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E. EINFELDT.

DEVICE FOR EXCLUDING DUST FROM BEARINGS.

APPLICATION FILED JUNE 23, 1904.

NO MODEL.

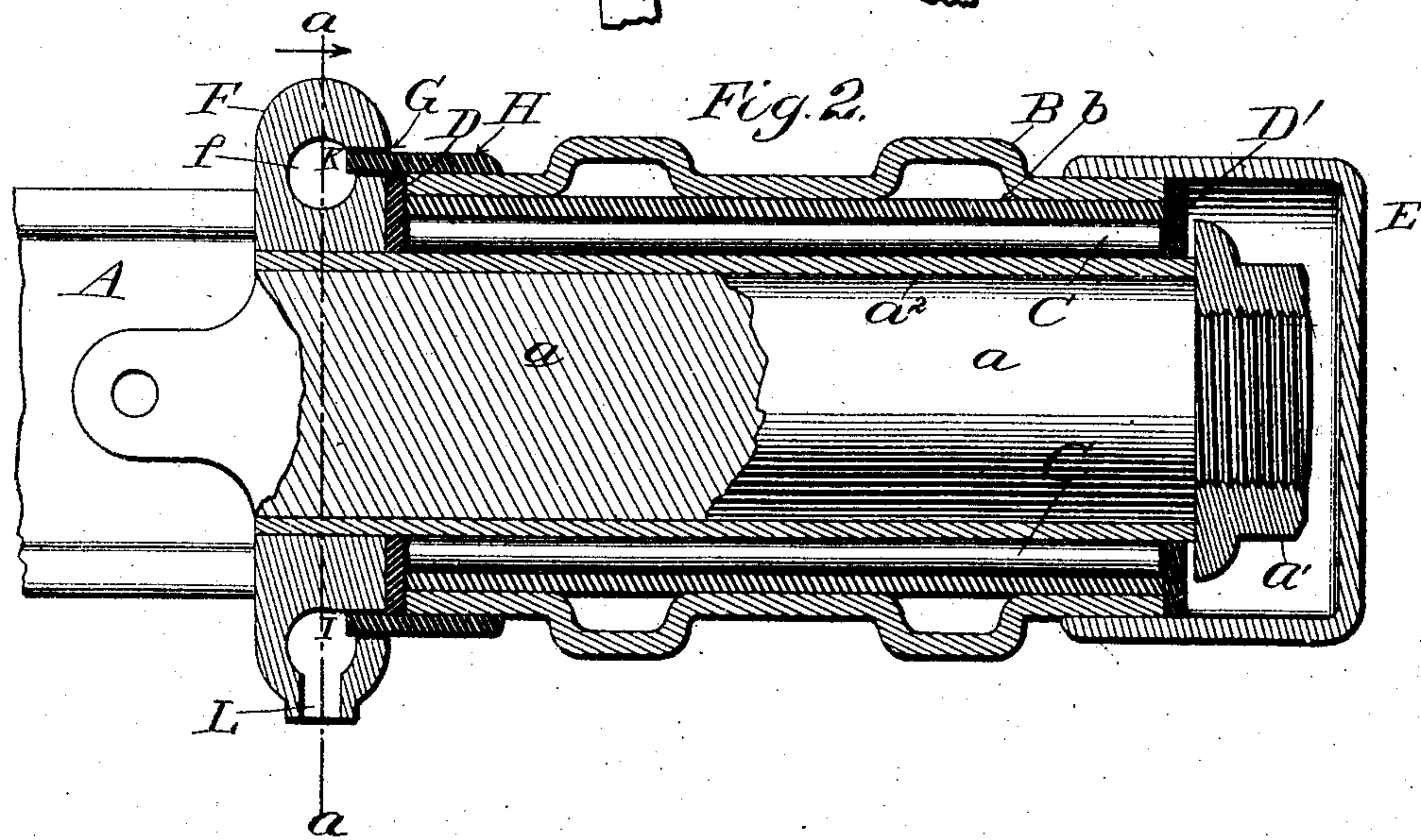
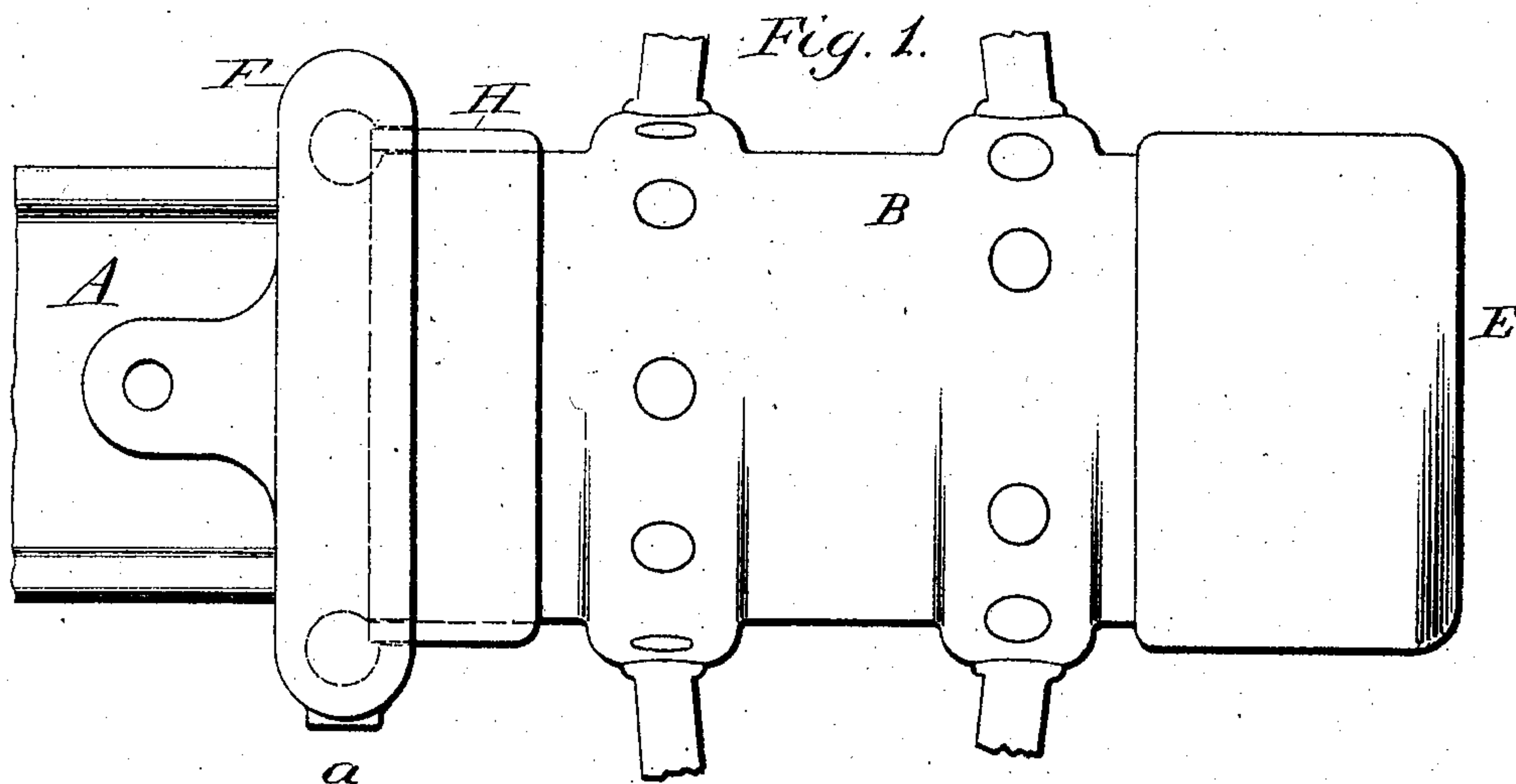
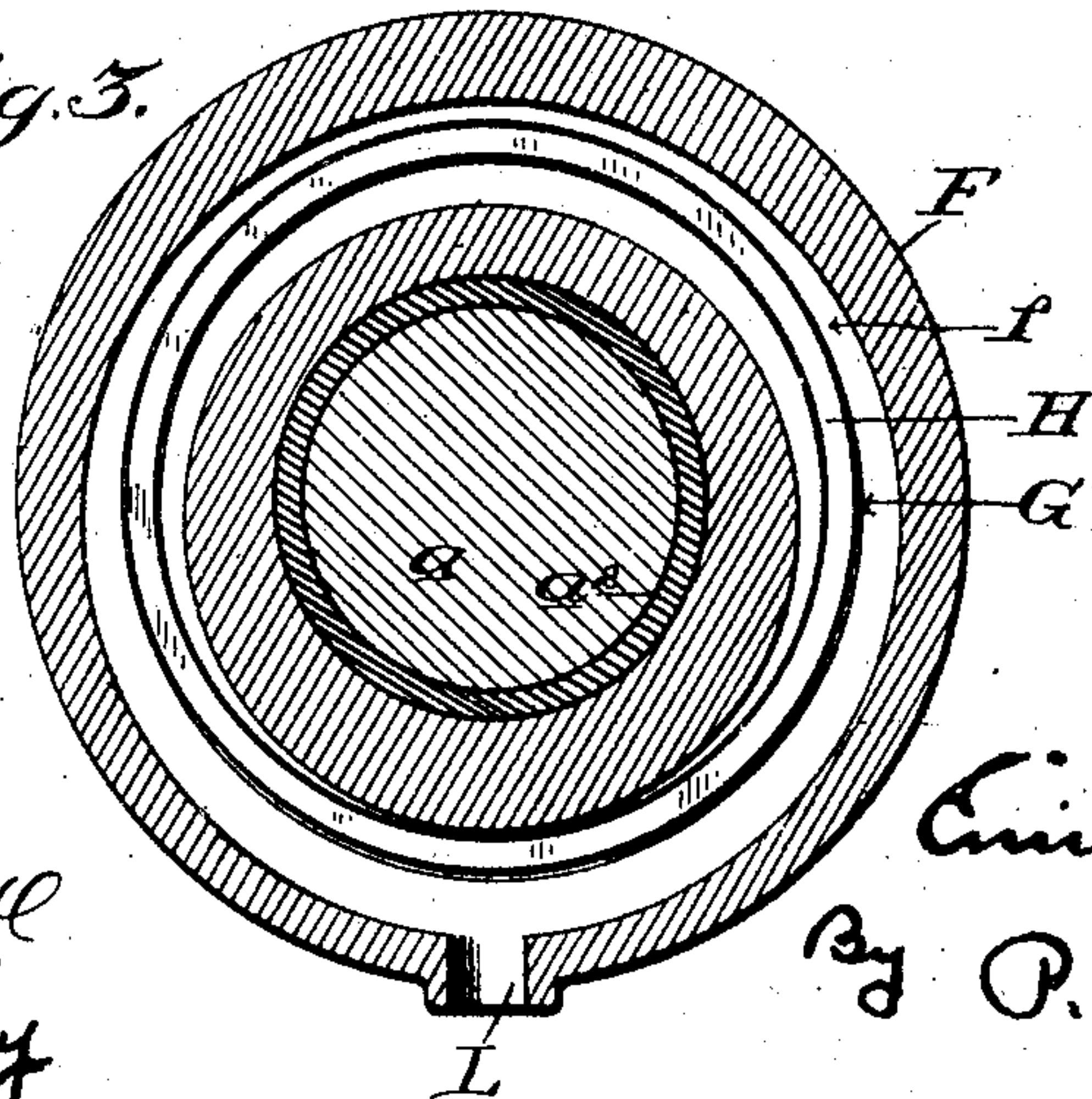


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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DEVICE FOR EXCLUDING DUST FROM BEARINGS.

SPECIFICATION forming part of Letters Patent No. 778,181, dated December 20, 1904.

Application filed June 23, 1904. Serial No. 213,901.

To all whom it may concern:

Be it known that I, EMIL EINFELDT, of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful
 5 Improvements in Devices for Excluding Dust from Bearings, of which the following is a specification.

This invention relates to devices for preventing the entrance of sand, dust, &c., to the
 10 bearing-surfaces of wheel-hubs, &c.; and the invention consists of a device of improved form and construction designed to receive the dust or sand and lead the same away from the bearing-surface and effect its discharge.

15 The invention, while applicable to hubs or analogous bearing-surfaces generally, is of peculiar use in connection with roller-bearings now commonly adopted for lighter vehicles and in which the presence of dust or other
 20 foreign substances is attended with great annoyance and objections, and I have represented such bearing in the drawings as embodying my invention.

In the accompanying drawings, Figure 1 is
 25 a side elevation of a hub and the outer end of an axle having my invention applied thereto. Fig. 2 is a longitudinal section through the same. Fig. 3 is a transverse sectional elevation on the line *a a* of Fig. 2 as viewed in
 30 the direction of the arrows in said figure.

A represents the outer end of an axle reduced in diameter, as usual, to form a spindle
 35 *a*, which spindle is threaded on its outer end to receive the fastening-nut *a'* and which is provided with a hard bearing-sleeve *a''*.

B represents a hub-shell within which is fixed a box *b* of an internal diameter sufficiently greater than the external diameter of the wearing-sleeve to admit a series of bear-
 40 ing-rollers C, which rollers are confined at their inner ends by a washer D, encircling the wearing-sleeve, and at their outer ends by a similar washer D', encircling said sleeve inward of the fastening-nut *a*, the outer end
 45 of the axle and the bearing being covered and inclosed by a cap E, fitted tightly over the outer end of the hub-shell. In applying my invention to a bearing of this form I firmly

fix to the axle, by any suitable means, at the inner end of the reduced spindle and back of
 50 the inner washer a dust-collar F, which projects radially some distance, thereby forming an annular fixed shoulder at the inner end of the hub. This collar has formed in it a cir-
 55 cumferential dust-receiving chamber *f*, preferably of circular form in cross-section, so that its sides slope inward, from which there extends forwardly through the front portion of the collar a circumferential longitudinal re-
 60 duced passage G for the entrance of the dust, into which passage extends an annular lip H, fixed to and projecting inward from the end of the hub.

The circumferential dust-chamber is ar-
 65 ranged, as clearly shown in Figs. 2 and 3, eccentric to the longitudinal axis of the hub, so that the dust-entrance passage in which the annular lip on the hub extends enters at the top of the dust-chamber both at the upper
 70 and under sides of the axle, and the lip H on the hub terminates at its inner end at the front side of the dust-chamber. As a result of this construction there is left beyond the end of the lip a free open space I within the dust-
 75 chamber at its under side and a free open space K beyond the end of the lip within the chamber at the upper side, so that this lip does not at these points offer a supporting surface or ledge on which dust or sand may deposit. As a result of this peculiar formation of the
 80 dust-chamber and the relation of the dust-entrance passage and the lip any dust or sand entering the chamber along the outer surface of the lip through the longitudinal passage will fall directly and immediately into the
 85 chamber and owing to its sloping sides will accumulate on its bottom and passing by gravity around the same will finally reach the lower side of the chamber, where it will find an exit and be discharged through a dis-
 90 charge-opening L, extending upward vertically through the collar into the chamber at its lower side. It will be observed, therefore, that there is no obstruction offered to the pas-
 95 sage of the dust outward through the discharge-opening after it has once entered the

dust-chamber, there being no sharp angles or projections or other conditions such as would cause the dust to be accumulated or retarded.

It is obvious, of course, to those skilled in the art that the cross-sectional form of the dust-chamber may be other than the circular, provided there is a free space back of the end of the lip at the lower side to prevent the dust falling in the chamber from depositing thereon.

While in the drawings I have illustrated the dust-collar as a separate structure fastened to the axle, it is obvious that it may be formed as an integral part thereof, and while I have shown the annular lip in the form of a band applied to the inner end of the hub it is understood that this lip may also be formed as an integral continuation or extension of the hub, the essence of the invention in this respect residing in a dust-chamber fixed with respect to the axle and a projection on the hub entering the chamber and disposed relatively to the same, as described.

It will be observed from the construction illustrated and described that the lip on the hub has its outer surface fitting closely the outer wall of the longitudinal passage which communicates with the dust-chamber, the result being that the passage through which the dust enters this chamber is horizontal, and therefore at right angles to the direction of the natural fall of the dust. This arrangement subserves two important functions. First, the entrance of the dust to the working parts is retarded and made more difficult than if the opening was vertical or in the direction of the natural fall of the dust; second, in case of wear of the parts, with the result of varying endwise play of the hub with reference to the axle, this dust-entrance opening remains constant and does not vary with the endwise movement, which would be the case if the entrance-opening were vertical.

Having thus described my invention, what I claim is—

1. In combination with an axle and hub thereon, a circumferentially-arranged dust-chamber carried by one of said parts and formed with a longitudinally-extending annular passage opening directly to the outside, and an annular longitudinally-extending lip carried by the other part and having its outer surface disposed closely along the outer wall of said passage.

2. In combination with an axle, a dust-collar thereon formed with a circumferentially-arranged dust-chamber having a discharge-opening at the under side, said collar having a circumferential longitudinally-extending contracted passage opening directly to the outside and entering the front of the dust-chamber, a hub on the axle, and an annular longitudinal projection on the hub extending into and fitting closely the contracted passage.

3. In combination with an axle provided

with a circumferentially-arranged dust-chamber having a discharge-opening at its under side and provided with a longitudinal forwardly-extending contracted passage for the entrance of the dust, said passage entering the top of the chamber at the upper side of the axle, and forming a direct communication between the chamber and the outside, a hub on the axle and an annular longitudinal lip on the hub extending into said longitudinal passage and terminating at its rear end at the front of the dust-chamber.

4. In combination with an axle provided with a circumferentially-arranged dust-chamber having a discharge-opening and a forwardly-extending longitudinal passage for the entrance of the dust, said passage entering the top of the dust-chamber, both at the upper and under sides of the axle, a hub on the axle, and a lip on the hub extending into the longitudinal passage.

5. In combination with an axle, a circumferentially-arranged dust-chamber eccentric thereto, a longitudinal passage for the entrance of the dust opening into said chamber and arranged concentric to the axle, a hub, and an annular projection on the hub extending into the longitudinal passage.

6. In combination with an axle, a circumferentially-arranged dust-chamber formed with sides sloping downward toward each other in the direction of the axis of the axle, and having a discharge-opening, a longitudinal forwardly-extending circumferential contracted passage, for the entrance of the dust, communicating with said chamber, a hub, and a projection on the hub extending into the longitudinal passage.

7. In combination with an axle, a circumferentially-arranged dust-chamber circular in cross-section, a longitudinal dust-entrance passage communicating with said chamber, a hub, and a lip on the hub extending into said passage.

8. In combination with an axle provided with a circumferentially-arranged dust-chamber formed with a dust-discharge opening at the under side, and having a forwardly-extending dust-entrance passage entering at the top of the chamber on the under side of the axle, a hub, and an annular lip on the hub extending into said passage and terminating at its rear end at the front of the dust-chamber.

9. In combination with an axle, a dust-collar fixed thereto and formed with a circumferentially-arranged dust-chamber circular or substantially so in cross-section, said chamber having a discharge-opening through the under side of the collar and said collar formed with a forwardly-extending circumferentially-arranged dust-entrance passage communicating with the chamber, said passage entering the dust-chamber at its top, both at the upper and also the under sides of the axle, a hub on the axle, and an annular lip on the hub extend-

ing into the dust-entrance passage and terminating at the front side of the dust-chamber.

10. The combination with an axle and hub thereon, a circumferentially-arranged dust-chamber carried by one of said parts and formed with a longitudinal passage communicating directly with the outside, and a lip carried by the other part and disposed with reference to said passage to leave a contracted
10 space for the entrance of the dust, said space

forming a direct communication between the dust-chamber and the outside, and being disposed longitudinally.

In testimony whereof I hereunto set my hand, this 20th day of October, 1904, in the presence of two attesting witnesses.

EMIL EINFELDT.

Witnesses:

M. LOUISE DODGE,
NATHL. FRENCH.