No. 679,665. Patented July 30, 1901.

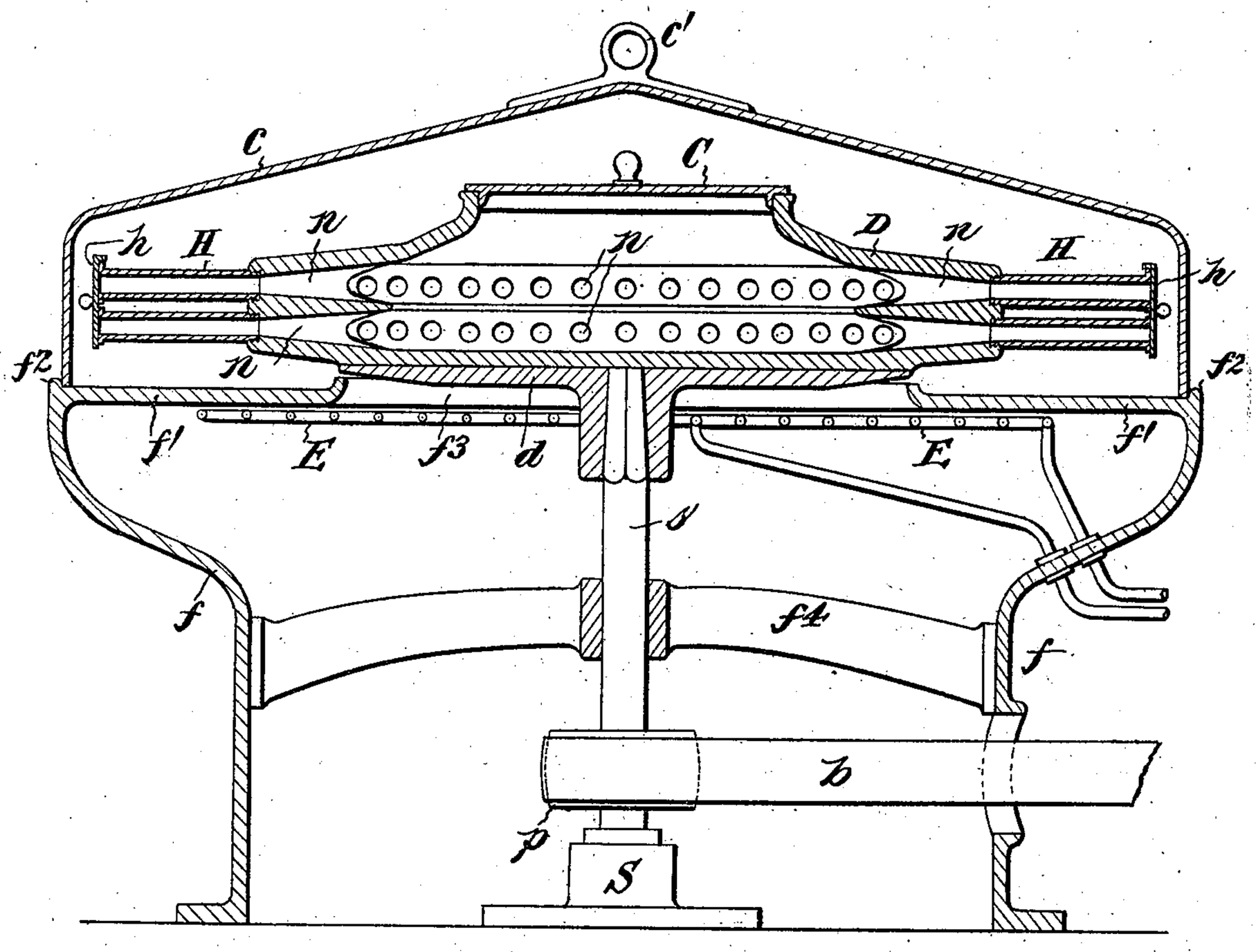
N. CEIPEK.

APPARATUS FOR FILLING CARTRIDGE-LIKE ENVELOPS.

(Application filed May 5, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses:
P. H. Sommers

Inventor:
Norbert Ceipek
by Geo. P. Barton
Atty.

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Fig. 2.

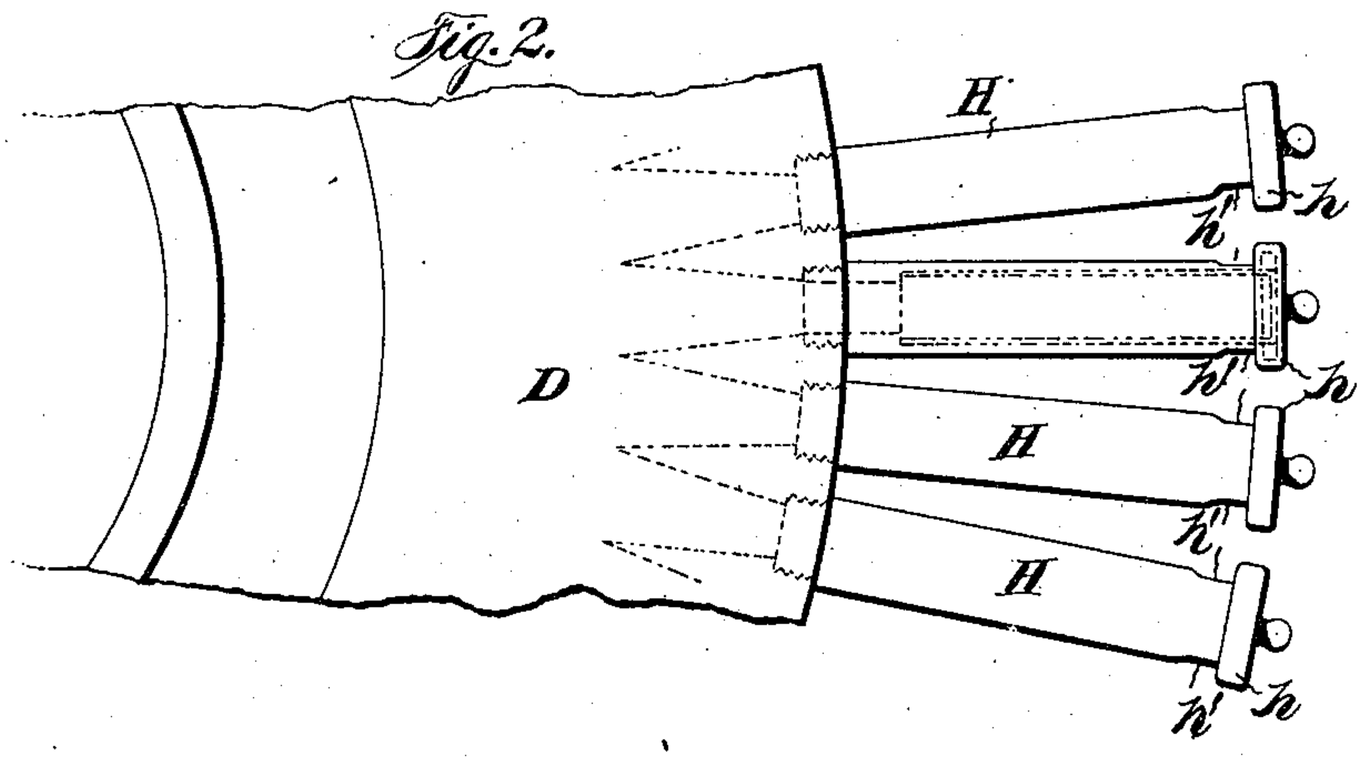


Fig. 3.

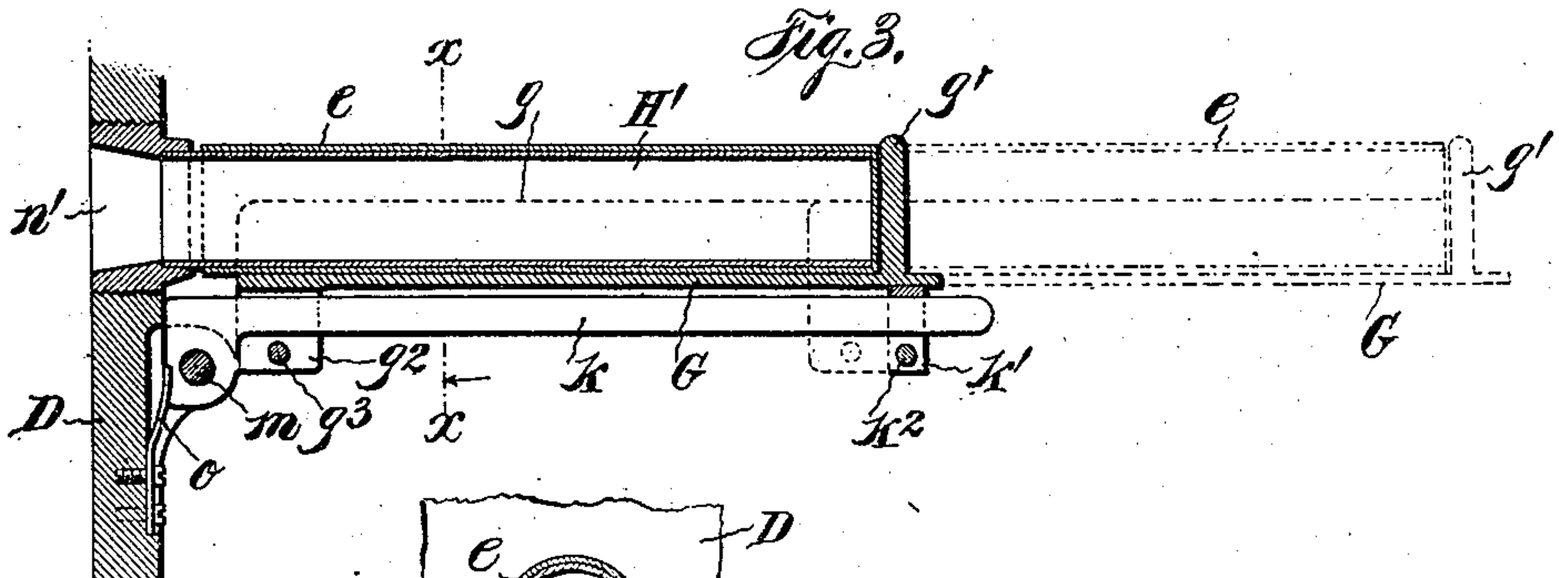


Fig. 4.

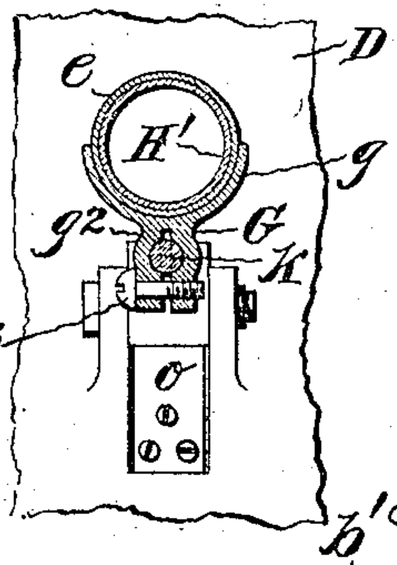


Fig. 6.

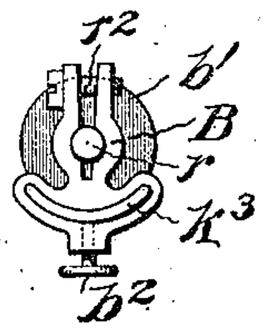
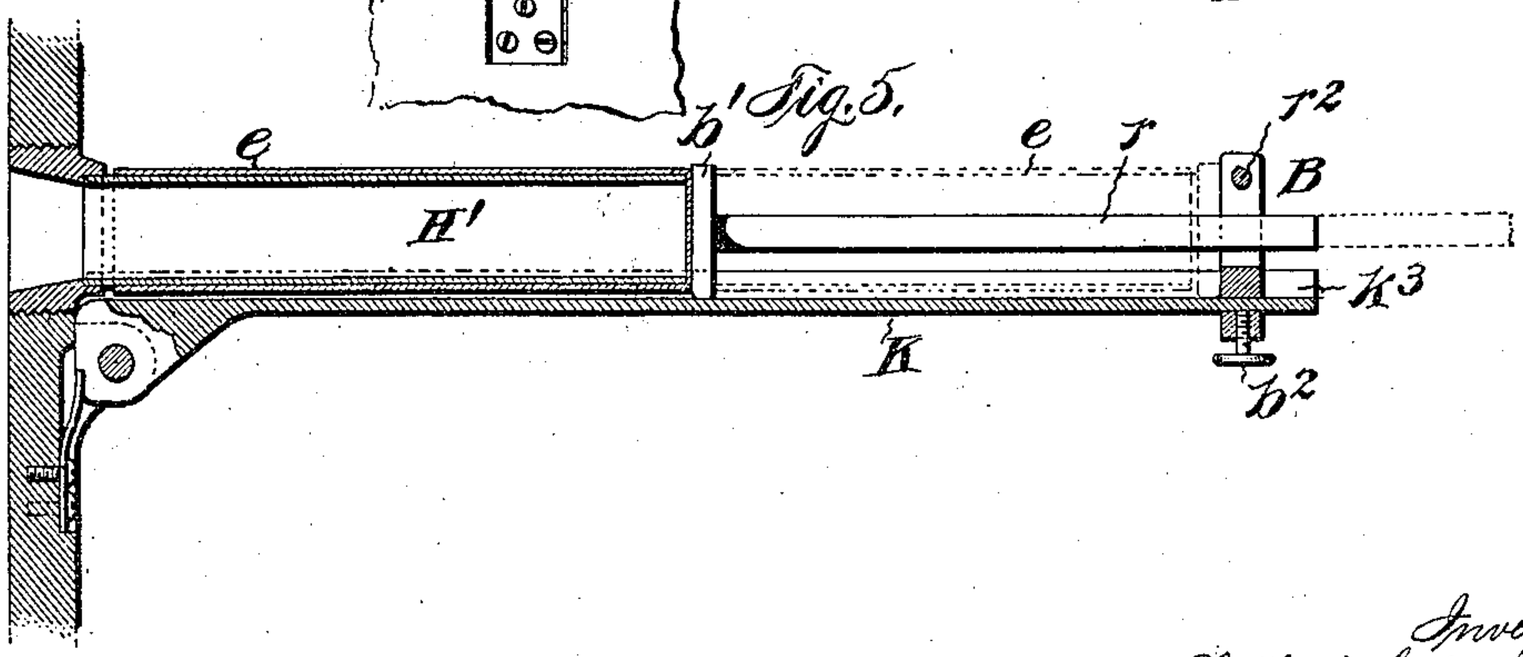


Fig. 5.



Witnesses:
B. T. Ober.
B. V. Sommers

Inventor,
Norbert Ceipek.
by Munn & Co
Atty.

UNITED STATES PATENT OFFICE.

NORBERT CEIPEK, OF VIENNA, AUSTRIA-HUNGARY.

APPARATUS FOR FILLING CARTRIDGE-LIKE ENVELOPS.

SPECIFICATION forming part of Letters Patent No. 679,665, dated July 30, 1901.

Application filed May 5, 1900. Serial No. 15,627. (No model.)

To all whom it may concern:

Be it known that I, NORBERT CEIPEK, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Apparatus for Filling Pulverulous or Doughy Materials into Cartridge-Like Envelops; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has relation to apparatus for packing pulverulent granular substances or a substance sufficiently fluid to be influenced by centrifugal action into suitable tubes, pockets, or shells, and my said invention is more particularly designed for loading cartridges.

My invention has for its object the provision of means whereby the substances referred to are packed into a tube, pocket, or shell by centrifugal force and whereby the degree to which such substances are compacted into the holders can be regulated within certain limits by regulating the speed of rotation of the centrifugal drum. This mode of packing substances such as referred to has many advantages in that the packing can be effected in a very rapid and economical manner, while in filling cartridges with high explosives—such as dynamite, explosive gelatin, and the like—the danger of explosion attendant upon the filling of the cartridges in the well-known screw-feed machines and due to the presence of hard foreign bodies is entirely avoided in that there is no pressure or compact sufficiently powerful to cause such hard substances to explode the explosive.

That my invention may be fully understood I will describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of a machine embodying my invention. Fig. 2 is a fragmentary plan view thereof; Fig. 3, a vertical sectional detail of a modified means for supporting and guiding the tubes or shells while being loaded. Fig. 4 is a section on line *x x* of Fig. 3. Fig. 5 is a view similar to Fig. 3, showing a modified arrangement for supporting and guiding the tube or shell while being loaded; and Fig. 6 is a right-hand elevation of Fig. 5.

Referring to Fig. 1, *f* indicates the framing of the machine, *f'* its top or table, having an encompassing vertical flange f^2 for the reception of a hood or cover *c*, having an eye *c'*, said table having a central aperture f^3, into which projects a vertical spindle *s*, having its bearings in a cross-brace f^4 of the frame *f* and being stepped to revolve in a suitable step S, said spindle *s* carrying a belt-pulley *p*, driven by a belt *b* from any suitable motor. The spindle *s* carries a disk *d*, to which is secured the centrifugal drum D, open at top and adapted to be closed by a cover C.

In practice the eye *c'* of frame-cover *c* has attached thereto a rope run over a pulley, and to the opposite end of said rope is secured a counterweight for facilitating the lifting off and replacing of the cover *c*.

The drum D has in its periphery two rows of nozzles *n* one above the other, and the internal configuration of the drum is such as to readily guide the material to said nozzles, into which screw tubular open-ended tube or shell holders H, adapted to be closed at their outer end by means of a cap *h*, one for each pair of superposed holders.

When the machine is used for loading high explosives that are more or less fluid or that will become more or less fluid under the influence of heat, I provide a heating-coil E, to which any suitable heating medium—as steam, for instance—is supplied to maintain the explosive in a sufficiently liquid condition to be carried into the tubes or shells by centrifugal force.

For general purposes the centrifugal drum D may be constructed of iron; but when the machine is used for packing substances that attack iron—as, for instance, nitrate of ammonium or acids—I construct the drum of a material that is indifferent to the action of these chemicals—as ebonite, for instance—while parts of the drum which are subjected to greater wear are or may be made of aluminium or an alloy thereof, and for the sake of lightness the cover *c*, which, with the ta-

ble f' of the frame f, constitutes the housing for the drum D, is preferably made of ebonite or aluminium, though it may be made of bronze.

The operation of the machine as described is as follows: The paper or other tubes or shells to be loaded are slipped into the holders H with their open ends facing the nozzles n. The caps h are applied to close the outer ends of said holders, and the drum D is charged with the material to be loaded or packed into said tubes or shells. If power is now applied to the pulley p through belt b to rotate the spindle s and drum D, the material therein will be carried by centrifugal force into the tubes or shells and packed therein, the degree to which such material is compacted depending upon the speed of rotation of the drum D, as will be readily understood. When the tubes or shells are loaded, the caps h are removed and the loaded shells withdrawn, and to facilitate this operation the holders H have on opposite sides at their outer ends finger recesses or notches h', Fig. 2.

Instead of locking the shells to be loaded into their holders, as described, I may provide means whereby said shells are progressively moved along their holders as said shells are filled by the material itself, and this arrangement I prefer for loading shells with gelatinous high explosives or high explosives which can be sufficiently softened by heat to be carried into the shells by centrifugal force, the construction of the periphery of the drum D being suitably modified and having, preferably, but one circular row of nozzles. Such an arrangement is shown in Figs. 3 and 4, the nozzles n' being preferably of aluminium or an alloy thereof. The shell-holder H' is also an open-ended tube supported in a cradle g of a carrier G of substantially the same length as the holder H' and having at its outer end a discoidal abutment g' of greater diameter than that of said holder. The carrier G has at its inner end a friction-brake consisting of a split lug g^2, embracing a preferably cylindrical bar k, and into the ears of said lug, below the bar, is screwed a clamping-screw g^3, by means of which the frictional contact between the lug and bar can be regulated to cause the carrier G to move more or less freely along its bar k, which is pivoted at m to the centrifugal drum D and is normally held in a horizontal position by the leaf-spring o. On the bar k is mounted a split lug k', embracing the same, the ears of said lug having screw-threaded perforations for a clamping-screw k^2, so that the lug k' can be secured to said bar k at any point of its length, according to the length of the carrier and the length of the tube or shell to be loaded and its holder, said lug k' performing the function of a stop and limiting the outward movement of the carrier and the tube or shell. The operation of these devices is as follows, it being assumed that the machine is being prepared for loading paper tubes or shells with a gelatinous high explosive, the housing being suitably heated: The lugs k' are removed from their bars k, and the latter are turned down against the stress of their springs o, the holders H' are secured to their respective nozzles n' of the drum D, and the tubes or shells e to be loaded are slipped onto their respective holders H'. The carriers G are now slipped onto their respective bars and the friction between the latter and the lugs g^2 regulated by means of the clamping-screws g^3. The lugs k' are now adjusted on bars k, according to the length of the travel of the carriers G, after which said bars are turned up into a horizontal position and held there by their springs o, so that the abutment-disk g' of the carriers G will bear against the closed end of the tube or shell e and its holder. A charge of high explosive is now introduced into drum D, and after replacing the covers C and c said drum is rotated at the desired or required speed. As the material is carried into the holders H' and compacted therein at their outer ends the pressure exerted on the like ends of the shells e and therethrough on the abutment-disks g' on carriers G, the latter, together with the shells being loaded, are moved along the bars k until further outward motion of said carriers is stopped by the lug g^2 thereon coming in contact with the fixed lug k' on bar k, which also serves as a support for the outer free end of the carrier. Inasmuch as the extent of travel of the carrier G depends upon the length of the shell e to be loaded, the latter will be loaded when further outward movement of the carrier is stopped. The lug k' is now removed from its bar k, the carrier G slipped off, or the bar with its carrier may simply be turned down on its pivots m, when the loaded tube or shell e can be readily removed from its holder H'. The adjustment of the parts is of course such that when the travel of the carrier is stopped there will remain a sufficient portion of the inner end of the tube or shell e unfilled, so that it may be properly closed.

In Figs. 5 and 6 I have shown a slight modification of the appliances just described and illustrated in Figs. 3 and 4, the carrier G being here dispensed with and the bar K constructed to form a cradle k^3. On the bar K is mounted a split bearing B for a rod r, having a discoidal abutment b' at its inner end performing the same function as the abutment g' described in reference to Figs. 3 and 4. The friction between the bearing and rod r is regulated by a clamping-screw r^2, while said bearing is adjustable on bar K by means of a binding-screw b^2. It is obvious that here also the pressure of the material on the bottom or outer end of the tube or shell e and therethrough on the abutment b will cause said rod and tube or shell e to move outwardly until the said abutment comes in contact with the split bearing B, the construction being

materially simplified and the manipulation facilitated, as will be readily understood.

Of course it will be understood that the so-called "holders" H or H′ are mere prolongations of the nozzles *n* or *n′*, though in practice I construct the said prolongations for connection with the nozzles, so that the length of the part of the nozzle projecting from the periphery of the drum may be varied to suit the length of the tube or shell to be filled. Prolongations H or H′ of different lengths can thus be interchangeably used on the machine. It will also be understood that by regulating the frictional contact between the fixed and sliding parts *k* and G or K and *r*, so that said sliding parts will offer more or less resistance to the pressure of the material forced into the tube or shell *e*, said material will be more or less firmly packed, and this, as hereinbefore stated, may be further regulated by regulating the speed of rotation of the drum D.

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

1. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles, and means for supplying heat to said drum; in combination with means for detachably connecting a tube or shell to be filled or loaded with a nozzle, for the purpose set forth.

2. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles, and open-ended tubular holders for the tubes or shells to be filled or loaded, constructed for connection with the nozzles, said tubes or shells adapted to move along their holders under the pressure of the material forced into the same, substantially as set forth.

3. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles and open-ended tubular holders for the tubes or shells to be filled or loaded, constructed for connection with said nozzles, said tubes or shells adapted to move along their holders under the pressure of the material forced into the same, and means for regulating said movement independently of said pressure, for the purpose set forth.

4. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles, and means for supplying heat to said drum; in combination with tubular open-ended holders for the tubes or shells to be filled or loaded, and an abutment at the outer end of each holder for the closed end of the tube or shell, for the purpose set forth.

5. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles and open-ended tubular holders for the tubes or shells to be filled or loaded, constructed for connection with said nozzles; in combination with an abutment at the outer end of each holder for the closed end of the tube or shell carried thereby, said abutment movable under the pressure of the material forced into such tube or shell, for the purpose set forth.

6. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles and open-ended tubular holders for the tubes or shells to be filled or loaded, constructed for connection with said nozzles; in combination with an abutment at the outer end of each holder for the closed end of the tube or shell carried thereby, said abutment movable under the pressure of the material forced into such tube or shell, and means for regulating said movement independently of said pressure, for the purpose set forth.

7. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles and tubular open-ended holders for the tubes or shells to be filled or loaded, and constructed for connection with said nozzles; in combination with an abutment at the outer end of each holder and adapted to bear on the closed end of the tube or shell carried thereby, a carrier for said abutment having motion parallel with the axis of said holder under the pressure exerted on the closed end of the tube or shell by the material forced into the same, and means for moving said carrier and its abutment into and out of contact with the holder and shell or tube, for the purpose set forth.

8. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles and tubular open-ended holders for the tubes or shells to be filled or loaded, and constructed for connection with said nozzles; in combination with an abutment at the outer end of each holder and adapted to bear on the closed end of the tube or shell carried thereby, a carrier for said abutment having motion parallel with the axis of said holder under the pressure exerted on the closed end of the tube or shell by the material forced into the same, and means for regulating the travel of the carrier, for the purpose set forth.

9. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles and tubular open-ended holders for the tubes or shells to be filled or loaded, and constructed for connection with said nozzles; in combination with an abutment at the outer end of each holder and adapted to bear on the closed end of the tube or shell carried thereby, a carrier for said abutment, a support for and on which said carrier has motion parallel with the axis of the holder, and a friction-brake controlling the speed of travel of the carrier, for the purpose set forth.

10. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles, holders for the tubes or shells to be filled, constructed for connection with said nozzles, an abutment at the outer end of each holder and adapted to bear on the closed end of the tube or shell carried thereby, a carrier for said abutment, a support for and on which

said carrier has motion, said support hinged to the centrifugal drum below the aforesaid holders, means for holding the support in a horizontal position, and a friction-brake for the carrier, for the purpose set forth.

11. In a machine such as described, a centrifugal drum having peripheral discharge-nozzles, holders for the tubes or shells to be filled, constructed for connection with said nozzles, an abutment at the outer end of said holders, and the closed end of the tube or shell carried thereby, carrier for said abutment, a support for and on which said carrier has motion, said support hinged to the centrifugal drum below the aforesaid holders, means for holding the support in a horizontal position, a friction-brake for the carrier, and means for regulating the amplitude of the travel of the carrier along its support, for the purpose set forth.

12. In a machine such as described, a centrifugal drum having peripheral tubular discharging devices, said devices comprising a fixed nozzle and a detachable tubular holder for the tube or shell to be filled, whereby holders of different lengths can be interchangeably used with the nozzles, for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

NORBERT CEIPEK.

Witnesses:
GUSTAV PHILIPPITSCH,
ALVESTO S. HOGUE.