

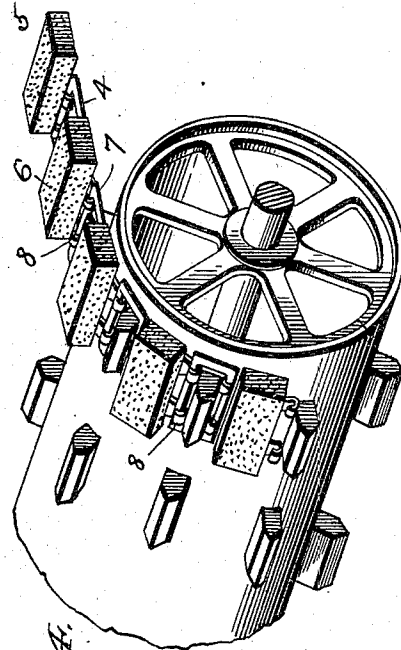
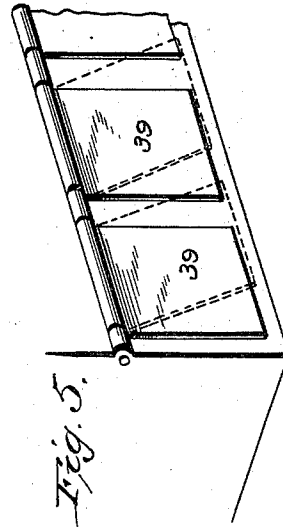
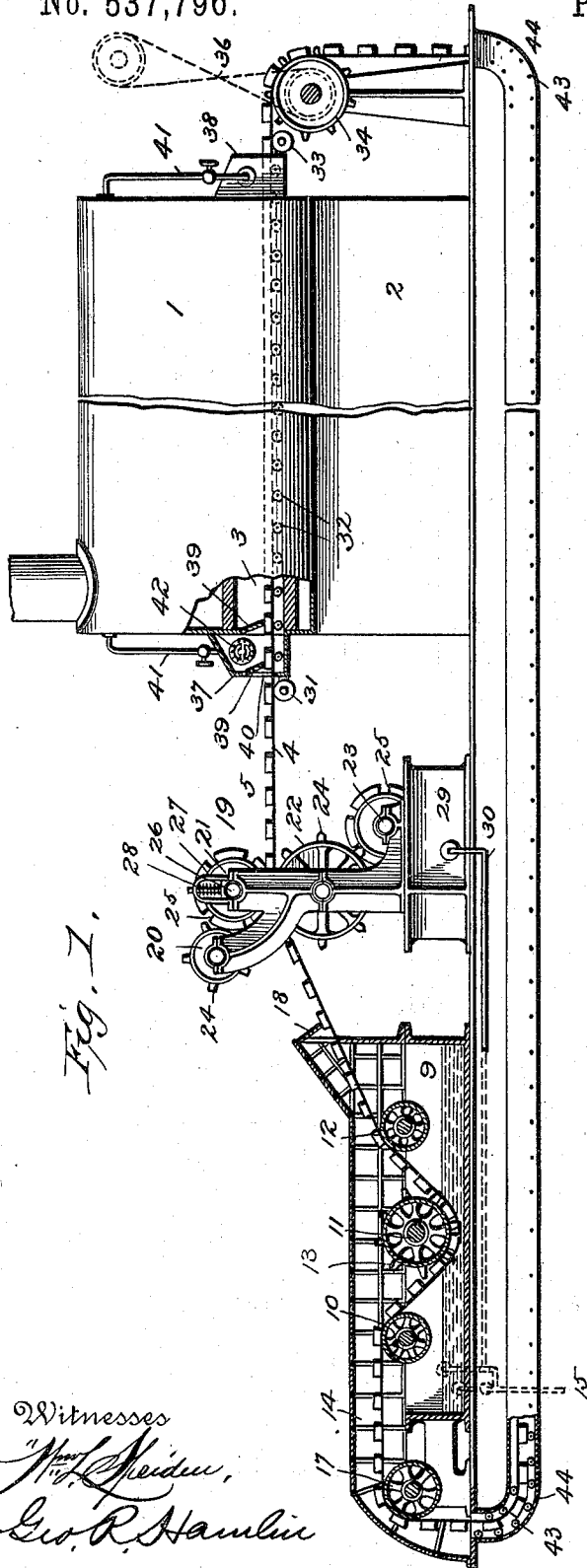
(No Model.)

3 Sheets—Sheet 1.

R. ALTSCHUL.
HYDROCARBON FURNACE.

No. 537,796.

Patented Apr. 16, 1895.



Witnesses
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(No Model.)

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Fig. 2.

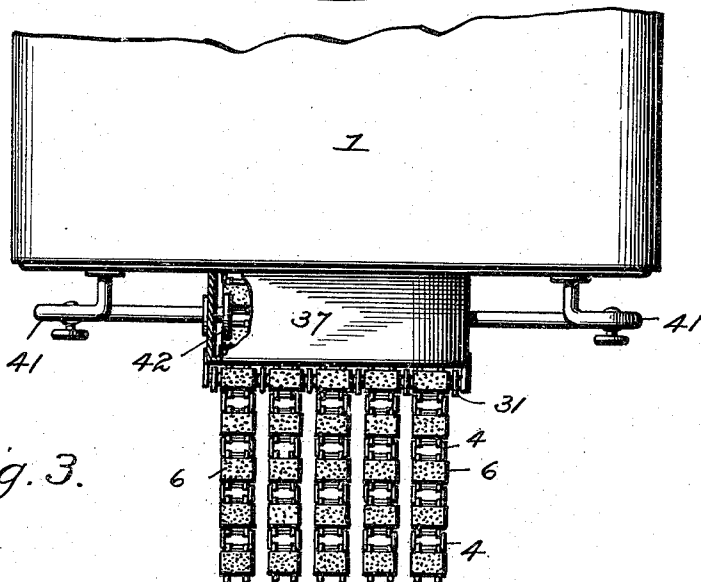
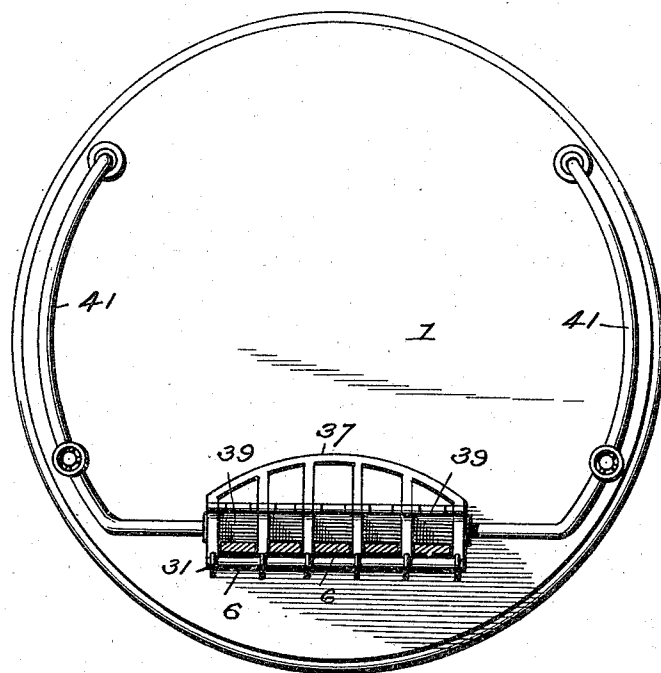


Fig. 3.

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Fig. 6.

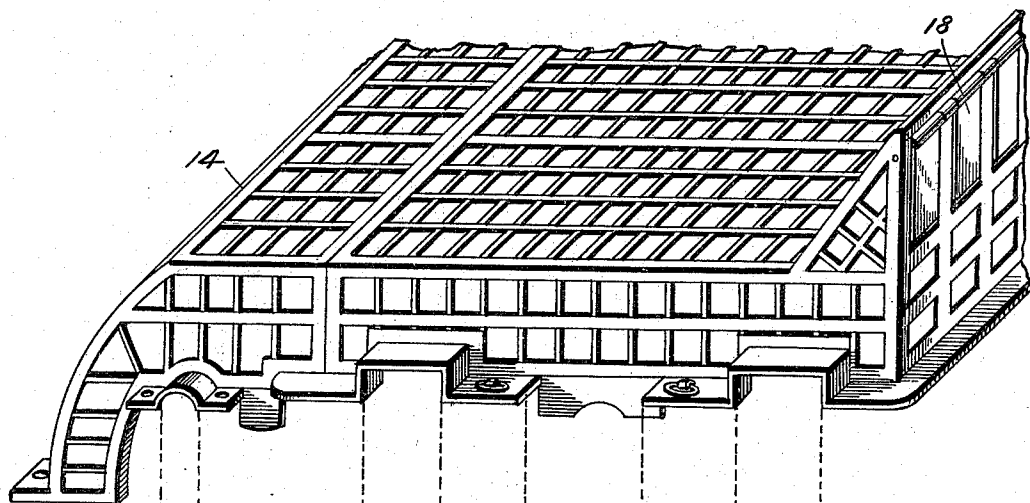
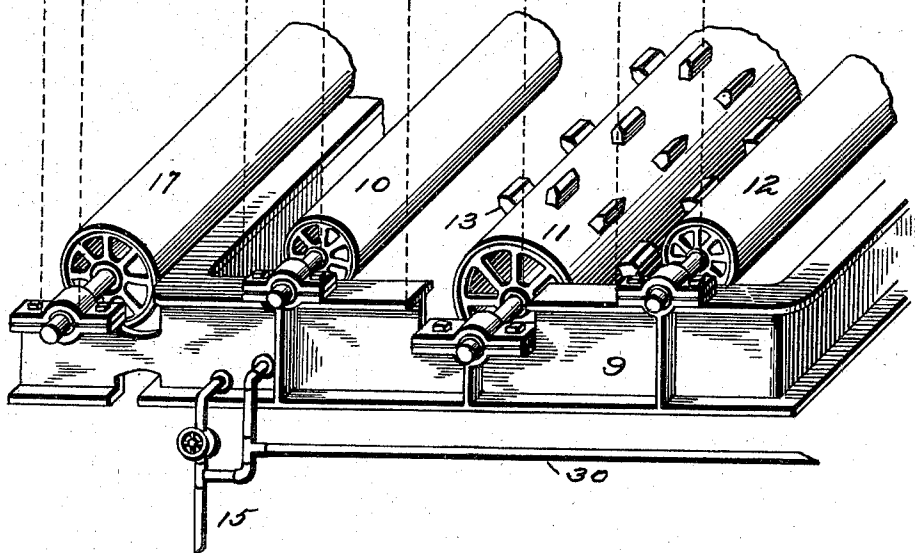


Fig. 7.



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UNITED STATES PATENT OFFICE.

RUDOLF ALTSCHUL, OF NEW YORK, N. Y.

HYDROCARBON-FURNACE.

SPECIFICATION forming part of Letters Patent No. 537,796, dated April 16, 1895.

Application filed December 17, 1894. Serial No. 532,078. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF ALTSCHUL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Hydrocarbon-Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a feeding device for hydrocarbon furnaces for steam boilers; and my object is to provide an apparatus for feeding petroleum or other hydrocarbon in a more safe and economical manner than has heretofore been accomplished.

To this end my invention consists of an automatic device wherein a series of bodies of non-combustible absorbent or porous material are charged with petroleum or other hydrocarbon, then carried by means of an endless conveyer through the boiler furnace, wherein the hydrocarbon is burned, after which they are returned through a cooling conduit to the charging tank where they are recharged with petroleum and again carried into the furnace to be re-burned.

In the accompanying drawings: Figure 1, represents a sectional elevation of my complete apparatus as applied to a marine boiler. Figs. 2 and 3, end and top views respectively of a boiler illustrating the mechanism for keeping the furnace chamber closed during the passage of the conveyers through it, and for preventing the flames from following the chains and escaping from the fire-box; Fig. 4, a perspective view of the end of a sprocket cylinder over which the chains pass; Fig. 5, an enlarged view of the doors or aprons at the ends of the boilers; Fig. 6, an enlarged perspective view of the oil-tank cover, and Fig. 7, an enlarged perspective view of the major portion of the oil-tank to better show the details of its construction, and the construction of the tank rollers.

In the present instance I have illustrated my invention as applied to a marine boiler,

although it is obviously applicable to nearly all other kinds of boilers.

The reference numeral 1 denotes the boiler which is mounted in a suitable setting 2, and provided with a fire-box 3, extending the entire length of the boiler, and having an opening at the front and rear.

The petroleum is fed to the boiler by means of a suitable number of endless chains 4, which pass through the fire-box of the boiler, and carry a series of non-combustible blocks 5. In the present instance these blocks consist of perforated boxes 6 of metal filled with asbestos or other non-combustible absorbent material. These boxes are interposed between the links 7, and constitute a part of the endless chains, being removably attached to the sides of the links by means of hooks 8 suitably fastened to the sides of the blocks.

The blocks are immersed in a tank 9 containing petroleum, or any suitable hydrocarbon, before they enter the fire-box of the furnace. This immersion or charging tank is provided with three rollers, 10, 11 and 12; and the chain, and hence the blocks, are made to dip down into the tank by first passing over the top of the first roller 10, thence down under the middle roller 11, and finally up over the third roller 12 and on to the boiler. The middle roller is larger than the others and is provided with sprockets 13 by which it is made to revolve by the movement of the chain.

The tank is inclosed by a removable glass cover 14 which serves to shield the oil from becoming accidentally ignited by sparks of fire, and at the same time permits the interior of the tank to be always visible. A drain pipe 15 at the side of the tank connects with a larger valved drain pipe 16 below the level of the bottom of the tank, and by means of which the oil can be quickly drawn off when desired. An additional roller 17 is located beneath the glass cover at the point where the chain turns to pass on to the charging tank. Hinged doors 18 are provided at the end of the cover where the chains pass through it in order to aid in keeping the cover closed as much as possible against the ingress of fire.

To prevent any possibility of the heat from the furnace igniting the oil in the tank, I interpose a fender or barrier 19 between the

front of the furnace and the oil tank. This barrier consists of a number of drums 20, 21, 22, and 23 composed of fire-proof material, and placed one above the other with their periph-
 5 eries in rolling contact in order to leave no opening between them. These rollers are made to travel in unison through the medium of sprockets 24 and sockets 25. The chains of saturated blocks are allowed to pass freely,
 10 yet tightly between the rollers 21, and 22, by permitting the journals 26 of the upper roller 21, and hence the roller itself, to yield and rise in the bearings 27, against the downward pressure of a spring 28. A basin 29 is placed
 15 below the barrier rollers to catch the drippings, and these drippings are carried off to the drain pipe by a pipe 30. Upon leaving the barrier the chains pass into the fire-box of the furnace over a roller 31 at the front of
 20 the box, and over rollers 32 within the latter, and then pass out at the back end over a roller 33, and a larger sprocket roller 34. This latter roller is connected by a pulley 35 and belt 36 to any suitable source of power. At the front
 25 and rear of the fire-box, where the blocks enter and depart, respectively, I provide damper-boxes 37 and 38, both of which are constructed alike so that a description of one will be suffi-
 30 cient for both. The box projects beyond the end of the furnace and entirely incloses the opening to the fire-box. It is kept closed, as far as practicable, from the admission of air from the outside, and of heat from the furnace
 35 chamber, by hinged doors 39, the lower ends of which bear by gravity upon the tops of the blocks as they pass through entrances 40. The blocks are kept enveloped in steam as they pass through these damper-boxes, by means
 40 of a valved steam pipe 41 connected with the boiler above, and provided with a perforated circular steam jet 42 within the box. By this means an additional safe-guard is provided against the spread of the flames from the fur-
 45 nace, the smoke is forced to pass out the chimney, and the bricks are dampened to extinguish any sparks before passing out.

The cooling of the blocks after they have become entirely exhausted of their contents within the furnace, is effected by passing them
 50 down and through a tunnel, or conduit, located below the furnace. This conduit is given a sufficient length to permit the blocks to become thoroughly cooled, after which they are returned to the immersing tank.

55 Rollers 43 are provided at the bends 44 at the ends of the conduit, to overcome friction.

It will be observed that various other forms of absorbent blocks or bodies might be employed successfully in carrying out my method,
 60 such, for instance, as compressed carbon, compressed asbestos, bricks, or any other oil absorbing or pregnable material or contrivance. The fender composed of rollers interposed between the front of the furnace and the oil-tank
 65 is only intended to be used in extraordinary cases where the oil is of inferior quality and low flashing point.

My invention is susceptible of infinite variation without departing from the spirit and scope of the essential features.

The preferred construction of the mechanism for carrying my invention into practice having been set forth, I will now proceed to describe its operation.

After the absorbent blocks have first been
 75 immersed in the oil in the tank a sufficient length of time to become thoroughly saturated, the chain is set in motion and they are carried out of the tank, through the barrier, the dampening box, and on into the fire-box.
 80 Here they are ignited and the chain stopped to allow the oil to burn out of the blocks, after which the chain is again set in motion, and the exhausted blocks passed out at the rear. While this operation is in progress the steam
 85 jets are playing on the blocks within the dampening boxes at the front and rear, and an additional quantity of blocks are soaking in the oil tank preparatory to entering the fire-box. The chain is now advanced a step farther to
 90 introduce a new supply of blocks of oil into the furnace, and at the same time pass an equal number of exhausted blocks out at the rear. This slow, intermittent action of the
 95 endless chain is kept up, the exhausted blocks passing out at the rear end of the furnace, while fresh ones enter and are burned.

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

1. The combination with the fire-box of a hydrocarbon furnace, of a chain of non-com-
 100 bustible porous or absorbent bodies arranged to pass into the fire-box, an oil supply tank, and mechanism for passing the bodies to and
 105 from the fire-box and tank.

2. In a hydrocarbon furnace, the combination with the fire-box, of an endless conveyer or chain provided with absorbent non-com-
 110 bustible material arranged and adapted to pass through the fire-box, an immersion tank, and mechanism for moving the chain through the box and tank.

3. In a hydrocarbon furnace, the combination of an endless conveyer or chain provided
 115 with blocks of non-combustible absorbent material, an immersion tank through which the blocks pass, a cooling conduit, and mechanism for moving the chain through the fire-box.

4. In a hydrocarbon furnace, the combina-
 120 tion with the fire-box, of an endless conveyer or chain provided with non-combustible absorbent blocks or bodies arranged to pass through the box, an oil tank through which the chain and bodies pass, said box being pro-
 125 vided with a transparent cover.

5. The combination with the fire-box of a hydrocarbon furnace, of an endless chain carrying bodies of non-combustible absorbent
 130 material, dampening boxes surrounding the chain and inclosing the ingress and egress openings of the fire-box, and an immersion tank.

6. In combination with the fire-box of a

hydrocarbon furnace, a chain of porous blocks adapted to be filled with hydrocarbon, and passed through the fire-box, and a dampening or steaming box inclosing the entrance of the fire-box, and through which the chain passes.

7. The combination with the fire-box of a hydrocarbon furnace, of a chain of porous blocks, an oil-tank through which the blocks pass, and a fender interposed between the furnace and tank.

8. The combination with a fire-box of an endless chain of non-combustible porous blocks passing through the box, an oil-tank through which the chain passes, a transparent cover over the tank, and a fender composed of rollers, one of which yields to the blocks as they pass between them.

9. The combination with the fire-box of a hydrocarbon furnace, an endless chain of porous

non-combustible blocks arranged and adapted to pass through the box, and doors having their free ends in engagement with the chain of blocks as they pass through the entrance and exit of the fire-box, and an immersion tank through which the chain passes before it enters the fire-box.

10. In combination with the fire-box of a hydrocarbon furnace, and a chain of non-combustible porous blocks passing through the box, of an immersion tank, and devices for draining the tank.

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

RUDOLF ALTSCHUL.

Witnesses:

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GEO. R. HAMLIN.