable to secure accuracy in the alinement and proper registering relation of the greasing-plate and forming-plate. Many specifically-different expedients may be employed for securing this result. In the particular form shown, to which, however, the invention is not limited, I provide in the sides or edges of the forming-plate suitable projections or lugs J, adapted to receive therebetween suitable projections K, carried by or mounted on the greasing-plate, as clearly shown in Figs. 1, 2, 3, 5, 13, and 14. By this arrangement provision is made whereby without special care the greasing-plate, containing its load of cartridges, may be quickly placed in position over or upon the forming-plate for the cartridges contained therein to be readily deposited and received in the passages or openings H in the forming-plate. With the greasing-plate and forming-plate thus arranged the cartridges will be free to drop from the greasing-plate into the seats or openings in the forming-plate by withdrawing or removing the retaining-plate E, by which the cartridges are retained in the greasing-plate, it being remembered that only every alternate opening or passage H in each division of the forming-plate receives a cartridge, as clearly shown in Fig. 4, and all the butt or cap ends of the cartridges being presented in the same direction. The cartridges thus deposited into the openings H of the forming-plate are prevented from passing or

falling all the way through by means of a floor-plate L, suitably arranged underneath the forming-plate, as clearly shown in Figs. 3, 4, and 5. The next step in the operation is to provide means whereby the alternating empty spaces or openings in the forming-plate may receive a corresponding charge of cartridges arranged in reverse order—that is, with the butt or cap ends thereof presented in a direction opposite to that in which the cap or butt ends of the cartridges first delivered present. To this end I provide means whereby the position of the forming-plate may be reversed—as, for instance, by turning over the forming-plate edge for edge. This result may be accomplished in many specifically-different ways. While, therefore, I have shown and will now describe a particular arrangement, I do not desire to be limited or restricted thereto, as many changes therein and variations therefrom would readily suggest themselves to persons skilled in the art and still fall within the spirit and scope of my invention. In the form shown I suitably hinge or pivot the forming-plate G at one of the side edges thereof, as indicated at M, (see Fig. 12,) upon a rod or other suitable support N, the floor-plate L being hinged about the same support. By this construction it will be seen that after the greasing-plate has been once emptied into the forming-plate and removed the forming-plate may be swung over into position to bring the bottom side thereof upwardly, as indicated most clearly in dotted lines in Figs. 4 and 5. In order to retain the cartridges in the forming-plate when said plate is reversed, as above explained, I provide the said plate with suitable grooves, as indicated at O, (see Figs. 3, 4, 6, 13, and 14,) adapted to receive a plate P, which forms the "floor," so to speak, of the forming-plate in its reverse position, the floor-plate L of said forming-plate when in its initial position being turned with the forming-plate about its pivotal support in order to retain the cartridges in the seats or openings through such plate, as clearly indicated in Fig. 4. After the forming-plate has been thus reversed the floor-plate L may be returned or swung back to its original position, as seen in Fig. 5. With the forming-plate in its reversed position, as shown in Fig. 5, the greasing-plate A, with a fresh load of cartridges, is again applied thereto, the reversing of the forming-plate bringing the alternate unfilled openings H therein into proper position to receive the second charge of cartridges from the greasing-plate. Thus it will be seen that while the arrangement or pattern of the openings or holes in the forming-plate and in the greasing-plate always remains the same, by reversing the forming-plate the cartriges contained in the greasing-plate are brought into position to exactly fill the open spaces left in a corresponding division of the forming-plate by the first filling. In other words, in the particular form shown, to which, however, the invention is not limited, the same arrangement of the cartridges in the greasing-plate will answer for the filling of the forming-plate, according as it is turned one way or the other. It will also be seen by reference to Fig. 5 that the cartridges supplied to the forming-plate in the second delivery from the greasing-plate are arranged in reverse position with respect to the cartridges supplied in the first filling or delivery—that is to say, the cartridges drop from the greasing-plate in the same position at both deliveries; but at the first delivery the cartridges are dropped into the forming-plate from one side thereof, and in the second delivery they are dropped into said plate from the other side thereof, as clearly seen in Fig. 5.

In practice and as shown, but to which the invention is not limited, each greasing-plate A is divided into three rows, each row containing three of the divisions above referred to, and the forming-plate is divided into nine rows, each row containing three of the divisions. It is obvious, however, that this particular arrangement of the divisions in the greasing-plate and also in the forming-plate may be varied or altered at pleasure without departure from the spirit and scope of the invention. The openings are preferably formed in the forming-plate by boring the same from one side through to the other, thus forming separate chambers, in each of which a cartridge is received, as clearly shown in Fig. 5, and in order to bring the cartridges deposited therein in as close relation as possible without injuring the strength of the forming-plate the holes or chambers are bored so as to be tangent to each other in a line across the length of the divisions of said plate, as clearly shown in Fig. 12, but with a desirable distance left between adjacent transverse rows of the divisions to give strength and rigidity to the forming-plate. With the same object in view a considerable space is left between adjacent divisions, (see Fig. 12,) thus leaving substantial webs or solid portions of said plates between such divisions. Thus it will be seen that the cartridges occupying the same transverse row of holes in each division of the forming-plate occupy such relative positions therein that they will just pass by each other lengthwise, each cartridge being contained in a separate passage or chamber in the forming-plate.

The next step in the operation of boxing the cartridges is to assemble the same in suitable relation and in suitable numbers to be received in the boxes. This result cannot be accomplished so long as the cartridges are in the forming-plate, for the reason that each cartridge is contained in a separate chamber. Therefore it is necessary to deliver the cartridges from the forming-plate in such manner that all the cartridges designed to be contained in a single box are associated together. After this delivery takes place it is also necessary to condense the cartridges thus as-

sembled, so as to take up the space necessarily resulting in the group of cartridges delivered from each division of the forming-plate. Many specifically different arrangements of apparatus for accomplishing this condensation of the groups of cartridges may be devised without departure from the spirit and scope of the generic idea. While I have shown and will now describe a simple and efficient apparatus embodying the principles of my invention and wherein the result sought is accomplished in an expeditious and satisfactory manner, I desire it to be understood that my invention is not limited or restricted thereto, as many changes therein and variations threfrom would readily occur to persons skilled in the art and still fall within the spirit and scope of my invention.

In the particular form shown I arrange what I shall hereinafter designate a "condenser" Q in position to receive the forming-plate G when said plate is reversed into the position indicated in dotted lines in Fig. 4. This condenser is divided in the particular form shown into compartments corresponding in number and arrangement to the divisions of the forming-plate, (see Fig. 15,) each compartment adapted to receive the cartridges contained in one of the divisions of the forming-plate. With the parts in the position indicated in dotted lines in Fig. 4 and in full lines in Figs. 5 and 6 the retaining-plate P, which up to this time has formed a removable bottom or floor for the forming-plate in its reversed position, said retaining-plate being received in the grooves O, as above explained, is withdrawn, thus permitting the cartridges contained in the forming-plate which occupy the required relative positions for being packed in the boxes to drop from their chambers in the forming-plate into the compartments of the condenser, each condenser-compartment receiving the cartridges contained in one of the divisions of the forming-plate, as clearly shown in Fig. 6. When this delivery of the cartridge into the compartments of the condenser is completed, the forming-plate G is again swung upon its pivot N into its initial position to receive further charges of cartridges in the manner above explained. From the foregoing description it will be seen that at this point in the operation all the cartridges designed to be contained in a single packing-box and arranged in suitable packing relation—that is, each alternate cartridge having its butt or cap end presented in one direction and the intermediate cartridges having their cap ends presented in the opposite direction—are assembled in a single compartment of the condenser; but by reason of the space between the unfilled chambers or passages in the forming-plate, each of which contained a cartridge, it will be observed that when the cartridges are thus assembled in the various compartments of the condenser considerable space will be left between the cartridges, as clearly indicated in Fig. 9. Therefore the next step in the operation is to condense these cartridges in each compartment, so as to form a compact mass therein to be received in the packing-box. This result may be accomplished in many specifically different ways. In the particular form shown, to which, however, the invention is not limited, I provide each compartment of the condenser with movable side and end walls, and I provide means for contracting or closing said movable side and end walls upon each other to effect the condensation of the cartridges. A simple and efficient construction for accomplishing this result is shown, wherein the condenser comprises a frame composed of a series of slats R S, (see bottom plan view, Figs. 16 and 17,) the slats R and S alternating with each other. Each of the slats R is provided with plates T, which constitute the side walls of the condenser-compartments. The intermediate slats S have movably mounted thereon projecting flanges W, constituting the end walls of the compartments. The several slats R and S are suitably supported in the condenser-frame for lateral movement relative to each other, and in the particular form shown, to which, however, the invention is not limited, each flange or plate T extends transversely across the condenser-frame and constitutes the side wall for all the compartments in each transverse row of compartments, and, together with the slats R, upon which they mounted, they move laterally with respect to each other, so as to contract the space between them in the operation of condensing the cartridges. The flanges W, however, are mounted upon slats S for movement longitudinally thereof, thus contracting the space endwise of said slats between the ends of each compartment. These end walls W are of a length corresponding to the transverse dimensions of the compartment in its contracted condition. A convenient arrangment of the movable partitions or flanges W is shown, wherein each flange is formed with or has connected thereto a projection A′, arranged to be received in a groove B′, formed longitudinally in the top surface of the slats S, thus constituting a guide for the movable end walls W. (See Figs. 9, 10, and 11.) The end walls of the several compartments of the condenser at the extreme left edge of the condenser-frame, as viewed in Figs. 6, 7, and 15 and which I will distinguish from the other end walls by reference-sign W′, are fixed against movement relative to the slat carrying the movable walls for the compartments contained in the same transverse row. By this arrangement, to which, however, the invention is not limited, I am enabled to effect a contraction of the compartments endwise by moving all the end walls W in the transverse row of compartments toward said fixed end walls W′. To this end the first end wall W next adjacent to the fixed end wall W′ is provided with a guide-arm A′ of a length

which permits the end thereof to abut against a suitable stop or shoulder—such, for instance, as shown at C', Figs. 6 and 7—when said end walls W W' occupy their contracted positions—that is, when said end walls are closed upon each other to condense the cartridges. Similarly the guide A' of the second end wall W from the stationary end wall W' in the same transverse row of compartments of the condenser is shouldered, as at D', (see Fig. 7,) and in the reduced portion forming such shoulder slides a flange E' of the first end wall W, as clearly shown in Fig. 7, a set-screw F' working in a slot (indicated at G') in flange E'. Similarly the guide-arm A' of each succeeding end wall of the transverse row of compartments is also reduced to form a shoulder D' and receiving a flange E' on the preceding end wall W, which flange is slotted, as at G', to receive a set-screw F', carried by the guide-arm A' of the outer movable wall, and so on. From this arrangement it will be seen that when the outermost end wall W—that is, the extreme end wall W at the right-hand side of the condenser-frame, as viewed in Figs. 6 and 15—is moved toward the left the slide-guide A' travels in the longitudinal groove B' in slat S, and the set-screw F' travels in the slot G' in the flange E' of the next adjacent end wall W on the left until the limit of slot G' is reached and the end of the slide A' of the outer end wall abuts against a shoulder upon the next adjacent end wall to the left. This point is reached when the two outermost end walls have been contracted or moved toward each other the desired extent to effect a compression of the compartment to the desired degree endwise thereof, as clearly shown in Fig. 7. Thereafter continued movement of the outermost end wall W toward the left will cause the two outermost end walls to move together in their contracted positions until this movement is taken up by the next adjacent end wall on the left, which point will be reached when the next adjacent compartment has been contracted to the limit endwise thereof, and so on until all the compartments in the same row are contracted endwise by being closed upon the stationary end wall W'—that is, until the slide A' of the first end wall to the right of the stationary end wall W' (see Fig. 7) abuts against the shoulder C'. Thus if the limit of space between the stationary end wall W' and the next adjacent end wall in the same row therewith, through which the movable end wall must travel to effect a compression to the desired degree, is one-fourth of an inch, then the second end wall from the stationary end wall must move through twice that space, or one-half an inch, in order to effect the proper contraction of the first two compartments, and similarly the third wall from the stationary end wall W' must move three times as far, or three-fourths of an inch, and so on. In the same manner after the compartments have been contracted and it is desired to separate the end walls by applying power to the end wall W on the extreme right—for instance, to move the same in a direction away from the stationary end wall W' in the same row therewith—said movable end wall will first move a distance corresponding to the maximum space between it and the next adjacent end wall on the left—that is, until screw F' travels the length of slot G'—and thereafter the two end walls will move in unison until the distance between the next two end walls is increased to its maximum, and so on until all the end walls have been again separated to their widest extent, the movements of the end walls being telescopically upon each other, as will be understood. In the same way provision is made for collapsing the slats R S laterally upon each other, and with this object in view the slat at one of the extreme ends of the condenser-frame is in the particular form shown made immovable or rigid. This slat is distinguished from the others by reference-sign H', (see Figs. 15, 16, and 17,) and the first side wall, which is distinguished from the others by reference-sign T', is carried by said rigid slat. As will be seen by reference to the bottom plan views in Figs. 16 and 17 and the top plan view in Fig. 15, the slat at the opposite extreme end of the condenser-frame, and which is distinguished from the others by reference-sign H^2, carries the extreme movable side wall T^2 and is connected to the next adjacent movable slat S of the condenser through one or more suitable plates J', said plates J' being secured to the slat S and having a slot K' in the end thereof, in which slot operates a screw L', carried by the slat H^2. By this arrangement it will be seen that slat H^2 is permitted lateral movement relative to the next adjacent slat S, dependent in extent upon the length of slots K'. In a similar manner the plates J' are connected through slots K' and screws L' with the next adjacent slat R on the other side of slat S. In the same manner all the slats of the condenser-frame throughout are connected up, thus permitting said slats to be collapsed or moved upon each other when power is applied to the extreme end slat H^2. Thus when the end slat H^2 is moved or collapsed upon its next adjacent slat then the two slats move together until the play between the second and third slats is taken up, and thereafter the three move together toward the stationary slat H', and so on throughout the entire condenser. In this manner the side walls of the condenser-compartments are collapsed or closed upon each other. It is evident that many other arrangements for accomplishing the same result may be employed, and therefore the invention is not limited to the particular construction and arrangement shown, that shown having been found in practice to be suitable and adapted to the purposes in view.

It is obvious that the slat construction of condenser-frame is not absolutely necessary,

as any other construction wherein the side and end walls of the condenser-compartments may be closed upon each other to contract the area of such compartments would serve the same purpose. In case a slatted construction of condenser is employed the cartridges may be prevented from falling through between the slats when such cartridges are delivered to the condenser in any suitable or convenient manner—as, for instance, by means of the plates M′, (see Figs. 11 and 15)—which may be suitably secured upon the top surfaces of the slats, the side walls T having passages N′ formed therein (see Figs. 9 and 10) to accommodate such plates M′, and in order to permit of the movement of the end walls W the plates M′ may be slotted, as at O′.

Any suitable or convenient means may be employed for effecting the movements of the side and end walls of the condenser-compartments toward or from each other to contract or increase the area of such compartments in the operation of condensing the cartridges to receive the packing-boxes or to release the same. While, therefore, I will now describe a particular construction for accomplishing this result, I desire it to be understood that the invention is not limited or restricted thereto, as variations therefrom and changes therein would readily suggest themselves to persons skilled in the art and still fall within the spirit and scope of my invention.

In the particular form shown I provide an operating-lever P′, said lever being pivotally mounted in the particular form shown intermediate its ends upon a suitable part of the condenser-frame—as, for instance, the transverse brace or plate Q′. The inner end of said lever is connected by means of a link R′ to a bar S′. Said bar is connected to to move with a rod A^2, upon which are mounted to slide sleeves B^2. Each sleeve B^2 is connected to the end wall W in each row of compartments in the condenser which is farthest away from the corresponding stationary end wall W′ at the opposite side of the condenser-frame and in the same row of compartments therewith. From this construction it will be seen that when lever P′ is swung about its pivot it will cause the bar S′ and connected rod A^2 to move laterally with respect to themselves and transversely across the condenser-frame, and through the connection of the sleeves B^2 with the end walls at one side of the condenser-frame said end walls are collapsed upon the end wall of the next adjacent compartment in the respective rows of compartments, and thereafter the two end walls move together until the second one is collapsed upon the third the required distance, and the three will then move together or in unison, and so on until all the end walls of all the compartments of the condenser-plate are collapsed or moved toward each other to the required limit. In order that the collapsing upon or the movement of the end walls toward each other may be effected simultaneously with the collapsing or movement of the side walls of the condenser-compartments upon each other, the lever P′ may be provided with an arm C^2, connected to a link D^2, which is connected to the end slat H^2 of the condenser-frame. Therefore it will be seen that when the lever P′ is rocked to effect a movement of the end walls of the several compartments of the condenser toward each other the same movement of said lever will effect the movement of the side walls of the compartments toward each other, thus simultaneously contracting the area of the condenser-compartments at the sides and ends in the manner above described. It will be observed that the slat H^2, to which the end of the link D^2 is connected, is broader than the other slats of the condenser-frame. The object of this construction is to enable said slat to withstand the strain to which it is subjected during the movements of the side walls of the condenser-compartments. In fact, it will be seen the entire power is applied solely upon this individual slat both in moving the side walls of the compartments toward each other and also away from each other. If desired and in order to still further strengthen the slat H^2, a brace J^2 may be provided. (See particularly Figs. 9, 10, and 15.)

In Fig. 15 I have shown in top plan the condenser-frame with the side and end walls separated from each other to their fullest extent, and in Fig. 16 I have shown a bottom plan view of the same frame with the operating parts in the positions corresponding to the open or expanded positions of the side and end walls of the compartments, as shown in Fig. 15. In Fig. 17 I have shown the operating parts in the positions occupied thereby when the side and end walls of the compartments are closed upon each other. In Fig. 9 I have shown in a section taken transversely of the length of the condenser-compartments the arrangement of the cartridges before the condensation thereof takes place. In Fig. 10 I have shown the same parts after the condensation and with the packing-box K^2 inverted over the cartridges and partially telescoped thereon. I have shown in Fig. 7 a view similar to Fig. 10 in a section longitudinally of the condenser-compartments, showing the arrangement after the compression has taken place, with the boxes K^2 partially telescoped upon the condensed batches of cartridges. It will be observed that the top edges of the side and end walls W W′ T T^2 are beveled. The purpose of this arrangement is to facilitate the insertion of the edges of the packing-boxes around the compacted groups of cartridges contained in the several compartments. After the side and end walls of the compartments have been contracted upon each other to condense the cartridges into a compact mass to receive the boxes the boxes are inverted and the edges of the boxes are telescoped over the condensed group of cartridges. The lever P′ is then rocked in a

direction to partially open or move the side and end walls away from each other in order that the boxes may be slipped down into place in the compartments, telescoping over the cartridges. The lever P′ is then actuated to again draw the side and end walls together, thus firmly clamping the boxes in place over the condensed groups of cartridges.

It now remains to describe the means for removing the filled boxes with the cartridges contained therein. This may be effected in many different ways. In the particular form shown, to which, however, the invention is not limited, I hinge or pivot the condenser-frame Q at one side thereof, as shown at L^2. (See Figs. 4, 5, 6, 15, 16, and 18.) By this construction I am enabled to swing the condenser-frame, with the boxes firmly held and clamped therein, into the position shown in Fig. 18, with the bottoms of the boxes resting upon a conveniently-arranged table M^2. When in this position, by suitably operating the lever P′ the side and end walls of the compartments may be separated, thus releasing the filled boxes and depositing the same upon the table M^2. Thereafter the condenser-frame Q may be swung back again about its pivot L^2 into position to receive another charge of cartridges, when the operation above described may be repeated. In practice and in order to effect the operations expeditiously and without delay I may so mount the condensing-frame Q that when it receives a charge of cartridges it may be moved to one side and another condenser-frame brought into the proper position to be filled, so that the operation of condensing the cartridges in the condenser and of applying the packing-boxes and of discharging the filled boxes therefrom may not interfere with or interrupt the operation of the greasing and forming plates and the filling of the condenser-compartments with fresh charges of cartridges. This result may be accomplished in many different ways. In the particular form shown, to which, however, the invention is not limited, the hinge-pin L^2, about which the condenser-frame swings, may be in the form of a rod of extended length, and the condenser-frame may be hinged thereon by means of sleeves P^2, which may freely slide along said rod. At the opposite edge of the condenser-frame I provide one or more shoes Q^2, (see Figs. 5, 6, 16, 17, and 18,) these shoes being arranged to ride upon a track R^2. From this construction it will be seen that when a condenser-frame has received a full load of cartridges from the forming-plate said condenser-frame may be slid along out of the way and an empty frame moved up into position to again receive cartridges in the compartments thereof from the forming-plate while the previously-loaded condenser-frame is having the boxes applied to the cartridges and discharged therefrom.

The operation of the apparatus will be readily understood from the foregoing description and is as follows: Cartridges are shaken or otherwise placed in the holes through the greasing-plate, being suspended by their butt or cap ends in such plate. In this position they may be dipped in the grease and then the greasing-plate placed over the forming-plate and the cartridges deposited therein, a cartridge in this first filling being deposited only in every alternate chamber of the forming-plate and with all their butt or cap ends presented in the same direction. The forming-plate is then reversed side for side, and the same or another greasing-plate similarly filled with cartridges is again emptied into the forming-plate, the cartridges in the second filling being deposited in the alternate chambers of the forming-plate left blank or vacant from the first filling, thus filling all the chambers in the forming-plate with cartridges, half of which present their butt-ends in one direction and the other half presenting their butt-ends in the other direction, the cartridges alternating with each other with respect to the direction in which they present their butt-ends. From the forming-plate the cartridges are deposited into the condenser, where they are condensed into compact groups, each group containing the required number of cartridges to fill a packing-box. The packing-boxes are now applied and are delivered filled with the cartridges in compact condition and properly condensed and arranged ready for storing or shipping when the tops of the packing-boxes are placed thereon.

It will be observed that I provide an exceedingly simple and efficient apparatus for accomplishing these several operations. It will also be seen that the work of packing the cartridges in boxes, which has heretofore been generally accomplished by hand and was consequently slow and tedious, is by the arrangement of apparatus above described accomplished mechanically and expeditiously, thus making a large saving in time, as well as in the expense attending such packing.

I desire it to be understood that many changes and variations in the details of construction and arrangement of parts would readily suggest themselves to persons skilled in the art and still fall within the spirit and scope of my invention. I do not desire, therefore, to be limited or restricted to the exact construction shown and described; but,

Having now set forth the object and nature of my invention and a form of apparatus involving an operative embodiment of the principles thereof and having explained the construction, function, and mode of operation of such apparatus, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent, is—

1. In an apparatus for boxing cartridges, a condenser comprising a frame having a bottom composed of slats, said slats being linked together for lateral movement relative to each other and carrying the side walls of compartments, each compartment adapted to receive

the cartridges to be boxed, and means for moving said slats laterally to close the space between them, whereby said side walls are contracted upon each other to condense the cartridges in said compartments, as and for the purpose set forth.

2. In an apparatus for boxing cartridges, a condenser having compartments, each adapted to receive the required number of cartridges to fill a packing-box, movable slats carrying the side walls of said compartments, said slats being mounted for relative lateral movement, and means for closing said slats upon each other, whereby said side walls are contracted to condense the cartridges contained in said compartments, as and for the purpose set forth.

3. In an apparatus for boxing cartridges, a condenser having compartments, each adapted to receive the required number of cartridges to fill a packing-box, laterally-movable slats, each alternate slat carrying a side wall of said compartments, plates or projections carried by the intermediate slats, said plates or projections being movable longitudinally with respect to the slats and forming the end walls of said compartments, means for moving said slats upon each other to contract the side walls of said compartments, and means for moving the end walls to contract the space between them, as and for the purpose set forth.

4. In an apparatus for boxing cartridges, a condenser having compartments, each adapted to receive the required number of cartridges to fill a packing-box, movable slats carrying the side and end walls of said condenser, means for moving said slats laterally toward or from each other to contract the area of said compartments, and plates secured upon said slats to retain the cartridges in said compartments when supplied thereto, and to prevent the same from falling through said slats, as and for the purpose set forth.

5. In an apparatus for boxing cartridges, a condenser having a bottom composed of slats, said slats being laterally movable with respect to each other, and carrying plates or projections forming the side and end walls of compartments, each compartment adapted to receive the required number of cartridges to fill a packing-box, means for moving said slats toward or from each other to contract or expand the area of said compartments, and plates carried by said slats, said side walls having grooves or passages to receive said plates, as and for the purpose set forth.

6. In an apparatus for boxing cartridges, a condenser having a bottom composed of slats, said slats being laterally movable with respect to each other and linked to each other to permit said slats to be crowded together or separated, each alternate slat carrying projecting plates forming the side walls of compartments, projections or plates carried by the intermediate slats, said projections or plates being movable lengthwise of the slats and relative to each other and forming the end walls of said compartments, plates carried by said intermediate slats and forming the floor for said compartments, and means for moving said side and end walls toward each other respectively, as and for the purpose set forth.

7. In an apparatus for boxing cartridges, a condenser having a plurality of compartments adapted to receive the cartridges, the side and end walls of said compartments being movable toward and from each other to contract the area of said compartments, and a lever connections between said lever and said side and end walls for simultaneously moving the same, as and for the purpose set forth.

8. In an apparatus for boxing cartridges, a condenser having a plurality of compartments, each adapted to receive the cartridges in proper relation and of the required number to fill a packing-box, the side and end walls of said compartments being movable toward and from each other respectively, a lever, and intermediate connections from said lever to said side and end walls, whereby said end walls of all the compartments are simultaneously moved when said lever is actuated, as and for the purpose set forth.

9. In an apparatus for packing cartridges, a condenser composed of slats transversely arranged, the transverse slats at one end of the condenser being stationary, the other of said slats being movable laterally with respect to each other and toward said stationary slat, each alternate slat carrying a longitudinally-arranged projection or plate, forming side walls for compartments, and each intermediate slat carrying projections or flanges forming the end walls of said compartments, the projections or flanges at the end of each of said intermediate slats being fixed, and the other flanges or plates carried by the same slat being movable toward said stationary flange, and means for simultaneously moving said slats toward or from each other and said movable flanges or projections endwise with respect to said intermediate slats, as and for the purpose set forth.

10. In an apparatus for boxing cartridges, a condenser having a bottom composed of movable slats, the alternate slats carrying flanges or plates constituting side walls of compartments, the intermediate slats carrying projecting flanges or plates constituting the end walls of said compartments, a rod mounted for movement longitudinally with respect to said slats, sleeves loosely mounted to slide upon said rod and movable with said rod, said sleeves connected to said end walls, and means for moving said rod and for collapsing said slats upon each other, as and for the purpose set forth.

11. In an apparatus for packing cartridges, a forming-plate adapted to receive the cartridges in suitable relative relation to be packed in a box, a condenser arranged in position to receive the cartridges from said form-

ing-plate, an extended rod arranged at one edge of said condenser, upon which said condenser is sleeved, and a track or way adapted to receive the opposite edge of said condenser, whereby when said condenser is filled it may be replaced with an empty condenser in position to be filled from said forming-plate, as and for the purpose set forth.

In witness whereof I have hereunto set my hand, this 3d day of January, 1899, in the presence of the subscribing witnesses.

GERSHOM MOORE PETERS.

Witnesses:
J. H. McKIBBEN,
F. C. TUTTLE.