

No. 687,899.

Patented Dec. 3, 1901.

R. C. PEABODY.
AUTOMATIC STOKER.

(Application filed Mar. 13, 1901.)

(No Model.)

2 Sheets—Sheet 1.

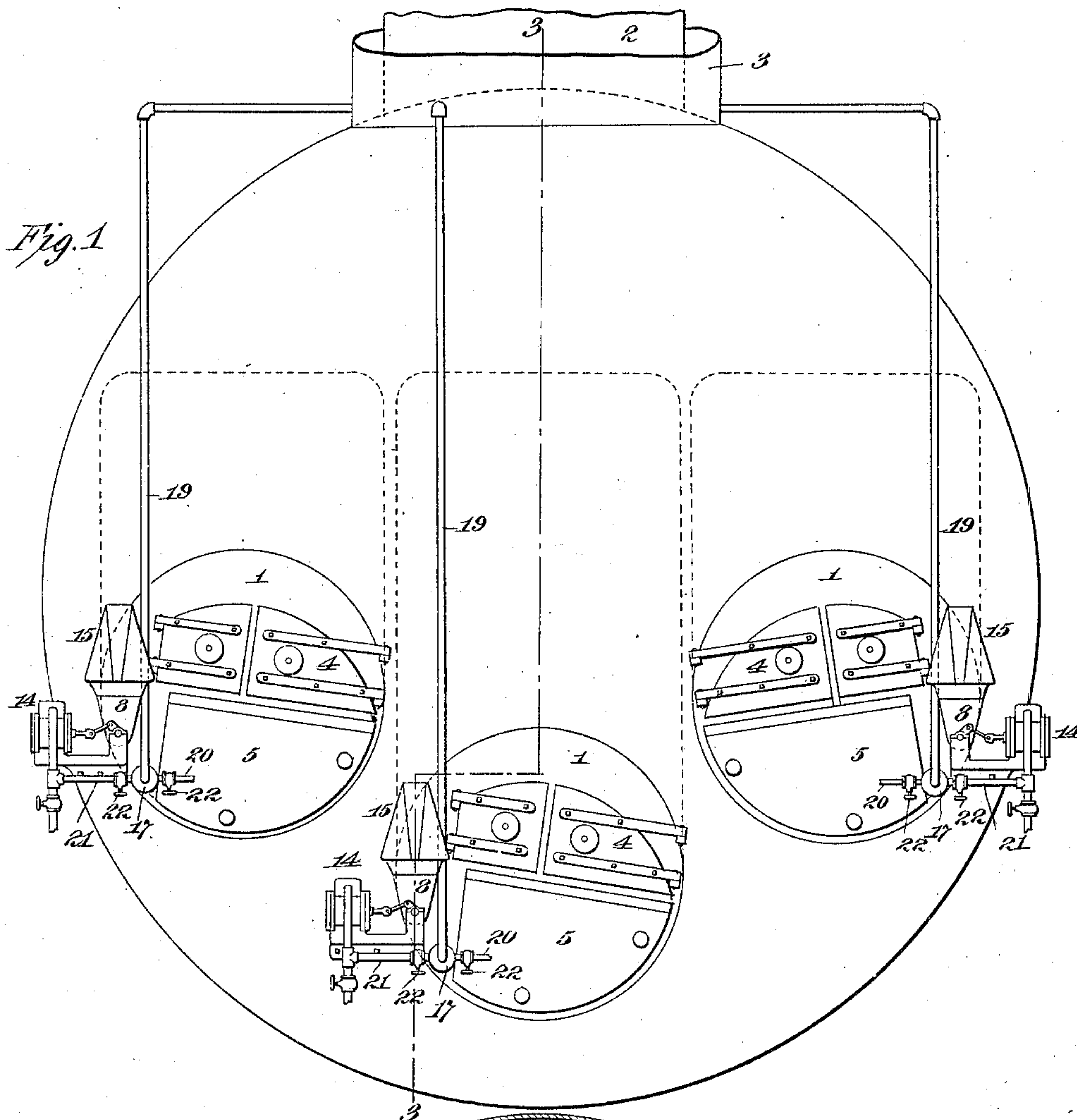
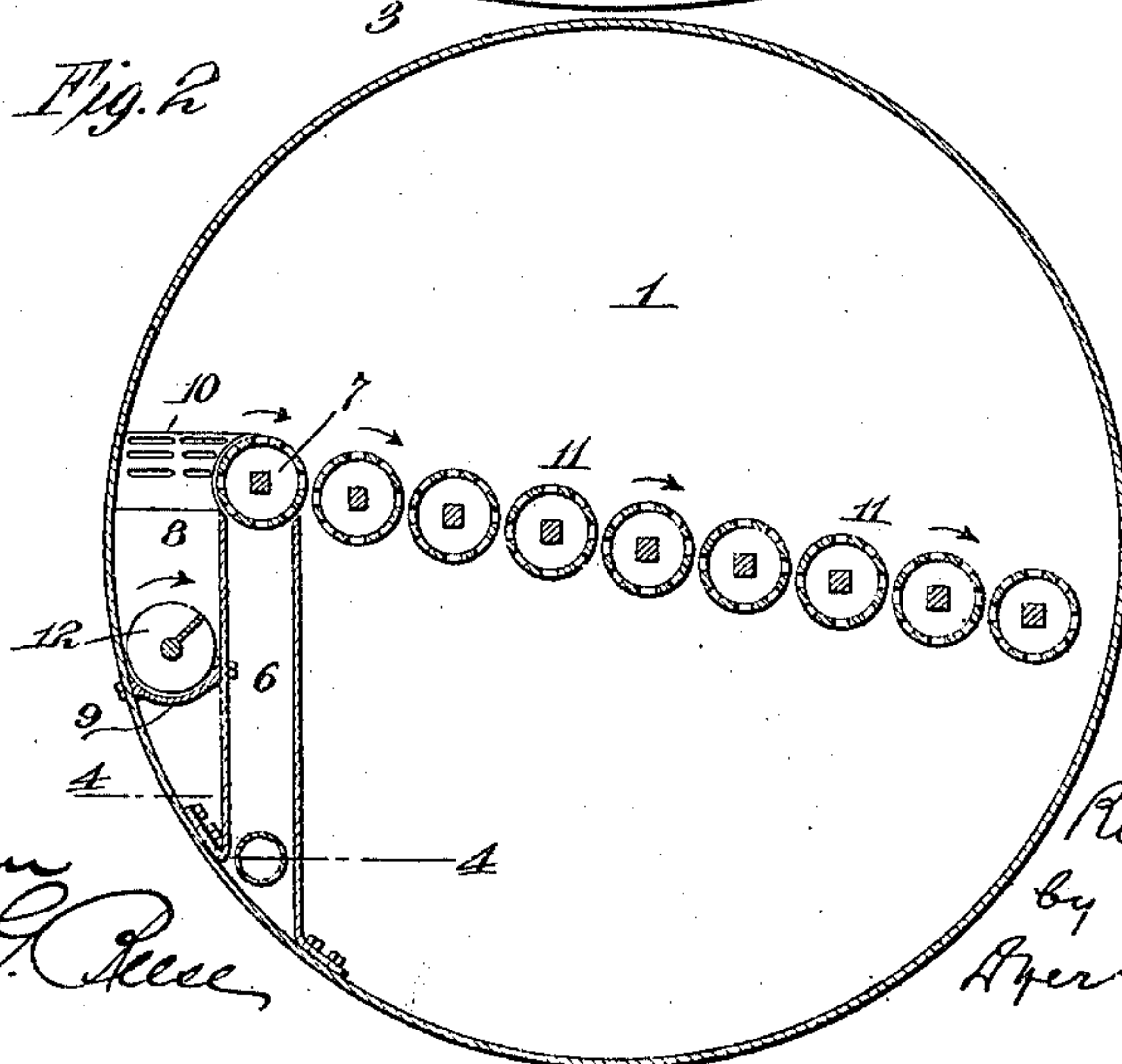


Fig. 2



Witnesses:

Geo. F. Coleman
Archibald G. Reese

Inventor

Royal C. Peabody
by
Her. Edmunds & Co.
Att'ys.

No. 687,899.

Patented Dec. 3, 1901.

R. C. PEABODY.
AUTOMATIC STOKER.

(Application filed Mar. 13, 1901.)

(No Model.)

2 Sheets—Sheet 2.

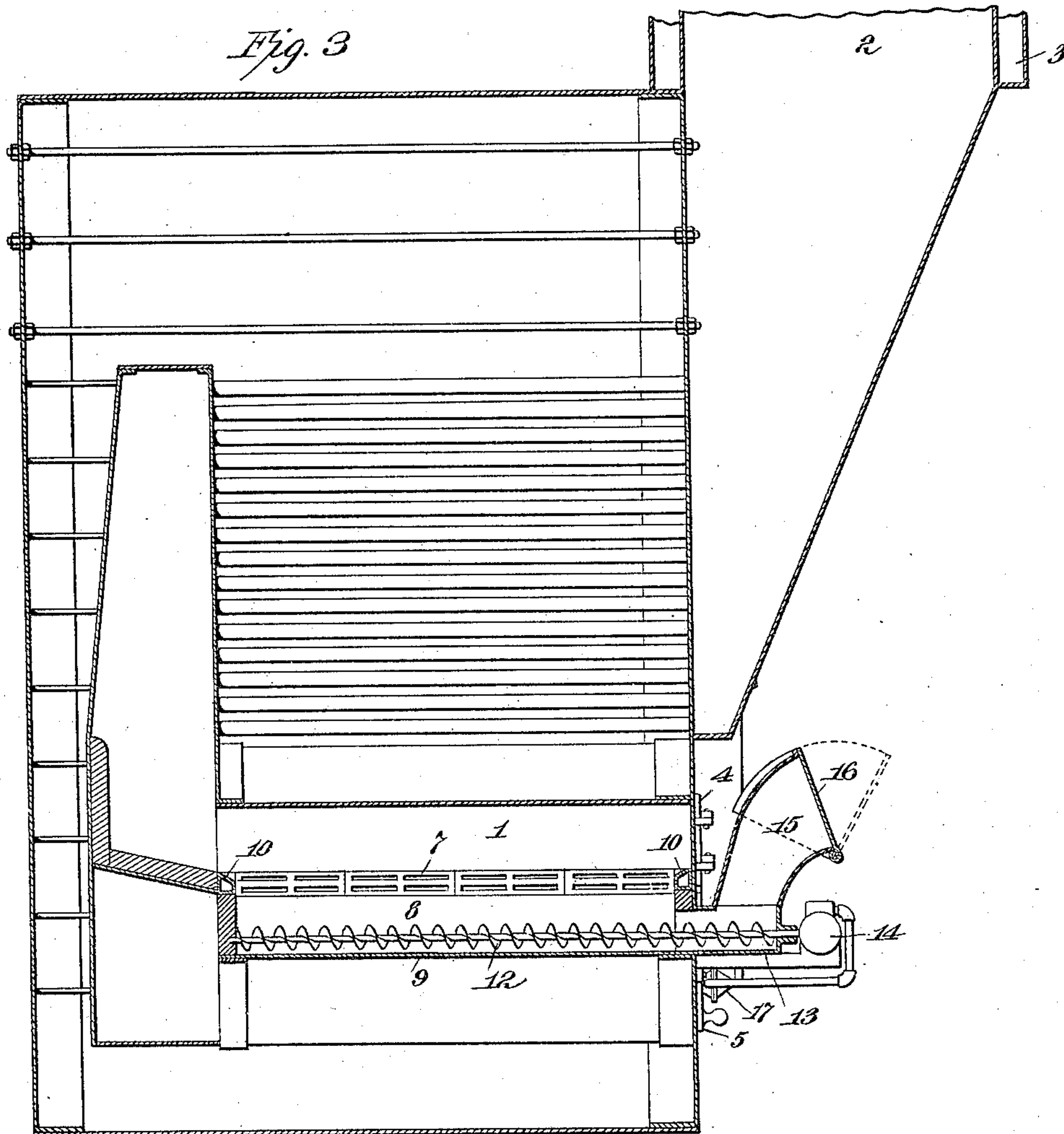
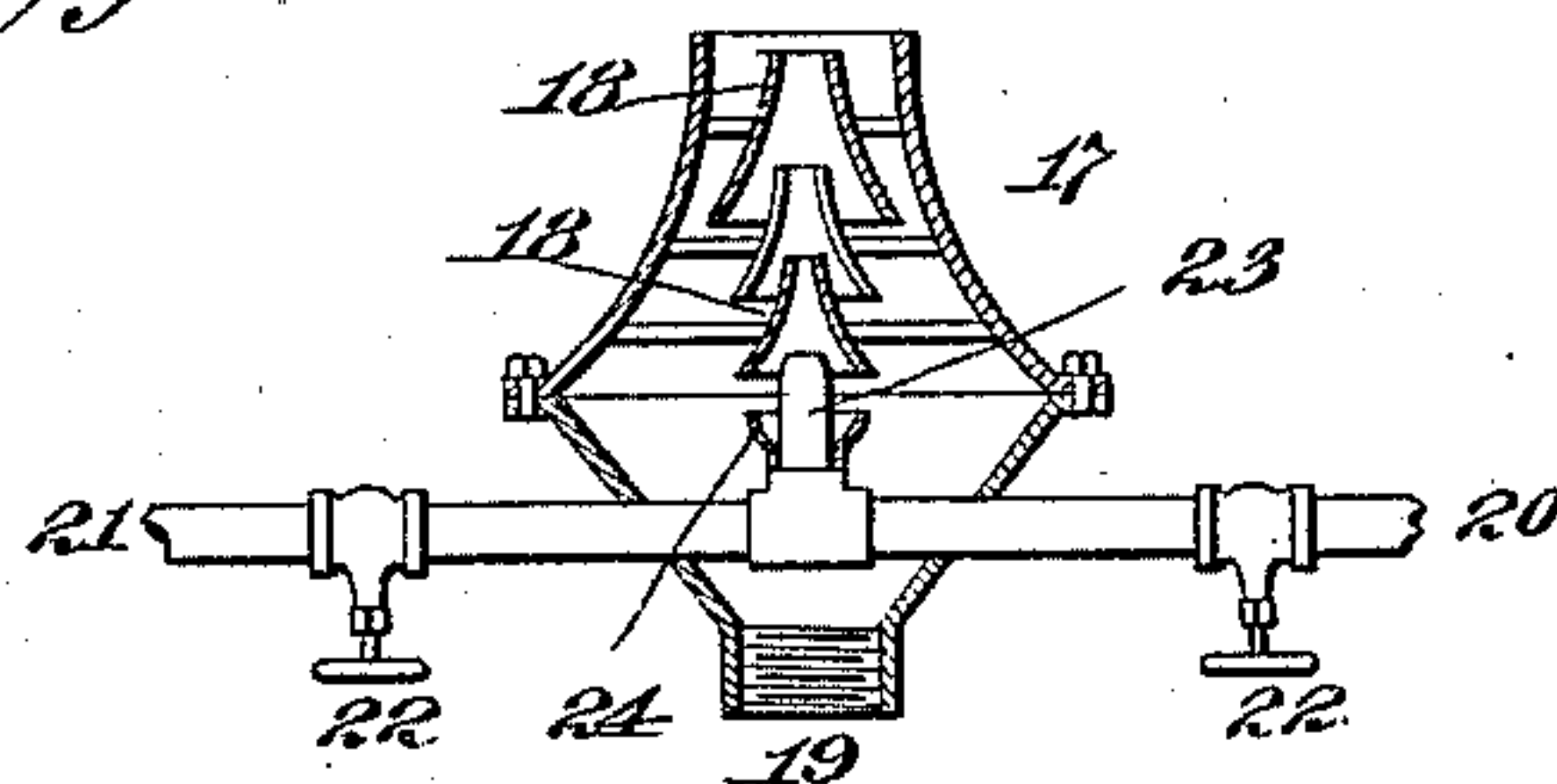


Fig. 4



Witnesses:

Jas. F. Coleman
Archibald F. Reese

Inventor

Royal C. Peabody
by
Alfred Edmonds & Co.
Att'ys

UNITED STATES PATENT OFFICE.

ROYAL C. PEABODY, OF BROOKLYN, NEW YORK.

AUTOMATIC STOKER.

SPECIFICATION forming part of Letters Patent No. 687,899, dated December 3, 1901.

Application filed March 13, 1901. Serial No. 50,921. (No model.)

To all whom it may concern:

Be it known that I, ROYAL C. PEABODY, a citizen of the United States, residing in the borough of Brooklyn, city of New York, State of New York, have invented a certain new and useful Improvement in Automatic Stokers, of which the following is a description.

My invention relates, in the first place, to an improved automatic stoker for automatically and uniformly distributing coal or other pulverized fuel to the grate-bars of a fire-box—as of a steam-boiler, for example—and preferably to a set of hollow rotating grate-bars of the type described and claimed in an application filed by John MacCormack on the 29th day of December, 1900, Serial No. 41,473.

My objects generally are to provide means by which coal or other pulverized fuel may be economically, automatically, and uniformly distributed in a suitable fire-box.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a front view of a steam-boiler and furnaces of the Scotch type equipped with my present improvements; Fig. 2, a cross-sectional view through one of the fire-boxes; Fig. 3, a section on the line 3 3 of Fig. 1, and Fig. 4 a section on the line 4 4 of Fig. 2.

In all of the above views corresponding parts are indicated by the same reference-numerals.

The fire-boxes 1, as shown, are made tubular in form, and the furnace-flues lead to a common back connection, whence the products of combustion pass along through the nests of tubes to the smoke-pipe 2, which is preferably provided with an inclosing jacket 3, communicating with the atmosphere at the top, as is common. The front of each fire-box is provided with swinging doors 4 4, normally closed, but which may be opened for hand-stoking when desired, and with an ash-pit door 5, which may be opened or removed for cleaning out the ash-pit. Mounted within each fire-box is a wind-box 6, formed of vertical boiler-iron walls, as shown, and mounted above the wind-box and connected therewith is a hollow rotating perforated twyer 7, made of refractory material, as de-

scribed in said MacCormack application. The space between the wind-box 6 and the curved wall of the fire-box forms a coal-magazine 8, the bottom of which is formed by a curved partition 9. At each end of the coal-magazine is a stationary twyer 10 of the usual form.

11 11 are hollow perforated rotary grate-bars made of refractory material and preferably in sections, as described in said MacCormack application, and which are rotated in any suitable way. The grate-bars are arranged in line with each other and with the rotating twyer to form a slightly-inclined bed, on which the combustion takes place and beneath which the ash-pit is located. Mounted in each of the coal-magazines is a feed-worm 12, which extends through a tunnel 13 and is operated from the outside by a motor 14, which preferably is a small steam-engine, as is common in the art. Leading to the tunnel 13 is a hopper 15, having an open mouth and to which coal is supplied by hand or in any other way. Each hopper 15 may be provided with a hinged movable hood 16, which may be swung forward, as shown in dotted lines, if desired, to facilitate the introduction of coal therein by hand. The stationary twyers 10 connect with the wind-box 6, so that a blast supplied to the latter will pass upwardly through the rotating twyer 7 and also through the stationary twyers 10. Leading into each wind-box 6 is a blast-injector casing 17, having a series of bell-mouths 18 therein and connected at its back by a pipe 19 with the space between the stack and the shell 3 surrounding it. Leading into each injector-casing is a live-steam pipe 20 and an exhaust-steam pipe 21, having valves 22 therein and which connect with a nozzle 23, having a cap 24, which contracts the entrance of the outermost bell-mouth, as shown. The exhaust-steam pipe 21 may be supplied from the motor 14 of the stoker or from any other source.

In operation the worm 12, grate-bars 11, and rotary twyer 7 will be slowly rotated in the direction of the arrows. Pulverized fuel is now supplied to the hopper 15 and passes to the tunnel 13, from which it is forced into the magazine by the worm 12. As the magazine becomes filled the fuel therefrom will be

piled up over the rotating twyer and by the latter will be distributed in relatively thin strata over the several grate-bars of the furnace. The direction of rotation of the worm 12 tends
 5 to force the coal toward the rotary twyer, as will be understood. Combustion having been started, the coal in its passage from one grate-bar to another will be consumed until at the furthestmost grate-bar it will be reduced to
 10 ash or clinker. To increase the combustion, live or exhaust steam is admitted into the injector, and in passing through the several bell-mouths into the wind-box a powerful suction will be created, drawing air downwardly
 15 around the stack in a hot condition and blowing it into the wind-box, from which it passes up through the rotary twyer and stationary twyers 10. If desired, a blast may also be directed into the ash-pit, so as to pass up
 20 through the rotating grates. By thus blowing a blast of hot air into the furnace the combustion will be very intense, while the heat of the air will tend to disintegrate or vaporize any oil which may be mechanically entrained with the steam and which will be more
 25 effectively consumed in the furnace.

I do not claim herein the improvements in draft-producing apparatus before described, since specific claims on that invention are
 30 made the subject of my divisional application filed July 19, 1901, Serial No. 68,926.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

35 1. In a fire-box, the combination of the casing therefor, a series of grate-bars mounted in said casing, a vertical partition at one side of the casing within the same, a curved partition extending between said vertical partition
 40 and the adjacent casing-wall forming a fuel-magazine above said curved partition and between the vertical partition and the casing-wall, a feed-screw in said magazine, and a second vertical partition arranged parallel
 45 with the first vertical partition and forming

a wind-box between the two, substantially as and for the purposes set forth.

2. In a fire-box, the combination of the casing therefor, a series of grate-bars mounted in said casing, a vertical partition at one side of
 50 the casing within the same, a curved partition extending between said vertical partition and the adjacent casing-wall forming a fuel-magazine above said curved partition and between the vertical partition and the casing-wall, a
 55 feed-screw in said magazine, a second vertical partition arranged parallel with the first vertical partition and forming a wind-box between the two, and a hollow twyer above said wind-box, substantially as and for the
 60 purposes set forth.

3. In a fire-box, the combination of the casing therefor, a series of grate-bars mounted in said casing, a vertical partition at one side of the casing within the same, a curved partition
 65 extending between said vertical partition and the adjacent casing-wall forming a fuel-magazine above said curved partition and between the vertical partition and the casing-wall, a feed-screw in said magazine, a
 70 second vertical partition arranged parallel with the first vertical partition and forming a wind-box between the two, and a hollow rotary twyer above said wind-box, substantially as and for the purposes set forth.
 75

4. In a fire-box, the combination of the casing, a wind-box mounted therein and forming between it and the casing-wall a fuel-magazine, a rotating hollow twyer mounted
 80 above the wind-box, rotating hollow grates mounted in the casing at one side of said twyer, and a feed-worm in the magazine, substantially as set forth.

This specification signed and witnessed this 4th day of March, 1901.

ROYAL C. PEABODY.

Witnesses:

FRANK L. DYER,
 JNO. R. TAYLOR.