(No Model.)

G. A. CHAPMAN.

COMPRESSOR FOR COMPRESSING BRAN AND OTHER SUBSTANCES INTO PACKAGES.

No. 291,683. Patented Jan. 8, 1884.

Fig. 2

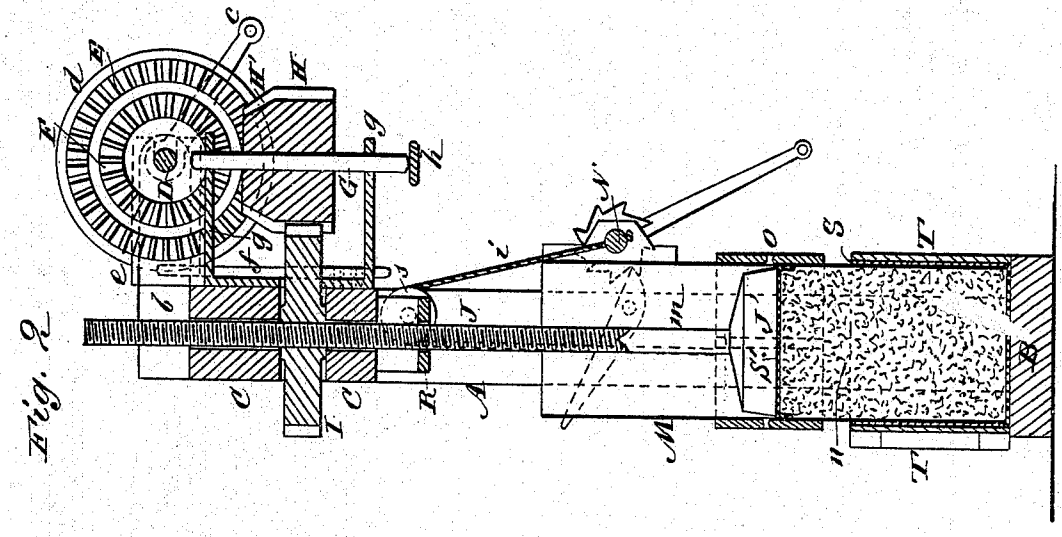


Fig. 1

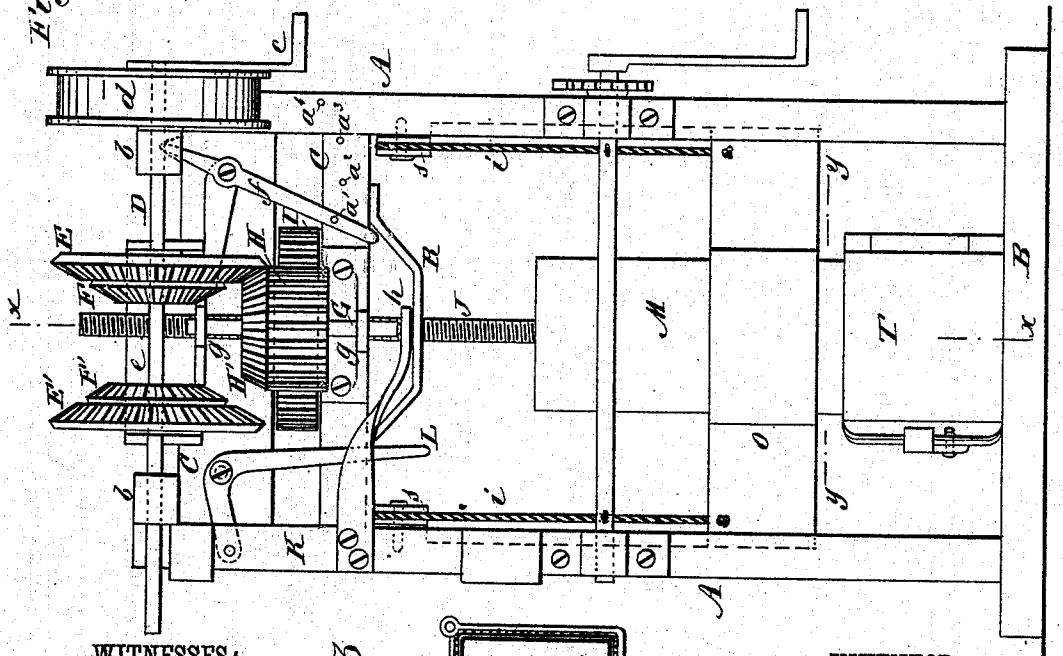
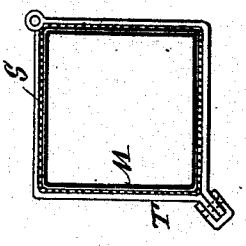


Fig. 3



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UNITED STATES PATENT OFFICE.

GENRY A. CHAPMAN, OF STRAWBERRY POINT, IOWA.

COMPRESSOR FOR COMPRESSING BRAN AND OTHER SUBSTANCES INTO PACKAGES.

SPECIFICATION forming part of Letters Patent No. 291,683, dated January 8, 1884.

Application filed June 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, GENRY A. CHAPMAN, of Strawberry Point, in the county of Clayton and State of Iowa, have invented certain new and useful Improvements in Compressors for Compressing Bran and other Substances into Packages, of which the following is a full, clear, and exact description.

This invention has more especially for its object the compressing of bran and other light substances into packages which may either be square, cylindrical, or other desired shape in their transverse section, and may be made of any suitable material or materials, but which will here be described as being sacks of square or right-angled shape, with bottoms to correspond, and which it is my intention to make the subject of a separate application for Letters Patent.

The invention, by way of illustration, will also here be described as used for the compression of bran into such packages; and it consists in certain novel constructions and combinations of parts in a compressor, and in a method of filling and closing the package, whereby great simplicity and efficiency are obtained and the packages may be sealed under a heavy pressure, which gives great density to the mass.

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

Figure 1 is a front view of a compressor constructed in accordance with my invention, and as in the act of compressing bran into a sack or package of square shape in its transverse section. Fig. 2 is a vertical section of the same on the line *x x* in Fig. 1; and Fig. 3 a horizontal section, in part, on the line *y y* in Fig. 1.

A A are the sides or uprights of the frame of the compressor; B, its base, and C C upper cross-ties, connecting the uprights A A. Said frame, however, may be otherwise suitably constructed.

D is the main or operating shaft, arranged to occupy a horizontal position on or in bearings *b b*, projecting outward from and in front of the main frame, which shaft may be rotated by hand applied to a crank, *c*, or by any suitable motor power applied to a pulley, *d*. This shaft is fitted to slide longitudinally in its bearings *b b*, and carries or has connected with it a frame, *e*, which is free to slide with the shaft, and within which and fast on the shaft, so as to rotate with it, are inner and outer large and small bevel-gears, E E′ and F F′. The longitudinal movement of the shaft D and frame *e*, carrying the gears E E′ and F F′ along with it, to the right or to the left, as required, is controlled by a lever, *f*, connected with an arm from the frame *e*.

G is an upright shaft, fitted to rotate and capable of sliding up and down within bearings *g g*, attached to the main frame. Fast on this shaft is a combined spur and bevel gear, H H′; or it may be separate gears. The spur gear or portion H gears with a horizontal spur-gear, I, arranged to work in between the upper cross-ties, C C, and through which, as a nut, a screw-threaded piston-rod, J, works, and the bevel gear or portion H′ gears with either of the wheels E E′ or F F′, accordingly as said wheels are slid to the right or to the left, and the gear H H′ is raised or lowered for the purpose. Said gear H H′ may be made to drop or lower of its own weight on suitably lowering a step bearing-arm, *h*, on which the shaft G rests, and which is connected with an up-and-down slide, K, on one of the uprights A. This slide is lowered or raised as required to adjust the bevel-gear H′ relatively to the gears E E′ and F F′ by means of a bell-crank lever, L. The piston-rod J has a square-shaped piston, J′, on its lower end, arranged to work within and up out of a correspondingly-shaped filling-tube, M, which may be of thin metal, and which is capable of being adjusted up and down by a windlass, N, and ropes or chains *i i*, attached at their one end to the windlass, (which may be controlled by pawl and ratchet,) and, after passing around sheaves *s*, are made fast at their opposite end to a cross-slide, O, that carries the filling-tube, and that is guided by and arranged to slide up and down within the uprights A A. When the piston J′ is within the filling-tube or filler M, it and its rod are of course prevented from turning as the wheel I is rotated to raise or lower the piston; and to prevent the piston from turning and putting its sides out of line with the sides of the filler when the piston is passing to and from the filler, the lower por-

tion of the rod is made square, or otherwise equivalently shaped, as shown at *m*, and arranged to slide through a correspondingly-shaped hole in a guide, R, suitably placed for the purpose.

S indicates a sack-body in the course of being packed with bran *n*, and S′ a detached cover or top to the sack. This sack, the body of which is of a capacity to fit snugly over the lower portion of the filler M, and which has a square top and bottom, may be made of sack-cloth, ducking, burlap-cloth, or other suitable material or materials.

T is a hinged or opening and closing clamp, arranged externally of the sack when on the filler, and of about the same depth as the sack, to hold the sack in position and to support or stiffen the filler against the pressure exerted within it by the compression of the bran.

In the operation of the compressor the filler or tube M is drawn up to its top or extreme upward limit by the windlass N, and the clamp T, if in place on it, removed. The sack S is then drawn up over the lower end portion of the filling-tube M, so that the bottom of the sack comes in contact with the lower end of said tube, after which the tube, with the attached sack, is let down onto the base B of the compressor. The clamp T is then applied around the sack and locked. The bran to be packed is now charged within the tube M from its top, which may be done by a spout, and which is continued until the filler M is full, or sufficiently so to fill the sack after compression. Then the sack cover or top S′, which is square and somewhat larger than the filler, is placed upon the loose bran in the filler, and the lever *f* is moved to the left and engaged with an outer left-hand side locking-pin, *a′*. The lever L is also moved to the left until the bevel-gear H′ engages with the large bevel-wheel E. Motion then being communicated to the shaft D, the wheel I will be rotated to work down the piston J′ into the filling-tube M for a distance of about one-fourth the depth of said tube, more or less. The lever *f* is then adjusted onto a second locking-pin, a^2, to slide the frame *e* and its inclosed gearing somewhat to the right, and the bevel-gear H′ is raised into mesh with the smaller bevel-wheel F. This will cause the piston J′ to be carried down slower and with greater power as the resistance increases, and is continued until the piston J′ reaches the top of the body of the sack or to a level with the top of the clamp T. The gears are then adjusted so as to stop the motion of the piston, and the filling-tube M is lifted by the windlass N out of the sack, and the clamp T is opened and removed. This leaves the sack-body with the bran compressed within it and under heavy pressure, ready for the top S′ to be sewed on, after which the lever *f* is adjusted onto the locking-pin a^3, and the lever L suitably moved to put the bevel-gear H′ in mesh with the reversing small wheel F′, to back up the piston a little when the sack is removed. Another sack-body is then drawn onto or over the lower end of the filling-tube, and said tube is let down onto the floor or base B again and the clamp T applied and secured, after which the lever *f* is adjusted into lock with the pin a^4 and the lever L adjusted to bring the bevel-gear H′ into mesh with the reversing larger wheel E′, for the purpose of running the piston quickly out of the filling-tube, which then is charged with bran, the sack-cover placed on top of the tube, and the compressing action repeated, as before.

A sufficient pressure may be obtained by this compressor to reduce the bulk of the bran in the sack, so that its weight will be even greater than a sack of like size filled with the grain itself, and the bran may be compressed, as described, into sacks or packages of both small and large dimensions.

The compression, it will be observed, takes place without the bran coming in contact with the sides of the sack and without any strain being thrown upon said sides, and the bottom of the sack is also supported from strain by its resting on the floor or base of the compressor, and the cover of the sack is secured while the bran is under heavy pressure.

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

1. In a compressor, the combination, with the sides A, base B, and reciprocating piston J′, of the filler-tube M, receiving within it the piston, the sack S, receiving the tube extended to its bottom, a detachable cover, S′, and the clamp T, substantially as shown and described.

2. In a compressor for compressing bran and other substances into or within packages, and in which the material to be compressed is supplied to and compressed within the package without coming in contact with or straining on its sides, the combination, with a raising and lowering filling-tube, and a piston arranged to work within and in and out of the charging end of the same, of different speeding-gearing for operating the piston at different velocities in either or both directions of its travel, essentially as described.

3. The combination of the sliding gears E E′ F F′, the rising and falling gear or gears H H′, the wheel I, constructed to operate as a nut, the screw-threaded piston-rod J, the piston J′, the filling-tube M, made capable of being raised and lowered, and the clamp T, substantially as and for the purposes herein set forth.

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Witnesses:
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B. P. RAWSON.