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R. H. HAMPEL

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MUSICAL INSTRUMENT WITH IMPROVED SPRING BEARING

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*Fig. 1.*

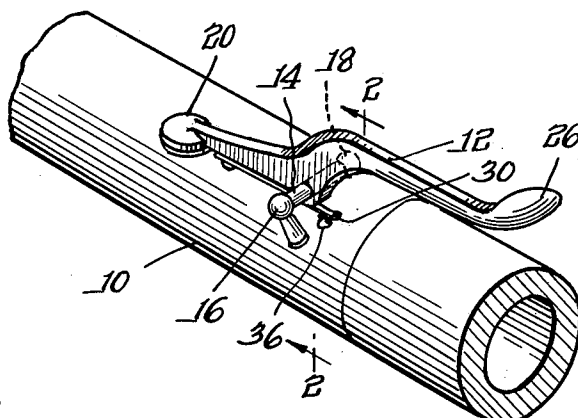


*Fig. 2.*

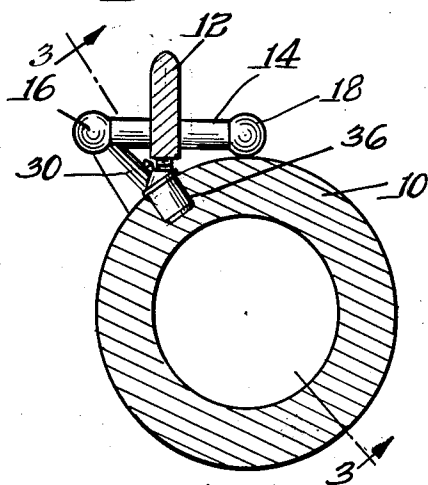


*Fig. 4.*

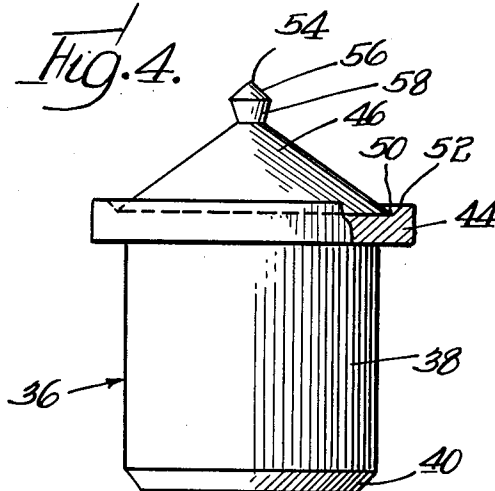
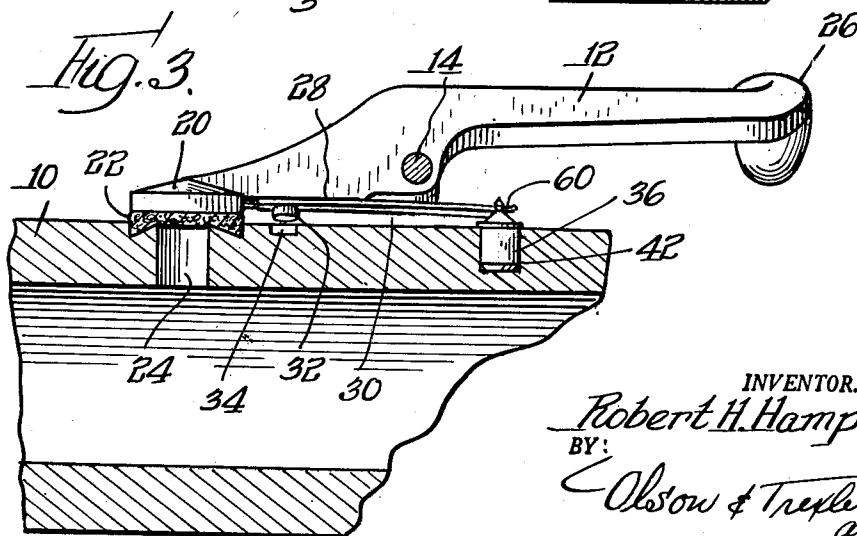


*Fig. 3.*



INVENTOR.  
*Robert H. Hampel*  
BY: *Olson & Trexler*  
attys.

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MUSICAL INSTRUMENT WITH IMPROVED  
SPRING BEARING

Robert H. Hampel, Kenosha, Wis., assignor to G. Le-  
blanc Corporation, Kenosha, Wis., a corporation of  
Wisconsin

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8 Claims. (Cl. 84—382)

This invention is concerned with the art of musical  
wind instruments, and more particularly with an improved  
spring bearing for clarinets and the like.

Most clarinets are made either of wood or of plastic.  
Spatula keys on such instruments are usually biased by  
means of flat blade springs. These springs in the usual  
case simply bear against the wood or plastic body. In  
many instances, a slot is milled in the surface of the body  
to position the spring properly. Such flat blade springs  
are necessarily of a rather hard nature, and inherently  
have sharp edges. Accordingly, they tend to wear into  
the wood or plastic of the clarinet body, thereby leading  
to binding of the springs and general improper opera-  
tion, as well as to wearing out of the body of the instru-  
ment. The problem is particularly acute in the case of  
certain keys, such as the Bb/Eb key, which are mounted  
off-center of the body of the instrument. The aforemen-  
tioned key pivots about an axis which is oblique relative  
to the surface of the body, rather than about an axis  
which is tangent to the immediately adjacent part of the  
body, thereby tending to force the biasing spring laterally  
so that it rides in the edge of the milled slot.

Accordingly, it is an object of this invention to provide  
an improved bearing for a spring to be used on a clarinet  
or the like.

More particularly, it is an object of this invention to  
provide an improved bearing for a spring to be used on  
a clarinet or the like, which bearing has a better sur-  
face, less friction, holds the spring against slipping, and  
provides a more positive action.

It is a further object of this invention to provide, in  
a clarinet or the like having a non-metallic body, a bearing  
for a spring providing metal to metal contact with the  
spring.

It is yet another object of this invention to provide a  
bearing for a spring to be used on a clarinet which ma-  
terially speeds manufacture of the clarinet.

Yet another object of this invention is to provide an  
inserted bearing for a spring to be used on a clarinet or  
the like which is of symmetrical construction and in-  
sertable in any position.

Other and further objects and advantages of the pres-  
ent invention will be apparent from the following descrip-  
tion when taken in connection with the accompanying  
drawings wherein:

FIG. 1 is a perspective view of a portion of a clarinet  
body showing the Bb/Eb key and the improved bearing  
thereon;

FIG. 2 is an enlarged cross-sectional view taken along  
the line 2—2 in FIG. 1;

FIG. 3 is a further enlarged, fragmentary longitudinal  
sectional view taken along the line 3—3 in FIG. 2; and

FIG. 4 is an enlarged plan view of the bearing.

Referring now in greater particularity to the drawings,  
there is shown a portion of the body 10 of a clarinet.  
Specifically, the body portion comprises an upper joint  
having a spatula key 12 pivoted thereon. This spatula  
key comprises the Bb/Eb key, and it is pivoted about a  
hinge rod 14 supported in the usual manner by a pair  
of posts 16 and 18. The post 16 is longer than the  
post 18, and the key 12 is supported in a position oblique  
relative to the adjacent surface of the body. In other

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words, the axis of the hinge rod 14 is oblique rather  
than tangent relative to the centrally underlying portion  
of the adjacent surface of the clarinet body.

The key 12 is provided with the usual key cup 20  
and pad 22 for closing the tone hole 24. At the opposite  
end, the key has the usual finger piece 26 for manual en-  
gagement to raise the cup and cover from hole closing  
position. In addition, the underside 28 of the key has  
a substantially flat blade spring 30 secured thereto by a  
screw 32. The body is recessed at 34 to provide adequate  
clearance for the screw at all times, and the opposite end  
of the spring is cantilevered rearwardly beyond the hinge  
rod 14 and rests against the improved bearing 36 forming  
the subject matter of this invention.

The bearing 36 includes a cylindrical plug 38 having a  
bevelled entering end 40 facilitating entry into a com-  
plementary aperture 42 in the clarinet body. The cylin-  
drical plug 38 is topped by a laterally outwardly project-  
ing peripheral flange 44. The bearing is installed in the  
aperture 42 in the clarinet body by a press fit, the bevelled  
lower end 40 facilitating entry of the cylindrical plug, as  
will be understood.

Above the flange, the bearing is provided with a conical  
bearing surface 46. This surface is countersunk down  
into the top of the flange 44 as at 50, the countersinking  
of the flange extending up and out at 52. In a typical  
example of the invention, the conical surface 46 forms  
an angle of 35° with the top of the flange 44, while the  
surface 52 forms an angle of 100° with the conical sur-  
face 46.

The bearing 36 is provided, at the top of the conical  
bearing surface 46, with an integral locator pin 54. The  
pin has an upper conical surface 56 which is parallel to  
the surface 46. The locator pin 54 is undercut by an  
inverted frustoconical surface 58, which in a typical  
example forms an angle of 100° with the conical bearing  
surface 46.

Since the spring bearing 36 is completely symmetrical  
about its central axis, it can be installed in any position.  
The upper edge of the bearing 46, as viewed in FIG. 2,  
is parallel to the hinge rod 14. Furthermore, the sur-  
face 46 underlies and is aligned with the key 12. Ac-  
cordingly, the spring 30 bears substantially flat against  
the bearing surface 46, albeit in a line contact where the  
spring is tangent to the bearing surface. The spring is  
positively located between the counterbore 50 and the  
flange 44 and the locating pin 54. Accordingly, the  
spring will not be displaced laterally, even though it is  
held only by a single screw to the underside of the key.

Preferably, the extreme tip of the spring 30 is deflected  
slightly upwards as is indicated at 60. The spring ter-  
minates in a rest position slightly beyond the locating  
pin or tip 54, and this upwardly deflected tip 60 slides  
onto the pin as the key is depressed to present more of  
a surface engagement with the bearing surface.

Although a particular embodiment of the invention has  
been shown for illustrative purposes, it will be understood  
that various changes in structure will no doubt occur to  
those skilled in the art. Such changes will be understood  
as coming within the scope of this invention insofar as  
they fall within the ambit of the following claims.

The invention is claimed as follows:

1. A musical woodwind instrument such as a clarinet  
including a body, a tone hole in said body, a key adapted  
to close said tone hole, means mounting said key on said  
body for pivotal movement about an axis oblique relative  
to the immediately subjacent portion of said body, a  
biasing spring resiliently engaging said key, and a bearing  
fixed on said body, said bearing have a substantially con-  
ical bearing surface engaged by said spring.

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2. A musical instrument as set forth in claim 1 wherein the portion of the bearing surface engaged by the spring is substantially parallel to the pivotal axis of said key.

3. A musical instrument as set forth in claim 1 and further including projections on said bearing at the opposite extremities of said conical bearing surface and substantially transverse thereof for positioning and guiding said spring.

4. A musical woodwind instrument such as a clarinet including a body, a tone hole in said body, a key adapted to close said tone hole, means mounting said key on said body for pivotal movement about an axis oblique relative to the immediately subjacent portion of said body, a biasing spring resiliently engaging said key, and a bearing on said body, said bearing being rotationally symmetrical and having a cylindrical body portion received in a complementary aperture in said instrument body, said bearing further including a peripheral flange at the outer end of said cylindrical body portion, a frustoconical bearing surface disposed outwardly of said flange, and a projection at the tip of said frustoconical bearing surface projecting at least in part transversely of said frustoconical surface, said spring engaging said substantially frustoconical surface and being positioned and guided by said flange and said tip.

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5. A musical woodwind instrument as set forth in claim 4 wherein the flange is counterbored on the side of the frustoconical surface and the tip is undercut.

6. A musical woodwind instrument as set forth in claim 4 wherein the portion of the substantially frustoconical surface engaged by the spring is substantially parallel to the pivotal axis of said key.

7. A bearing of rotationally symmetrical construction comprising a cylindrical body portion, a transversely projecting peripheral flange at one end of said body portion, a substantially frustoconical bearing surface above said flange, and an extending tip above said substantially frustoconical surface.

8. A bearing as set forth in claim 7 wherein the flange extends radially outwardly beyond the frustoconical surface and is counterbored on the side thereof adjacent said frustoconical bearing surface, and wherein the extending tip is undercut.

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