T. R. WEYANT.

PACKING MACHINE.

APPLICATION FILED MAY 21, 1906.

932,732.

Patented Aug. 31, 1909.

3 SHEETS—SHEET 1.

Fig: 2.

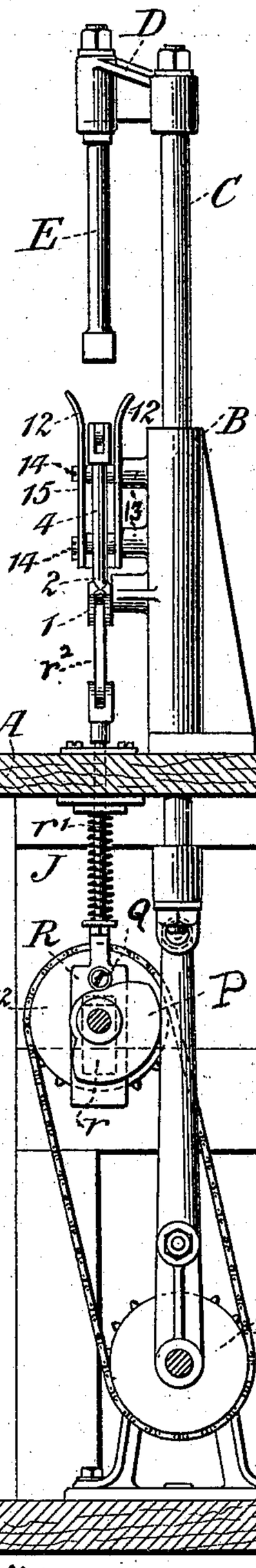
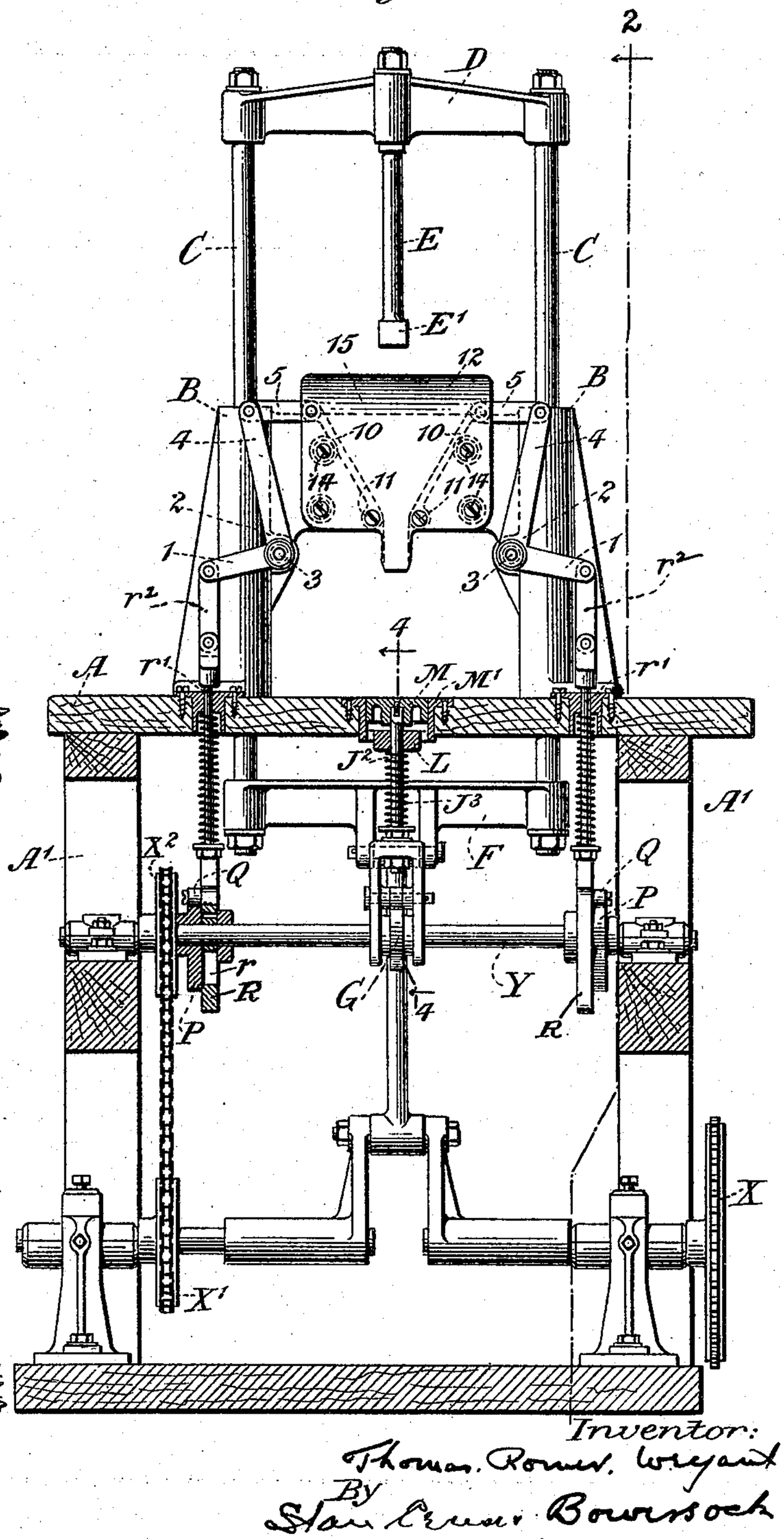


Fig: 1.



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3 SHEETS—SHEET 2.

Fig: 4.

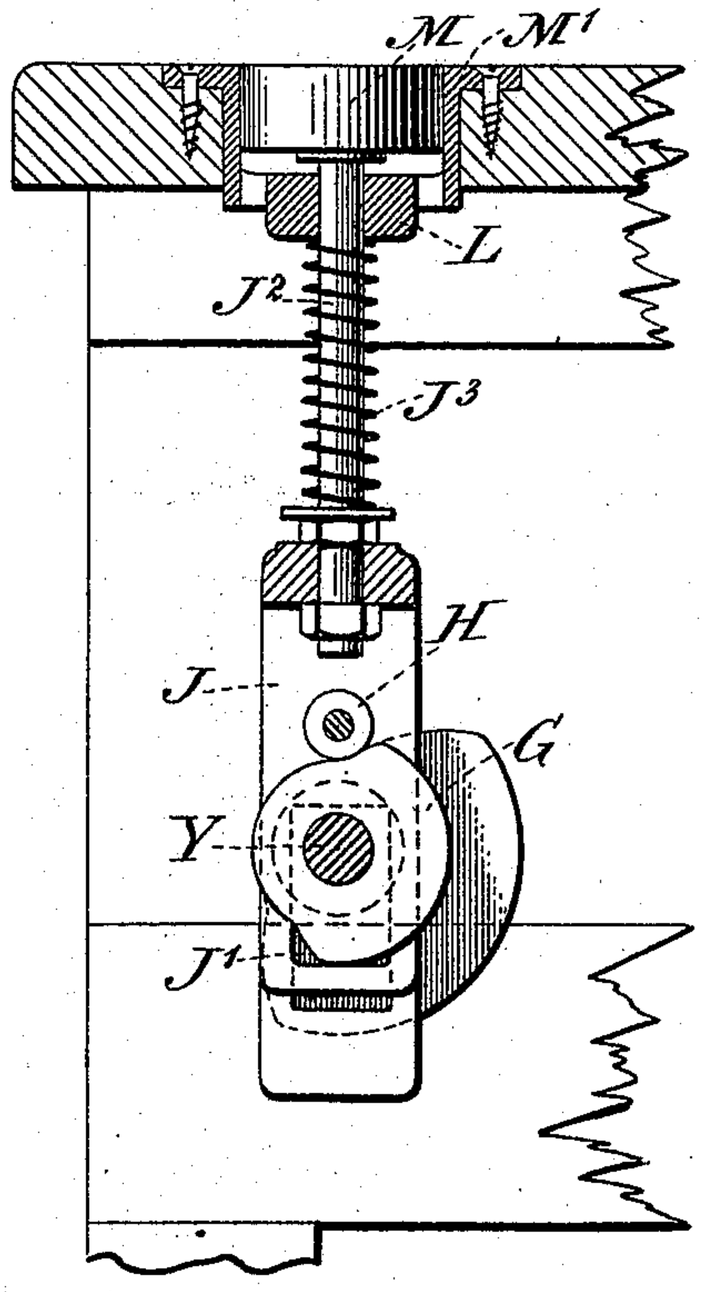
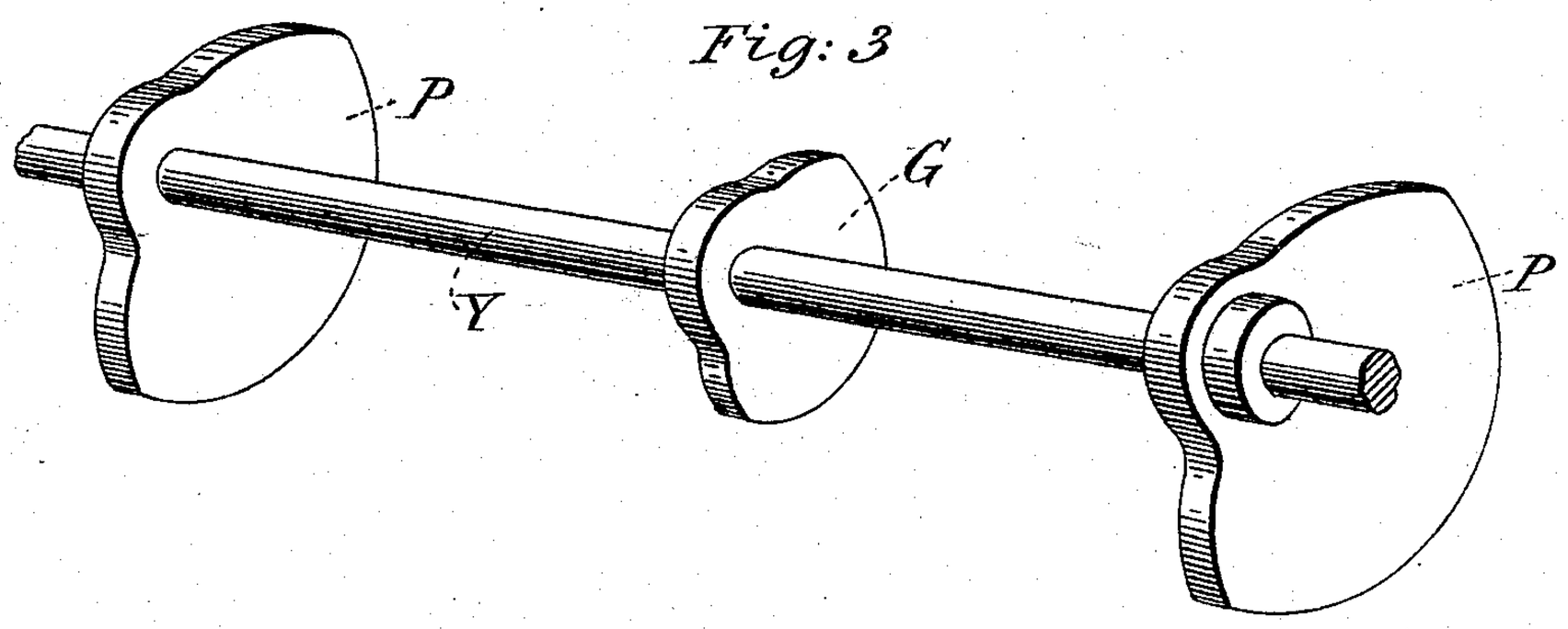


Fig: 3



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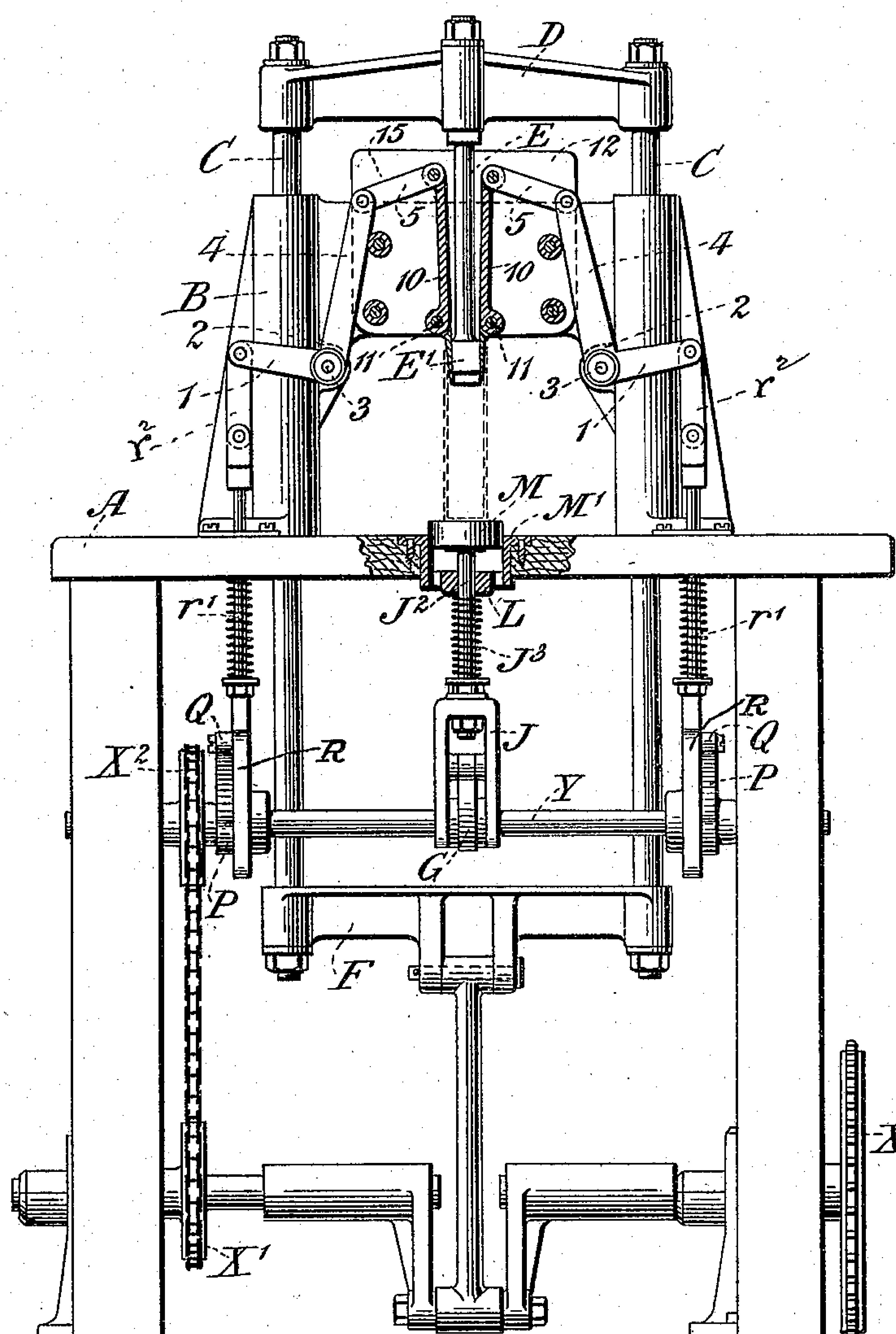
3 SHEETS—SHEET 3.

Fig: 5.



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UNITED STATES PATENT OFFICE.

THOMAS ROMER WEYANT, OF NEW YORK, N. Y., ASSIGNOR TO UNITED STATES AUTOMATIC WEIGHING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

PACKING-MACHINE.

932,732. Specification of Letters Patent. Patented Aug. 31, 1909.

Application filed May 21, 1906. Serial No. 317,925.

To all whom it may concern:

Be it known that I, THOMAS ROMER WEYANT, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Packing-Machines, of which the following is a specification.

My invention relates to improvements in packing machines and more particularly to that class of machinery adapted for packing firmly and evenly into a carton or other suitable package, a predetermined amount or weight of any substance delivered to the packing machine. The quantity of material to be packed will, in some cases, be delivered by hand and in other cases by an automatic weighing or measuring device, but in either event it is important to insure the entire amount of the substance delivered reaching the carton and being firmly and evenly packed therein. By the use of my invention both these results are accomplished.

I have illustrated the preferred form of my invention in the accompanying drawings in which similar reference characters designate corresponding parts, and in which,

Figure 1 is a front view partially in elevation and partially in section. Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1. Fig. 3 is a detail view of a cam-shaft and cams. Fig. 4 is a cross-section of a part of the apparatus shown in Fig. 1, taken on the line 4—4 of Fig. 1. Fig. 5 illustrates the same apparatus shown in Fig. 1, but with certain parts broken away and with the operating parts in a different position.

Referring now to these drawings in detail, A designates a table or other suitable support, which is mounted upon any suitable frame, such as that marked A′. B—B designate two hollow tubes or guides rigidly mounted in any suitable way upon the main table A. Working up and down and through these tubular guides B—B are two supporting rods C C arranged substantially parallel to each other and connected at or near their top ends by a cross-head D and at or near their bottom ends by a cross-head F. Arranged substantially at the center of the upper cross-head D is a plunger or piston E, provided with a head or packer E′ of substantially the same size and shape as the interior of the package or carton to be packed. The supporting rods C—C and the other parts may be reciprocated vertically in any suitable manner. As shown, the lower cross-head F is connected by a crank-shaft to a source of power communicated through the driving wheel X. Also arranged on the main-shaft is a sprocket-wheel X′ connected by a sprocket chain with another sprocket-wheel X^2 mounted on what may be called a cam-shaft Y. Rigidly connected to this cam-shaft and, as shown, at approximately its central point is a double operating cam G which co-acts with a cam lug or roller H which is rigidly secured to a plate J provided with an aperture J′ fitting over the cam-shaft Y to serve as a guide and to insure substantially vertical movement of the plate J.

Extending upwardly from the plate J is a connecting-rod J^2 which is connected at its upper end with a small centrally arranged operating table M. As shown, this table is arranged directly beneath the plunger E. It is free to move vertically up and down to a limited extent and as shown is surrounded with a packing M′ of any suitable character. Arranged in the lower portion of this packing and rigidly secured thereto is a block L provided with an aperture centrally arranged to permit of the passage through the same of the rod J^2. This rod J^2 is surrounded with a spiral spring J^3, one end of which abuts against the lower end of the block L and the other against the upper surface of a nut or other suitable projection on the lower part of the rod J^2. Obviously the spring may be confined and secured in any suitable manner and in fact a large number of modifications and arrangements of these parts will be apparent to one skilled in the art to which this device appertains.

As shown more particularly in Figs. 3 and 4 the table operating cam G is formed with a portion having a comparatively small diameter from which the cam surface extends at a sharp angle to the maximum diameter which continues, as shown, for approximately 150 degrees, then returning at an angle of substantially the same degree as that above mentioned to its minimum diameter. Considering the minimum diameter of the cam to be the rest position of the machine it is obvious that immediately upon the machine being put into motion the roller H, the plate J, connecting-rod J^2 and cen-

trally arranged operating table M will be rapidly and immediately forced upward to an elevation equal to the difference between the minimum and the maximum radii of the cam. As the machine continues to revolve the operating table will be held in this raised position until the cam-shaft Y is revolved 150°, when the operating table will abruptly be returned to its normal or rest position. The cartons may be delivered to this operating table M in any suitable manner, either by hand or by machinery.

Secured to the cam-shaft Y and, as shown, on either side or the cam G are two other cams P, P, each of which engages with a cam-roller Q, Q, or other suitable projection secured to a plate R provided with an aperture r fitting over the cam-shaft Y and serving as a guide to insure the movement of the plate being in a substantially vertical direction. Extending upwardly from each of these plates R, R, is a connecting-rod r', r'. These connecting-rods r', r', pass through suitable packings arranged in the main table A and above the said table are pivotally connected to connecting-bars r^2, r^2, which are also pivotally connected to the lower arms 1 of bell-crank levers 2 fulcrumed at suitable points such as 3 to parts rigidly connected with the main table. As shown they are pivoted at the points 3 to posts extending from a web connecting the tubes B B and preferably cast integral therewith. The upper arms 4 of these bell crank levers are pivotally connected to links 5 which extend inwardly and are in turn pivotally connected at their inward ends to the side walls 10—10 of the hopper 15. These side walls are pivotally connected at their bottom edges in any suitable manner as by a hinged or screw rod 11, 11. The other sides or rather the ends 12—12 of the hopper 15 are, as shown, rigid pieces of metal or other suitable material preferably flared outward at their upper ends. These end pieces 12—12 may be supported in any suitable manner. As shown, studs 13 project from the web connecting the tubular supports B—B, and the end pieces 12—12 are secured thereto by screws 14—14 which pass through both end pieces securing them to the projection 13. The space between these end pieces 12—12 is determined, as shown, by providing stops or blocks intermediate the same through which the screws 14 pass.

As shown more particularly in Fig. 3 cams P—P have a much less abrupt inclination and a greater maximum diameter than the table operating cam G already described. In practice, for example, assuming the minimum radius of each of these cams to be one inch, the maximum radius of the table operating cam will preferably be one and one quarter inches ($1\frac{1}{4}$) and that of the other cams P, P two and three eighth inches ($2\frac{3}{8}$). The maximum radius of the cams P, P in such cases extends throughout about 130°.

The operation of my device as shown in the accompanying drawings is briefly as follows:—When power is applied to the main driving wheel X the crank-shaft is operated to reciprocate the cross-head F, the connecting rods C, C and the piston E and its packer E′. Obviously, the sprocket-wheels X′ and X^2 are also revolved which results in rotation of the cams. When the machine is at rest or in normal position, the piston will be in its highest position and the cams in their lowest. Obviously, the use of the crank-shaft and cams provided with a portion of uniform minimum radius allows the parts to remain in the above stated position for a short period of time during each complete revolution of the main driving wheel, even when the machine is operating continuously. While the parts are in this normal or rest position the carton or package is placed by hand or otherwise on the operating table M and the desired amount or predetermined weight of the substance to be packed delivered to the hopper 15. As the main shaft continues to revolve the sharp cam face of the central or table operating cam G quickly forces the operating table and the carton upward for a short distance thereby insuring the spout of the hopper 15 entering the package. Gradually the pivoted sides 10, 10 of the hopper 15 are forced together by the links 5, bell cranked levers 2, connecting rods r' and the cams P, P. The crank shaft brings the piston E and its packer E′ down through the collapsed hopper and its spout, thus at once insuring the complete removal from the hopper of the entire amount or weight of material delivered thereto and also ramming down the substance into the carton and packing the same firmly and evenly. This having been accomplished the crank-shaft draws the piston and packer upward, the cams P, P and other connections, draw back the sides of the hopper, and the central cam brings the operating table and the carton back to the original position.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a packing machine, the combination of a movable support for a package, a hopper having two opposing movable sides, means for moving said sides toward and away from each other, a reciprocating packer movable through the hopper, and means for moving said support toward and away from the hopper, for the purpose specified.

2. In a packing machine, the combination of a movable support for a package, a hopper having two movable opposing sides above said support, a reciprocating packer

movable through the hopper, a rotary crank shaft connected to said packer for reciprocating the latter, means operated by said crank shaft for moving said support, and means operated by said crank shaft for moving said opposing sides of the hopper toward and away from each other.

3. In a packing machine, the combination of a movable support for a package, a hopper above said support, a reciprocating packer movable through the hopper, a rotary crank shaft connected to the packer to reciprocate the latter, a second rotary shaft connected to be driven by said crank shaft, and a cam on the second shaft for moving said package support toward the hopper.

4. In a packing machine, the combination of a movable support for a package, a spring normally tending to move the support to its lowest position, a hopper above said support, a reciprocating packer movable through the hopper, a rotary crank shaft connected to the packer to reciprocate the latter, a second rotary shaft connected to be driven by said crank shaft, and a cam on the second shaft for moving said package support toward the hopper.

5. In a packing machine, the combination of a hopper having two movable opposing sides, a package support below the hopper, a reciprocating packer movable through the hopper, a rotary crank shaft connected to the packer to reciprocate the latter, a second rotary shaft connected to be driven by the crank shaft, two vertically reciprocating rods, cams on said second shaft to engage the respective rods and lift them, and connections between said respective rods and the respective movable sides to move the latter toward each other when the rods are lifted.

6. In a packing machine, the combination of a hopper having two movable opposing sides, a package support below the hopper, a reciprocating packer movable through the hopper, a rotary crank shaft connected to the packer to reciprocate the latter, a second rotary shaft connected to be driven by the crank shaft, two vertically reciprocating rods, springs normally tending to move the rods to their lowest position, cams on said second shaft to engage the respective rods and lift them, and connections between said respective rods and the respective movable sides to move the latter toward each other when the rods are lifted.

7. In a packing machine, the combination of a hopper having two movable opposing sides, a package support below the hopper, a reciprocating packer movable through the hopper, a rotary crank shaft connected to the packer to reciprocate the latter, a second rotary shaft connected to be driven by the crank shaft, two vertically reciprocating rods, springs normally tending to move the rods to their lowest position, cams on said second shaft to engage the respective rods and lift them, two pivoted bell crank levers, and connections between the arms of the levers and the said rods and movable sides.

In witness whereof, I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

THOMAS ROMER WEYANT.

Witnesses:
G. C. BINDSEIL,
HENRY R. BAUER.