

(No Model.)

2 Sheets—Sheet 1.

J. KOELNER.
BRAN PACKER.

No. 591,260.

Patented Oct. 5, 1897.

Fig. 2.

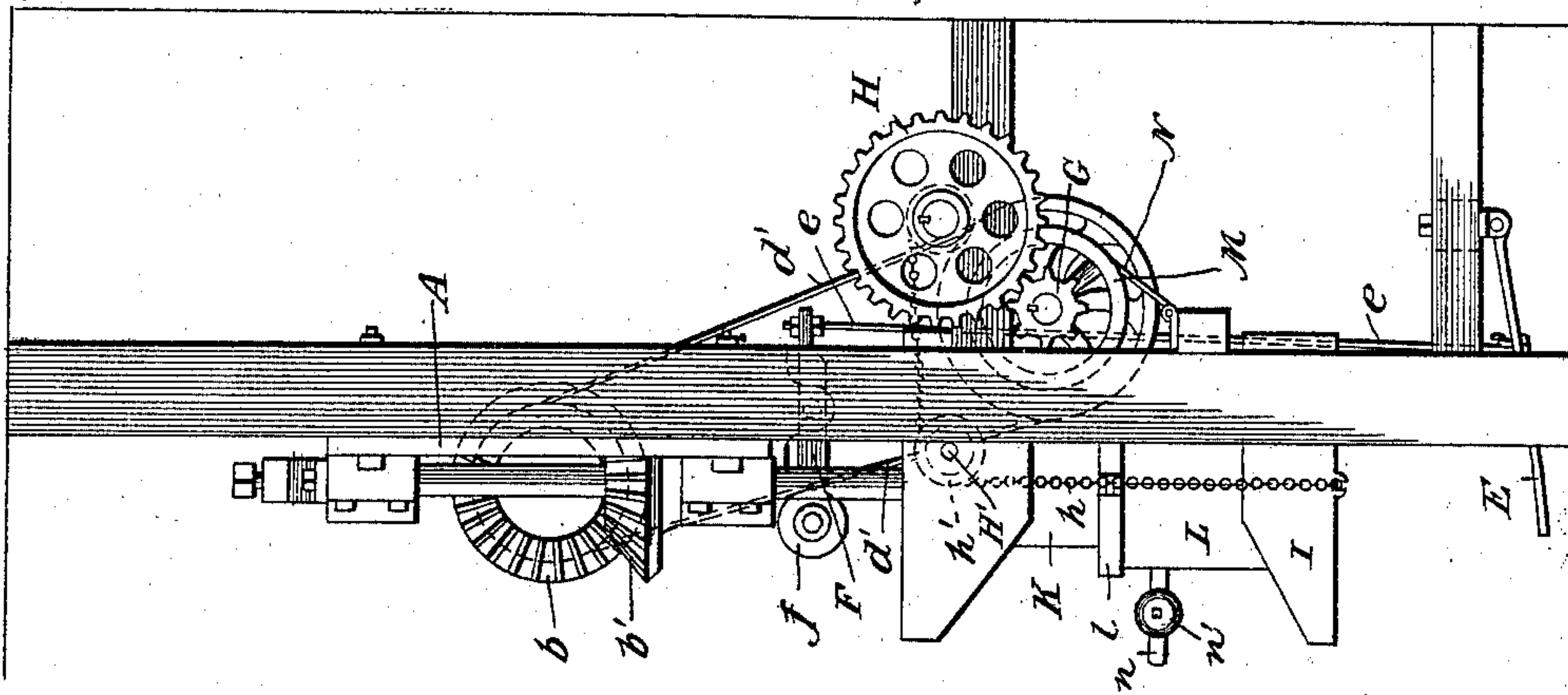
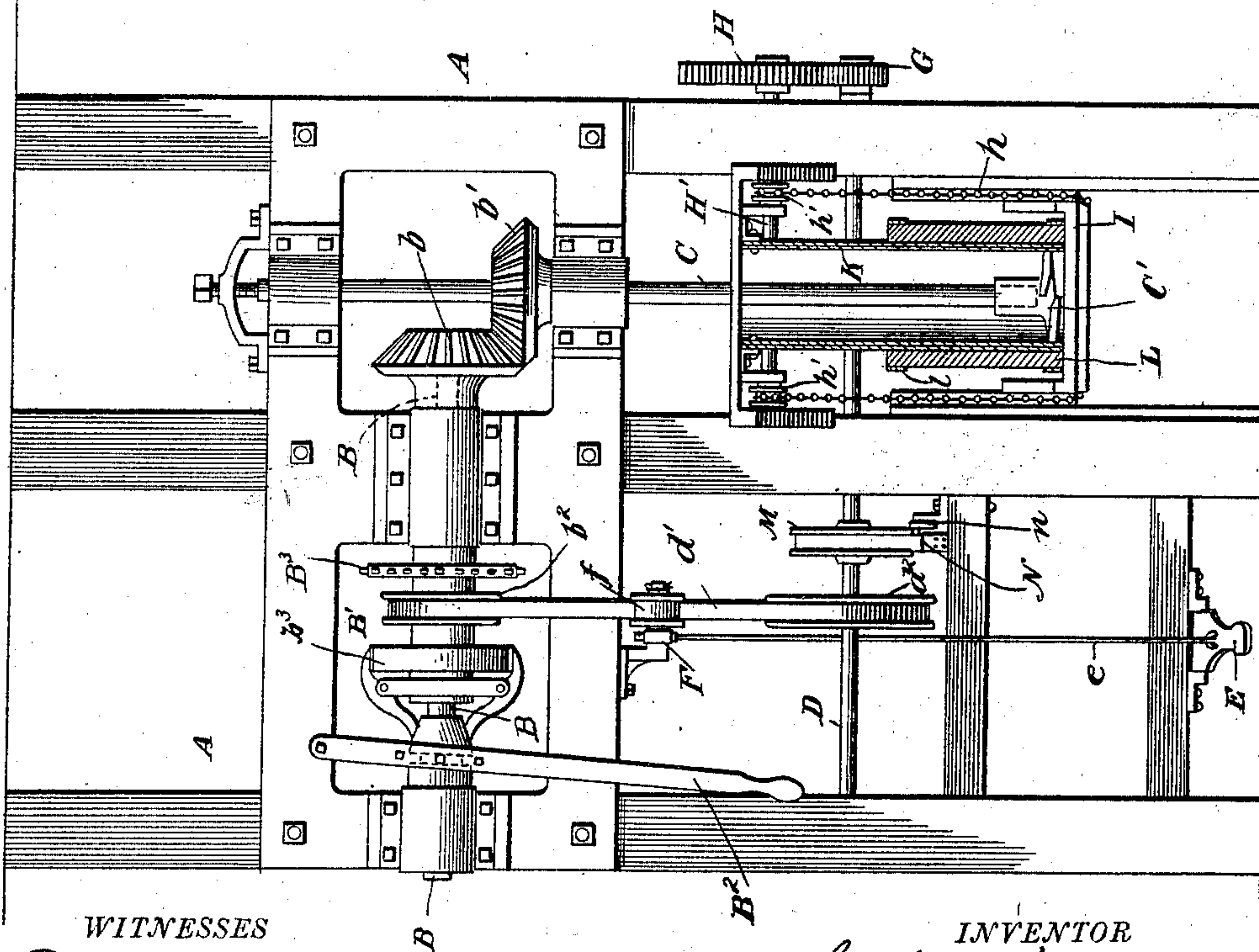


Fig. 1.



WITNESSES

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his Attorneys

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Fig. 3.

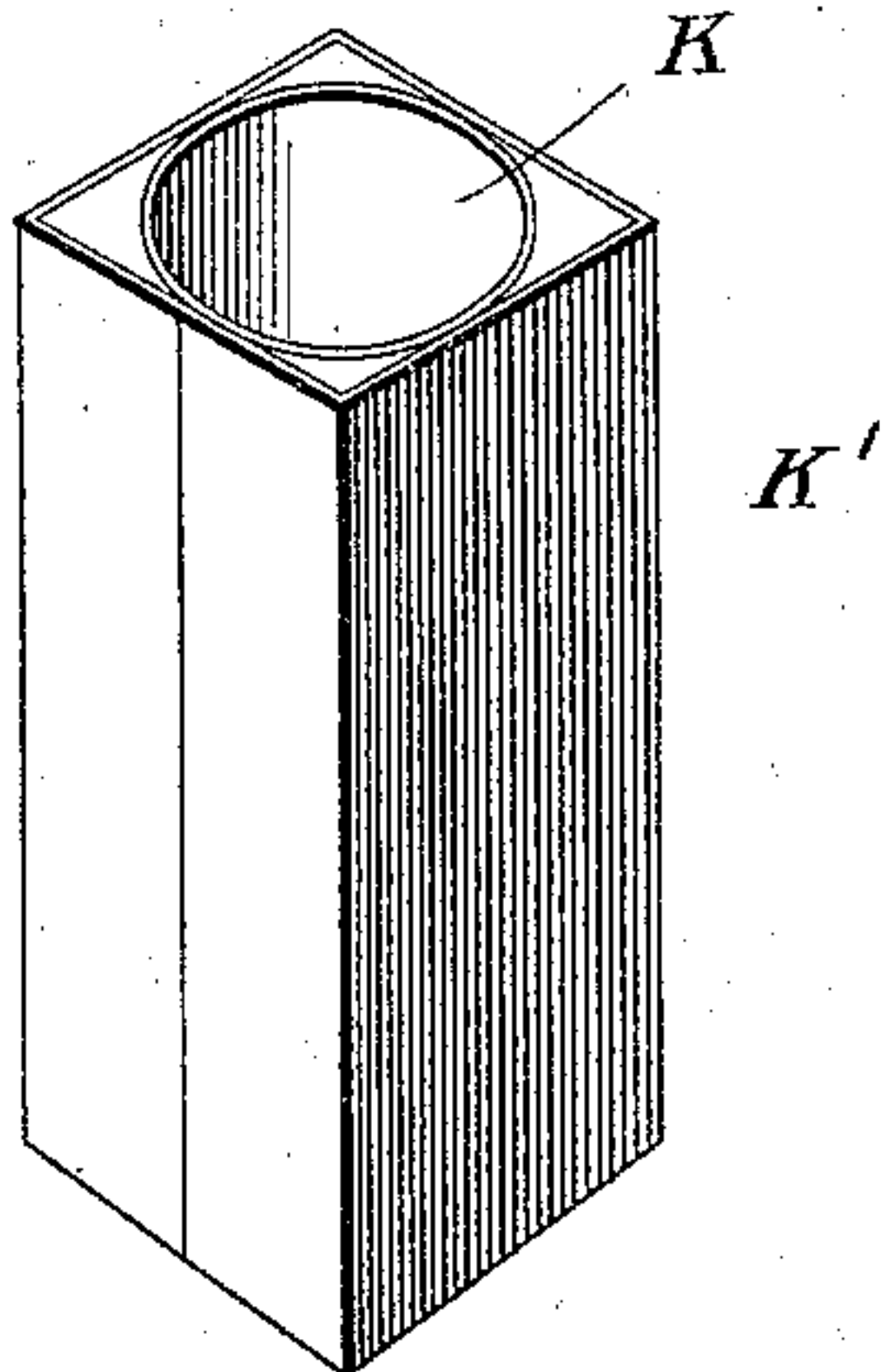


Fig. 5.

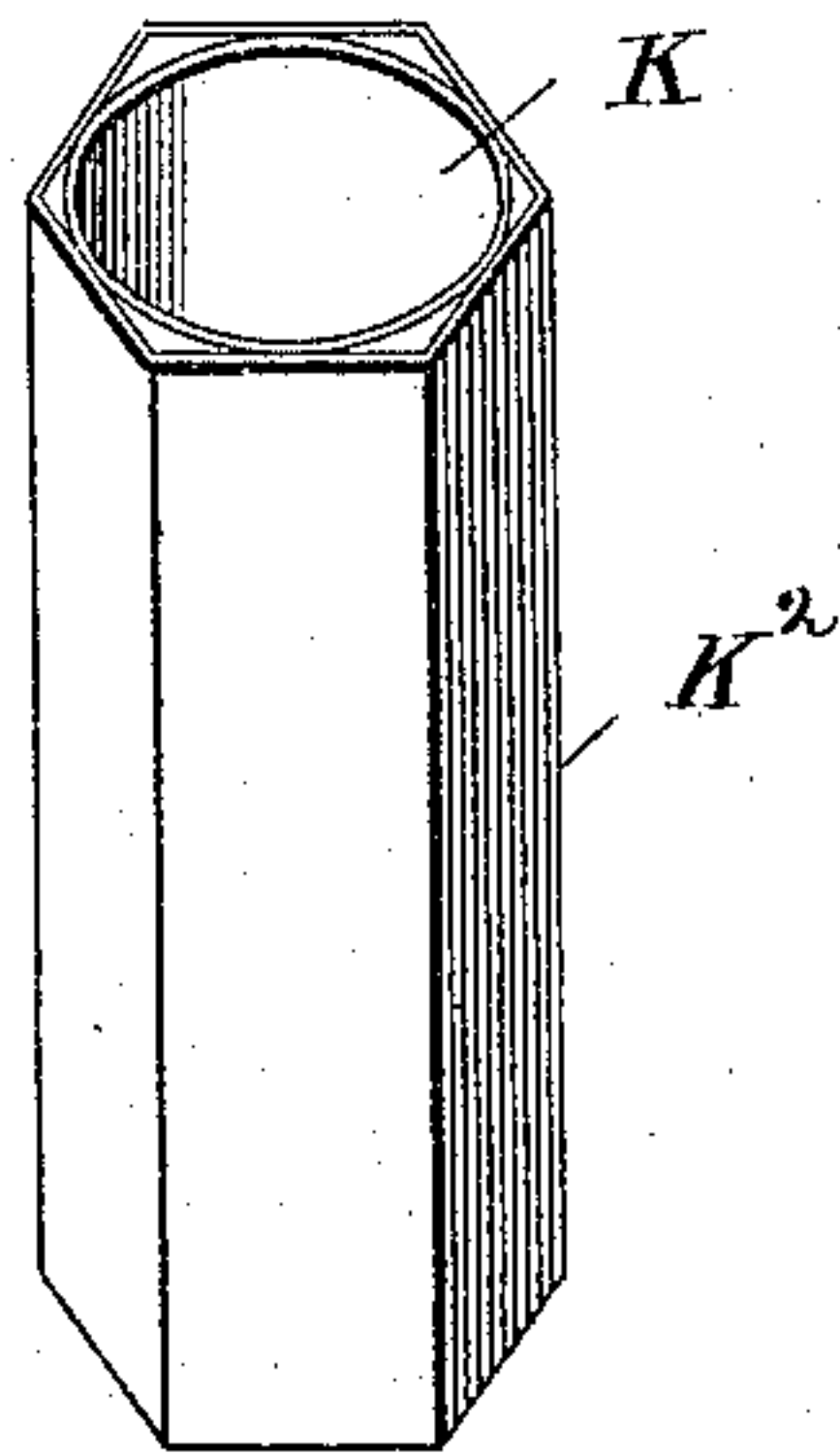


Fig. 4.

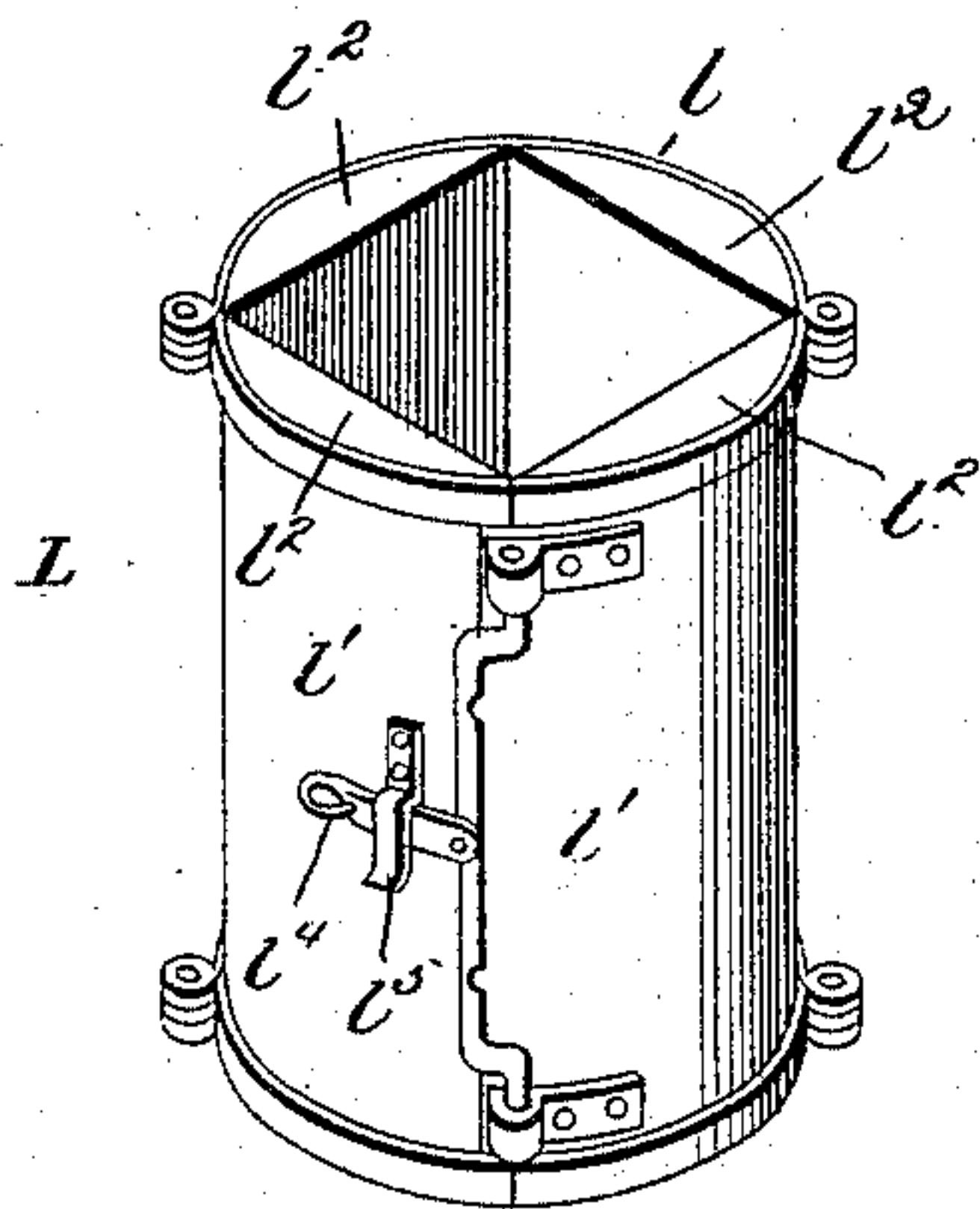
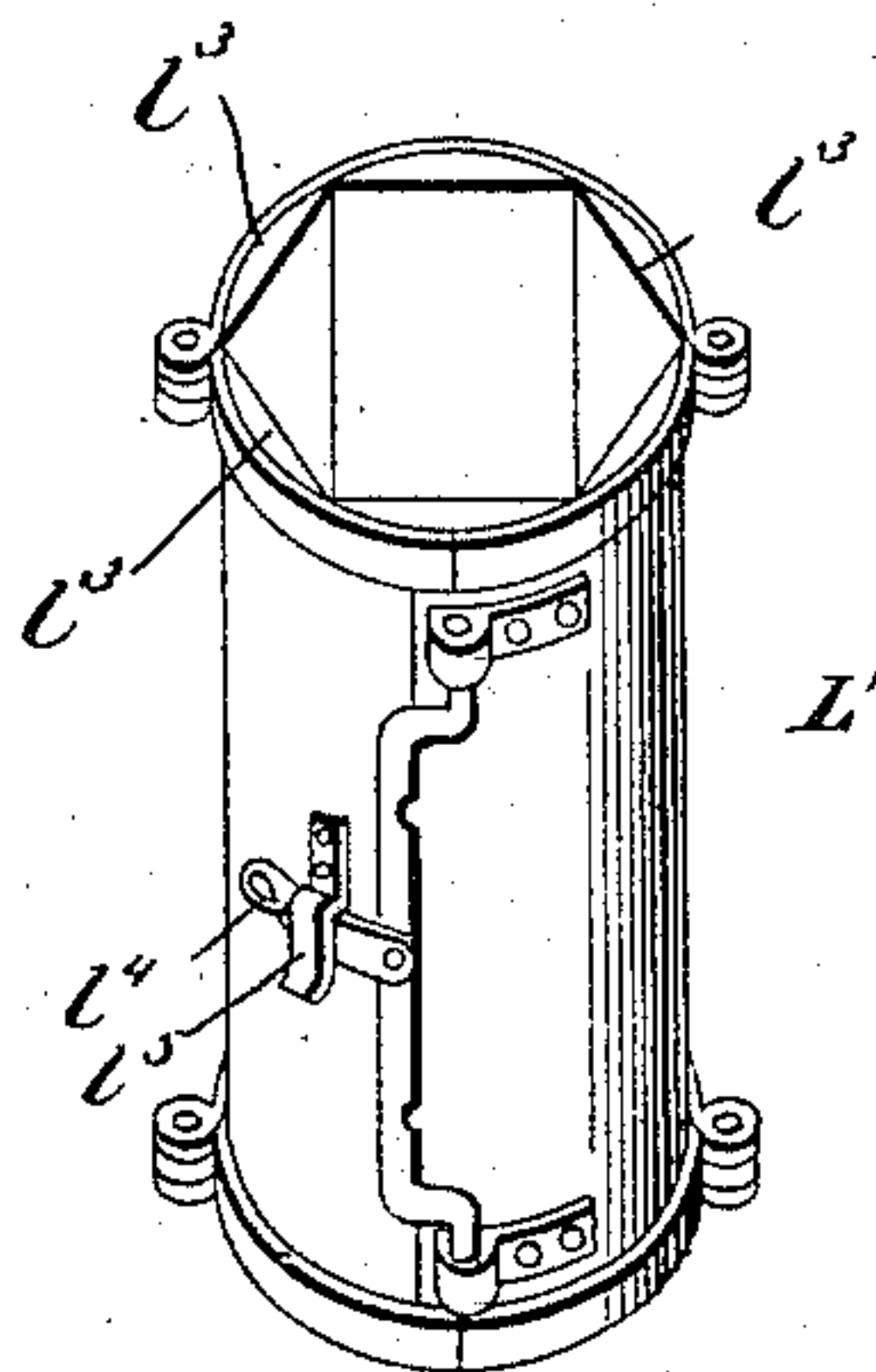


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN KOELNER, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO THE BALLARD
& BALLARD COMPANY, OF SAME PLACE.

BRAN-PACKER.

SPECIFICATION forming part of Letters Patent No. 591,260, dated October 5, 1897.

Application filed February 18, 1897. Serial No. 624,081. (No model.)

To all whom it may concern:

Be it known that I, JOHN KOELNER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Bran-Packers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines or apparatus for packing the products of grain and other materials, particularly bran and offal, in small or angular packages suitable for shipping in vessels or transporting in railway-cars or other vehicles.

In preparing bran, offal, &c., for transportation, particularly for shipment in vessels, it is desirable to get the material in the smallest possible compass, as the space ordinarily required for packing a given weight of material, particularly bran, is so much in excess of the space required for packing the same quantity by weight of flour or meal that the freightage is considerably greater on bran than on flour or meal, and hence it is desirable to pack the bran in packages of such shape that the greatest quantity possible to be packed within a given space may be stowed in the hold of a vessel.

The primary object of my invention is to provide improved means for packing bran and other material in square or angular packages, which are adapted to be compactly placed in the hold of a vessel or a railway car or carriage for transportation, so as to economize in the use of space and permit a greater quantity of material to be stowed in a given space than is possible when the material is packed in round or similar packages.

The invention will first be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and then pointed out in the claims at the end of the description.

Referring to the drawings, in which similar letters of reference are used to denote similar parts, Figure 1 represents a front elevation, partly in section, of a machine embodying my invention, the usual hopper and

spout or conduit for conveying the material to be packed from the source of supply to the packing-auger being omitted. Fig. 2 is a side elevation of the machine. Fig. 3 is a perspective view of a preferred form of stationary funnel or tube within which the packing-auger works. Fig. 4 is a perspective view of the outer casing or jacket for inclosing said tube, the jacket being adapted to be mounted on and to move with the movable platform. Fig. 5 is a perspective view of a modified form of funnel or stationary tube, and Fig. 6 is a perspective view of a modification of the outer casing or jacket.

The letters A A denote the framework of the machine, with which may be connected in any suitable manner a feed-hopper and conduit or spout for conducting the material to be packed into the stationary funnel or tube within which the packing-auger works.

B denotes a driven shaft for imparting motion to the auger-shaft by means of a bevel-wheel b thereon, which meshes with a similar bevel-wheel b' on the vertical shaft C, carrying the packing-auger C'. These shafts may be journaled in suitable bearings on the frame, as shown, or in any proper manner and provided with a suitable clutch device at B' and a hand-lever B² for shifting the clutch device so as to throw the shaft B in and out of gear with the sprocket-wheel or gear B³ at the will of the operator. The sprocket B³ is loose on the shaft B and is preferably continuously driven by a suitable chain or belt connected with a similar wheel on the main driving-shaft. (Not shown.) A band wheel or pulley b^2 and a friction-disk b^3 are fixed to the hub of the sprocket B³, so as to revolve freely therewith on the shaft B, and by means of the usual clutch-levers engaging the friction-disk b^3 the latter may be locked to the shaft B, so as to cause said shaft to revolve with the said disk and sprocket-wheel and thereby impart motion to the auger-shaft.

D denotes a counter-shaft which is journaled in suitable bearings on the frame and arranged to receive motion from the driven shaft B by means of an endless belt or band d' , which passes around the band wheel or pulley b^2 and over a similar band wheel or pulley d^2 , fixed on the counter-shaft D, said

belt being preferably loose on said band-wheels, but so arranged that it may be tightened at the will of the operator for imparting motion to the counter-shaft by exerting a pressure on the band which will cause the main and counter shafts to revolve together.

In order to tighten the band d' so as to cause the shaft D to revolve, I may employ a foot lever or pedal E, connected by a rod e with a rocking or pivoted lever F, carrying a pulley or wheel f , journaled thereon so as to engage the band d' and tighten the latter when the foot-pedal is depressed.

On the shaft D is fixed a pinion G, which meshes with a driving-gear H, secured to a shaft H', which is journaled in the frame A and connected by chains h with the movable platform I, so as to adapt the latter to be raised when said shaft H' is revolved in one direction and to be lowered when the shaft is revolved in an opposite direction.

The movable platform I may be of any suitable construction and provided with suitable guiding means at either side thereof, similar to a window-sash, to adapt the platform to be raised and lowered and maintained in an upright position, as is common in this class of machines.

The auger-shaft C has a packing-auger C' thereon, arranged to revolve within a stationary funnel or tube K, which latter is preferably incased in a square or rectangular casing K', for a purpose to be hereinafter explained, though said casing may in some cases be dispensed with, as I will presently explain.

Below the incased funnel or tube K and in alinement therewith, so as to inclose or surround the same when the platform is elevated, is placed an outer casing or jacket L, which is mounted upon the platform I so as to be raised and lowered therewith in telescopic connection with said tube or its casing K'. This jacket L preferably consists of a semi-cylindrical or larger segmental portion l and two quadrants or smaller segmental portions l' , hinged to the portion l , so that the quadrants may be turned outward upon their hinges to open the casing or jacket to permit the removal of the sack or bag, or for other purposes. Segmental strips or solid blocks l^2 of wood or other suitable material are placed in the cylinder formed by said hinged segments, with their convex surfaces adjacent to the circumference of the cylinder, so as to form a square or rectangular opening through the jacket to receive a similarly-shaped funnel or funnel-casing, so that when the jacket is placed over such funnel or casing the latter may exactly fill the opening in the jacket, thereby making a stronger and more compact jacket and providing a firm backing for the sides of the bag that is being filled, in order that a square or rectangular package may be formed.

Any suitable means may be employed for securing the quadrants or segments l' of the

jacket in a closed position—such, for instance, as the latch l^4 on one segment l' engaging a catch l^5 on the other segment l' , as shown in Fig. 4.

In Figs. 5 and 6 I have shown a modification of the casing for the funnel or tube in which the packing-auger works and of the outer casing or jacket therefor, the funnel-casing, in this instance marked K², being hexagonal in cross-section, while the jacket L' is constructed with a hexagonal opening there-through—assuming the parts thereof to be in a closed position—to adapt the same to conform to the exterior form of the funnel-casing.

Instead of four segmental filling-strips, as in Fig. 4, six similar strips l^3 are provided, as shown in Fig. 6, so as to make the opening hexagonal in form. A greater or less number of strips may of course be provided, so as to form an octagonal or other polygonal opening adapted to form packages which are angular or polygonal in cross-section, so as to adapt a greater number thereof to be stowed in a given place than is possible with round or cylindrical sacks or packages.

While I have described the outer casings L and L' as being composed of outer segmental plates hinged together and inclosing solid segments of wood or other material, it is obvious that simple bands might be placed about the wooden segments and that any suitable material may be employed for the plates or filling; but for durability and efficiency in use metallic plates of the character described and shown, hinged together in the manner indicated in Figs. 4 and 6, are preferred.

The packing-auger C' may be of any improved construction, but I preferably employ an auger having a single spiral blade or flange thereon, forming a gradual inclined plane from the highest point or toe thereof to its lowest point or heel, said heel and toe portions terminating the one over the other at the point of discharge and being slightly separated from each other to provide an opening between them. Said heel and toe portions extend inwardly from the circumference of the auger to substantially the axis thereof or center of rotation, so as to form an opening equal or substantially equal to one-half the diameter of the auger, whereby I avoid the heating and injurious effects which are due to the use of an auger of the usual construction having a central boss or projection on the under surface thereof and effect an equal distribution of the material and cause the same to be packed more evenly and uniformly than is possible with augers of the usual form. This auger, however, forms the subject-matter of a separate application filed simultaneously herewith, and hence is not specifically claimed as a part of the invention covered by this application.

In machines of this character as heretofore constructed it is the common practice to suspend the movable platform by chains depend-

ing from a shaft, to which motion is imparted for raising the platform in such manner that the pressure of the packing-auger is exerted upon the platform some distance in front of the points of support or resistance opposing the pressure of the packing-auger. This tends to cant or tilt the platform and break or injure the machine and causes the platform to bind and descend with an irregular or wobbling movement, thereby causing the pressure to be exerted unevenly on the material that is being packed and producing an unevenly-packed sack or package. In order to overcome this objection, I so arrange the suspending chains or cables $h\ h$ that the platform is supported from its base at preferably diametrically opposite points so arranged that the resistance opposed to the pressure of the auger shall be centrally disposed, the points of support for the platform being on a line passing through the center or substantially the center of rotation, thereby equalizing the pressure on opposite sides of the auger, preventing the platform from canting or binding, and sustaining it in an erect position at all times, so as to adapt the auger to exert an even pressure on the material from its center to its circumference.

In order to hold the platform I stationary in whatever position it may be placed and to adapt it to yieldingly resist the pressure of the packing-auger as it recedes with the gradual filling of the bag, any suitable brake mechanism may be employed. In the form shown I employ a brake wheel or pulley M, which is made fast on the counter-shaft D and is encircled by a steel or other suitable band N, to which is connected a hand-lever n , having a weight n' adjustably secured thereon. This brake mechanism is so constructed and arranged as to impede the descent of the platform, thereby regulating the degree of compression of the material to be packed or compressed. This also insures a uniform pressure upon the material in packing.

In operation for the purpose of packing bran or other materials the bag or sack is placed over the tube or funnel casing K', and the platform I is then raised to its highest position underneath said funnel, as shown in Figs. 1 and 2, so that the bag may rest thereon, whereupon the auger being put in motion by shifting the lever B², so as to cause the shaft B to revolve with the friction-clutch, and the material to be packed being constantly spouted into the cylinder, a certain quantity of the material will be forced into the sack or receptacle at each rotation of the auger, and as this operation continues the platform will gradually descend or recede from the tube while the bran or other material is being forced into the receptacle by the feeding and packing auger, the density to which the material is compressed being determined by the resistance which the platform opposes to the pressure of the auger. This resistance may be regulated by increas-

ing or decreasing the pressure or friction which the band N exerts on the friction brake-wheel M either by hand or by adjusting the weights on the lever n . The platform having completed its descending movement and the bag or sack being filled, the rotation of the feed-auger is stopped by shifting the clutch-lever B², and thereupon the outer casing or jacket L may be opened, the filled sack removed, and another sack placed upon the funnel or funnel-casing K'. To raise the platform I, the operator with his foot depresses the pedal E, thereby tightening the belt d' , which will cause the shaft D to rotate with the continuously-driven pulley b^2 and raise the platform to the position indicated in Figs. 1 and 2, and by removing his foot from the pedal the operator releases the belt, thereby stopping the platform in the desired position for filling the sack, whereupon the operation of filling another sack may be repeated.

The platform may be lowered or permitted to descend with greater or less rapidity by wholly or partly releasing the friction of the band N on the brake-wheel M, which may be done by operating the lever n . By these means I am enabled to form an angular package by the use of a round auger, this result being accomplished when the square or polygonal funnel-casing is used by stretching the sack or bag to be filled over said casing and inclosing the same in a jacket having the same angular interior formation as the exterior contour of the casing inclosing the tube, (though the jacket may be, and preferably is, cylindrical on the outside,) whereby the sack is firmly held in position between two angular surfaces of the shape desired for the finished package, and by reason of the pressure with which the material is forced from the cylinder into the package and compressed therein it is spread and forced to assume the shape desired and is so firmly packed that the angular shape thereof will be retained, thus adapting large numbers of such packages to be stowed in much less space than is required for a like number of round packages.

While I preferably employ a funnel-casing of square or polygonal shape in cross-section inclosing the tube in which the packing-auger works and an outer casing or jacket having a square or polygonal opening there-through arranged so as to move in telescopic connection with the exterior angular funnel-casing, I may dispense with the funnel-casing and employ an ordinary stationary cylinder or tube in connection with the outer jacket or casing having its interior square, rectangular, octagonal, or of other angular shape in cross-section conforming to the desired shape of the finished package, and in such case I am enabled to form an angular package with a round auger by securing the sack in position between the tubular funnel and the angular surface of the outer inclosing

case or jacket, and owing to the pressure of the auger the bran under compression will be forced out against the sides of the jacket, causing the bag to conform to the shape of the interior of the jacket and forming a square or polygonal package.

While the machine shown and described is specially designed for packing bran and offal, I do not desire to be limited in the application of the invention to the packing of any particular material, as the machine is capable of other uses, particularly for packing meal, flour, and other products of grain, and may be used for packing various kinds of material.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A machine for packing the products of grain and other materials into angular packages by the use of a round auger, comprising a vertically-movable platform and means for raising the same and permitting it to descend with a yielding resistance against applied pressure, a jacket or casing mounted on said platform having a polygonal opening therethrough, a polygonal stationary casing arranged over said jacket adapted to fit the interior thereof and having a cylindrical opening therethrough, a packing-auger working in said opening, and means for rotating the auger, whereby a square or polygonal package may be formed by the action of a round feeding and forcing device adapted to force the material from a cylindrical into a polygonal opening containing the sack to be filled, substantially as described.

2. In a machine for packing the products of grain and other materials, a vertically-disposed shaft carrying a packing-auger, a stationary tube in which said auger works, a vertically-movable platform arranged below said cylinder, means for permitting said platform to descend with a yielding resistance opposing the pressure of the auger on the material that is being packed, mechanism for elevating the platform, and a casing or jacket on said platform having its interior shaped to conform to the exterior of said tube and between the same and the elevating mechanism arranged in substantially the same vertical plane with the auger-shaft or axis of the

auger, to make telescopic connection therewith; said platform being suspended by connections arranged so that the resistance to the pressure of the packing-auger shall be exerted centrally thereof, substantially as described.

3. In a machine for packing the products of grain and other materials, a vertically-disposed shaft carrying a packing-auger, a stationary tube in which said auger works having its exterior angular in cross-section, a vertically-movable platform arranged below said cylinder, means for permitting said platform to descend with a yielding resistance opposing the pressure of the auger on the material that is being packed, mechanism for elevating the platform, and a casing or jacket on said platform having its interior shaped to conform to the exterior of said tube and arranged to make telescopic connection therewith; said platform being suspended by flexible connections between the same and the elevating mechanism arranged in substantially the same vertical plane with the auger-shaft or axis of the auger, so that the resistance to the pressure of the packing-auger shall be exerted centrally thereof, substantially as described.

4. In a machine for packing the products of grain and other materials, a round packing-auger combined with a cylindrical inclosure in which the auger works having an exterior casing made square or polygonal in cross-section to receive the sack to be packed, together with a jacket having an angular opening therethrough corresponding in shape with said exterior casing and adapted to fit over the sack stretched on said casing; said jacket being mounted on a vertically-movable platform suspended by flexible connections arranged centrally below the axis of rotation of the auger, and means for raising the platform and yieldingly resisting its downward movement caused by the pressure of the auger on the material that is being packed, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN KOELNER.

Witnesses:

CHARLES E. RIORDON,
WILLIAM B. CROWELL.