W. MAXWELL.

BEARING FOR SUGAR CANE CRUSHING MILLS.

APPLICATION FILED DEC. 6, 1909.

995,699. Patented June 20, 1911.

3 SHEETS—SHEET 1.

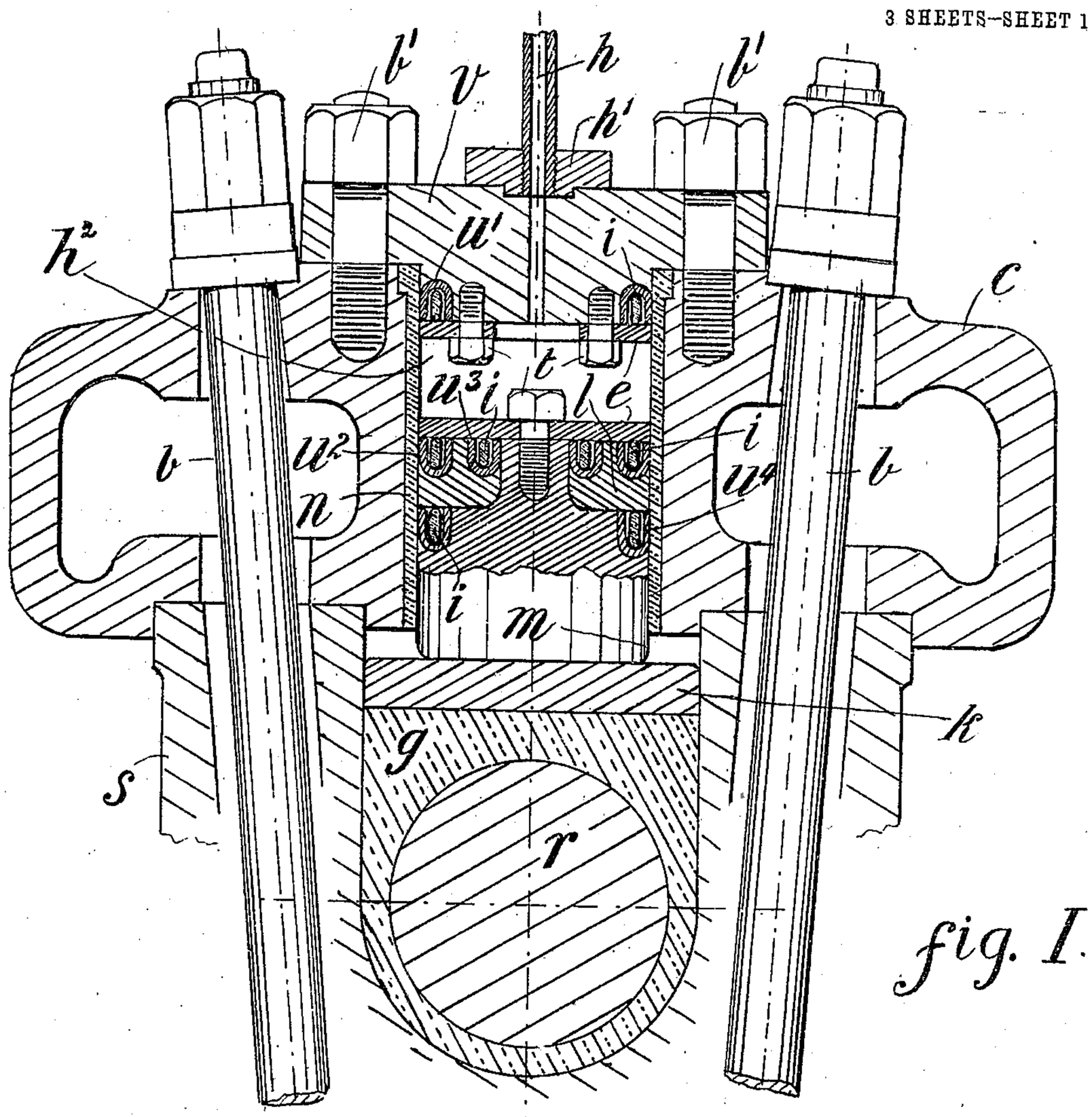

fig. I.

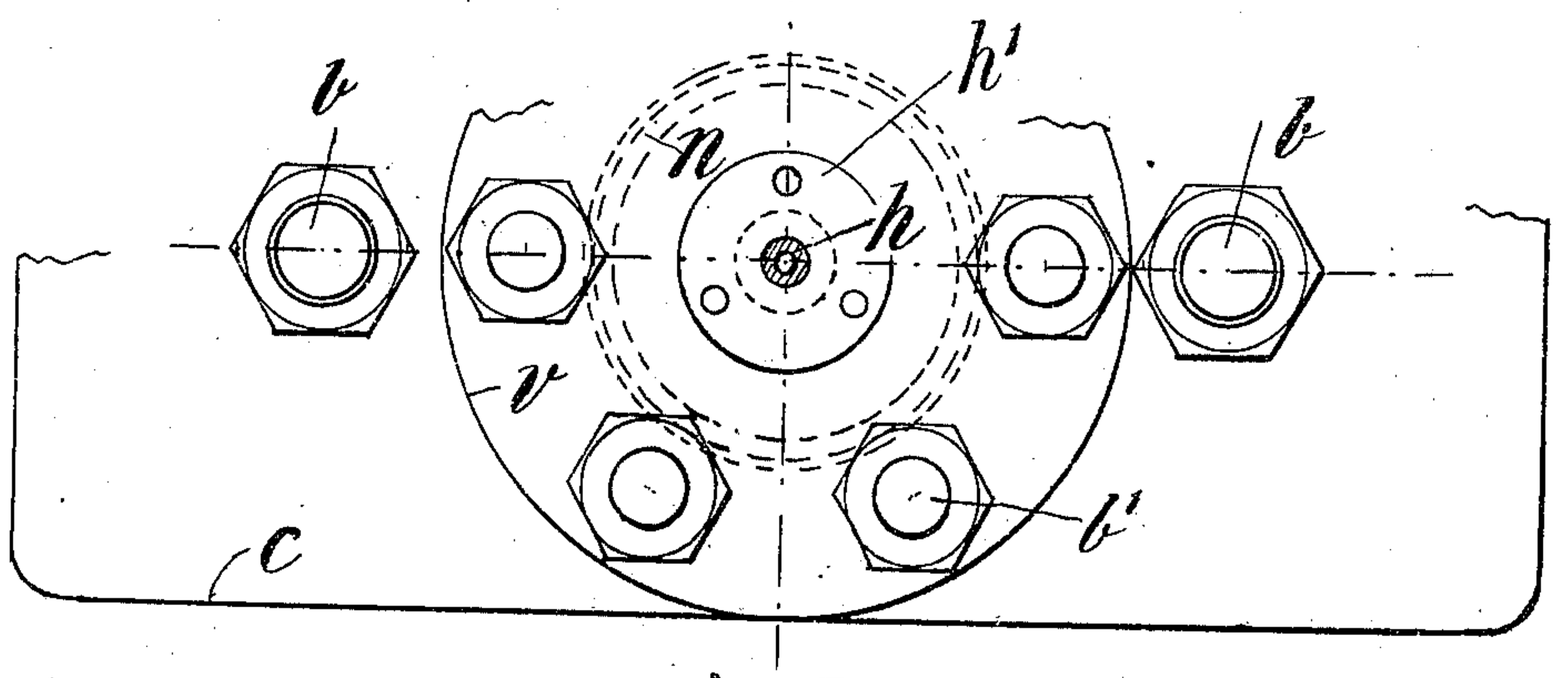

fig. II

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3 SHEETS—SHEET 2.

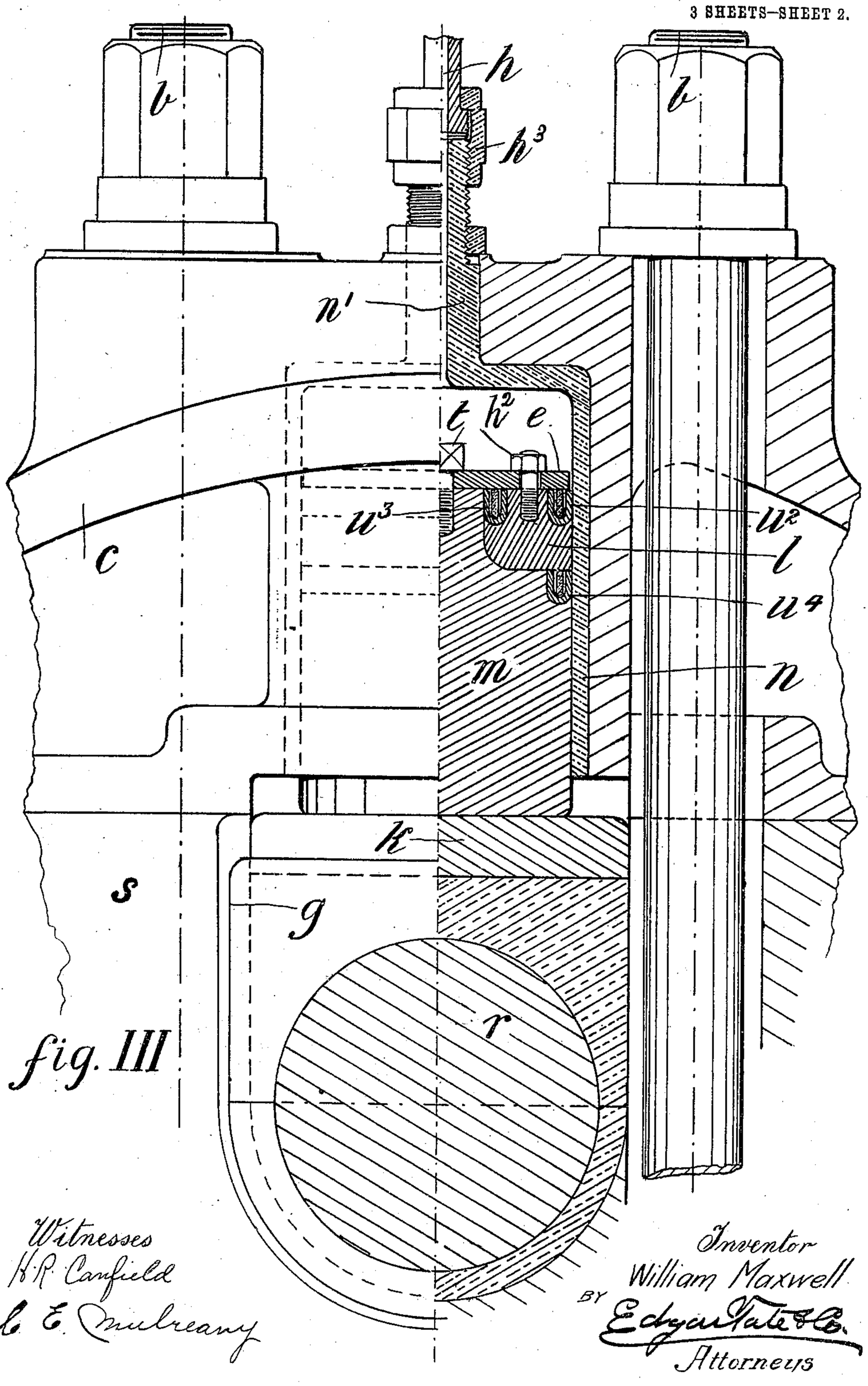

fig. III

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3 SHEETS—SHEET 3.

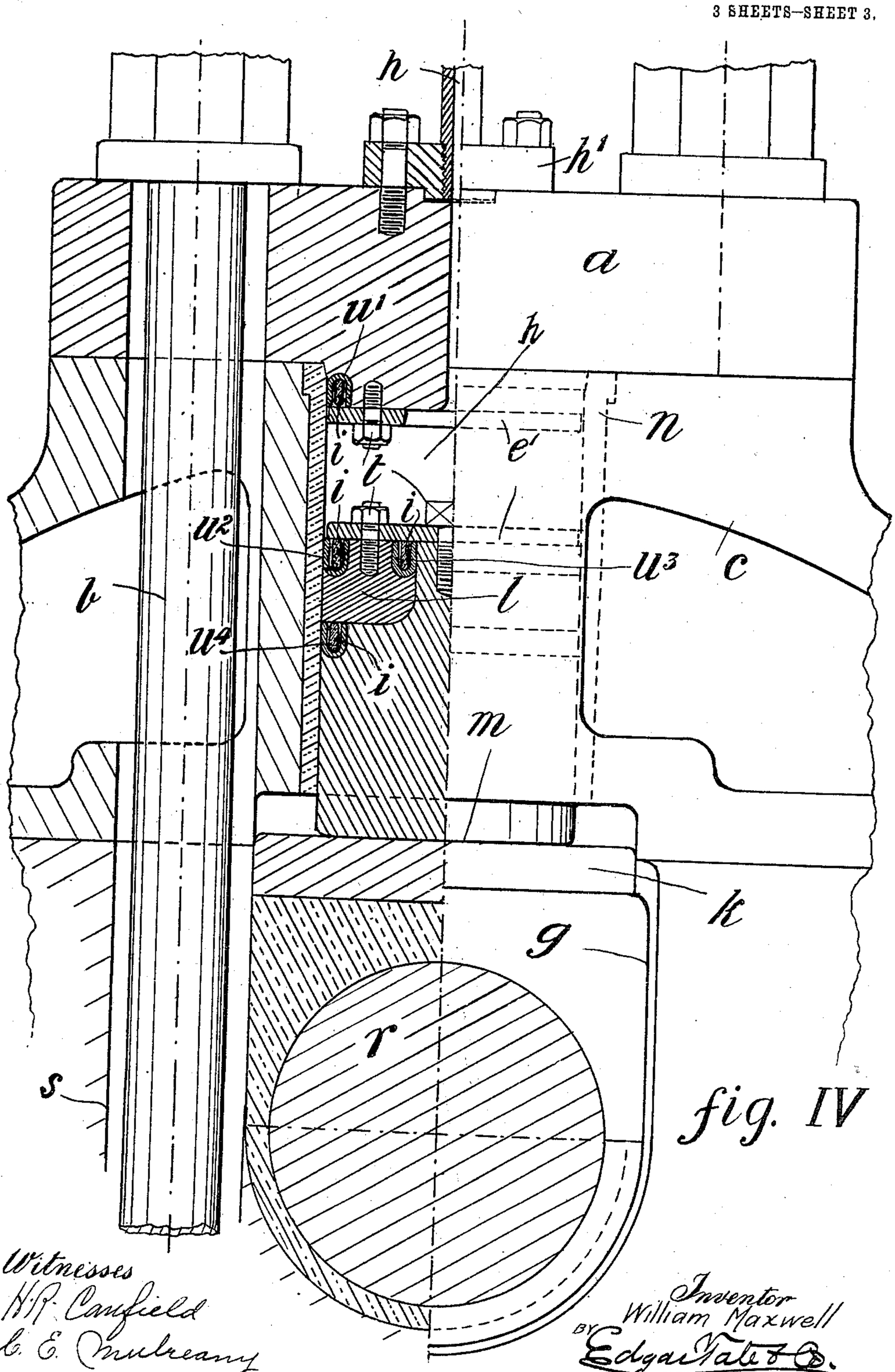

fig. IV

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UNITED STATES PATENT OFFICE.

WILLIAM MAXWELL, OF SYDENHAM, ENGLAND.

BEARING FOR SUGAR-CANE-CRUSHING MILLS.

995,699. Specification of Letters Patent. Patented June 20, 1911.

Application filed December 6, 1909. Serial No. 531,511.

To all whom it may concern:

Be it known that I, WILLIAM MAXWELL, a subject of the King of Great Britain, and residing at Sydenham, in the county of Surrey, England, have invented certain new and useful Improvements in Bearings for Sugar-Cane-Crushing Mills, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to sugar-cane crushing mills and the object thereof is to provide improved bearings for the rollers of mills of this class, or one of said rollers, a further object being to provide bearings of the class specified which employ hydraulic pressure to hold the roller or rollers up to their work; and my invention particularly relates to means for preventing the leakage of the liquid used in such bearings for producing the hydraulic pressure required.

In my improvement I accomplish the desired object by the use of an improved construction of bearing-cap having a hydraulic ram or plunger device as a means for regulating the pressure it is required to exercise on one or more of the crushing rollers used in a mill of the class specified, and I prevent leakage of the pressure liquid from such bearing by the employment of an improved form of hydraulic ram or plunger device having a compound or multiple series of U-shaped packing rings preferably composed of leather and suitably held in position.

The invention is fully disclosed in the following specification of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which;—

Figure 1 is a sectional elevation of my improved bearing construction. Fig. 2. a sectional plan view thereof. Fig. 3. a view similar to Fig. 1 but showing a modification, and Fig. 4. another view similar to Fig. 1 but showing another modification.

In each of the three modified forms of bearing-cap as shown in Figs. 1, 2, 3, and 4, *c* represents the body or principal part of the cap, which is held down to a frame or standard *s*, in the usual manner by bolts *b*. The body of the cap *c* is, in each case, bored out to receive a brass liner *n*, in which a hydraulic ram or plunger device *m* has an accurate sliding fit. The lower end of the ram or plunger device *m* bears directly upon a block *k*, which in turn bears upon the upper half of a bearing *g*, the latter resting on the shaft *r* of a crushing roll.

The liquid or hydraulic pressure medium is introduced through a pipe *h* which passes through the cap *v* and communicates with a hydraulic pressure chamber h^2 and in order to prevent leakage of pressure liquid from between the liner *n* and the ram or plunger device *m*, the ram or plunger device is constructed with three U-shaped leather packing rings u^2, u^3, and u^4; of these the lower leather ring u^4 is held in position by the junk ring *l*, and the two upper leather rings u^2 and u^3, by the plate *e* secured to the body of the ram or plunger device *m* and junk ring *l* by screws *t*. Each of the leather packing rings may be further provided with a metallic ring as shown at *i*, in Figs. 1 and 4, for the purpose of assisting to maintain the leather rings in position.

To facilitate the removal of the bearing ram or plunger device *m*, I either provide the cap *c* with a cover as shown at *v*, Figs. 1 and 2; or, I provide the bearing-cap with a slab cover as shown at *a*, Fig. 4; in either of these forms of bearing-cap I provide the underside of the cover with a leather packing ring U-shaped in cross section and retaining plate as shown at *u'* and *e'*, to prevent leakage.

In cases where it is not desirable to use a cover as shown at *v*, or *a* in Figs. 1, 2 and 4, for the removal of the ram or plunger device, I construct the body of the bearing-cap *c* as shown in Fig. 3. In this form of bearing-cap I provide the liner *n* with a neck extension *n'*, which is continued up through the body *c* of the bearing-cap to form a connection with the pressure supply pipe *h* by means of a union coupling h^3; I, however, prefer to connect up the pressure supply in the manner shown at *h'* in Figs. 1, 2 and 4.

I am aware that prior to my invention, sugar-cane crushing mills have been made with compensating bearings by which it has been possible to hold the rolls up to one another by pressure controllable by a hydraulic ram or plunger device; but

Having fully described my invention what I claim as new, and desire to secure by Letters Patent is;—

1. A hydraulic pressure bearing for crushing mills, comprising a cylindrical pressure chamber open at one end and closed at the

other, the closed end being provided with a central inlet, a plunger movable in the open end of said chamber and the inner end of which is provided with a central projection, a junk ring mounted on said central projection and a cap plate secured to said projection and holding said junk ring in position, said junk ring being provided in its outer face with annular concentric grooves, and annular packings placed in said grooves and held in place by said cap plate, one of said packing rings bearing on the wall of said chamber and the other on the central projection of the plunger, the body of the plunger being also provided with an annular groove in which is placed an annular packing which is held in position by the junk ring and which bears on the wall of said chamber.

2. A hydraulic pressure bearing for crushing mills, comprising a body portion having a cylindrical pressure chamber open at one end and closed at the other by a cap secured to the body portion, a plunger movable in the open end of said chamber and the inner end of which is provided with a central projection, a junk ring mounted on said projection and held in place by a cap plate secured to said projection, said junk ring being provided with annular concentric grooves in which are placed annular packings held in position by said cap plate, and one of which bears on the wall of said chamber and the other on the projection of the plunger, the body of the plunger being also provided with an annular groove in which is placed an annular packing which is held in position by the junk ring and which bears on the wall of said chamber and the cap which closes one end of said chamber being provided with an annular groove in which is placed an annular packing held in position by a plate secured to said cap and which bears on the wall of said chamber, and said cap being also provided with a central inlet.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 5th day of November 1909.

WILLIAM MAXWELL.

Witnesses:
FRANCIS MAXWELL,
MARIUS MAXWELL.