No. 887,717. PATENTED MAY 12, 1908.

G. H. BENJAMIN.

CONTAINER FOR EXTRUSION MACHINES.

APPLICATION FILED NOV. 20, 1907.

FIG. 1.

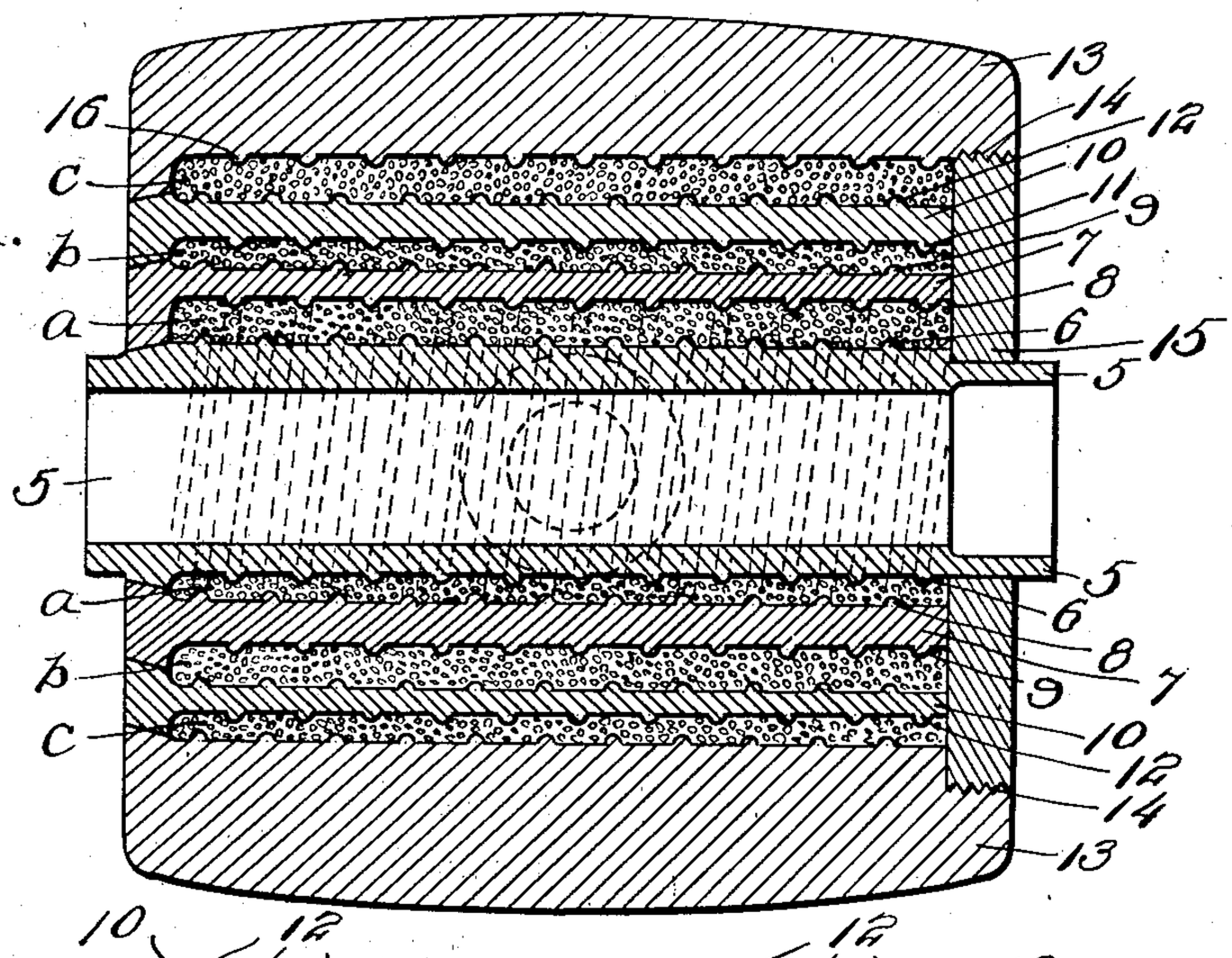


FIG. 2.

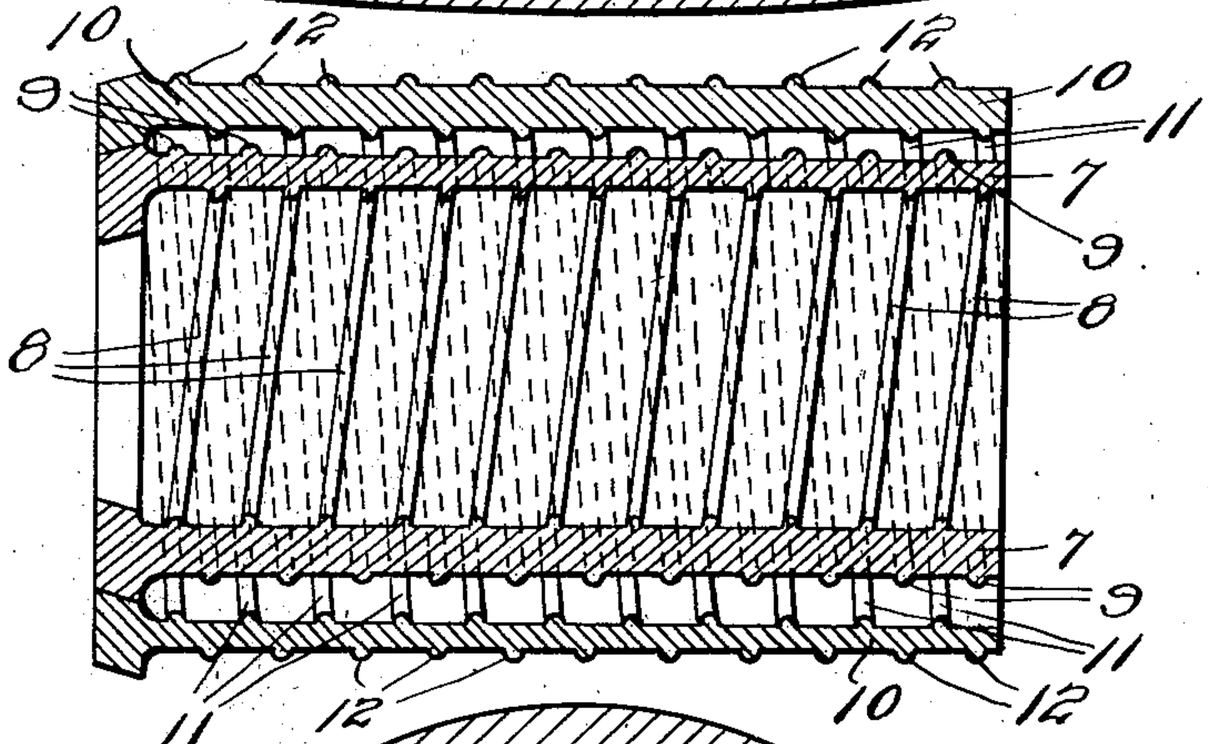
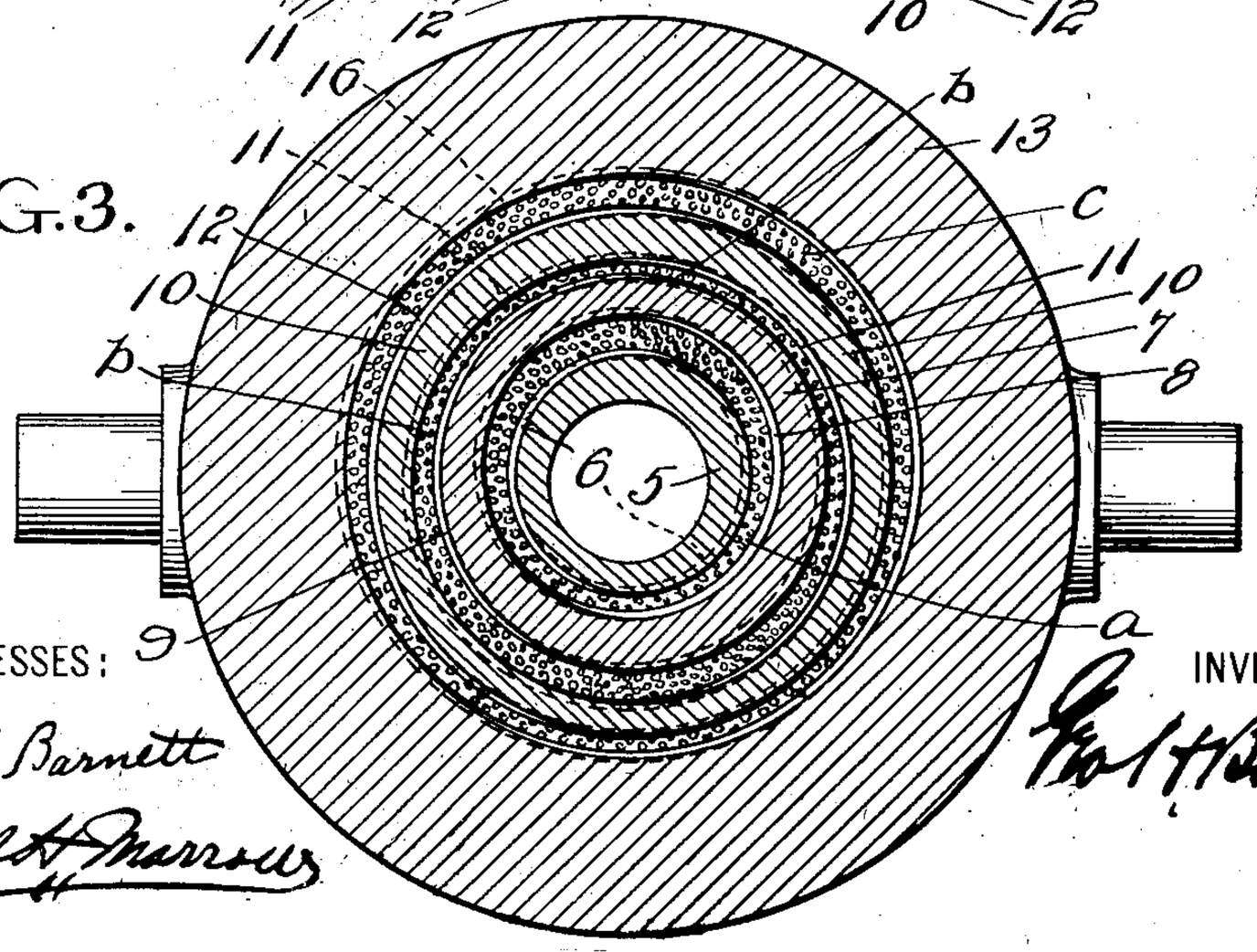


FIG. 3.



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CONTAINER FOR EXTRUSION-MACHINES.

No. 887,717. Specification of Letters Patent. Patented May 12, 1908.

Application filed November 20, 1907. Serial No. 403,050.

To all whom it may concern:

Be it known that I, GEORGE HILLARD BENJAMIN, a citizen of the United States, residing at the city, county, and State of New York, have invented certain new and useful Improvements in Containers for Extrusion-Machines, of which the following is a specification.

Containers for use in extrusion machines have heretofore been made in two ways: (*a*) by forming a cylinder and introducing therein a lining of slightly smaller diameter, of Krupp steel and forcing into the space between the cylinder and the lining a body of heat non-conducting material; (*b*) by arranging around a centrally disposed tube or lining, a series of concentric tubes, each tube of successively greater diameter so as to leave a space between it and the lining or tube over which it is placed, with one end of such tubes arranged to overlap to form a built-up end wall, and forcing between the tubes and the lining bodies of heat non-conducting material, and closing the opposite end of the tubes by a screw-threaded ring.

The objection which has been found in practice to these types of container consists in the fact that when pressure is exerted upon the metal to be extruded within the container, the frictional adhesion of such metal to the inner surface of the lining of the container forces the lining forward in the container, and as the forward end of the lining is usually conical in shape, it tends to spread and burst the container; or in the case of the built-up form (*b*) to carry the concentric tubes longitudinally forward, thus rapidly destroying the container.

To overcome the objection above stated, I have devised a new form of container, which is shown in the accompanying drawings, in which

Figure 1 is a vertical section of the container as a whole; Fig. 2 a vertical section of two of the tubes of the container, illustrating the relation of the helically disposed ribs on the interior and exterior of a tube, and their relation to similar helically disposed ribs on adjacent tubes; Fig. 3 is a transverse section.

Referring to the drawings: 5 indicates the interior tube or lining of the container in which the metal to be extruded is placed. This tube or lining is slightly longer than the tubes of the container and is provided on its exterior with a projecting rib 6 disposed helically and inclining from above downward from right to left. Surrounding the lining 5 is a tube 7, of larger diameter, but of less length. The left hand end of this tube, is thicker than the body of the tube, and is arranged to rest upon the left hand end of the outer surface of the lining 5, and to project above the outer periphery of the tube 7. By this arrangement a space *a*, which is closed at the left hand end, is formed between the lining 5 and the tube 7. The inner periphery of the tube 7 is provided with the projecting rib 8, which is helically disposed in the same direction as the helical rib 6 on the exterior surface of the lining 5, and is provided on its outer periphery with the rib 9 which is helically disposed in a direction opposite to that of the rib 8, that is—the rib 9 is inclined from above downward from left to right. Surrounding the tube 7 is a second tube 10. This tube is substantially similar in construction to the tube 7 and is provided with ribs 11 and 12, the rib 11 corresponding in direction to the rib 9 of the tube 7, and the rib 12 corresponding in direction to the rib 8 of the tube 7.

Between the tubes 7 and 10 is a space *b*. Surrounding the tube 10 is an inclosing tube 13 of greater thickness, the left hand end of which co-acts with the ends of the tubes 7 and 10 to form a built-up wall to close the spaces between the lining 5 and tube 7, tube 7 and tube 10, the tube 10 and outer tube 13. The right hand end of this tube is provided with a thread 14 and is adapted to receive a ring 15 which closes the right hand end of the container. On the inner periphery of the tube 13 is the helically disposed rib 16, which conforms in direction to the rib 12 on the outer periphery of the tube 10. Between the tubes 10 and 13 is a space *c*. Introduced into the spaces *a*, *b*, *c*, are bodies of heat insulating material which are introduced in a granular and moist state and rammed by very heavy pressure into place. This material may conveniently consist of a mixture of finely divided trap rock, an alkaline salt, such as soda, and a binding material, such as siccative oil, which will char under a high temperature but not burn.

In practice it has been found that by arranging the projecting ribs 6, 8, 9, 11, 12, 16, as described, the heat insulating material may be forced into position and when in po-

sition will co-act with such ribs to prevent the lining 5, as well as the tubes 7 and 10, from being moved longitudinally forward under the pressure exerted by the pusher of the extruding machine transmitted through the metal body to be extruded.

It will be observed that the helical ribs in the first space, *a*, and third space, *c*, have an inclination opposite to those of the space *b*. In other words,—the inclination of the disposed ribs in the spaces *a*, *c* are from above downward and from right to left, and in the space *b* from above downward, from left to right. By reason of this arrangement the wedge action of the ribs in the spaces *a* and *c* is counteracted by the oppositely directioned wedge action of the ribs in the space *b*. In arranging the ribs I prefer that they shall be staggered as shown, along opposing surfaces.

Having thus described my invention, I claim:

1. A container comprising a lining, having a helical rib on its outer periphery, a series of concentric tubes surrounding said lining and having helical ribs on their inner and outer peripheries, and a containing tube having a helical rib on its inner periphery.

2. A container comprising a lining, having a helical rib on its outer periphery, a series of concentric tubes surrounding said lining and having helical ribs on their inner and outer peripheries, said ribs disposed in opposite directions, and a containing tube having a helical rib on its inner periphery.

3. A container comprising a lining, having a helical rib on its outer periphery, a series of spaced concentric tubes surrounding said lining and having helical ribs on their inner and outer peripheries, and a spaced containing tube having a helical rib on its inner periphery, the helices in each space being disposed in the same direction and in an opposite direction to the next adjoining space.

4. A container comprising a lining, having a helical rib on its outer periphery, a series of spaced concentric tubes surrounding said lining and having helical ribs on their inner and outer peripheries, a containing tube having a helical rib on its inner periphery, and heat insulating material filling the spaces between the concentric tubes.

5. A container comprising a tubular lining, provided with helical ribs on its outer surface inclined from above downward from left to right, a tube of greater diameter surrounding said lining and having a helical rib on its inner surface inclined from above downward from right to left, and on its outer surface from left to right, a second tube of larger diameter than the first named tube surrounding the first named tube and having a helical rib on its inner surface inclined from above downward from left to right and on its outer surface from right to left, and a third tube of larger diameter than the second tube having a helical rib on its inner surface inclined downward from right to left, said first, second and third named tubes having one end arranged to have a built-up wall and compacted insulating material introduced between said linings and said tubes, and a closure for the end of the tubes opposite to the built-up wall.

6. A container for an extrusion machine, consisting of a series of concentric spaced tubes provided with circumferential helical ribs, compacted insulating material between said tubes whereby said helical ribs and said compacted material will co-act to prevent longitudinal movement of the tubes relative to each other when under strain.

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

GEO. H. BENJAMIN.

Witnesses:

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