

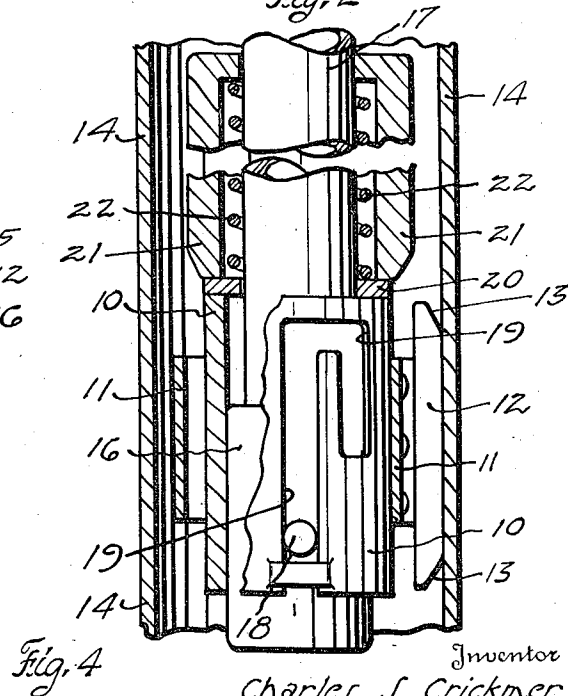
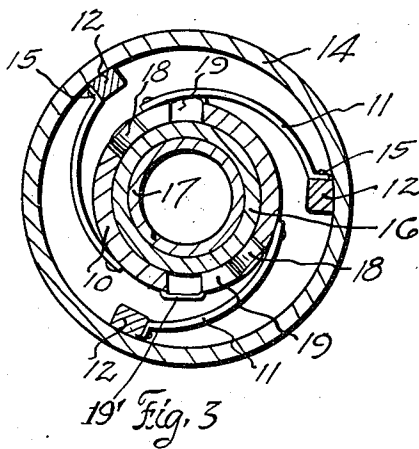
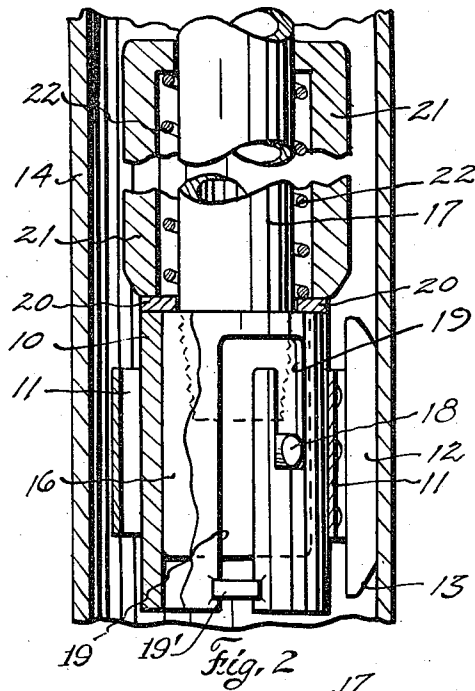
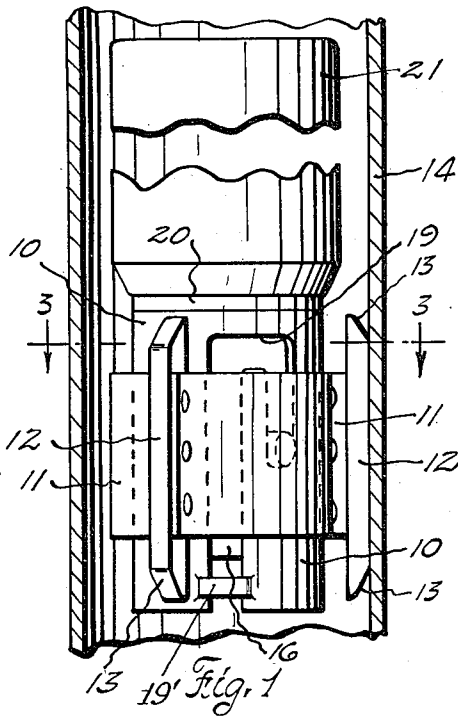
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FRICION SHOE

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FRICTION SHOE

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8 Claims. (Cl. 308—4)

This invention relates to new and useful im-
provements in friction shoes.

One object of the invention is to provide an
improved friction shoe for well devices and the
like.

A particular object of the invention is to pro-
vide a shoe having spring pressed runners adapt-
ed to engage the inner wall of a well casing or
tubing and arranged so as to center the shoe in
the casing or tubing, as well as providing for
greater spring tension than can be obtained with
the usual upright friction springs, whereby a
more positive supporting of the shoe is accom-
plished.

A further object of the invention is to provide
a shoe having runners carried by volute springs
disposed transversely of the tubing or casing,
whereby the runners may be engaged with the
wall with more equal pressure and also whereby
an amplified spring pressure may be exerted on
said runners to increase their frictional contact
with the wall of the tubing or casing.

An important object of the invention is to pro-
vide a shoe having runners carried by springs
disposed transversely of the tubing or casing,
whereby the runners engage the wall and take all
the wear, the springs carrying the runners never
being in engagement with the walls.

A construction designed to carry out the in-
vention will be hereinafter described, together
with other features of the invention.

The invention will be more readily understood
from a reading of the following specification and
by reference to the accompanying drawing, in
which an example of the invention is shown, and
wherein:

Figure 1 is an elevation of a shoe constructed
in accordance with the invention and having its
runners in engagement with the inner wall of a
well casing which is shown in section, the shoe
being in its locked position,

Figure 2 is a vertical sectional view of the same,

Figure 3 is a horizontal cross-sectional view
taken on the line 3—3 of Figure 1, and

Figure 4 is a view similar to Figure 1, showing
the shoe unlocked.

In the drawing the numeral 10 designates a
cylindrical sleeve. The inner ends of curved leaf
springs or arms 11 are riveted or otherwise fas-
tened to the outer surface of the sleeve at equi-
distant points. The arms extend horizontally or
transversely in volute curves with reference to the
center of said sleeve. The arms may be made of
strips of flat spring steel or other metal of such

width as is desired and of the necessary spring
tension.

On the outer end of each spring or arm is
mounted a vertical runner 12 having its upper
and lower ends beveled at 13 so as to ride over
joints and the like in the casing or tubing 14.
While the runners may be attached to the ends
of the arms in any suitable manner, I prefer to
provide a narrow upright flange 15 on the outer
end of each arm and to rivet or otherwise fasten
each flange to one of the sides of each runner.
This leaves the outer faces of the runners free
to travel on the inner surface of the casing 14.

By the use of volute arms it is obvious that
amplified spring tension can be obtained. By
constructing the shoe so that the arms must be
sprung inwardly or retracted to a considerable
extent to insert them in the casing 14, or by mak-
ing said arms of heavier spring metal so that
they need not be retracted to such an extent,
more tension can be obtained than is possible
with the usual upright spring arms. Further the
runners, engaging the casing at equi-distant
points and owing to their volute curves, will
center the sleeve 10 and thus become guides. It
is pointed out that the outer side of the runners
engaging the inner wall of the casing 14 will be
subjected to all the wear as they travel vertically
within the casing. By observing Figure 3 it will
be seen that the volute springs 11 are never in
engagement with the walls of the casing, and
therefore do not at any time become worn along
their outer surfaces through frictional contact.

The sleeve 10 has a free sliding fit on a collar
16, which may be employed to connect the ends
of upright tubular members 17 or any other ele-
ments with which the device is to be used. The
collar is provided with diametrically opposite lugs
18, which engage in inverted J-slots 19 in the
sleeve, such slots being very common in the well
art. The sleeve 10 is also provided or formed
with connectors 19' which bridge the gaps formed
by slots 19 and allow the lug 18 to pass inside of
them. Normally the lugs engage in the short
legs of the slot, as is shown in Figures 1 and 2,
whereby the upper ends of the sleeve and collar
both engage and support a washer 20, or any
other element with which the anchor is to be used.
I have shown a tubular member 21, which may be
the weight of a tubing catcher resting on said
washer and enclosing a coiled spring 22, which
is also supported on said washer and partially
compressed by said element.

When the assembly is lowered in the casing 14,
the lugs 18 burying in the lower ends of the

short legs of the slots 19, will push the sleeve downwardly, whereby the runners 12 will slide down the inner surface of the casing. When the tubing 17 or other element is arrested and lifted upwardly, the frictional engagement of the runners with the casing, will hold the sleeve 10 stationary, whereby the lugs 18 will be moved to the tops of the slots 19. With the lugs in this position, the tubing 17 may be rotated to bring said lugs over the upper ends of the long legs of said slots, whereby the lugs may be lowered in said long legs, as is shown in Figure 4. During this movement the sleeve 10 will hold the element 21 in its arrested position, while the tubing 17 is being moved downwardly. This operation provides for the unlatching of the shoe.

The amplified tension of the arms 11 assures against movement of the shoe during the unlatching operation. They also hold the elements in the center of the casing so that there is no interference between the elements and the casing during either the running operation or the unlatching operation.

The description which has been given recites more or less detail of a particular embodiment of the invention, which is set forth as new and useful; however, I desire it understood that the invention is not limited to such exact details of construction, because it is manifest that changes and modifications may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent, is:

1. A friction shoe comprising, a sleeve, transverse spring arms secured at their inner ends to the sleeve and extending outwardly therefrom, and elongated upright runners secured to the outer ends of said arms.

2. A friction shoe comprising, a sleeve, spring arms secured at their inner ends to the sleeve and curved outwardly in volute curves from the sleeve so as to expand outwardly from the sleeve

to their outer ends, and upright runners mounted on the outer ends of the arms.

3. A friction shoe comprising, a sleeve, spring arms secured at their inner ends to the sleeve and curved outwardly in volute curves from the sleeve so as to expand outwardly from the sleeve to their outer ends, flanges on the outer ends of said arms, and upright runners secured to said flanges.

4. A friction shoe comprising, a collar having lugs, a sleeve slidable on the collar having slots receiving said lugs, volute spring arms secured at their inner ends to said sleeve, and elongated upright runners carried by the outer ends of said arms.

5. A friction shoe comprising, rigid runners adapted to engage the inner surface of a tubular member, a central support, and spring arms curved inwardly from their outer ends substantially horizontally from the runners and attached at their inner ends to said support, whereby said runners may be swung inwardly and outwardly without deflection from their upright planes.

6. A friction shoe including, a sleeve, an upright elongated runner; and a spring rigidly secured at one end to the sleeve and at its other end to the runner.

7. A friction shoe including, a sleeve, a spring having one end rigidly secured to the sleeve and its other end extending outwardly therefrom, and an upright elongated runner secured to the outer end of said spring as its sole means of support by the sleeve.

8. In a well casing having a reciprocating member therein, supporting means carried by the reciprocating member in the well casing, a spring having one end rigidly connected with said supporting means and extending substantially tangentially therefrom toward the casing, and an upright elongated runner connected with the outer end of said spring and pressed against the well casing thereby.

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