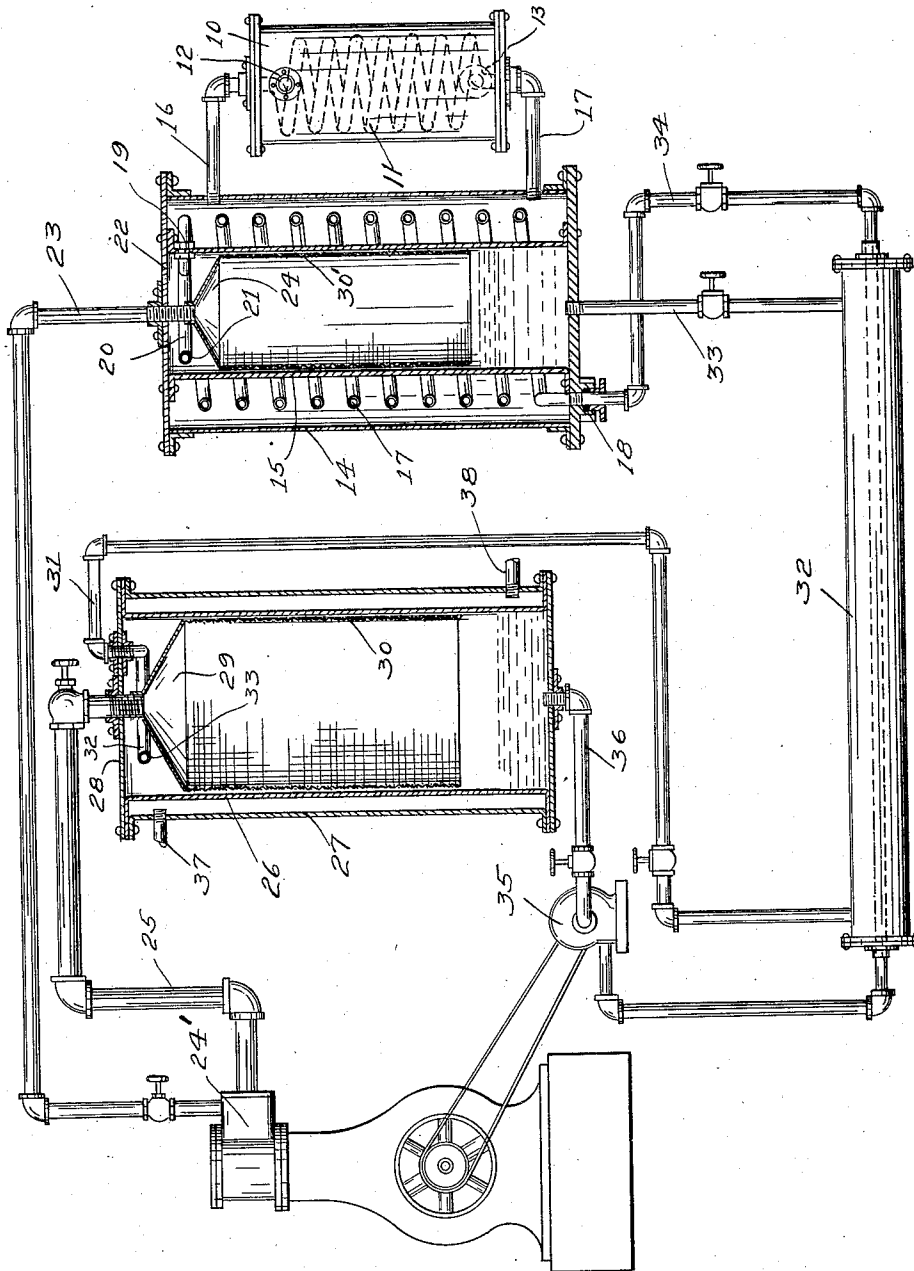


F. C. BELL.
POWER PRODUCING PLANT.
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1,047,903.

Patented Dec. 17, 1912.



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UNITED STATES PATENT OFFICE.

FRED C. BELL, OF ALAMEDA, CALIFORNIA.

POWER-PRODUCING PLANT.

1,047,903.

Specification of Letters Patent.

Patented Dec. 17, 1912.

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To all whom it may concern:

Be it known that I, FRED C. BELL, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented certain new and useful Improvements in Power-Producing Plants, of which the following is a specification.

This invention relates to prime-motors and the principal object of the invention is to provide an improved method of operating prime motors and utilizing the heat of the exhaust from a steam or internal combustion engine or the heat from the sun or other similar source of heat.

Another object of the invention is to provide an improved apparatus for carrying out this method.

With the above and other objects in view the invention consists in general of certain novel constructions, arrangements and combinations of parts as will be hereinafter fully described, illustrated in the accompanying drawings; and specifically claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views, and the figure is a diagrammatic illustration of a plant for carrying out this method.

In the embodiment of the invention herein set forth there is indicated a heater 10 of the type usually employed to heat feed water for boilers. This heater consists of a drum containing a coil of pipe 11 and is in communication with a suitable source of exhaust steam, gas, or the like, by means of a pipe 12, utilized fluid after passing through the heater passes out of an exhaust pipe 13. This heater has its coil filled full of water and both its upper and lower ends are in communication respectively with the upper and lower ends of a drum 14 having an inner jacket 15. This communication is effected by means of the pipes 16 and 17 respectively. These pipes lead to the space between the inner and outer drums and this space is kept filled with water so that constant circulation is maintained the hot water rising through the coil 11 and passing into the space between the drums through the pipe 16, from whence it flows down and passes out through the pipe 17 and again through the drum.

Within the space between the inner and outer drums there is also a coiled pipe 17 which passes out through a suitable stuffing

box 18 at the bottom of the drum and passes in through the wall of the inner drum by means of a suitable fitting 19. Within the inner drum this pipe is connected to a ring 20 of suitable piping having openings 21 in the bottom thereof. Passing downward through the upper head 22 of the drum is a pipe 23 which terminates in an inverted funnel 24 lying just below the ring 20 so that as the fluid passes from the openings 21 it will be distributed evenly around the edges of the funnel 24. This pipe 23 leads to the steam chest or valve chest 24' of an ordinary steam engine, the exhaust from which passes out through a pipe 25. This pipe 25 communicates with the interior of a drum having an inner cylinder 26 and an outer cylinder 27 and on the lower end of the pipe 25 where it passes through the head 28 of the last mentioned drum there is fitted an inverted funnel 29 around the edges of which is secured a cylinder 30 of suitable open mesh fabric. Leading through the head 28 is a second pipe 31 which terminates within the cylinder 26 in a ring 32 provided with suitable openings 33 so that the fluid passing out of the ring will flow around the edges of the funnel and flow down evenly over the mesh fabric. This pipe 31 is connected to one end of a heater 32 the other end of said heater being connected to the inner drum 15 by means of a valved pipe 33. The coil 17 has its lower end connected to a valved pipe 34 which passes through the heater 32 and connects with a pump 35 preferably belt driven from the engine. This pump furthermore is connected to the inner cylinder 26 by a pipe 36. The outer jacket or cylinder 27 is connected with inlet and outlet pipes 37 and 38 so that a constant flow of cold water may be kept in constant circulation about the inner cylinder 26, water being supplied from city water works or any other convenient source of supply.

Within the inner drum 15 there is placed a quantity of the compound which has the property of absorbing gas at low temperatures and giving off said gas by the application of heat. Many of the ammonium compounds possess this property and ammonium sulfo-cyanid has been found satisfactory in practice. This compound has the property of absorbing or occluding anhydrous ammonium gas when cold. The same compound is also placed in the cylinder 26 and

the balance of the system is filled with anhydrous ammonium gas. Now as the cylinder 26 is kept cold by water circulating about it the ammonium sulfo-cyanid will
5 absorb gas in this cylinder. From there it is pumped together with the gas of occlusion through the heater 32. As the coil 11 is kept constantly hot by the circulation of exhaust gas or the like the jacket surrounding the drum 15 will, in like manner, be
10 kept hot so that the ammonium sulfo-cyanid in this latter drum in passing down through the pipe 33 is heated and parts with a certain portion of its heat to the fluid which is passing through the pipe 34. The fluid
15 thus enters the coil 17 warm to a certain extent so that when it flows down through the openings 21 it is in condition at once to give off anhydrous ammonium gas. This
20 latter passes through the pipe 23 and operates the engine, it being, of course, understood, that the liquid flows down to the bottom in a thin sheet closely adjacent the wall so that the gas is all the more readily
25 given off.

When the ammonium gas has been used it then flows through the pipe 25 and out of the funnel 29. At this time, however, the heated ammonium sulfo-cyanid is flowing
30 out of the openings 33 and trickling down the mesh fabric where it comes into intimate communication with the ammonium gas. As the sulfo-cyanid cools while passing over the fabric the ammonium gas is again absorbed and the cycle thus becomes a recurring one. It is to be understood that the pressure developed in the drum 15 is not
35 only sufficient to run the engine but also acts to force the fluid out of the bottom part of the drum and lift it to the top of the cylinder 26.
40

By properly proportioning the various parts the exhaust steam or gas may be utilized so that substantially all of the heat is used.

Having thus described my invention, what is claimed as new, is:—

1. In a device of the kind described, a heating drum comprising a pair of concentrically arranged cylinders, a coil of pipe
50 between said cylinders and surrounding the inner cylinder, a ring at the upper end of the inner cylinder consisting of a perforated pipe and connected to the upper end of said
55 coil of pipe, an outlet pipe connected to the upper end of the heating drum and extending into the inner cylinder, an inverted funnel carried on the inner end of said outlet pipe and having its edge extending below the perforated ring, and a second outlet pipe
60 leading from the lower end of the inner drum.

2. A cooling drum comprising an inner and outer cylinder in concentric disposition, cold water inlet and outlet pipes communicating with the space between said cylinders, an inlet pipe extending into the inner cylinder and provided on its lower end with an inverted funnel, an open mesh fabric
65 screen depending from the edge of said inverted funnel, a second inlet pipe extending into said inner cylinder at the top thereof and communicating with a ring of perforated pipe arranged above the inverted funnel, and
70 an outlet pipe extending from the lower end of the inner cylinder.
75

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

FRED C. BELL.

Witnesses:

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W. A. STOCK.