C. DE L. RICE.

FRICTION RELIEF BEARING.

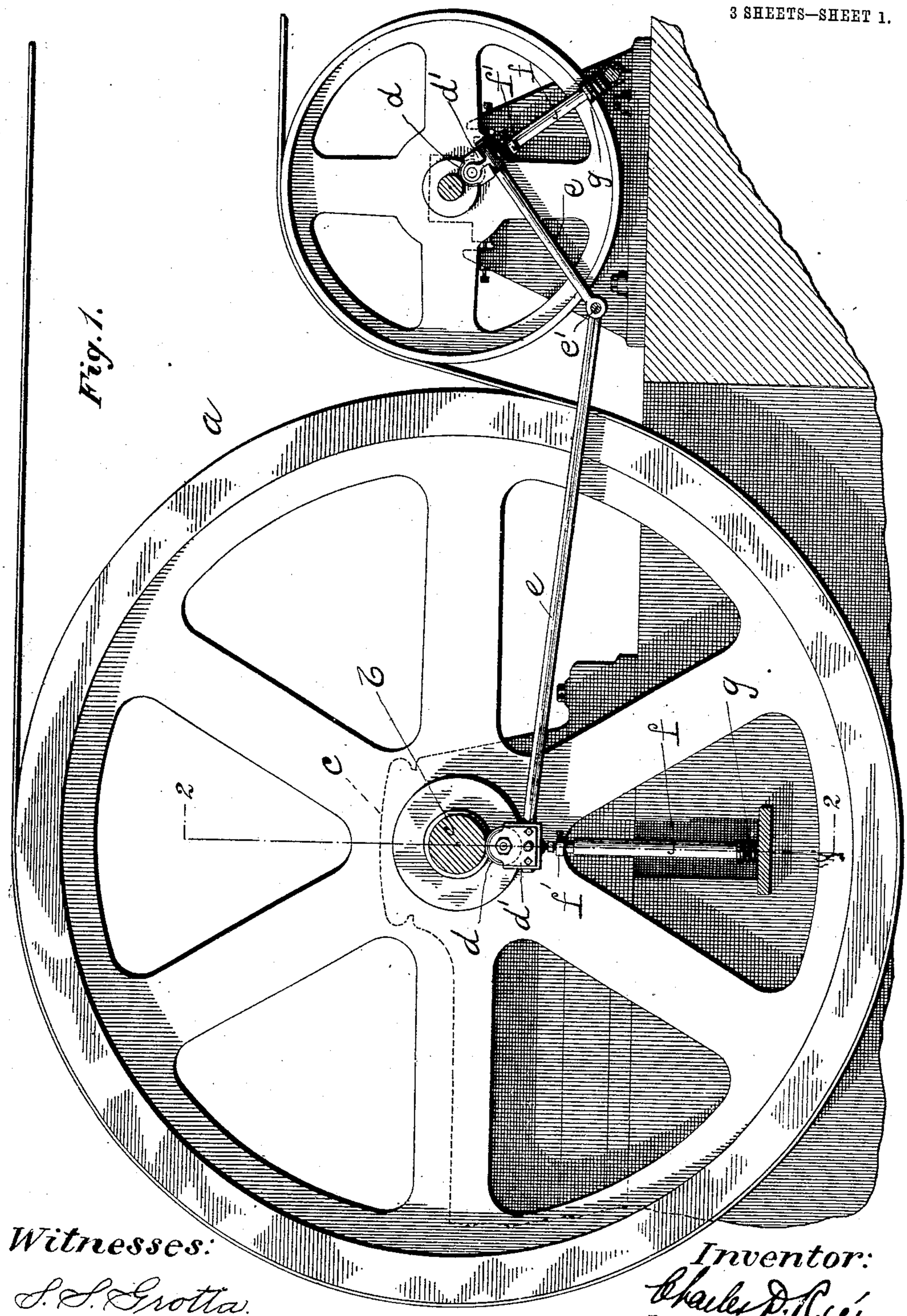
APPLICATION FILED OCT. 15, 1906.

912,417.

Patented Feb. 16, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 5.

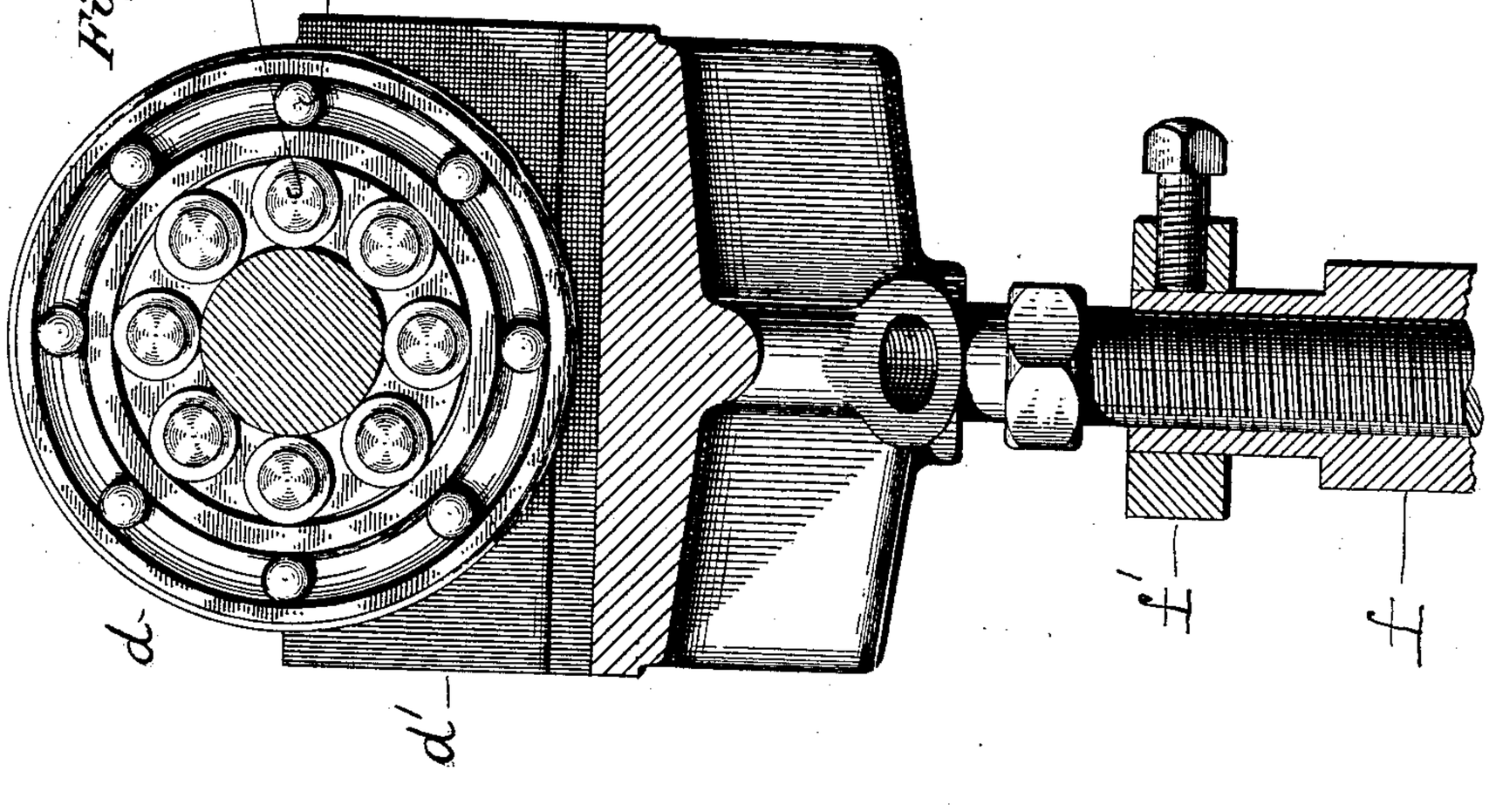
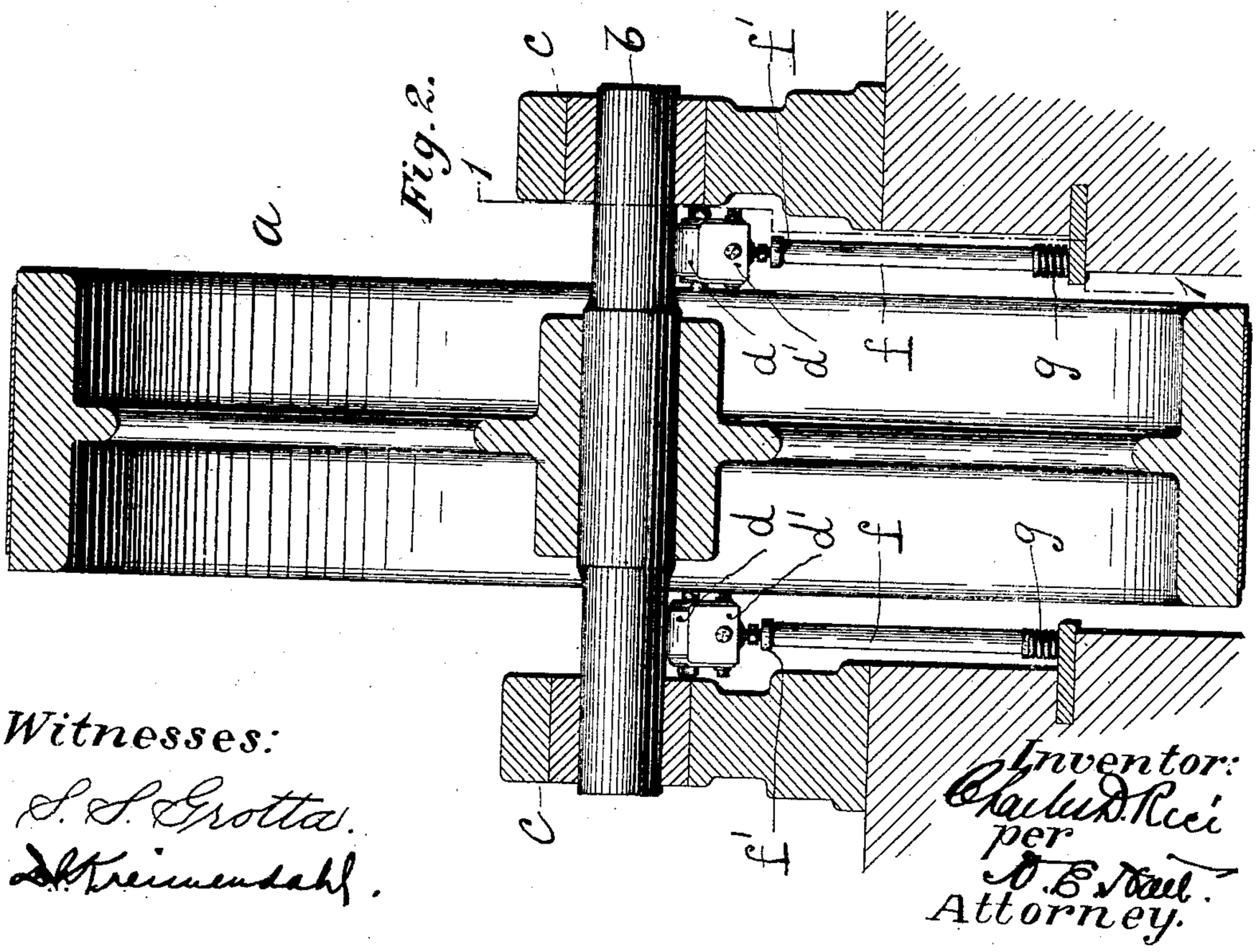


Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

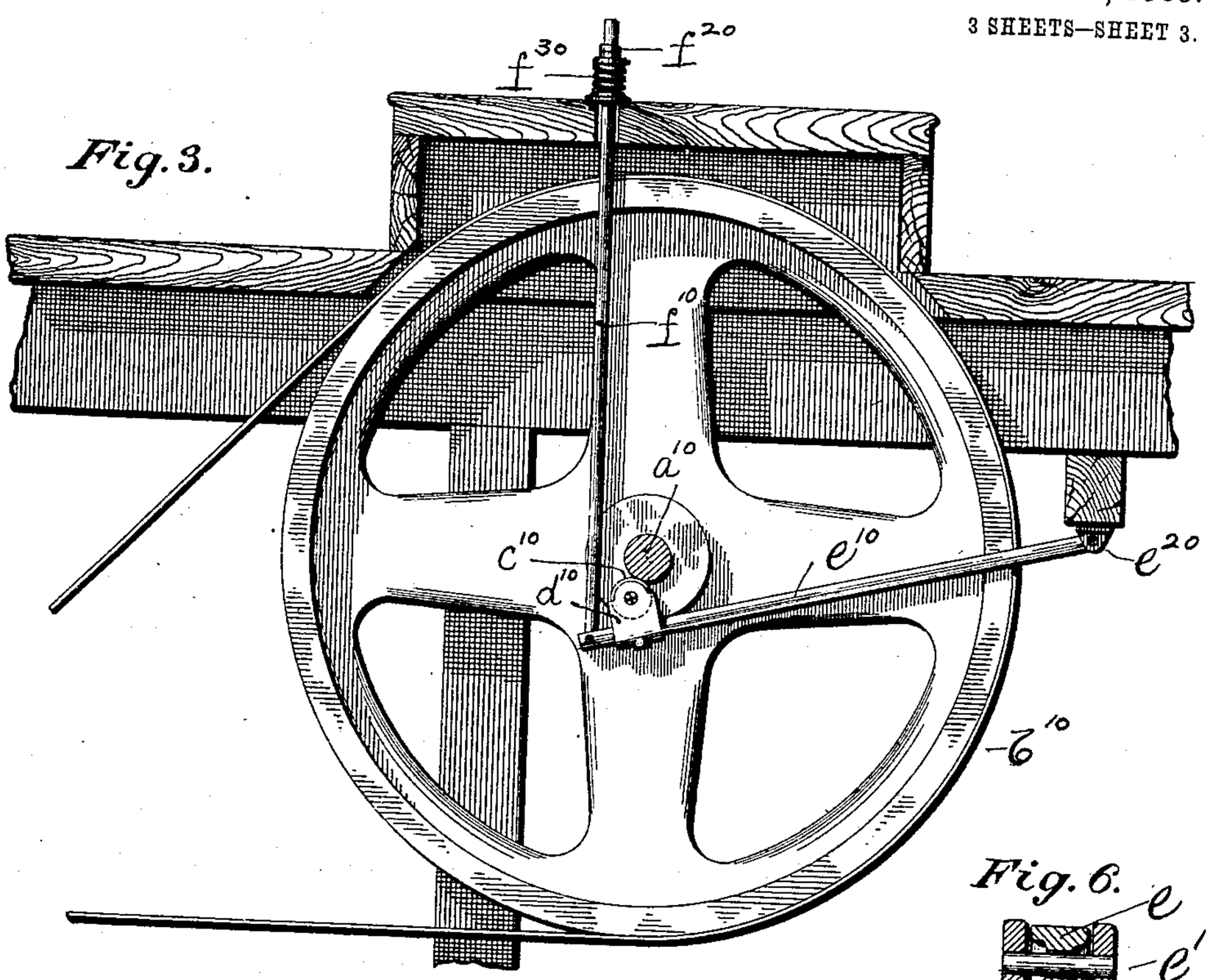
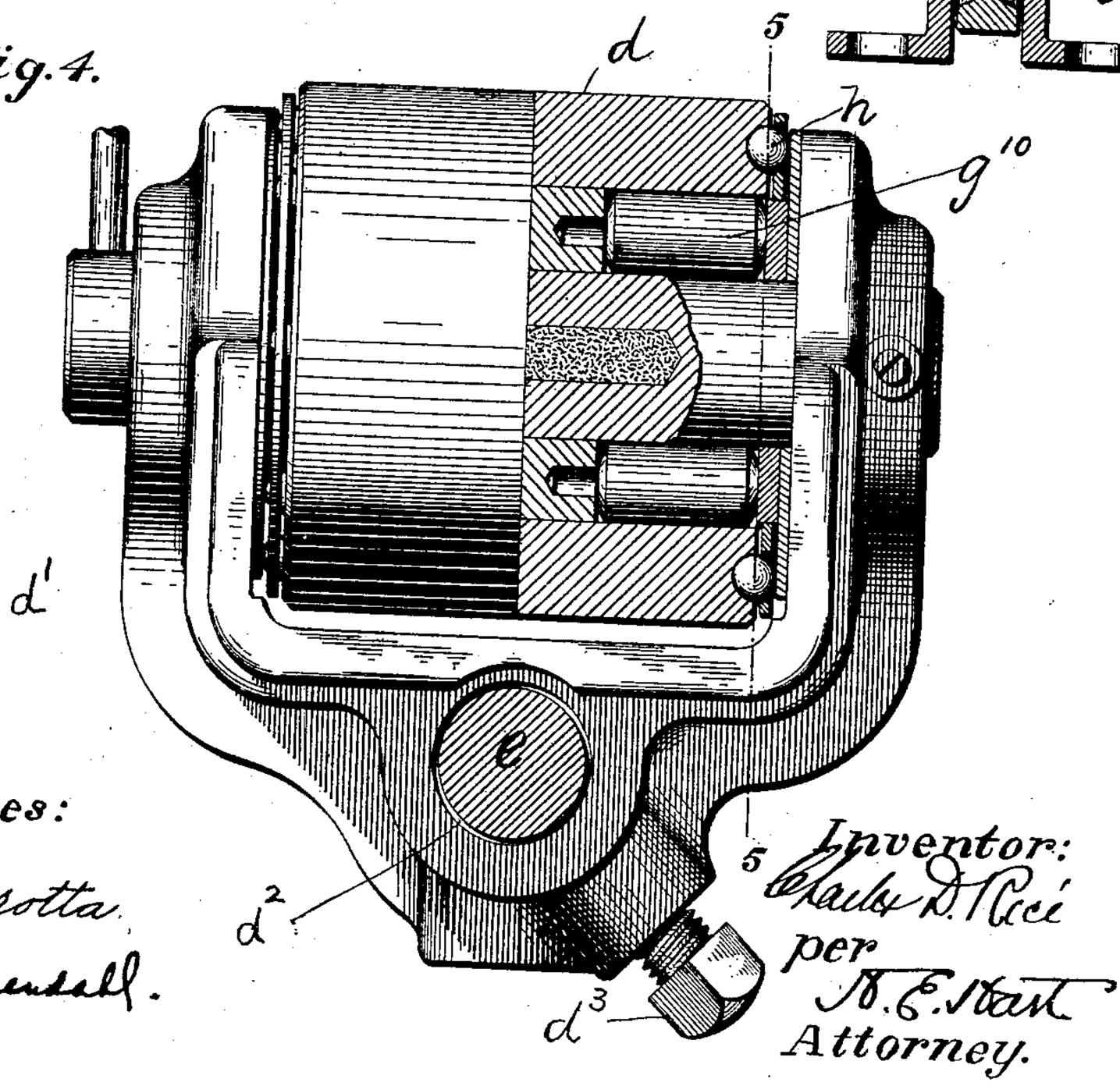


Fig. 6.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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FRICTION-RELIEF BEARING.

No. 912,417. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed October 15, 1906. Serial No. 339,000.

To all whom it may concern:

Be it known that I, CHARLES DE LOS RICE, a citizen of the United States of America, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Friction-Relief Bearings, of which the following is a specification.

The object of the invention is to provide a roller bearing of novel construction and application to relieve the friction load of shafts in their bearings.

Figure 1 is a side elevation of my device as applied to the shaft of an engine-fly-wheel and also to the shaft of an idler pulley over which the engine belt runs. Fig. 2 is an end view showing the application of my device to the fly-wheel shaft. Fig. 3 is a side elevation showing my device as applied to a line shaft. Fig. 4 is a detail view in side elevation and partly in section showing the mounting of the roller. Fig. 5 is a sectional view on the line 5—5 of Fig. 4. Fig. 6 is a detail view showing the anchorage for the support.

Referring to Figs. 1 and 2 of the drawings *a* is the fly-wheel, *b* is its shaft, *c* denotes one of the pair of pillow blocks in which the shaft is illustrated as mounted. My invention is applied at each side of the fly-wheel inside of the pillow blocks. It comprises the roller *d* mounted on anti-friction bearings in a suitable housing *d'*. This housing is mounted on a suitable support, in this case a bar *e* which is anchored at its outer end, as at *e'*, and along which the housing is adjustable so that the point of contact of the roll with the shaft can be altered to suit conditions of the load. The anchorage of the bar *e* should be so located that the direction of movement of the shaft and roll at their point of contact is away from the anchorage so that the action of the shaft on the roll tends to draw it away from its anchorage. This action of the shaft on the roll tends to swing the supporting bar laterally, or from side to side, until the roll is in exact parallelism with the shaft. This insures a perfect working condition between the shaft and its supporting roll and prevents all tendency towards end chasing of the shaft, since it merely rests on the periphery of a single roll whose axis is parallel to it. Since, as just above described, the shaft will always force the roll to a condition of parallelism when it is running, and keep it there, I do not attempt to establish this condition of parallelism accurately but prefer to allow a sidewise or lateral adjustment of the supporting bar by leaving a little freedom of movement in the anchorage of the supporting bar, as illustrated in Fig. 6, so that the roller *d* can always move into and be maintained in the desired position of parallelism with the shaft. This makes it necessary to obtain only an approximately accurate location of the anchorage. It is important, however, to have the axis of the roller *d* arranged at right angles to the bar *e* and in order to even the load on the roller the bar should support it at a point midway between its ends.

A load adjuster is provided, which in Figs. 1, and 2 takes the form of a jack-screw *f* provided with a locking collar *f'*, by means of which the roll is thrown into contact with the shaft to take such part of the weight of the shaft and fly-wheel as is desired. This jack-screw is preferably mounted on a calibrated spring *g* by means of which the load can be quite accurately determined as to pressure applied.

In applying my friction relief bearings to a shaft I place them at a point where they will oppose the load, which is made up of the weight of the shaft and pulley, and the direction of the belt strain. In the case of an engine fly-wheel I have found it advisable to locate the roller directly under the center of the shaft as illustrated in the drawings. It is of course understood that a roll is provided for the shaft at each side of the fly-wheel, as shown in Fig. 2. The application of my bearing to the idler shaft, as illustrated in Fig. 1, is similar to its application to the fly-wheel shaft except that the roll is brought into contact with the shaft to oppose the belt strain on the pulley, the weight of the pulley also being taken into account so that as nearly as can be determined the pressure exerted on the shaft by my relief bearing will be directly opposed to the combined weight of, and belt strain on, the idler.

Another instance of a relief bearing made in accordance with my invention is illustrated in Fig. 3, where it is applied to an overhead line shaft. a^{10} denotes the line shaft, b^{10} the pulley, c^{10} is the roll mounted in the housing d^{10} and carried on the supporting bar e^{10} which is anchored as at e^{20}. In this case the roll is drawn up into con-

tact with and to take the load of the shaft by the suspension rod f^{10} which is drawn up by the nut f^{20}. When the line shafts are heavy I prefer to place a calibrated spring f^{30} underneath the nut in order that the amount of weight on the roll can be accurately determined.

The term "load adjuster" is used to describe a device for putting a load on the roller whether or not provision is made for varying the amount of load, as in the particular form of device illustrated herein.

The anti-friction mounting for the roller is illustrated in Figs. 4 and 5 of the drawings, the roller being in the form of a shell mounted on anti-friction devices g^{10} and provided with an end-thrust ball bearing h. The housing d' has a bore d^2 arranged at right angles to the axis of the roller d and midway between its ends. This bore receives the supporting bar e. A set-screw d^3 is provided to lock the housing to the bar at any position of adjustment.

The advantages of my device are readily apparent. A roller bearing is provided for shafting of all classes and kinds. There is no necessity of fitting my bearing accurately to a shaft—that is, one size bearing can be used on shafts of different sizes and probably three different sizes would be all that would be required to entirely equip a factory wherever the use of such a device would be advantageous. A roller bearing is provided which does not cause the tendency to end-chasing which is present in the shaft where roller bearings of the encircling type are used. The bearings can be put up and removed without stopping the machinery and with little or no trouble. This roller bearing is quite independent of the regular bearings which are used and can be applied at any point where they are desired. The forms which the support and the load adjuster take will vary under different conditions of use, but my invention as disclosed in this application is not concerned particularly with the details of construction of these parts.

I claim as my invention:

1. A friction relief bearing for shafting and the like comprising a roller, a support therefor secured at one end and extending transversely of the shaft, and a load adjuster connected with the opposite end of said support.

2. A friction relief bearing comprising a support anchored at one end, a roller mounted near its opposite end, and a load adjuster.

3. A friction relief bearing for shafting and the like comprising a roller, a support therefor secured at one end and extending transversely of the shaft, and a load adjuster connected with the opposite end of said support near said roller.

4. In a friction relief bearing for shafting and the like the combination with a shaft, of a roller mounted in contact therewith, a support for said roller extending transversely of said shaft in a direction opposite to the direction of movement of the shaft and roller at their point of contact, an anchorage for the end of said support, and a load adjuster.

5. A friction relief bearing comprising a roller, a support therefor secured at one end and adapted for lateral movement, and a load adjuster connected with the opposite end of said support.

6. A friction relief bearing comprising a roller, a laterally movable support therefor, and a load adjuster.

7. In a friction relief bearing the combination with a shaft, of a roller in contact therewith, a housing in which said roller is mounted, a supporting rod on which said housing is mounted, said rod being arranged at right angles to the axis of said roller, and means for adjusting the load on said roller.

8. In a friction relief bearing the combination with a shaft, of a roller, and anti-friction bearings therefor, a support on which said roller is mounted, said support being anchored at one end, and a load adjuster acting on the free end of said support to move said roller into contact with said shaft.

9. In a friction relief bearing the combination with a shaft, of a roller and anti-friction bearings therefor, a support on which said roller is mounted, said support being anchored at one end, and a rod connected with the free end of said support and provided with means to move said roller into contact with said shaft.

10. In a friction relief bearing the combination with a shaft, of a roller mounted in contact therewith, a suitable support therefor, said roller being adjustable on said support to change the direction of pressure, said support being mounted free to swing sidewise to permit the roller to adjust itself into parallelism with said shaft, and means for adjusting the load on said roller.

11. In a friction relief bearing the combination with a shaft, a supporting bar anchored at one end and free to swing sidewise, a roller adjustably mounted on said bar, anti-friction bearings for said roller, and means for adjusting the load on said roller.

12. A friction relief bearing comprising a roller a support therefor anchored at one end, a load adjuster, and a yielding support therefor.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES DE LOS RICE.

Witnesses:

EDWARD P. STORY,

JOS. F. COLLINS.