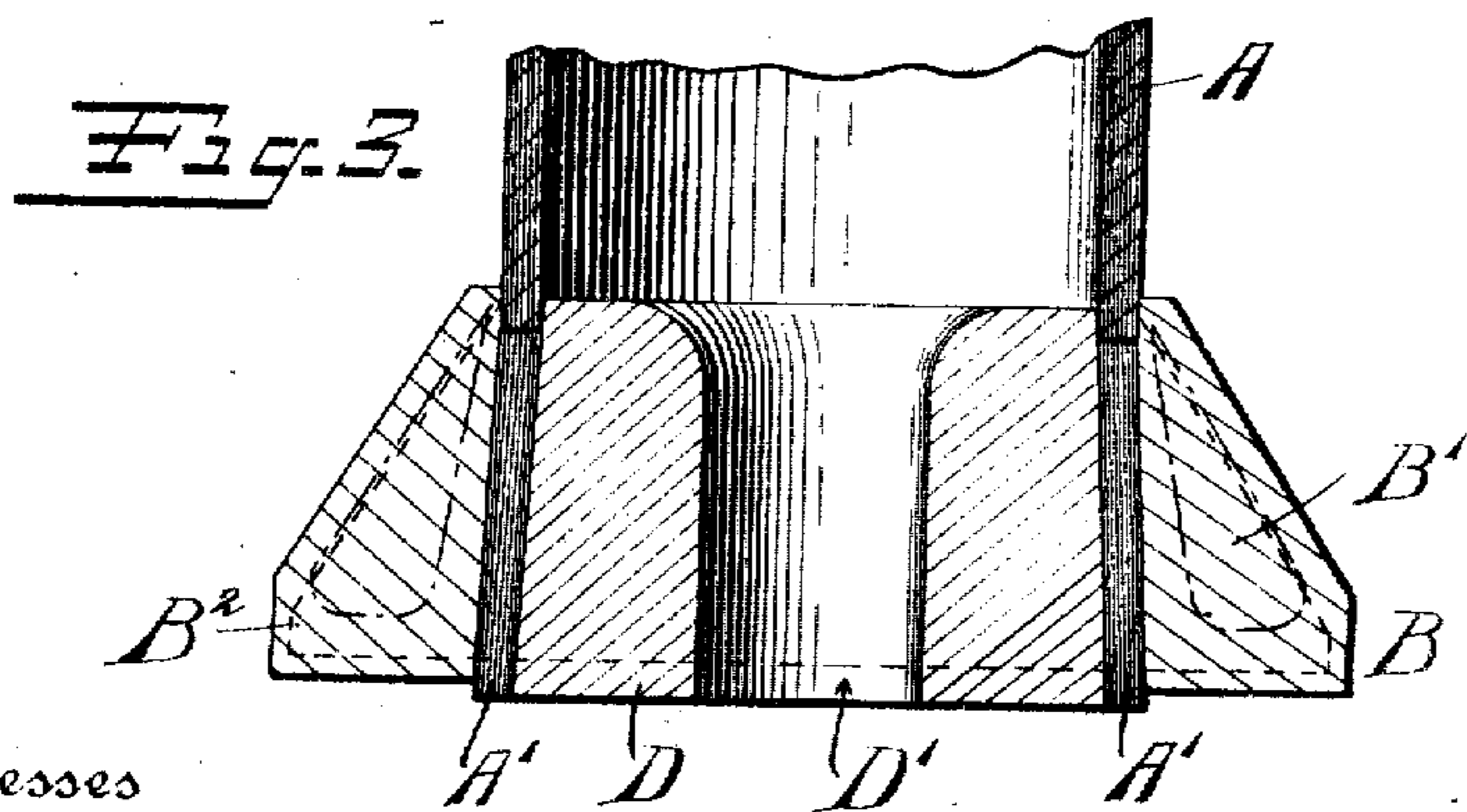
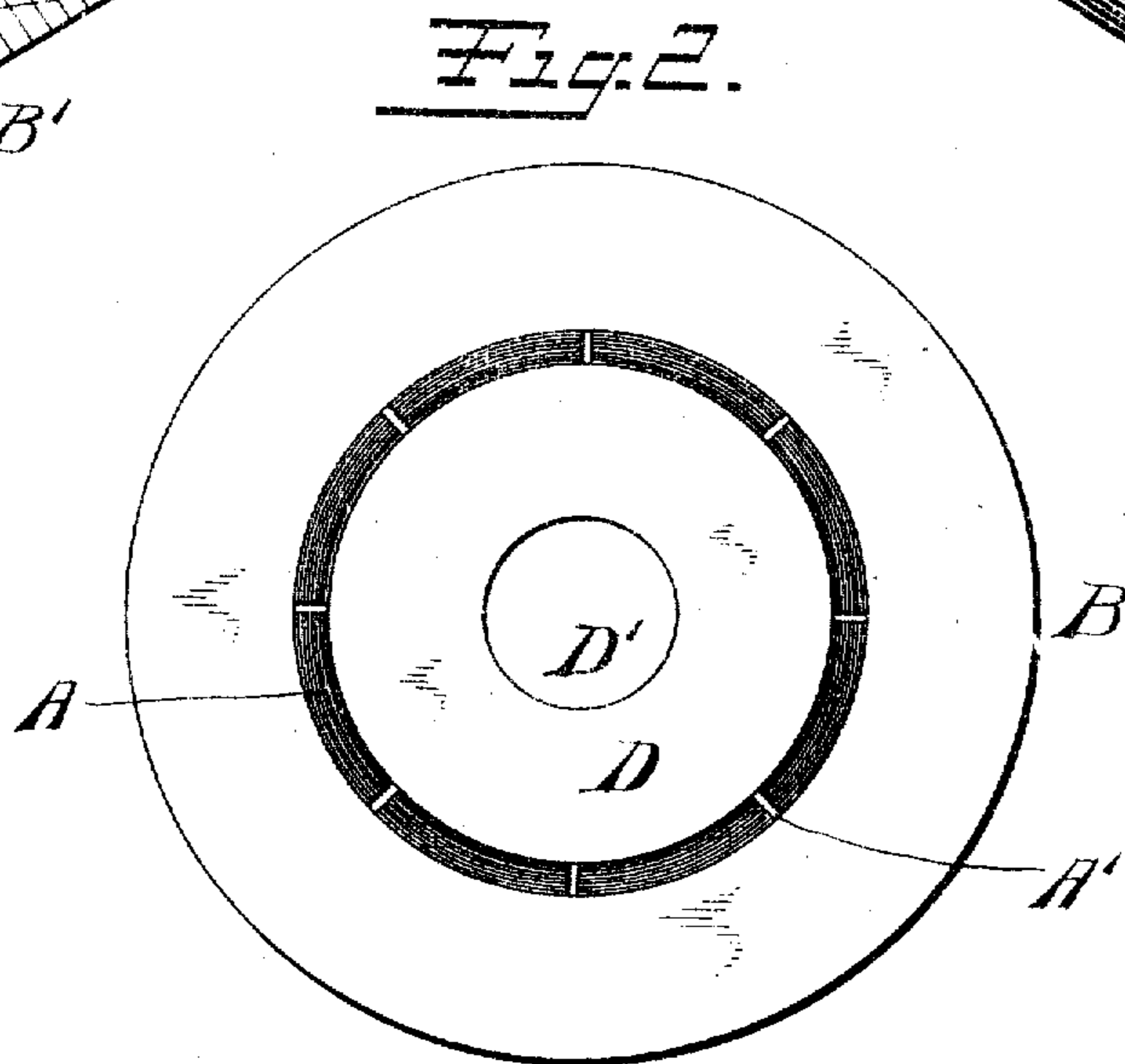
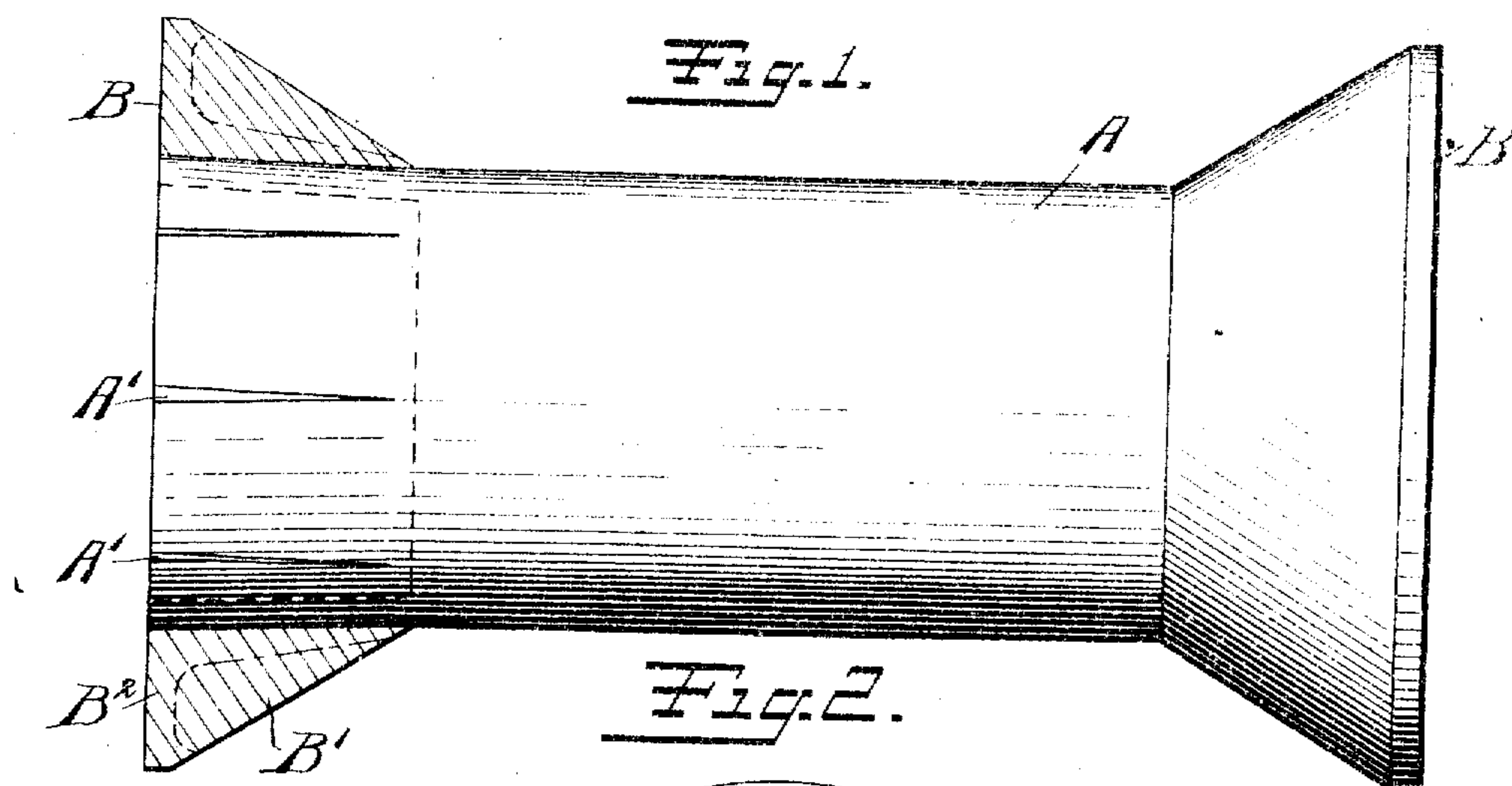


No. 843,454.

PATENTED FEB. 5, 1907.

P. HARDMAN.
SPOOL.

APPLICATION FILED MAY 17, 1906.



Witnesses
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UNITED STATES PATENT OFFICE

PETER HARDMAN, OF WILLIMANTIC, CONNECTICUT.

SPOOL.

No. 843,454.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed May 17, 1906. Serial No. 317,294.

To all whom it may concern:

Be it known that I, PETER HARDMAN, a citizen of the United States, residing at Willimantic, county of Windham, State of Connecticut, (post-office address the same,) have invented certain new and useful Improvements in Spools, of which the following is a full, clear, and exact description.

My invention relates to improvements in spools for thread and the like; and the object is to provide a simple, inexpensive, and lightweight article of that type, the same when completed possessing great strength and durability, the head portion thereof being so constructed as to effectively resist strains and so as to relieve shock and wear of thread-guides commonly employed in winding-machines for laying the thread upon the spool. The exposed portions of the heads are practically waterproof.

In the accompanying drawings, Figure 1 is a side elevation of the finished article with one head in section. Fig. 2 is an end elevation of the finished article. Fig. 3 is a fragmentary sectional view of one end of a spool with the head applied thereto and prior to the finishing operation.

A is the body or cylindrical portion of the spool. This is formed, preferably, of a strip of paper wound on itself to form a series of laminations which may be cemented together (by glue, for instance) and which collectively constitute a tube of sufficient thickness to give the necessary strength.

B B are the heads. These heads are formed of pulp (preferably wood-pulp) and are first molded to the cross-section size and outline shown in Fig. 3. The inner bore of each head is outwardly flared, the inner end being adapted to snugly fit the tubular body A. The end of the tubular body is slitted, as at A' A'.

D D are plugs tapered in form and arranged to be inserted into the slitted ends of the body A, so that when the heads B B are in position said slitted ends will be expanded and pressed into intimate and firm contact with the inner wall of said spool-heads, thus effectively holding the latter against being forced off. Glue is preferably used to more effectively unite the parts. Each of the plugs D D is centrally bored, as at D', so as to provide a bearing for the spindle while the spool is being wound or while it is in use. The plugs D are preferably made of wood, since that material affords good

bearing and wearing surfaces and possesses sufficient strength and rigidity to effectively hold the tube ends against compression.

The heads B B, as before described, are made from pulp. When a head is first formed, it has the size and cross-sectional outline shown in Fig. 3. This head is then treated with a suitable sizing and hardening element, preferably glue and milk, which is allowed to penetrate well into the entire outer surface, care being taken, however, to leave an inner relatively soft core portion B', Fig. 3. The hardened shell portion, bounded by dot-and-dash lines, is indicated by B². Since the hard shell thus formed (particularly on the tapered side) would offer great resistance to the thread-guide, the latter might be rapidly worn or injured in use, therefore I remove in any suitable way—for example, by grinding down to the dotted outline—part of the hardened shell portion and on the tapered side, cutting it back until the core or relatively soft portion B is reached. In this manner that portion of the head which supports the thread and with which the thread-guide comes in contact is relatively soft, although sufficiently firm to properly support the several layers of thread. By this improvement no severe shocks are imparted to the guide. By providing a relatively hardened shell portion I gain another advantage, to wit: I thereby render the exposed spool-heads more durable and incapable of absorbing moisture to the same degree that the relatively soft pulp would absorb moisture. Hence when the spools are used in moist climates there is no danger of the heads swelling and softening.

It will be understood that the beveled thread-bearing surface of each spool-head (which is relatively soft) is covered with thread when wound, and hence protected against moisture.

What I claim is—

1. In a spool, a tubular body portion, and a head portion therefor made from homogeneous material, the inner wall and end wall of said head being hardened, the tapered thread-bearing wall being relatively soft.
2. A spool comprising a hollow or tubular body, a head for each end of said body portion, said heads being formed of pulp, the thread-supporting surfaces thereof being relatively softer than the other portions thereof, and means for securing the heads in place on the ends of the body portion.

3. In a spool, a laminated tubular body
formed by winding a strip of paper upon
itself, a head for each end of said body, each
of said heads being formed of pulp, the inner
5 bore of each of said heads flaring outwardly,
a plug for each end of said body portion, the
external wall of each of said plugs having a
flare corresponding to the flare of the bore in
each of the heads, and a central spindle pas-
10 sage or bore in each of said plugs, the thread-
supporting surface of each of said leads be-
ing relatively softer than the other portions
of said head.

4. A spool comprising a tubular body,

homogeneous heads formed of pulp hardened 15
on the ends and relatively soft at the thread-
bearing portions, and means for securing the
heads to the body.

5. A spool comprising a tubular body,
homogeneous leads formed of pulp hardened 20
on the ends and relatively soft at the thread-
bearing portions, and wood plugs in the body
for securing the leads to the body.

PETER HARDMAN.

Witnesses:

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