

H. BOLZE.

MACHINE FOR PRODUCING CYLINDRICAL NON-CONDUCTORS OF HEAT.

No. 325,490.

Patented Sept. 1, 1885.

Fig. 1.

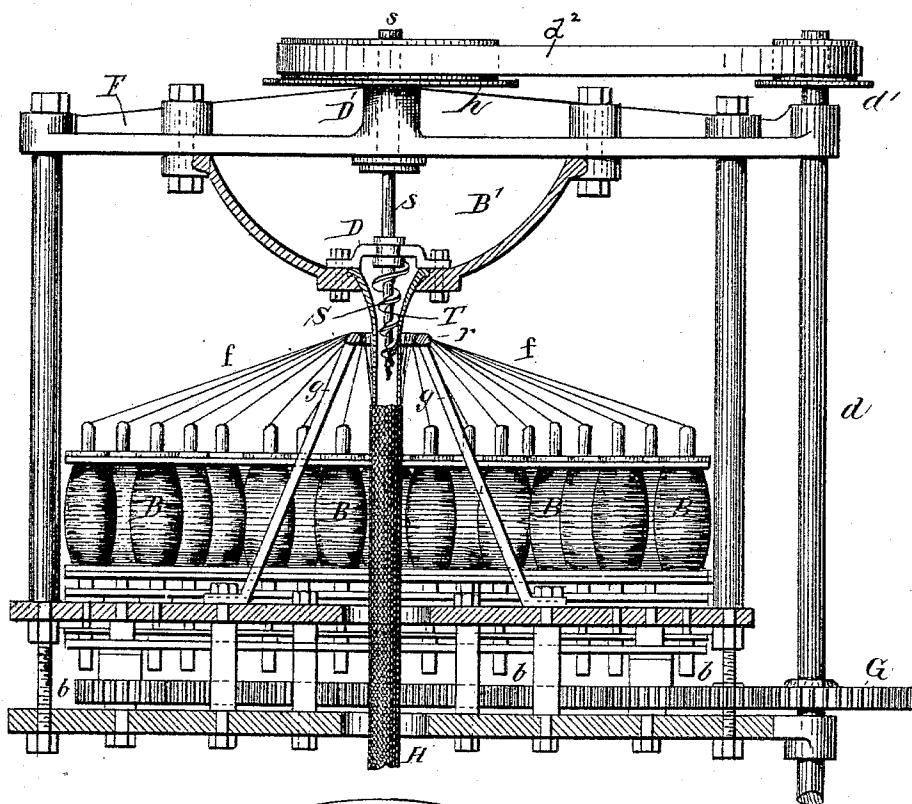
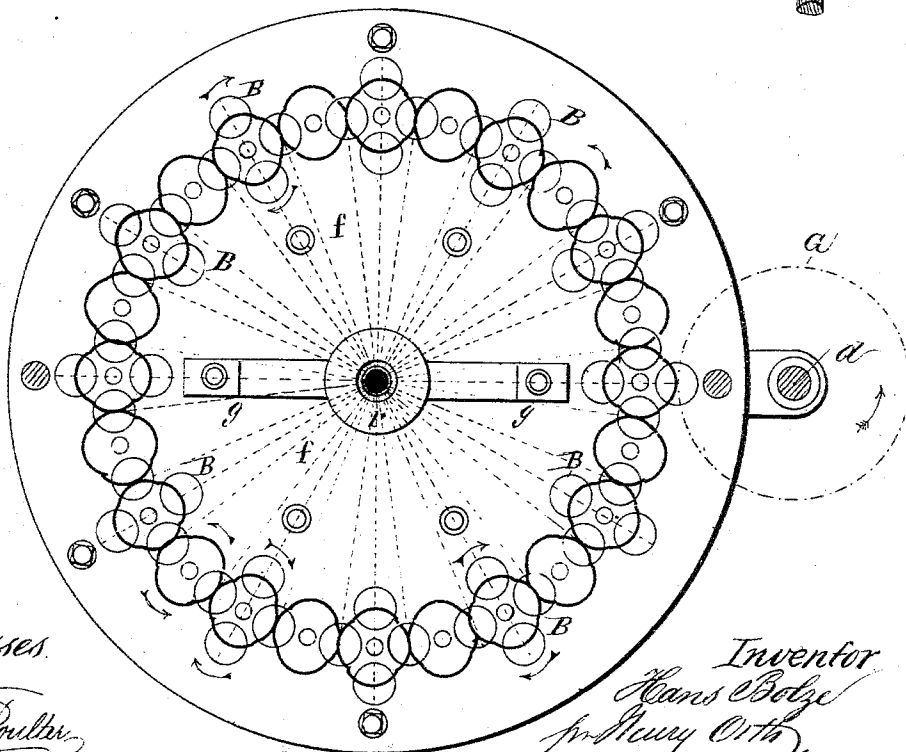


Fig. 2.



Witnesses.
Wm. H. ...
W. H. ...

Inventor
Hans Bolze
per *Henry Orth*
Husatt

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

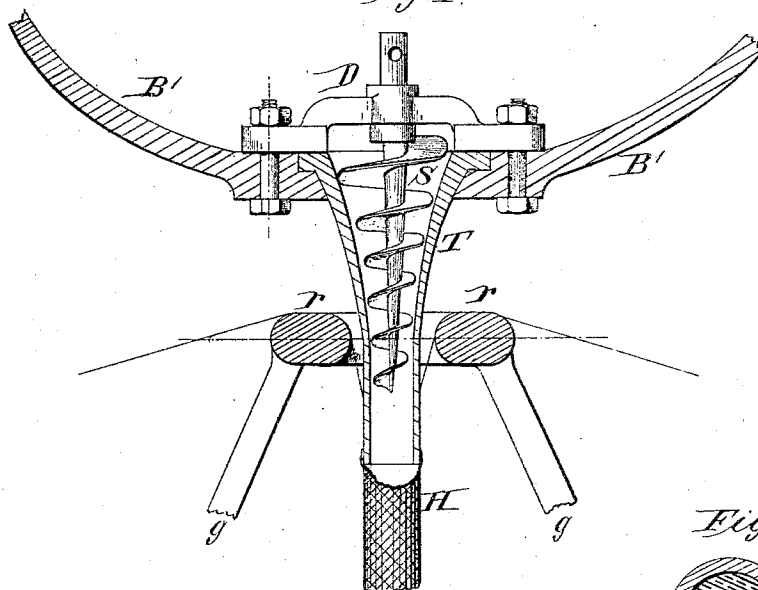


Fig. 5.

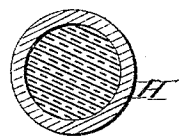
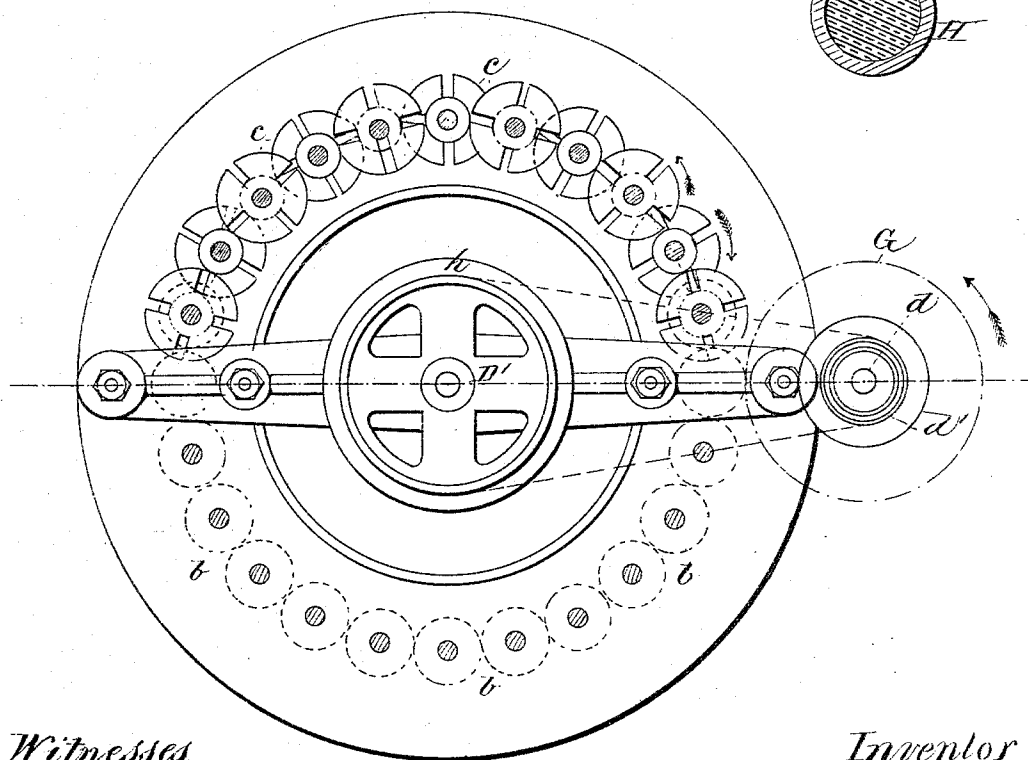


Fig. 3.

Witnesses.

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UNITED STATES PATENT OFFICE.

HANS BOLZE, OF BRUNSWICK, GERMANY.

MACHINE FOR PRODUCING CYLINDRICAL NON-CONDUCTORS OF HEAT.

SPECIFICATION forming part of Letters Patent No. 325,490, dated September 1, 1885.

Application filed April 10, 1884. (No model.) Patented in Germany March 7, 1883, No. 26,232; in England March 20, 1884, No. 5,223; in Belgium April 23, 1884, No. 64,911, and in Austria-Hungary September 24, 1884, No. 11,406 and No. 43,933.

To all whom it may concern:

Be it known that I, HANS BOLZE, a subject of the Duke of Brunswick, residing at Brunswick, German Empire, have invented certain
5 new and useful Improvements in Machines for Producing Cylindrical Non-Conductors of Heat; 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
10 the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

15 This invention relates to the manufacture of cylindrical non-conducting agents of heat, more especially designed for application to fluid-conducting pipes that are exposed to atmospheric influences—such, for instance, as
20 water-pipes, soil-pipes, or other conductors located above ground—though said non-conducting agents may be employed for other purposes where a good non-conductor of heat or cold is found desirable.

25 Non-conductors of heat of cylindrical form have heretofore been made by sewing a woven fabric into tubular form, and then filling the same with some non-conducting agent. This process is a slow and expensive one, and the
30 non-conductor obtained, unless great care is had, becomes more or less rigid, and consequently cannot be applied closely to the surfaces it is intended to protect.

35 The object of my invention is to provide a means whereby a cylindrical non-conducting agent of heat of great flexibility and strength is obtained, and whereby the cost of such non-conductors is greatly reduced.

40 To this end the invention consists in the combination, with a braiding mechanism, of devices operating to feed a pulverulent material into the tube as it is being braided, and in certain details of construction and arrangement of parts, substantially as hereinafter fully
45 described.

In carrying out my invention I effect the braiding on the inner periphery of a ring, through which projects a feed-tube of conoidal form containing a feed-screw, and receiving the
50 non-conducting material from a receptacle

located above said tube and screw, and driving the latter from the driving-shaft that drives the spindles at a rate of speed corresponding with that of the operation of the machine in the formation of the tube. In this manner the
55 sheathing is practically braided around the non-conducting core, the tightening of the interlaced strands taking place at the small end of the feed tube.

In the accompanying drawings, Figure 1 60 shows, by a vertical sectional elevation, a braiding-machine of well-known construction provided with my improvements for filling the tubular fabric. Fig. 2 is a top plan view, the upper part of the framing being removed. 65 Fig. 3 is a like view, the spindles and race plates or circles being removed. Fig. 4 is an enlarged detached sectional view of the filling devices for filling the tubular fabric with a non-conducting material, and Fig. 5 is an enlarged 70 cross-section of the completed non-conductor.

Like letters of reference indicate like parts, wherever such may occur in the above figures
75 of drawings.

The braiding-machine shown in the accompanying drawings is of a well-known construction, and has in this instance forty-eight spindles, B, driven from twenty-four intermeshing pinions, b, which latter receive motion
80 from a gear-wheel, G, on a driving-shaft, d. Each pinion-shaft carries a disk, c, cross-slotted, which serve to guide the spindles along the intercrossing race-circles in the usual and well-known manner. The disks c are located
85 at different elevations on the pinion-shafts, so as not to interfere with each other in their rotation, as more plainly shown in Fig. 3.

The interlacing or braiding of the cords or strands f takes place on the inner periphery
90 of a ring, r, that is supported from standards g, and located centrally of the spindles, one half of which latter move uniformly from right to left, and the other half from left to right, as is usual in this class of machines. 95

T indicates a feed tube or funnel of conoidal form, the larger feed-mouth of which is attached to a receptacle, B', secured to the frame F of the machine. This receptacle is designed to receive the non-conducting material, either 100

in a comminuted, pulverulent, or plastic form. The discharge end of the feed-tube projects some distance below the ring *r*, and upon this end the braided meshes of the tubular fabric 5 or hose *H* are tightened.

Within the tube *T* is arranged a feed-screw, *S*, that rotates in a bearing, *D*, secured in the receptacle *B'*, and is coupled to a shaft, *s*, that has its bearing *D'* in the upper portion of the 10 frame, and carries at its outer end a belt-pulley, *h*, belted by means of a belt, *d'*, to a pulley, *d'*, mounted on the driving-shaft *d*, so that the screw *S* and the spindles *B* are operated from the same driving-shaft.

15 It is obvious that when the machine is started, and the receptacle *B'* provided with non-conducting material, the tubular fabric will be practically braided around a core of non conducting material, it being, of course, 20 understood that as soon as a portion of the tube has been braided the end thereof is tied to prevent the material from escaping therefrom, the filled tube passing through and out of the center of the machine, below which a suitable 25 reel may be located and the non-conductor wound thereon.

Cylindrical non-conductors produced as described possess a greater strength and flexibility than those produced in the usual man- 30 ner by sewing a woven fabric into tubular

form and then filling the same with a non-conducting material. They adapt themselves more readily and more closely to the surfaces to which they may be applied, and consequently form a better protective agent, and 35 may be obtained at a greatly-reduced cost than the non-conductors above referred to.

I am aware that fuse has been made by braiding a tube and simultaneously filling the same with an explosive or slow-burning powder; and I am also aware that packing has 40 been produced by braiding a tube around an elastic core, and I do not desire to broadly claim the mode of producing the cylindrical non-conductor.

45 Having now described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

The combination, with a braiding mechanism for braiding tubular fabrics, of the funnel 50 *T*, feed-screw *S*, operating within the funnel, the driving-shaft *d*, and means for operating said shaft, and screw for rotating the same, substantially as and for the purpose specified.

In testimony whereof I affix my signature in 55 presence of two witnesses.

HANS BOLZE.

Witnesses:

WILLIAMS C. FOX,
JOH. KRACKE.