

(No Model.)

J. M. NAPIER.
SPEED INDICATOR.

No. 498,483.

Patented May 30, 1893.

FIG. 1

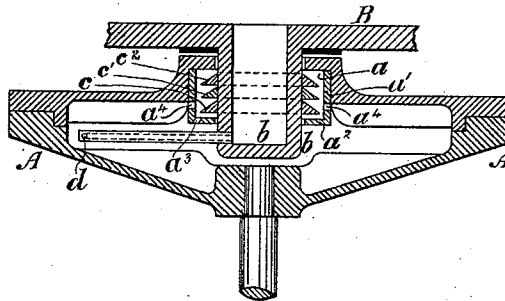


FIG. 2

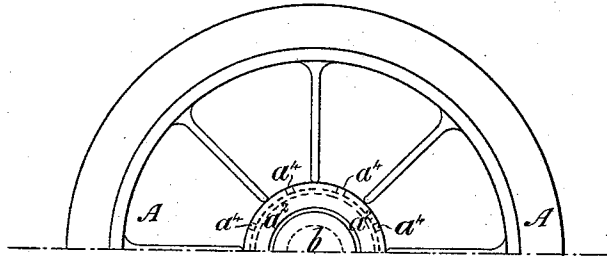
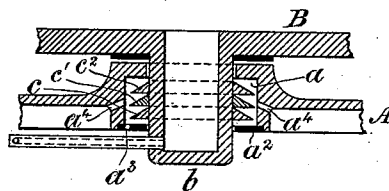


FIG. 3



Witnesses:
B. W. Miller.
C. F. Sensner.

Inventor,
James Murdoch Napier.
By his Attorneys
Palmer, Quinlan & Wright

UNITED STATES PATENT OFFICE.

JAMES MURDOCH NAPIER, OF LONDON, ENGLAND.

SPEED-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 498,483, dated May 30, 1893.

Application filed April 12, 1893. Serial No. 470,035. (No model.) Patented in England March 11, 1891, No. 4,388.

To all whom it may concern:

Be it known that I, JAMES MURDOCH NAPIER, engineer, a subject of the Queen of Great Britain, residing at York Road, Lambeth, London, in the county of Surrey, England, have invented certain new and useful Improvements in Speed-Indicators, (for which I have received Letters Patent in Great Britain, No. 4,388, dated March 11, 1891,) of which the following is a specification.

This invention relates to speed indicators such as are described in the specification of my former patent, No. 184,653, dated November 21, 1876, in which mercury is rotated in a vessel or container and in accordance with the varying speed of the rotation is caused to rise and fall in a fixed central indicating tube by its varying pressure against an orifice in connection with the fixed central tube and it has for its object improvements in the means for preventing the escape of the mercury out of the rotating vessel or container along with the air through the annular space between the hollow cylindrical boss which forms a continuation of the indicating tube downward into the container, and the circumference of the hole in the container through which it passes.

In the accompanying drawings illustrating my invention,—Figure 1 is a vertical section of a portion of a speed indicator which, in its general arrangement, is such as shown in my patent above referred to. Fig. 2 is an under side view, showing one-half of the upper portion of the mercury vessel or container. Fig. 3 shows a modification.

The mercury vessel or container A, is mounted on a shaft which is driven by the machine, the speed of which the indicator is required to show. A cylindrical recess a is formed in the top portion of the vessel A, and into this recess is fitted a cylindrical chamber a' , which surrounds a hollow cylindrical boss b , which passes down from a horizontal support or bracket B, of the indicating tube into the rotating vessel or container A. On the boss b , in the chamber a' , are fitted three rings $c\ c'\ c''$. The lower ring c is fixed in its position on the boss b , while the rings $c'\ c''$ may be fitted loosely and rest on the ring c . The rings are of triangular section, so that they incline downward at the top from the

inner to the outer circumference, while the bottom is flat, leaving the edge thin. The diameter of the rings is such that they do not touch the walls of the chamber a' , but leave a passage for the return of any mercury which may work up and also for the entrance and escape of air. The rings may, if preferred, be formed in one piece and made fast to the boss.

The chamber a' is provided with a bottom a^2 , which has a hole a^3 , through which the mercury, which may have passed above the bottom of the chamber a' , may flow back into the body of the container A. The rings are so arranged that they are fixed at a convenient height, so as not to touch the bottom of the chamber, which turns with the container, while the ring or rings remain stationary upon the fixed hollow cylindrical boss which passes freely through a hole in the bottom of the chamber.

The orifice pipe d , serves for the passage of the mercury to and from the container A, and the hollow boss b , as the speed of rotation of the container varies. The holes a^4 are provided to allow the air to enter and escape from the container, when the other passages are closed by the mercury. These holes a^4 may be screwed and packed with cotton wool. When the container is rotated, the centrifugal force will assist to clear the chamber a' of mercury through the hole a^3 .

In case that the speed of rotation of the instrument is reduced from a high to a low point, the mercury falls in the indicating tube and passes through the orifice pipe d , which is fixed to the hollow, cylindrical boss b , into the container A, and the air which is displaced by it passes out through the annular space between the hollow cylindrical boss and the circumference of the hole in the bottom of the chamber a' , through which it passes along under the lowest ring on the boss, then up and through the annular space or spaces between the ring or rings, and the walls of the recess or chamber, and finally out of the annular space between the hole in the upper part of the container, and the hollow cylindrical boss which passes into it. The air will also pass out through the hole at the bottom of the recess or chamber.

It will be observed that I provide also that

the air may enter and escape from the container, when the passages mentioned are closed by the rising of the mercury in the container above the level of the bottom of the recess or chamber. For this purpose, as shown, I bore the holes a^4 through the walls of the cylindrical recess or chamber, leading from the inside of the container at the top into the recess or chamber.

10 In Fig. 3, I have shown a slight modification, the bottom a^2 of the recess or chamber a' being made in a separate piece.

I claim as my invention—

15 In a speed indicator in which rotary motion is imparted to a vessel containing mercury, and in which the mercury is thereby caused to enter an orifice and to rise in a fixed central indicating tube, the device herein de-

scribed for preventing loss of mercury, consisting of a partially closed cylindrical chamber upon the rotating mercury vessel and surrounding the boss at the lower end of the indicating tube, and a fixed or stationary ring or rings within the chamber and mounted upon the boss, such stationary ring or rings serving to baffle the air escaping from the mercury vessel, thereby causing it to deposit particles of mercury which it may contain.

JAMES MURDOCH NAPIER.

Witnesses:

T. C. CARPENTER,

24 Southampton Buildings, Chancery Lane,
London, W. C.

T. F. BARNES,

17 Gracechurch Street, London, E. C.