Jan. 2, 1923.

R. S. RILEY.

CLINKER GRINDER.

FILED JUNE 5, 1920.

1,441,027.

3 SHEETS—SHEET 1.

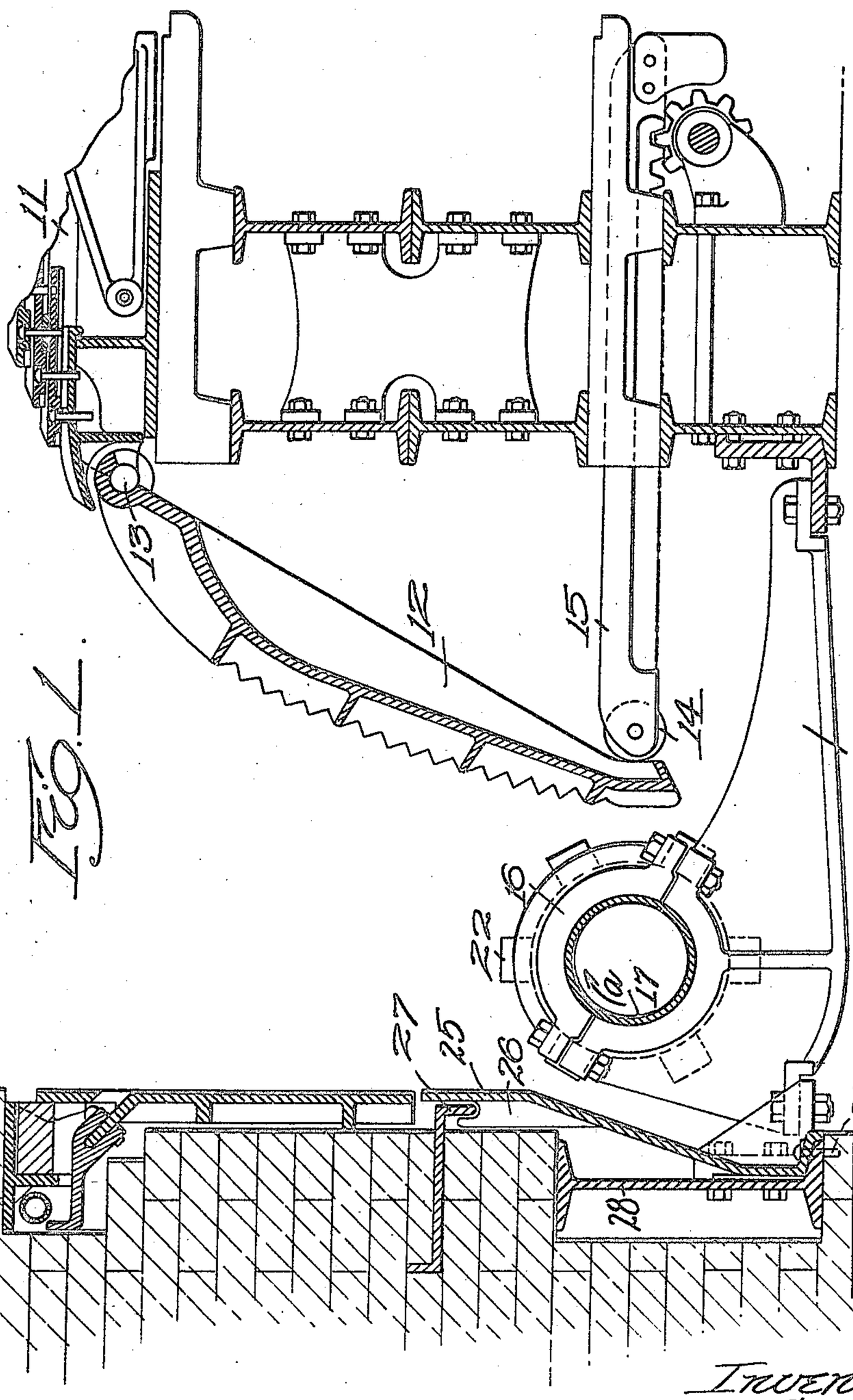


Fig. 1.

Inventor:
Robert S. Riley.

By attorneys
Southgate & Southgate

Jan. 2, 1923.

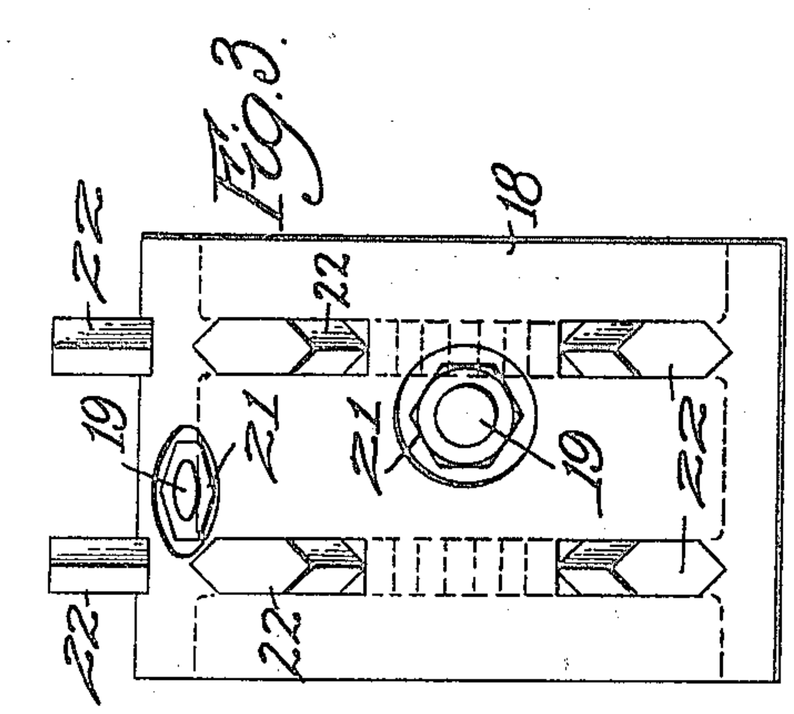
1,441,027.

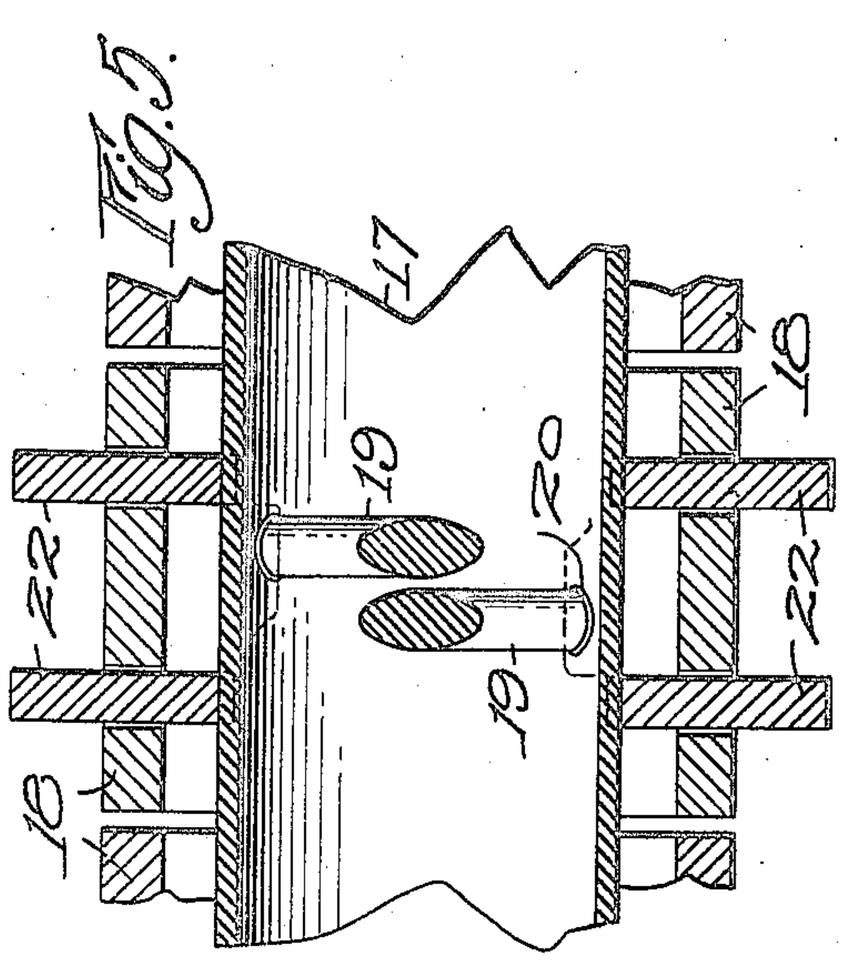
R. S. RILEY.

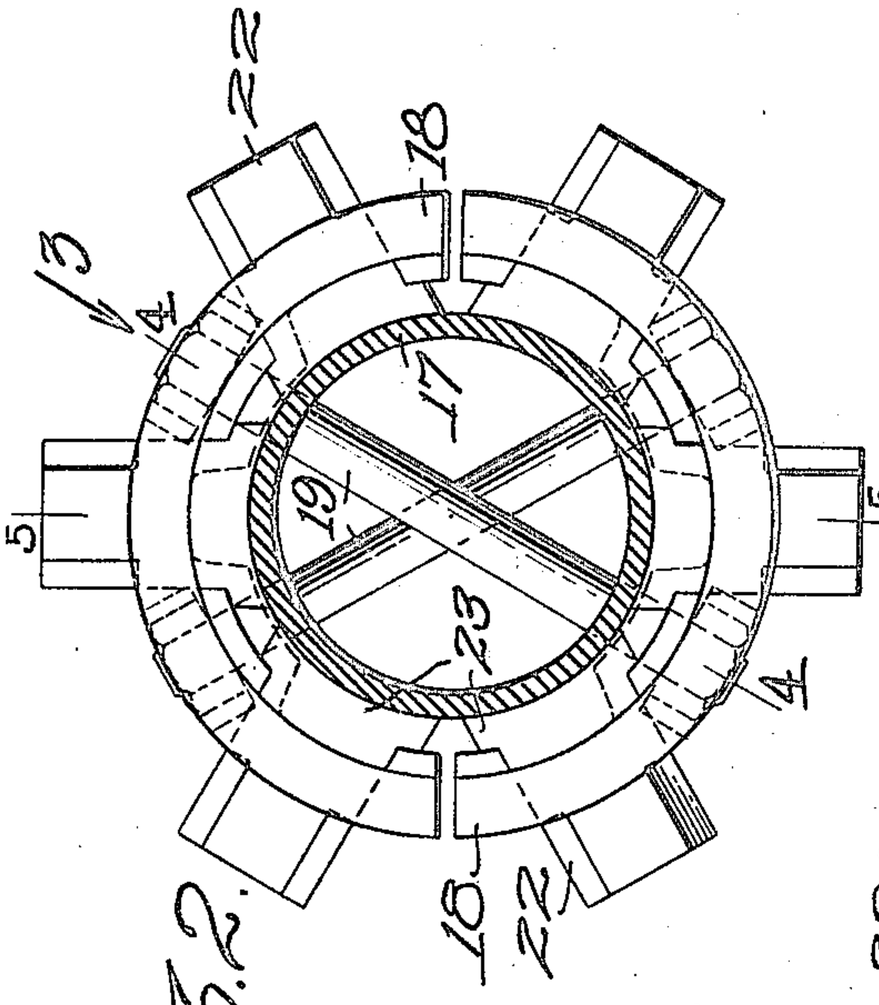
CLINKER GRINDER.

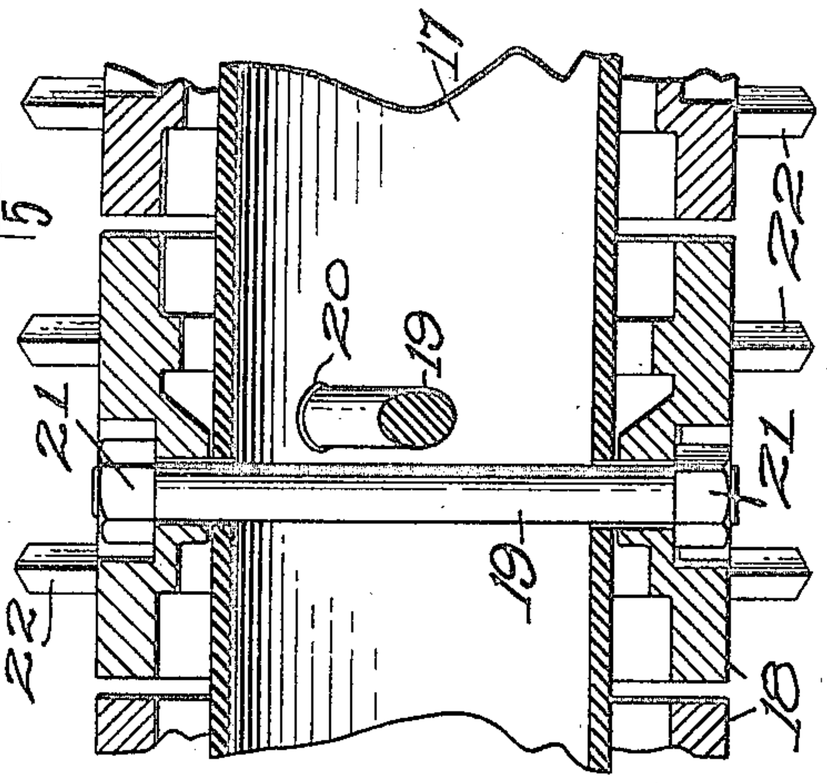
FILED JUNE 5, 1920.

3 SHEETS—SHEET 2.









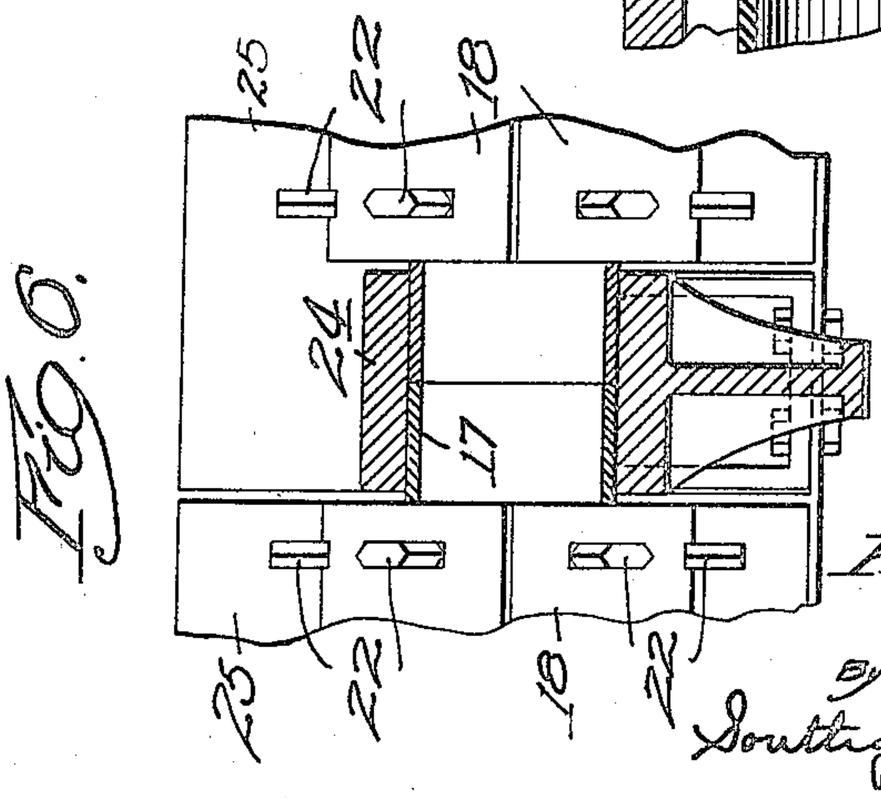


Fig. 4.

Inventor
Robert S. Riley.

By attorneys
Southgate & Southgate

Jan. 2, 1923. 1,441,027.

R. S. RILEY.

CLINKER GRINDER.

FILED JUNE 5, 1920. 3 SHEETS—SHEET 3.

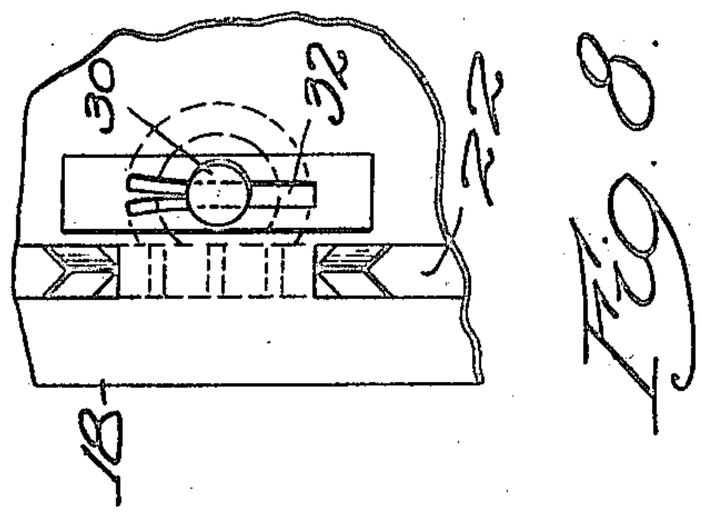


Fig. 8.

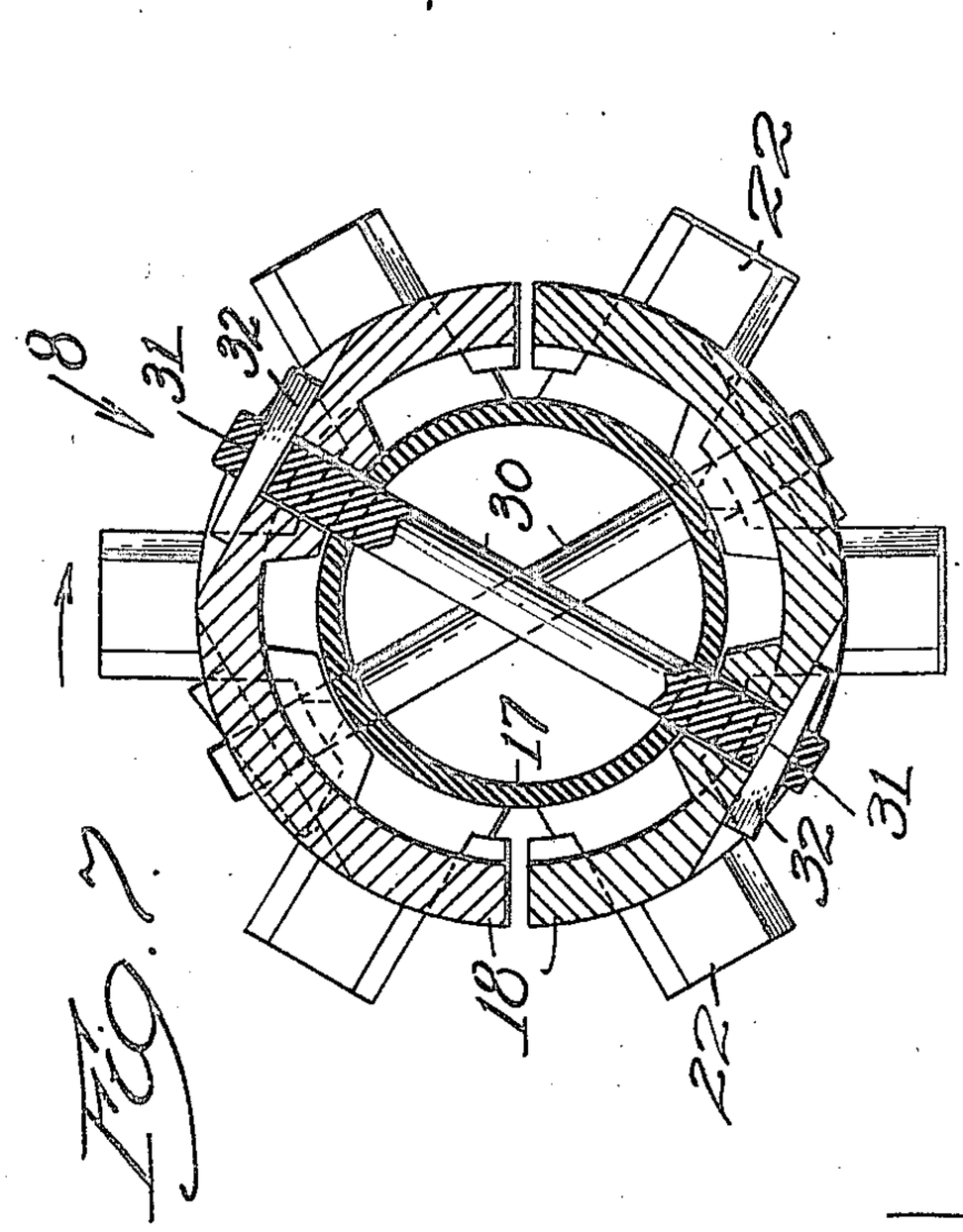


Fig. 7.

Inventor.
Robert S. Riley

By attorneys
Southgate & Southgate

Patented Jan. 2, 1923. 1,441,027

UNITED STATES PATENT OFFICE.

ROBERT SANFORD RILEY, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO SANFORD RILEY STOKER CO., OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

CLINKER GRINDER.

Application filed June 5, 1920. Serial No. 386,848.

To all whom it may concern:

Be it known that I, ROBERT S. RILEY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Clinker Grinder, of which the following is a specification.

This invention relates to furnace construction and more particularly to an improved clinker grinder and parts associated therewith.

As furnace operation becomes increasingly automatic, it becomes desirable to make provision for breaking up the clinkers and fuel refuse so that the same may be handled by a conveyor or other mechanical means. A heavy grinding roll, termed a clinker grinder, has been used for this purpose, and it is one object of my present invention to improve the construction of such rolls, making them more efficient in operation and more economical to manufacture.

Another object of my invention is to provide a removable and renewable wear plate adapted to be secured to the rear wall of the furnace adjacent the clinker grinder, thus rendering frequent renewal of the wall unnecessary.

My invention further relates to arrangements and combinations of parts hereinafter described and more particularly pointed out in the appended claims.

The preferred form of my invention is shown in the drawings, in which—

Fig. 1 is a sectional side elevation of a portion of a furnace of the underfeed type, embodying my invention;

Fig. 2 is an enlarged transverse sectional elevation of the clinker grinder;

Fig. 3 is a plan view of a portion of the clinker grinder, looking in the direction of the arrow 3 in Fig. 2;

Figs. 4 and 5 are longitudinal sectional views of the clinker grinder, taken along the lines 4—4 and 5—5 in Fig. 2;

Fig. 6 is a front elevation of a portion of the clinker grinder, showing one of the bearings in section;

Fig. 7 is a transverse sectional elevation of a clinker grinder embodying a modified construction; and

Fig. 8 is a detail plan view, looking in the direction of the arrow 8 in Fig. 7.

Referring to the drawings, I have shown a portion of a furnace comprising a rear wall 10, a portion of an underfeed retort 11, and a refuse discharge plate 12. The plate 12 is pivoted at 13 to the rear end of the retort section 11 and is supported at its lower end by a roll 14 mounted at the end of a rack bar 15 which may be manually adjusted to position the discharge plate 12 at any desired distance from the clinker grinder 16.

The discharge plate and the portion of the retort to which it is attached are commonly reciprocated by driving mechanism not shown.

The grinder 16 is of simple construction and comprises a heavy hollow cylinder or tube 17 and semi-cylindrical casing plates 18 which are held in position on the tube 17 by bolts or rods 19 extending through openings 20 suitably located in the tube 17.

The bolts 19 preferably extend diametrically through the tube 17, and the two bolts which hold each pair of plates 18 in position are preferably disposed in the angular relation indicated in Fig. 2. The plates 18 are recessed so that the nuts 21 on the bolts 19 are substantially below the outer surface of the plates.

Each plate is provided with openings enlarged at their inner ends and adapted to receive grinding teeth 22 having heads 23 at their inner ends.

In assembling the clinker grinder, the teeth are inserted in the openings from the concave side of the plate and the heads are received in the enlarged inner ends of the openings. The plates are then clamped in pairs about the tube 17 and the grinding teeth are thus held firmly in position between the plates and the tube. When the teeth become worn or broken the plates are easily removed and the teeth may be quickly replaced at small expense.

I prefer to make the plates 18 in short sections, such as are shown in Fig. 3, using as many sections as necessary to build up a roll of the desired length. Suitable bearings 24 (Figs. 1 and 6) are provided at such points as are necessary to firmly support the grinder.

The hollow construction of the clinker grinder is desirable for several reasons as it permits the circulation of air or water

through the grinder to cool the same and it also permits inspection of the interior of the roll from either end thereof.

The grinder is rotated by suitable driving mechanism and commonly turns in the direction of the arrow *a* in Fig. 1, the grinding operation taking place between the grinding roll and the discharge plate 12.

Nevertheless, it is found, that a considerable amount of wear of the wall 10 occurs if the wall 10 at the rear of the grinder is not protected, and for this reason I have provided the wear plate 25 shown in Fig. 1. This plate is preferably made in relatively short sections and is provided with lugs or projections 26 at its rear side adapted to engage hooks or similar fastening devices 27 fixed in the wall 10.

At its lower end, each plate 25 is formed to engage the lower portion of an I-beam 28 which supports the rear ends of the bearings 24. The plates 25 may be secured to the beam 28 in any convenient manner as by bolts 29 loosely dropped into suitable openings in the plate and in the flange of the beam.

In Figs. 7 and 8 I have indicated a slight modification in which the rods 30 are provided with transverse openings 31 at each end through which keys 32 may be driven to hold the casing plates in position. The keys should be inserted as shown in Fig. 7 so that the action of the grinder against the material upon which it operates will tend to seat the keys more firmly in the openings 31. The thin end of each key may be slotted and the ends separated as shown in Fig. 8 for additional security.

Having thus described my invention and a modification thereof, it will be evident that other changes and modifications can be made therein within the spirit and scope of my invention as set forth in the claims, and I do not wish to be otherwise limited to the details herein disclosed, but what I claim is:—

1. A clinker grinder comprising a hollow cylindrical tube, a plurality of sectional casing plates disposed about said tube and provided with grinding teeth, and fastening rods each extending directly through the wall of said tube at two separated points and through each of a pair of plates and securing said plates to said tube.

2. A clinker grinder comprising a hollow cylindrical tube, a plurality of sectional casing plates disposed about said tube and provided with grinding teeth, and means to secure said plates to said tube, said means comprising fastening rods each extending substantially diametrically through openings in said plates and through the wall of said tube at two separated points.

3. A clinker grinder comprising a hollow cylindrical tube, semi-cylindrical casing plates disposed in pairs about said tube and provided with grinding teeth, and means to secure said plates to said tube, said means comprising bolts each extending substantially diametrically through openings in said plates and in opposed wall portions of said tubes.

4. A clinker grinder comprising a hollow cylindrical tube, sectional casing plates disposed about said tube and provided with grinding teeth, fastening rods each extending diametrically through said plates and through the opposed wall portions of said tube at separated points along the axis of said tube, and holding devices for said rods.

5. A clinker grinder comprising a hollow cylindrical tube, sectional casing plates disposed about said tube and provided with grinding teeth, fastening rods each extending through said plates and through separate wall portions of said tube, and holding devices for said rods, the rods holding each pair of plates extending substantially along diameters of said tube and at a substantial angle to each other.

6. A clinker grinder comprising a hollow cylindrical tube, sectional casing plates disposed about said tube and provided with grinding teeth, and means to secure said plates to said tube, said means comprising rods each extending through said plates and through separate wall portions of said tube, and keys disposed transversely in said rods outside said plates.

In testimony whereof I have hereunto affixed my signature.

ROBERT SANFORD RILEY.