No. 889,475. PATENTED JUNE 2, 1908.

J. MERRITT.

HERMETIC SEALING APPARATUS.

APPLICATION FILED MAR. 5, 1906.

2 SHEETS—SHEET 1.

Fig. 1

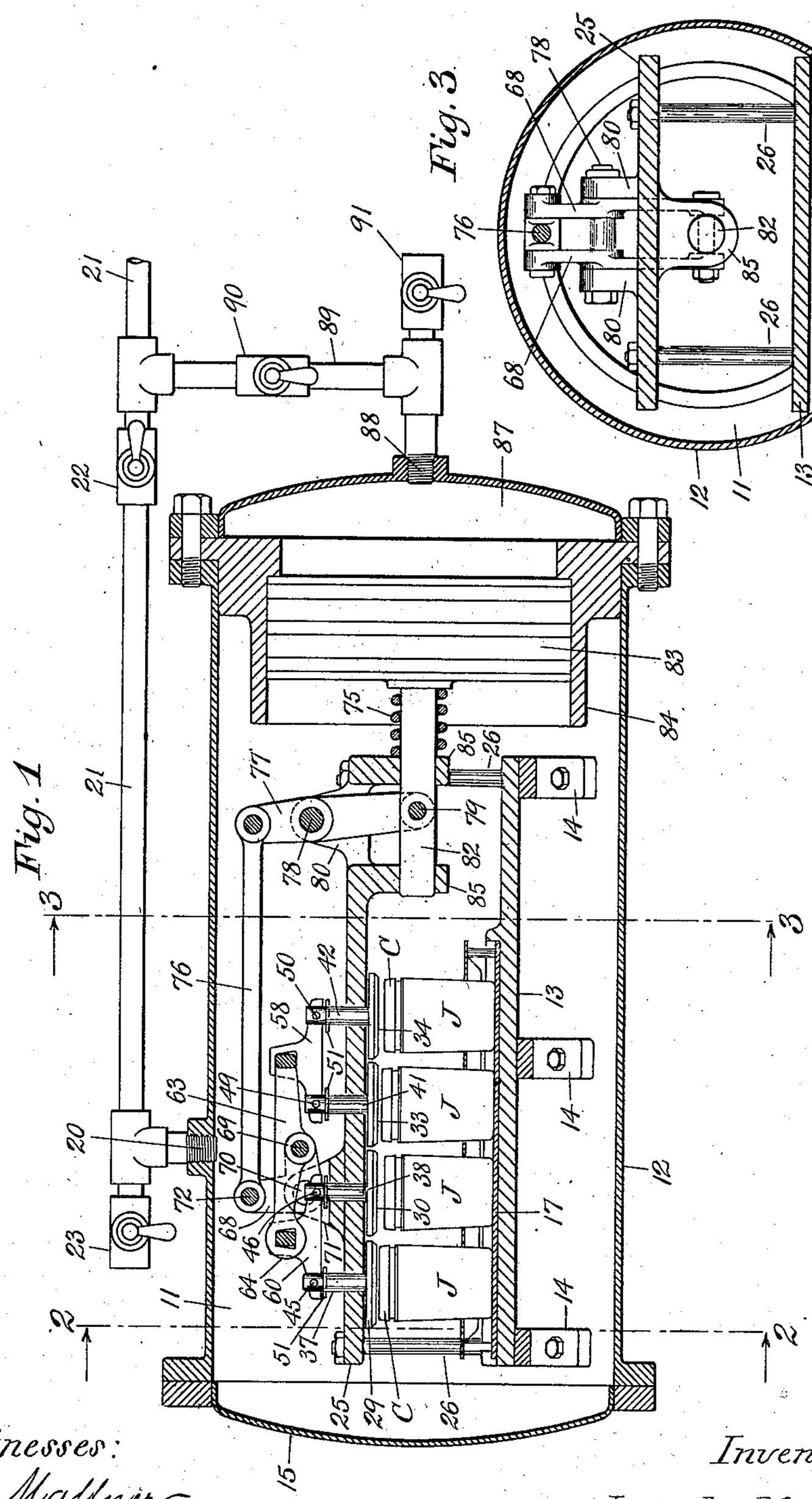

Fig. 3.

Witnesses:
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Janette L. Ellsworth

Inventor.
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2 SHEETS—SHEET 2.

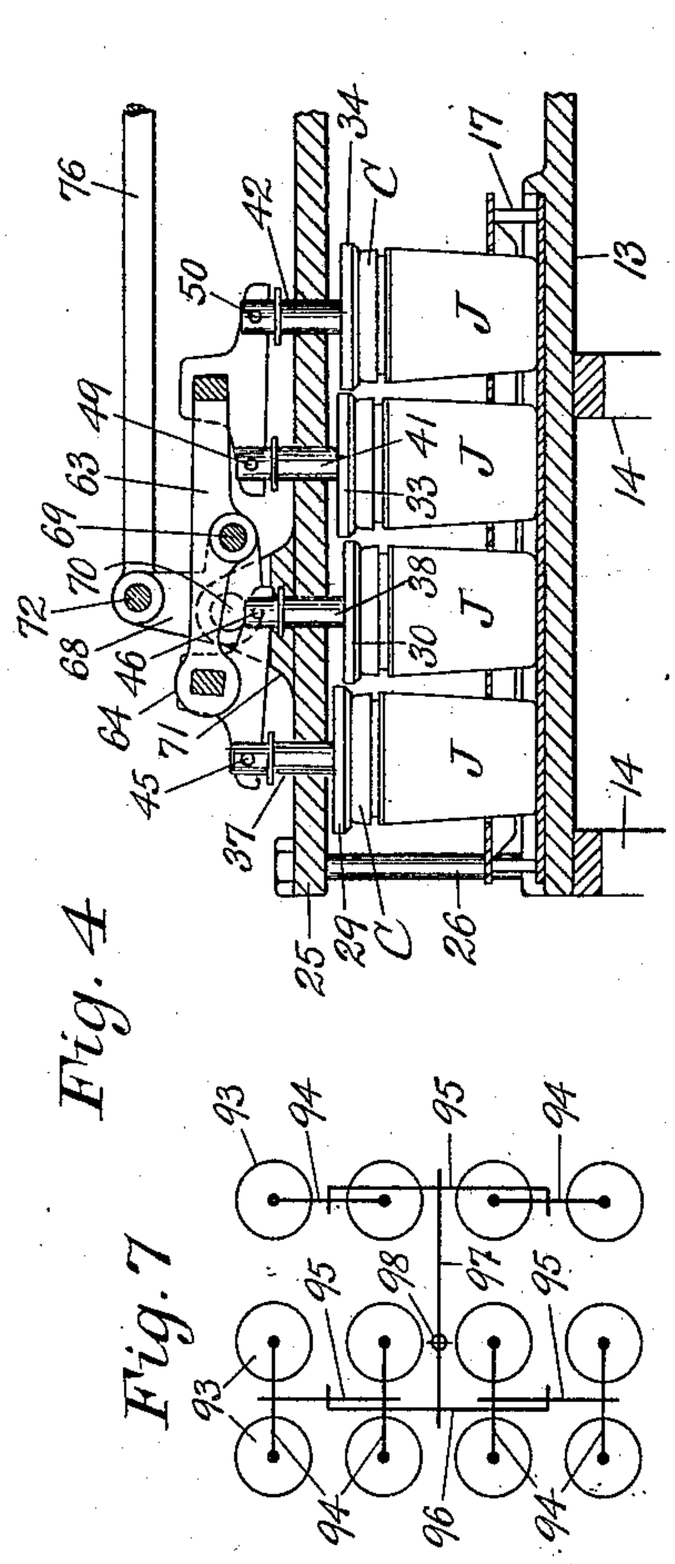

Fig. 4

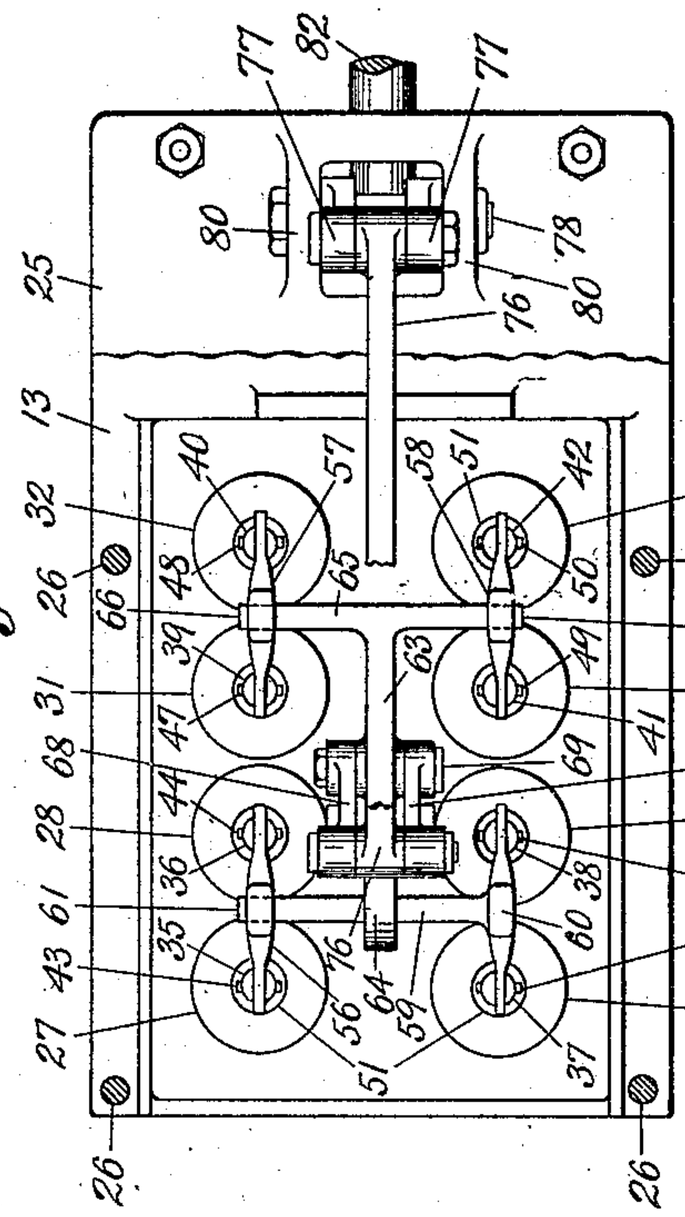

Fig. 5

Fig. 7

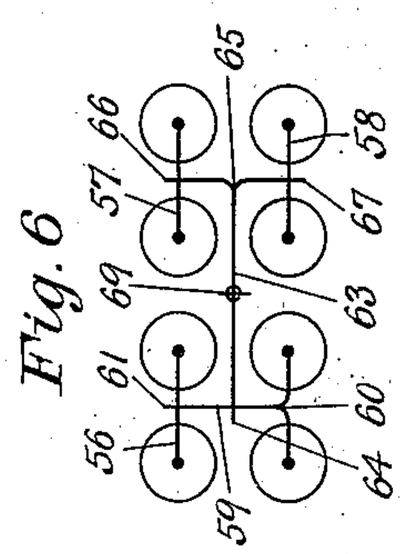

Fig. 6

Fig. 2

Witnesses:
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UNITED STATES PATENT OFFICE.

JOSEPH MERRITT, OF HARTFORD, CONNECTICUT, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-FOURTH TO WILLIAM A. LORENZ AND ONE-FOURTH TO WILLIAM H. HONISS, OF HARTFORD, CONNECTICUT, AND ONE-HALF TO BEECH-NUT PACKING COMPANY, OF CANAJOHARIE, NEW YORK, A CORPORATION OF NEW YORK.

HERMETIC-SEALING APPARATUS.

No. 889,475. Specification of Letters Patent. Patented June 2, 1908.

Application filed March 5, 1906. Serial No. 304,398.

To all whom it may concern:

Be it known that I, JOSEPH MERRITT, a citizen of the United States, and resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Hermetic-Sealing Apparatus, of which the following is a full, clear, and exact specification.

This invention relates to apparatus for hermetically sealing jars of the class in which a more or less complete vacuum is formed within the jar and the cap or cover is retained in place by the outside atmospheric pressure, which presses the cap down upon an elastic gasket inserted between the cap and the jar.

This invention is herein shown in connection with apparatus in which, after a suitable vacuum is obtained within and around the jars, the jar caps are pressed firmly down before and during the readmission of the atmospheric pressure to the jars, thus finally and securely sealing the closures without leaving any chance for the readmitted air to enter the closure joints, and thus destroy or diminish the vacuum in the jars. In sealing these jars on a commercial scale, it is desirable to operate simultaneously upon a number of jars In thus operating upon a group of jars, the difficulty is encountered that the tops of the caps are of different heights from the base or tray on which the jars rest, caused by variations incident to the commercial manufacture of the jar, the gasket and the cap. Therefore, if the group of caps were to be pressed down by a single level platform, the pressure would be distributed unevenly on the jars, because of their varying heights. The taller jars, and sometimes only one or two of them, would receive all of the pressure, leaving the shorter jars either without pressure, or with an amount of pressure insufficient to securely close the joint against the readmission of air.

The object of the present invention is to provide improved means for distributing the sealing pressure with substantial equality upon all of the jars, regardless of their height. This distribution is effected by means of a set or series of equalizing levers interposed between a set of individual jar pressers, and the motive power, which is herein shown as being obtained by the operation of atmospheric pressure.

Figure 1 of the drawings is a side view in section on the line 1—4 of Fig. 2, of a sealing apparatus with the present invention incorporated therein, and shows the parts in position for exhaustion. Figs. 2 and 3 are end views of Fig. 1 in section on the lines 2—2 and 3—3, respectively. Fig. 4 is a side view of a portion of Fig. 1 and shows the pressers and connections at the close of the cap pressing operation. Fig. 5 is a plan of the presser apparatus with the presser guide plate removed. Fig. 6 is a diagram showing the arrangement and connections of the yokes and pressers. Fig. 7 is a diagram showing a modified arrangement of the yokes and pressers.

The jar chamber 11 is preferably of a cylindrical form inclosed by the shell 12. A door 15 adapted to be closed hermetically gives access to the interior of the chamber. Brackets 14 secured to or resting upon the shell 12 sustain the base 13 upon which rests the jar tray 17 which registers and supports a set of jars J in proper positions during the exhausting and sealing operations. Connection with suitable exhausting apparatus is made through the opening 20 and the pipe 21, and is controlled by the cock 22. A cock 23 is also provided through which communication with the outside air may be had.

Above the base 13 and supported thereon by the uprights 26 is the presser guide plate 25 through which the stems 35 to 42 of the jar pressers 27 to 34 extend. The pressers are so disposed that each one is over a jar J when the tray 17 is properly placed on the base 13. The six presser stems 35, 36, 39, 40, 41, 42 (Fig. 5), are loosely pivoted in pairs at 43, 44, 47, 48, 49, 50, respectively to the ends of the three plain primary lever yokes 56, 57 and 58. The two presser stems 37 and 38 are loosely pivoted at 45 and 46 respectively to the cross bar 60 of the T-shaped primary yoke 59, the shank of which fits loosely at its end 61 into a hole formed in the plain primary yoke 56 between the pivots 43 and 44. The shank of the small T yoke 59 fits loosely near its center into a hole formed in the shank end 64 of the secondary T yoke 63 (Fig. 1) while the cross bar 65 of

the latter yoke fits loosely at its ends 66 and 67 into the two plain primary yokes 57 and 58. Near its center the secondary yoke 63 is loosely pivoted at 69 to the two crank levers 68 fulcrumed at 70 in lugs 71 appurtenant to the presser plate 25. The other ends of the two crank levers 68 are pivoted at 72 to the rod 76, which is connected with the upper ends of the levers 77 fulcrumed at 78 in lugs 80 appurtenant to the presser plate 25. The lower ends of the two levers 77 are connected at 79 with any suitable motor, which as herein shown may be inside of the shell 12, or may be outside thereof by extending the rod 82 through a stuffing box in the shell. The motor herein shown, is however, inclosed within the shell and is adapted to be operated by atmospheric pressure. The cylinder 84 is secured at the rear end of the jar chamber 11, and contains a piston or diaphragm 83, provided with the piston rod 82, which may be guided by the guides 85. The inner end of the cylinder is open to the vacuum chamber, while the piston chamber 87 on the other side of the piston 83 communicates by means of the opening 88 and the pipe 89 with the exhaust pipe 21. A cock 90 controls communication through the pipe 89 and a cock 91 communicates with the atmosphere, or it may be made to communicate with any suitable or convenient supply of steam, water, or air pressure.

The operation of the devices is as follows, it being assumed that atmospheric pressure is utilized in connection with the cock 91. The tray 17 with its complement of jars J ready for sealing, is placed in proper position within the jar chamber 11 so that the jar caps C are beneath their respective pressers. The door 15 is now closed, the cocks 23 and 91 are closed, and the cocks 22 and 90 opened, all parts being now in the position shown in Fig. 1. This enables the jar chamber 11 and the piston chamber 87 to be exhausted through the pipes 21 and 89, the caps C being free to lift sufficiently to permit the air to also pass out from the interior of the jars. When the desired degree of vacuum has been obtained, the cock 90 is closed and the cock 91 opened thus admitting atmospheric pressure to the rear side of the piston 83 while the vacuum still exists on its front side. This moves the piston towards the front end of the jar chamber 11, and draws the connecting rod 76 towards the rear end of the chamber by means of the levers 77, thereby swinging the crank levers 68 and drawing the secondary T yoke 63 downward through the connection 69 at its center. The yoke 63 imparts downward movement to the primary yokes 59 through its connections therewith. Downward movement is thus imparted simultaneously to all the eight pressers of the set, thus bringing them into engagement with uniform pressure upon their respective caps C and forcing the caps downward upon the jars J, as shown in Fig. 4. In Fig. 4 and in Fig. 1 the second and fourth jars are shown a little shorter than the other two jars. All receive the same amount of pressure, however, as each plain yoke has enough freedom of movement in its connections to permit either end to move downward after the movement of the other end has been arrested. The same is true of the small and large T yokes, the extremities on each yoke readily shifting their positions till the pressure is equalized upon all the pressers. The cock 22 may now be closed and the cock 23 opened, thus admitting air to the jar chamber 11 and releasing the pressers from the caps C by equalizing the pressure on both sides of the piston 83, by the time the full atmospheric pressure takes effect upon the closures themselves. Having thus transferred control of the closures to the atmospheric pressure, which is henceforth to hold them, the cock 91 is closed and the cock 90 opened, the air in the piston chamber 87 will be exhausted thus enabling the atmospheric pressure in the jar chamber 11 to move the piston 83 back to its original position, thereby lifting all the pressers upward so that they once more occupy the position shown in Fig. 1. Or the parts may be returned to their position first by means of a suitably placed spring or springs 75.

In case one or more jars are lacking from the full number, the pressers over the vacant places will move downward until the collars 51 of their respective stems come in contact with the top of the plate 25, thus stopping them, and enabling the other pressers to exert their pressure properly on their respective jars.

It will be readily understood that the various joints where the pressers are connected to the yokes and the yokes to each other, may be constructed in a number of ways other than those shown in the drawings. Freedom of movement in the joints is however advisable as affording a simple means for permitting the pressures to promptly equalize at all points.

It is also possible to operate the pressing devices by means of a series of plain yokes of increasing size similar in operation to the small plain yokes 56, 57 and 58. This is illustrated in the diagram, wherein is shown a series of twelve pressers 93 operated by pressure received successively through the yokes 94, 95, 96 and 97, from a single point 98 on the yoke 97, each yoke transmitting its power from its two ends and receiving its power from a point between its ends. This receiving point should be located midway between the end connections if an equal amount of power is to be transmitted from each end. Where, however, this amount required is less at one end of the yoke than at the other, the receiving point should be proportionally close

to the end which must transmit the most power. This is clearly seen in the case of the yoke 97, the receiving point 98 being located twice as far from the yoke 95 as from the yoke 96, since the yoke 96 operates eight pressers while the yoke 95 operates only four.

Although it is thought preferable to operate the presser by means of a piston or some similar device by which the atmospheric pressure may be utilized, it is obvious that many other means may be employed and may be operated either from within or without the jar chamber. In the latter case the pressing devices may be operated by a rod passing through a stuffing-box in the shell 12 and operated by any suitable source of power. Obviously, the amount of pressure exerted upon each presser relative to the total pressure upon the operating piston will depend upon the purchase or leverage of the connecting levers. It is preferable to have the cylinder on the pressure large enough to exert upon each cap a pressure considerably in excess of the atmospheric pressure which ultimately retains the cap in place. Experience has shown that this excess of pressure contributes materially to the final security of the seal.

I claim as my invention:—

1. In jar sealing apparatus, a plurality of jar pressers, a yoke articulately connected to the plurality of pressers, and means articulately connected to the yoke for exerting pressure upon an intermediate portion of the yoke.

2. In a jar sealing apparatus, a plurality of jar pressers, a yoke articulately connected at each of its ends to a presser, and means articulately connected to the yoke for exerting pressure upon an intermediate portion of the yoke.

3. In jar sealing apparatus, a series of jar pressers, a series of yokes articulately connected to the pressers, and means articulately connected to the yokes for exerting pressure upon an intermediate point of each yoke.

4. In jar sealing apparatus, a series of jar pressers, a series of yokes articulately connected at their ends to the pressers, and means articulately connected to the respective yokes for exerting pressure upon an intermediate point of each yoke.

5. In jar sealing apparatus, a plurality of jar pressers, a motor for operating the pressers, and a plurality of yokes each connected with a plurality of the pressers, each yoke being also connected with the motor at a portion of its length intermediate the connections with the pressers.

6. In jar sealing apparatus, a set of jar pressers, a set of yokes, each connected to a plurality of the pressers, and means for exerting uniform pressure upon each of the yokes at portions thereof intermediate their connections with the pressers.

7. In jar sealing apparatus, a set of individual jar pressers, a set of primary yokes each operably connected to a plurality of the pressers, a secondary yoke operably connected to a plurality of the primary yokes, and means for exerting pressure upon the secondary yoke.

8. In jar sealing apparatus, a set of individual jar pressers, a set of primary yokes, each operably connected at each of its ends to the pressers, a set of secondary yokes each operably connected at each of its ends to an intermediate portion of a primary yoke, and means for exerting pressure upon an intermediate portion of each secondary yoke.

9. In jar sealing apparatus, the combination of a plurality of individual jar pressers, a motor for operating the pressers, and a series of equalizing lever connections between the motor and the pressers.

10. In jar sealing apparatus, the combination of a vacuum chamber for receiving the jars, a set of individual pressers for the jars, a motor piston connecting one side with the vacuum chamber, a series of equalizing levers connecting the piston with the individual pressers, and means for admitting atmospheric pressure to the other side of the piston.

11. In jar sealing apparatus, the combination of a vacuum chamber for receiving the jars, a set of individual pressers for the jars, a set of primary yoke levers, each connected to a plurality of the pressers, a set of secondary yoke levers each connected with the primary yoke levers at portions thereof intermediate the connections between the primary levers and the pressers, a motor piston operatively connected with the secondary lever yokes, and communicating on one side with the vacuum chamber, and means for admitting atmospheric pressure to the other side of the piston.

12. In jar sealing apparatus, the combination of a vacuum chamber, a set of individual jar pressers, a presser guide plate on which the pressers are mounted for vertical movement, a motor, and a series of equalizing levers carried by the guide plate and operatively connecting the motor and the individual pressers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this third day of March 1906.

JOSEPH MERRITT.

Witnesses:

CAROLINE M. BRECKLE,

NELLIE PHOENIX.