

J. A. TYNAN.
STOVE OR FURNACE GRATE.
APPLICATION FILED OCT. 7, 1908.

Patented Apr. 6, 1909.

2 SHEETS—SHEET 1.

917,382.

Fig. 1.

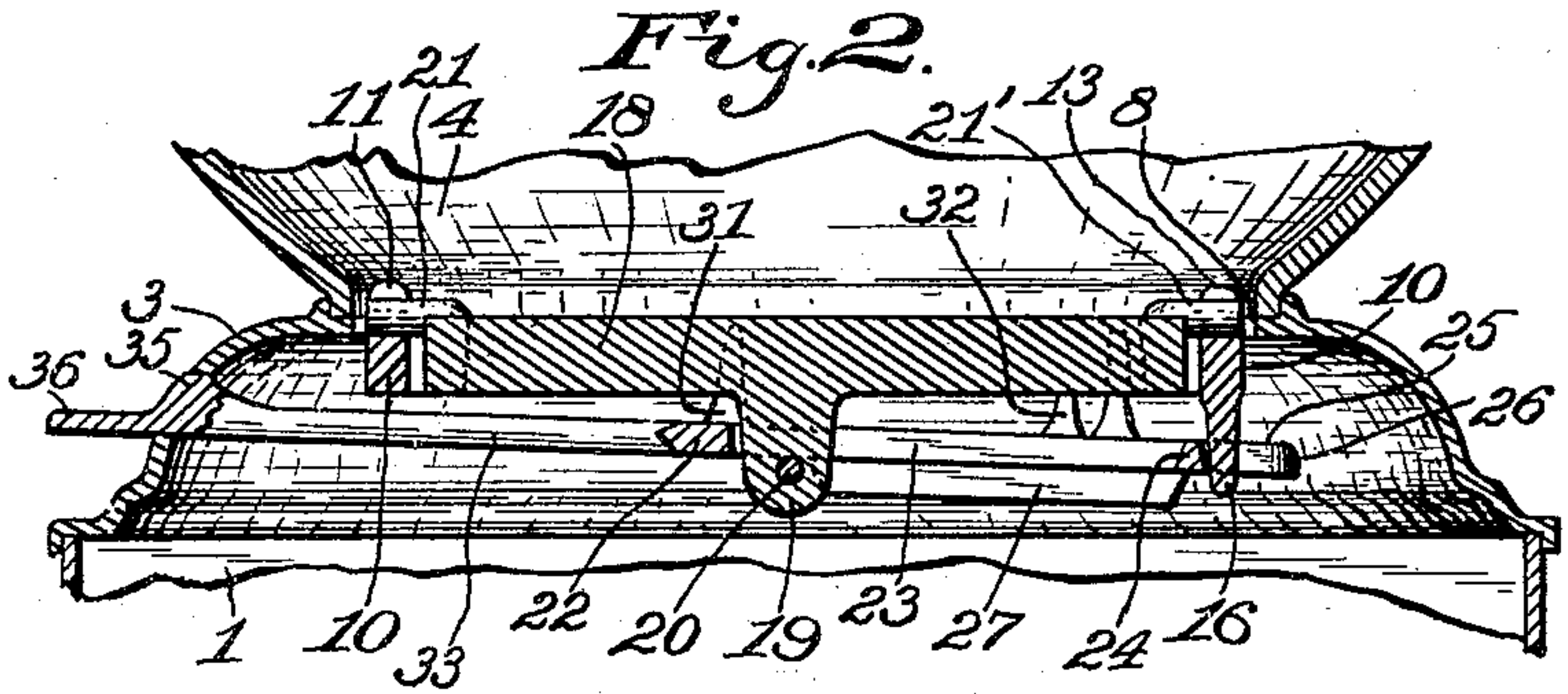
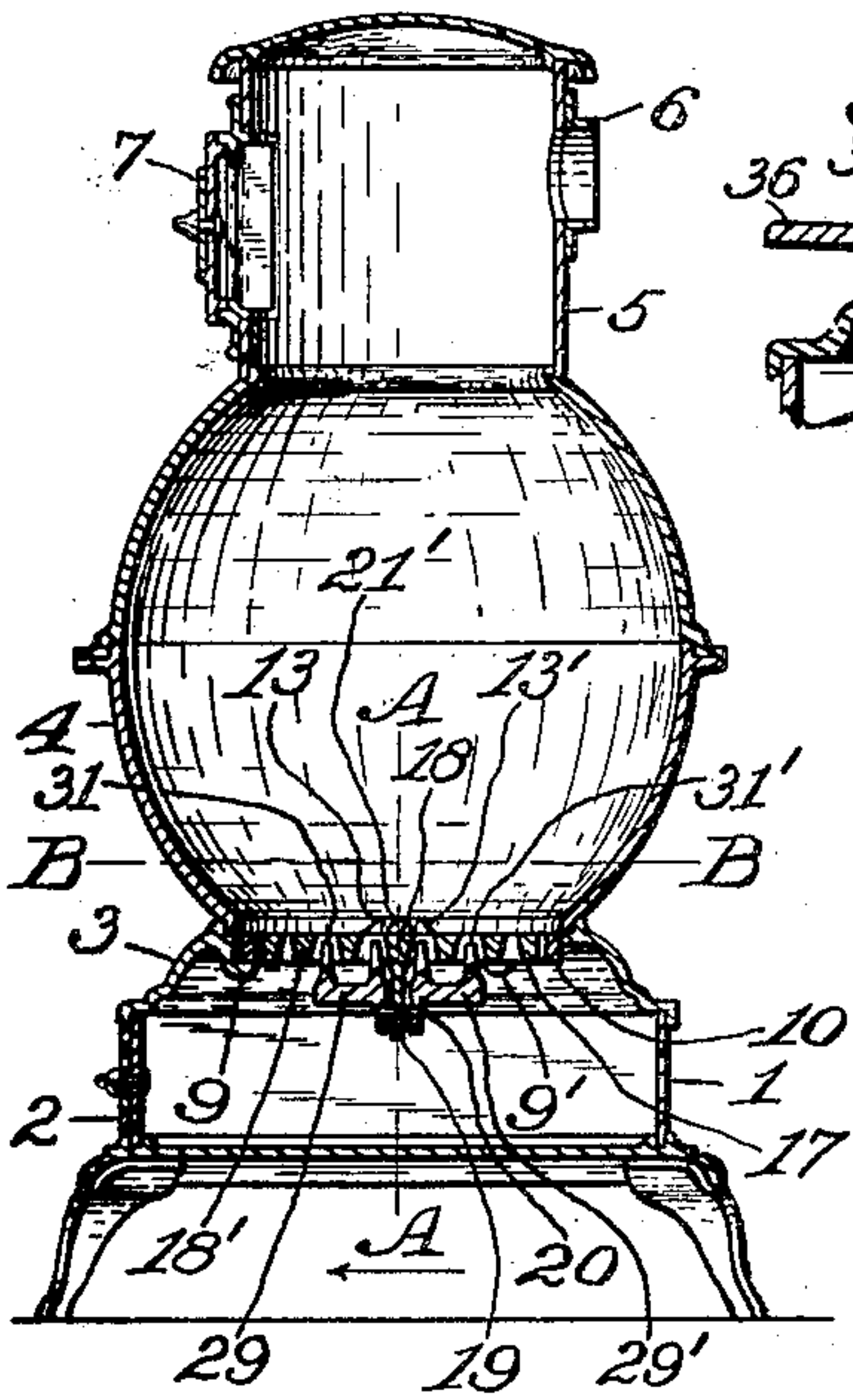


Fig. 3.

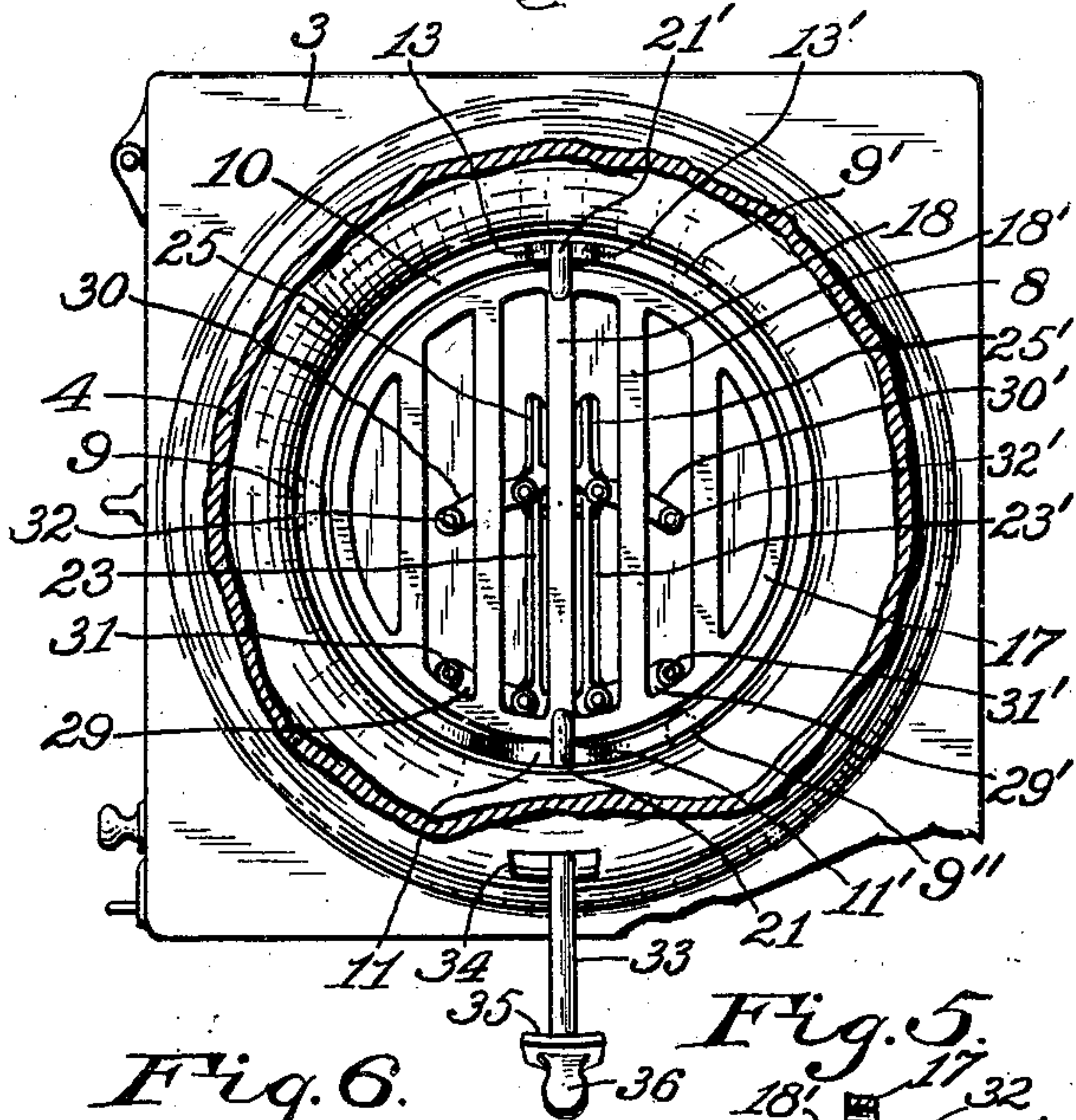


Fig. 4.

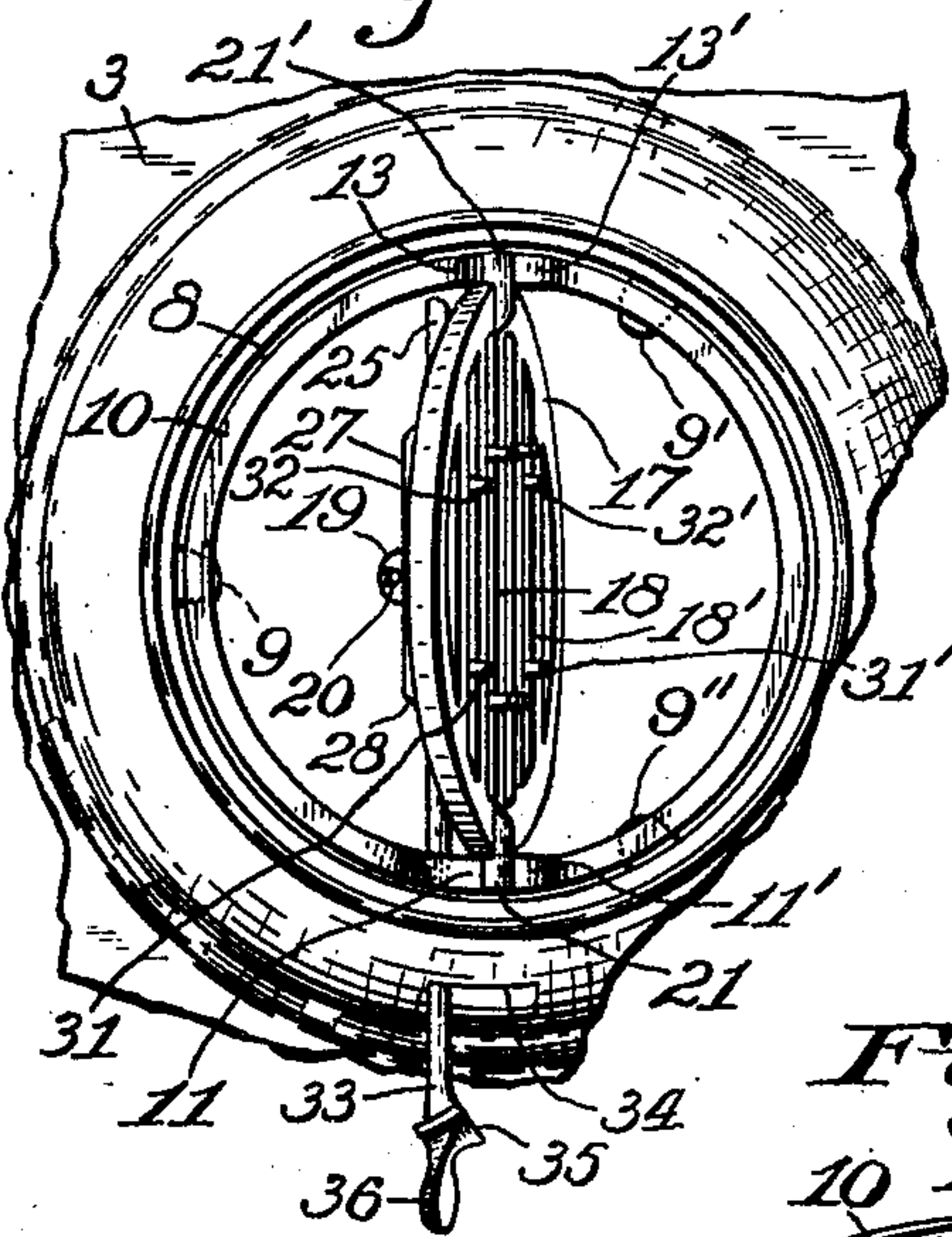


Fig. 6.

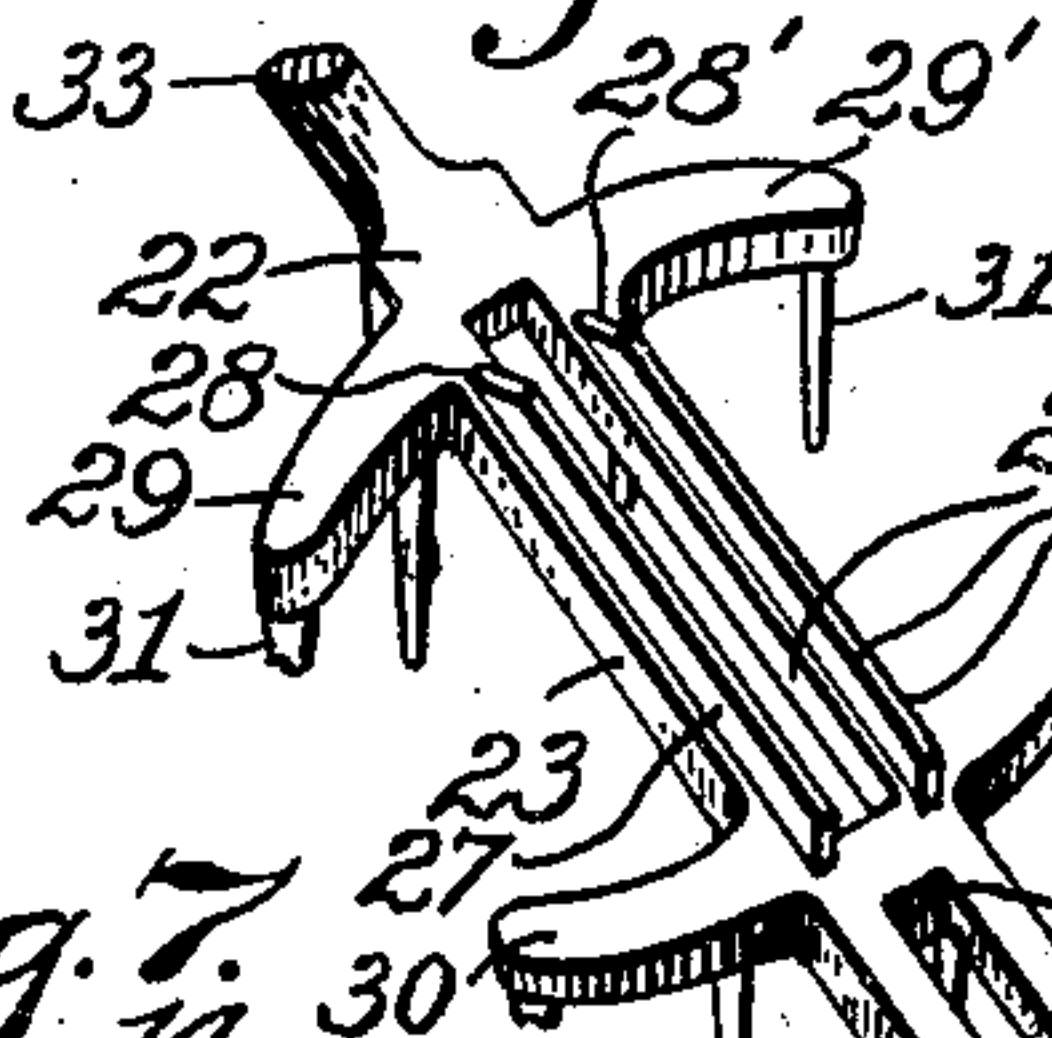


Fig. 5.

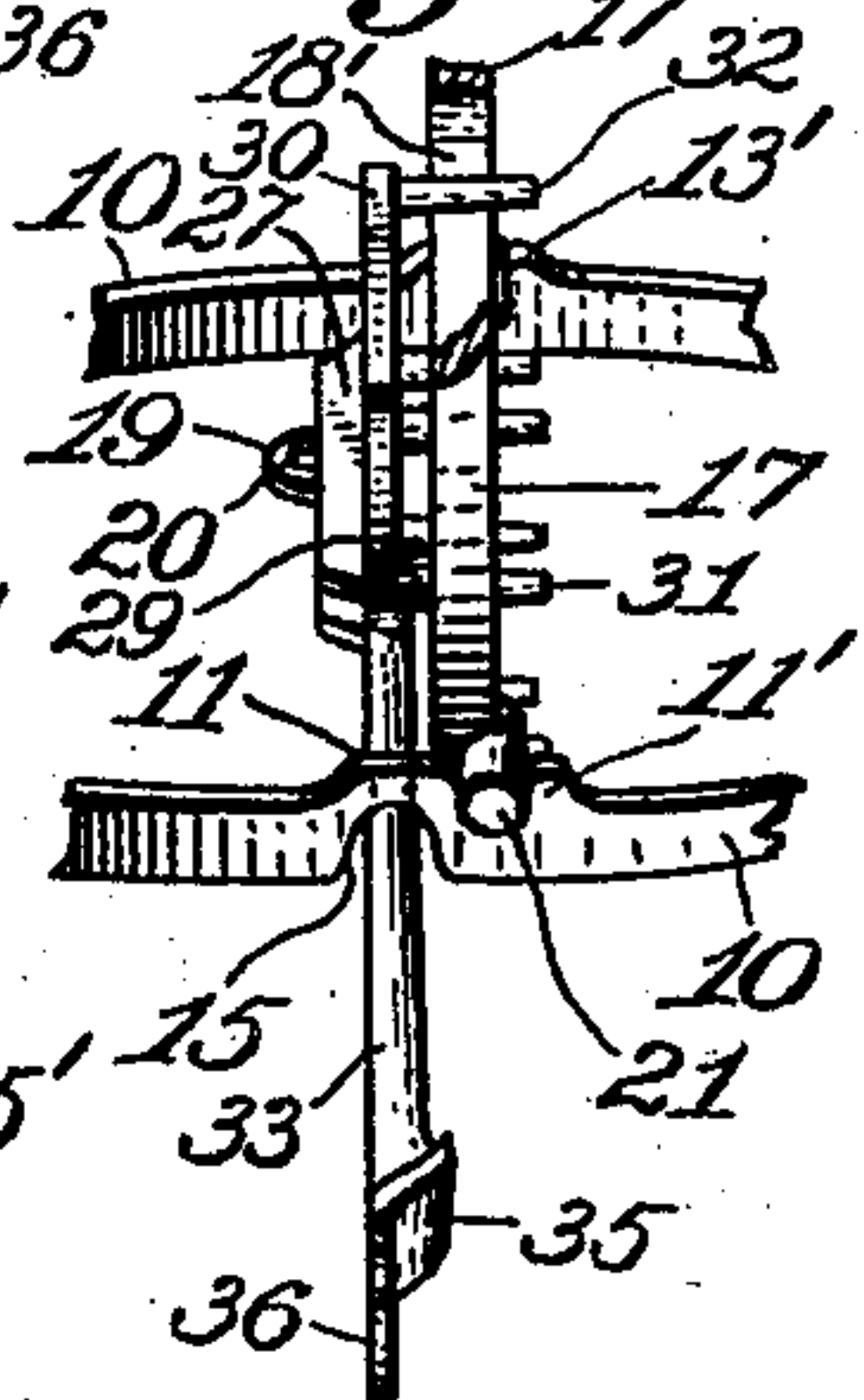
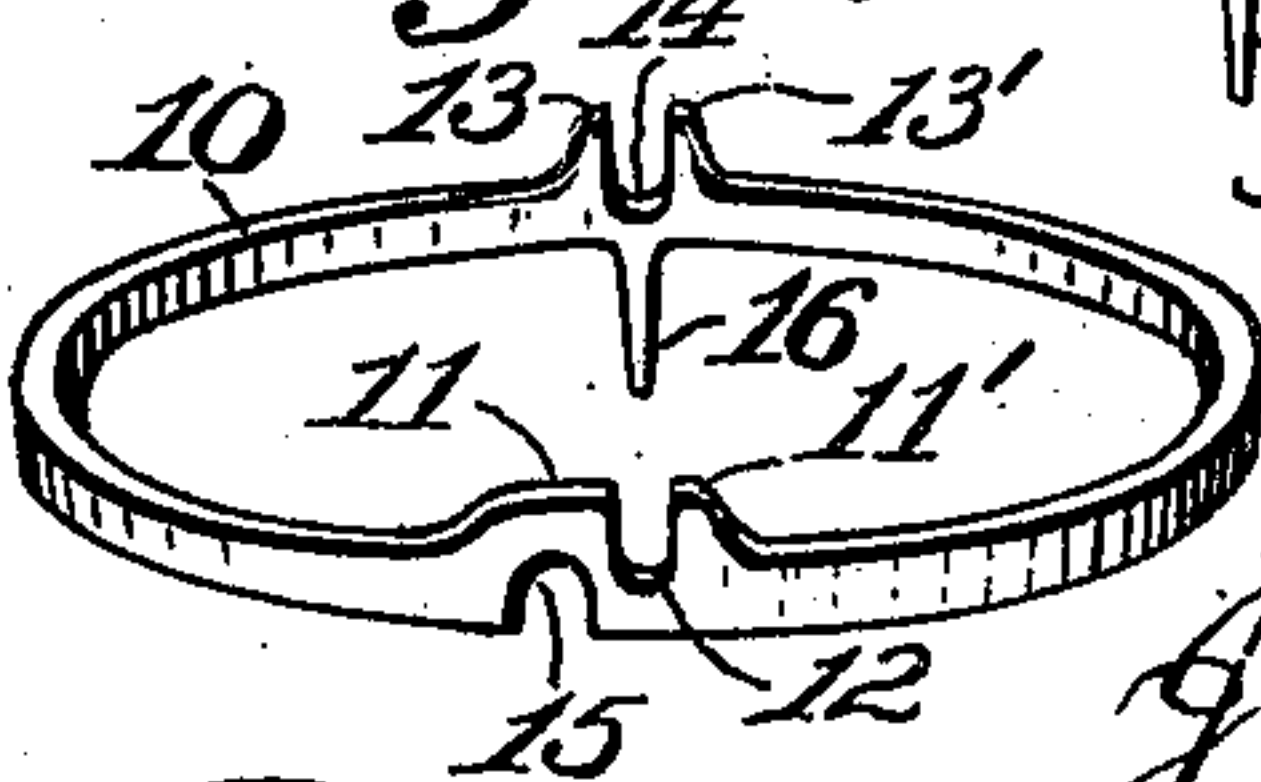


Fig. 7.



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INVENTOR:

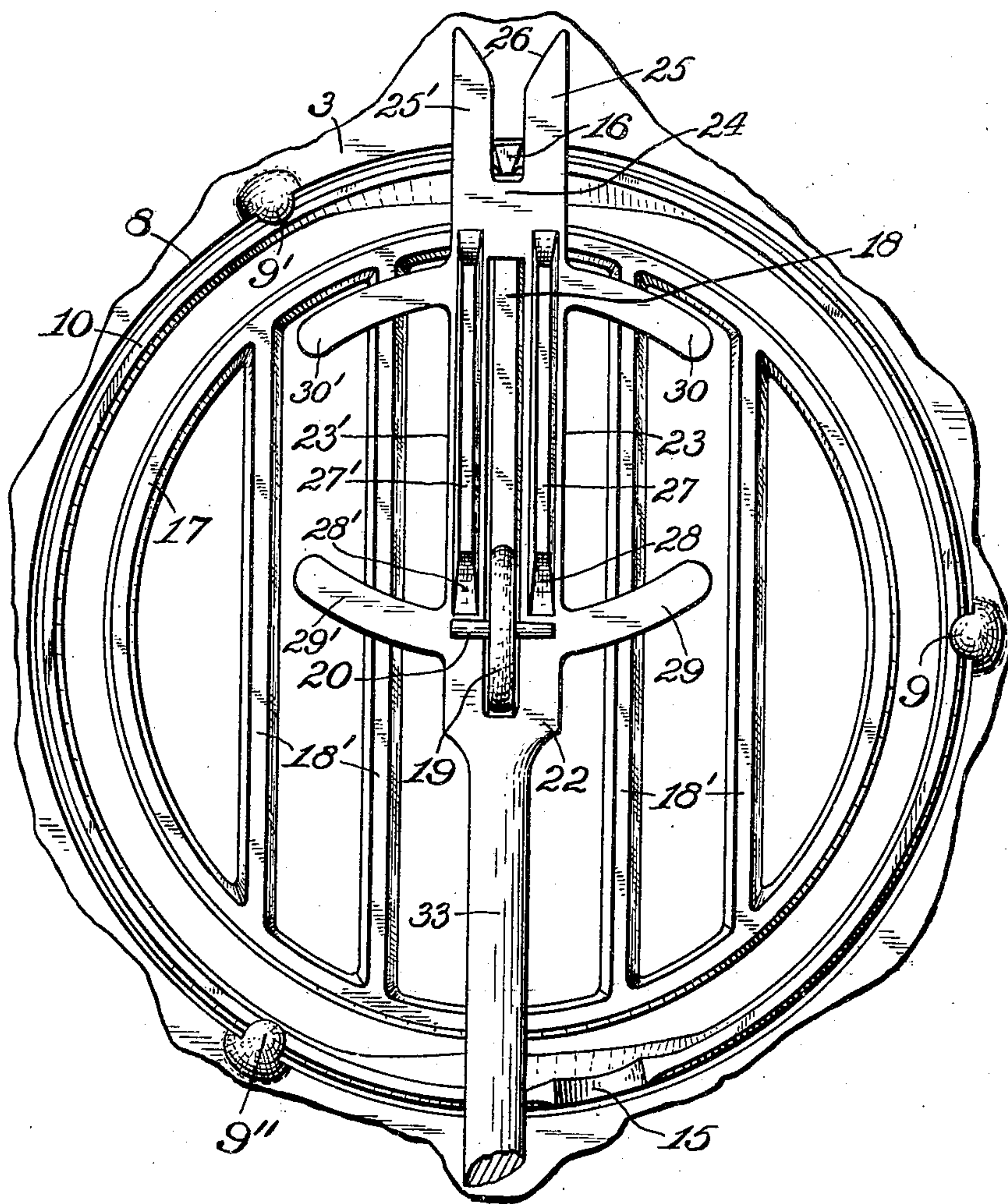
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2 SHEETS—SHEET 2.

Fig. 8.



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UNITED STATES PATENT OFFICE.

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STOVE OR FURNACE GRATE.

No. 917,382.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed October 7, 1908. Serial No. 456,561.

To all whom it may concern:

Be it known that I, JOHN A. TYNAN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Stove or Furnace Grates; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to grates for stoves or furnaces of various types and has reference particularly to means for loosening ashes on the grates beneath the beds of fire so that the ashes may fall through the grates and without breaking up the beds of fire; the invention having reference also to grates that are adapted especially for stoves and provided with the means for dislodging the ashes.

The object of the invention is to provide means whereby fires in stoves or furnaces may be kept free of ashes that ordinarily accumulate on the grates and prevent free draft and consequently complete consumption of the fuel; the object particularly being to provide apparatus of the above mentioned character that may be operated without the necessity of breaking up a bed of fire and causing unconsumed fuel to drop through the grates and become lost in the ashes, the aim being to remove the ashes frequently or as often as may be desired to obtain the desired heat from the fire; a still further object being to improve the construction of stove grates to the end that economy in the consumption of fuel may be attained.

The invention consists in the application of rakes below stove or furnace grates, means for guiding the rakes longitudinally of the grate-bars, and means for raising and lowering the rakes during their operation, the rakes being adapted to be raised so that the fingers thereof may be projected between the grate-bars to loosen the ashes upon the grate-bars; the invention consisting further in a novel form of rake for grates and means for adjustably supporting and guiding the rake. The invention consists also in the novel parts, and combinations and arrangements of parts, comprised in the construction of grates, as hereinafter particularly

described and defined in the accompanying claims.

Referring to the drawings Figure 1 is a vertical sectional view of an ordinary coal burning stove having the improved grate and the novel rake applied thereto as illustration of the purposes of the invention; Fig. 2, a fragmentary vertical sectional view approximately on the plane of the line A A in Fig. 1; Fig. 3, a fragmentary horizontal sectional view approximately at the plane of the line B B in Fig. 1 showing the rake as when raised for operation; Fig. 4, a fragmentary top plan of the stove base without the fire-pot and showing the grate in operative position as when dumping clinkers and the large accumulations of ashes; Fig. 5, a fragmentary perspective view showing portions of the improved grate and a rake connected therewith; Fig. 6, a perspective view of the rake inverted and the operating rod thereof broken off; Fig. 7, a perspective view of a part of the grate as constructed for stoves; and Fig. 8, an inverted plan of the improved stove grate and rake in connection with the stove base partially broken away.

Similar reference characters in the various figures of the drawings indicate corresponding elements or features of construction referred to herein.

In the drawings the numeral 1 indicates the base of the stove to receive the ashes from the fire, the base having a door 2 and a top 3 on which is a fire-pot 4, there being a drum 5 on the top of the fire-pot and having a draft pipe connection 6 and also a door 7. It will be obvious, of course, that the stove may be variously constructed. The top 3 of the base has a circular opening 8 therein and the under side of the top is provided with grate supporting lugs 9, 9', 9'', that extend inward toward the middle of the stove beyond the inner side of the opening 8. The grate comprises a ring 10 which is supported on the tops of the grate supporting lugs, so as to slide thereon about the vertical axis of the stove. The top of the ring has an enlarged portion 11 extending upward at one side thereof and a projection 11' arranged oppositely so that a bearing 12 is provided between them on the top of the ring. Two other projections 13 and 13' are formed on the top of the opposite side of the ring, and a bearing 14 is formed between these projections. A

recess 15 is formed in the under side of the ring 10 in the enlarged portion 11. The ring has a projection 16 formed on the under side thereof below the bearing 14. The ring is guided when operated by the circular side of the opening 8 in the top 3 of the base. Another part of the grate comprises a ring or frame 17 having parallel grate-bars, as 18 and 18', formed integrally therewith one grate bar extending through the middle of the space within the ring, and the under side of the middle grate-bar 18 has a projection 19 formed thereon in which a guide-pin 20 is driven in a suitable hole formed in the projection and at a suitable distance from the grate-bar. The ring 17 has a pair of trunnions 21 and 21' formed on opposite portions thereof that are supported rotatively on the bearings 12 and 14 of the ring 10. The ring 17 is somewhat less in diameter than the ring 10, so that an air space is formed between the two rings. Any suitable provision may be made for preventing longitudinal movements of the trunnions so that the ring 17 will be maintained concentrically to the ring 10 when at rest.

The rake for loosening the ashes under the fire comprises a frame having a head portion 22 from which extends two parallel bars 23 and 23' joined by a cross bar 24 from which extends two guide fingers 25 and 25' having the inner side of the ends thereof beveled as at 26 to guide the fingers at opposite sides of the projection 16, and the projection preferably has its contact sides beveled as indicated in Fig. 8. The bars 23 and 23' are guided against opposite sides of the projection 19 which extends between the two bars, and the rake is stopped by contact of the head 22 with the projection 19 in one direction, and by contact of the cross bar 24 with the projection 19 in the opposite direction. The bars 23 and 23' normally rest on the pin 20 in inclined positions with the head 22 against the projection 19. The under sides of the bars 23 and 23' have ribs 27 and 27' thereon that have inclined ends 28 and 28' respectively adapted to engage the pin 20 when the head 22 is moved away from the projection 19 and force the under sides of the ribs up onto the top of the pin 20 to be guided thereon. The frame has two curved lateral arms 29 and 29' extending from the bars 23 and 23' near the head 22 and two other curved lateral arms 30 and 30' extending also from the bars 23 and 23' at or near the cross bar 24, the curved arms being formed as segments of circles corresponding approximately to the curvature of the ring 17 or to a smaller circle concentric thereto. The top of the arm 29 has a suitable number of fingers 31 thereon, similar fingers 31' being formed on the arm 29', and similar fingers 32 and 32' are formed on the tops of the arms 30 and 30', all the fingers extending up between the grate

bars nearly to the plane of the tops of the bars when the frame is in its normal lowermost position. The rake has an operating rod 33 extending from the head 22 of the frame and the rod extends through an aperture 34 in the top 3 of the base, the aperture being of suitable length to permit lateral movements of the operating rod therein, the end portion of the operating rod being provided with a stopper 35 to close the aperture when the rake is in normal position at rest, and the end of the rod 33 is provided with a handle 36 adapted to be engaged by any suitable implement for turning the operating rod rotatively to rock the grate bars when the stopper 35 is withdrawn from the aperture 34. The stopper normally prevents rotation of the rod.

It should be understood that modifications will obviously be made in the construction of various types of grates other than herein illustrated, and also modifications will be made in the rake and its guiding supports and means for raising and lowering the rake so as to be adapted to be used with various types of grates, within the scope of the claims appended hereto.

In practical use the invention as herein illustrated will be operated by means of the operating rod 33. When the draft needs to be improved only slightly the operating rod 33 may be drawn out slightly so as to open the aperture 34 and then may be moved laterally so as to turn the ring 10 and consequently move the other parts of the grate, which will cause fine ashes to be dropped and especially those above the opening between the rings 10 and 17 and permit the air to rise into the fire near the fire-pot wall or at the edge of the fire, which effect is always desired. If more draft is desired the operating rod may be further pulled out so that the guide ribs 27 and 27' will be drawn up on the pin 20 and thus force the rake fingers above the grate bars into the ashes, which may be dislodged so as to drop into the ash pan or ash pit, by moving the operating rod 33 longitudinally. In case that it be desired to break up clinkers the rod 33 is to be drawn out until the fingers 25 and 25' are drawn away from the projection 16, and then the ring 17 may be rocked sufficiently to break the bed of clinkers, and when desired the clinkers may be dumped by rotary movement of the operating rod 33 so as to tilt the inner portion of the grate comprising the ring 17 and the grate bars as illustrated in Fig. 4, and when so dumped the operating rod 33 will be carried into the recess 15 in the under side of the ring 10. When the fingers 25 and 25' engage the projection 16 as they do normally they assist the stopper 35 in preventing the accidental dumping of the grate.

Having thus described the invention, what is claimed as new, is—

1. A stove or furnace including a base with a circular opening in the top thereof, a ring supported in the circular opening, a grate part mounted to rock in the ring, a rake 5 mounted movably under the grate part, means connecting the rake with the grate part for enabling the rake to control the grate part, and means with which the rake may coöperate to lock the grate part to prevent its rocking. 10

2. A stove or furnace grate including a supporting ring having two journal-bearings on opposite sides of the top thereof and having also a recess in the under side thereof 15 near one of the journal-bearings, and a grate part having two trunnions to rest or rotate on the journal-bearings and having also an operating rod connected with the under side thereof for tilting the grate part on the journal-bearings, the rod normally extending under the journal-bearings and being carried 20 laterally by the tilting grate part into the recess.

3. A stove or furnace including a plurality 25 of grate-bars, one of the grate-bars having a projection on the under side thereof that has a bearing member thereon, a rake-frame normally resting on the bearing member and having a rib on the under side thereof that 30 has an inclined end to be moved against the bearing member for raising the rake-frame, the rake-frame having also lateral arms, fingers on the tops of the arms in planes between the grate-bars, means for guiding the 35 rake-frame longitudinally of the grate-bars, and an operating device connected to the rake-frame for movement thereof to force the rib onto the bearing member and raise the rake-frame and fingers.

4. A stove including a base, a ring supported movably by the base and having journal-bearings thereon and also a projection on the under side thereof, a grate-part 45 comprising a ring and integral grate-bars and provided with trunnions that are mounted in the journal-bearings, one of the grate-bars having a projection on the under side thereof, a bearing-pin attached to the projection of the grate-bar, a rake-frame comprising 50 two bars normally resting on the bearing-pin and having bevel-end ribs on the under sides thereof to be moved onto the bearing-pin,

the rake-frame having two fingers normally engaging the projection that is on the under side of the movably-supported ring, fingers 55 on the rake-frame in planes between the grate-bars, and an operating rod rigid on the rake-frame.

5. A stove including a base having an aperture in the side thereof and a circular 60 opening in the top thereof, a supporting ring supported in the circular opening to move rotatively and having journal-bearings thereon, a grate-part comprising a ring and integral grate-bars and provided with trunnions 65 that are mounted on the journal-bearings, a rake-frame mounted movably under the grate-part and having an operating rod thereon that extends through the aperture for moving the rake-frame, the rod having a 70 stopper thereon that normally closes the aperture, means connecting the rake-frame with the grate-part to tilt the grate-part or to move the supporting ring, fingers on the top of the rake-frame in planes between the 75 grate-bars, and means for raising or lowering the rake-frame.

6. In a stove or furnace grate, the combination with supporting means, of a supporting ring having two journal-bearings on the 80 top thereof and mounted on the supporting means to move rotatively in a horizontal plane, the ring having a recess in the under side thereof near one of the journal-bearings, a grate-part comprising a ring and integral 85 grate-bars and having two trunnions thereon that are mounted in the journal-bearings, a rake-frame mounted movably on the under side of the grate-part and having fingers thereon that extend upward in planes between the grate-bars, means for raising or 90 lowering the rake-frame, an operating rod rigid on the rake-frame for tilting or moving the rake-frame, the recess in the supporting ring receiving the rod when the grate-part is 95 tilted, and means acting to tilt the grate-part when the rake-frame is tilted.

In testimony whereof, I affix my signature in presence of two witnesses, on the 2nd day of October, 1908.

JOHN A. TYNAN.

Witnesses:

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K. R. WODDELL.