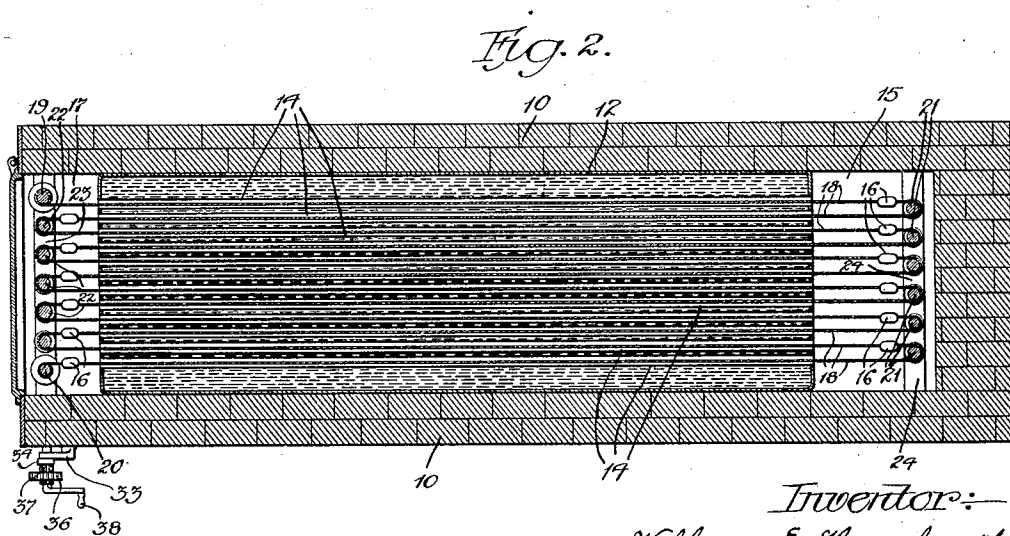
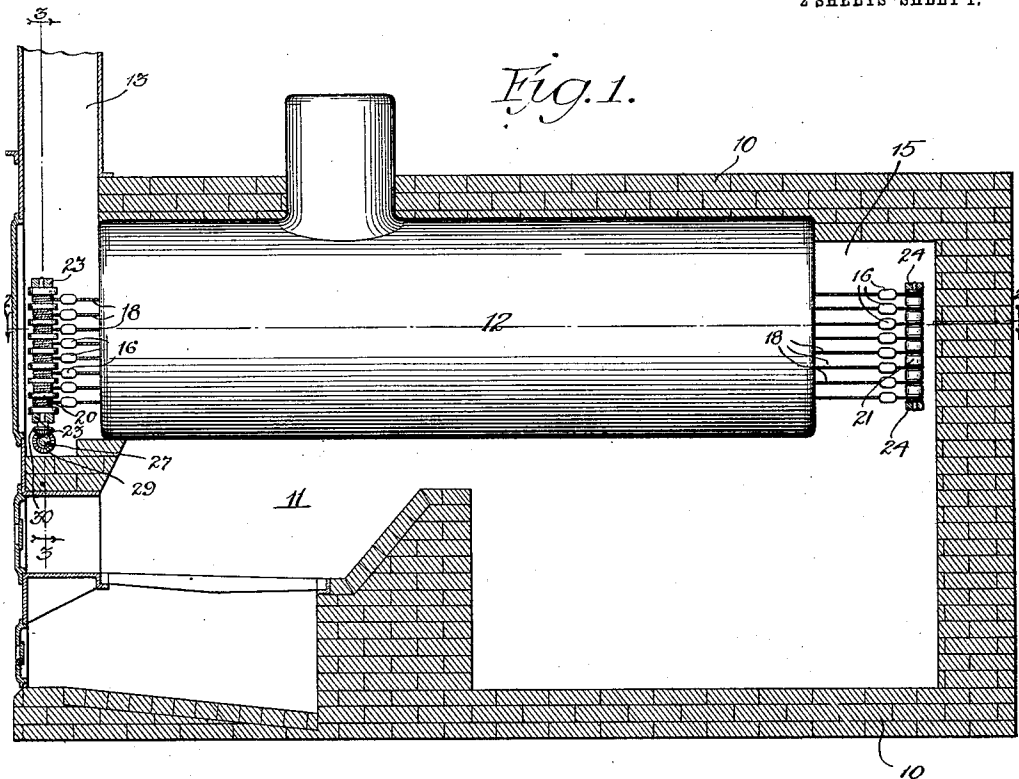


W. E. BERNHARDT.  
FLUE CLEANER.  
APPLICATION FILED MAY 31, 1911.

1,007,423.

Patented Oct. 31, 1911.

2 SHEETS-SHEET 1.



Witnesses:-  
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his Atty.

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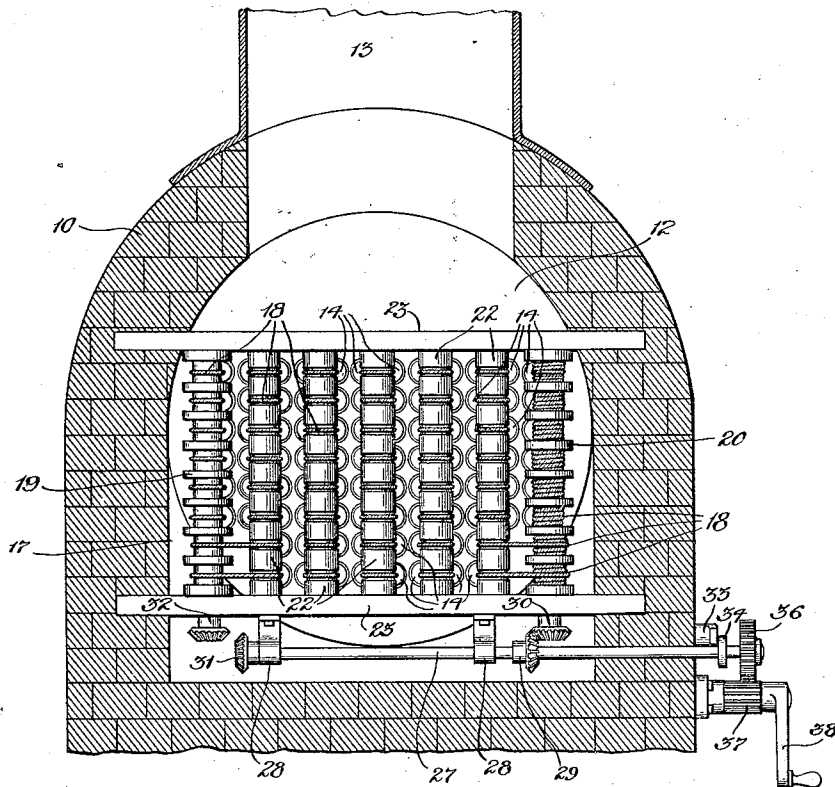


Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## FLUE-CLEANER.

1,007,423.

Specification of Letters Patent.

Patented Oct. 31, 1911.

Application filed May 31, 1911. Serial No. 630,535.

*To all whom it may concern:*

Be it known that I, WILLIAM E. BERNHARDT, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Flue-Cleaners, of which the following is a full, clear, and exact description.

The invention relates to flue-cleaners for steam boilers.

The invention designs to provide an improved flue-cleaner for boilers, which may be operated without interrupting the operation of the boiler, and whereby a number of the flues may be quickly and simultaneously cleaned.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings Figure 1 is a vertical section of a steam-boiler furnace embodying the invention. Fig. 2 is a horizontal section taken on line 2—2 of Fig. 1. Fig. 3 is a transverse section taken on line 3—3 of Fig. 1.

10 denotes the inclosing walls, 11 the fire-box, 12 the water-boiler, and 13 the chimney-flue, of a steam-boiler furnace of the usual construction, as well understood in the art. The boiler 12 has smoke-flues 14 extending longitudinally therethrough, from end to end thereof and a space 15 is formed between the back-wall of the boiler and the back wall of the furnace. The type of boiler shown exemplifies those generally known as "return-flue" boilers.

The invention designs to provide a series of cleaners which are mounted in the furnace in such manner that will not interfere with the operation of the boiler and may be operated at will, to clean the flues. For this purpose, a series of cleaners 16, corresponding in number of the number of flues in the heater, are secured to cables 18, which are formed of steel wire, or other suitable material which will not be affected by the heat in the flues, and which extend back and forth through the flues respectively and by operation of these cables the cleaners will be drawn through and will clean the flues. Normally, the cleaners are disposed at the front and back of the flues respectively so they will not interfere with the passage of the products of combustion through the flues, some of them being normally disposed in the space 15 adjacent

the back of the boiler, and the others in the space 17 between the front wall of the boiler and the front wall of the furnace. Each cable 18 has one of its ends fixed to a drum 19, extends thence back and forth successively through the flues of a horizontal series, being guided by, and extending around, rollers 21 at the back and rollers 22 at the front, and having its opposite end fixed to a drum 20. Drums 19 and 20 and rollers 22 are suitably journaled in transverse bars 23, which are fixed in the side-walls of the furnace, and rollers 21 are journaled in bars 24 which are also secured in the side-walls of the furnace. In this manner each cable 18 extends back and forth through a horizontal series of flues and is provided with a corresponding series of cleaners 16, that is one for each of said flues, which, as the drums 19 and 20 are rotated, will cause the cleaners to be drawn back and forth through the flues. A cable 18 with cleaners 16 thereon is provided for each of the horizontal series of flues and each cable has its ends secured to the drums 19 and 20 respectively, so that all of the cables will be simultaneously operated to draw all the cleaners back and forth through all of the flues, respectively.

Mechanism for operating the drums 19 and 20, to operate the cables with the cleaners thereon, consists of a shaft 27 which is slidably and rotatably mounted in bearings 28 which are secured to one of the cross-beams 23. Shaft 27 is provided with a beveled gear-wheel 29 adapted to mesh with a gear-wheel 30 on the shaft of drum 20, and another gear-wheel 31 is adapted to mesh with a gear 32 on the shaft of drum 19. A dog 33 is pivoted to the outside of the furnace wall and is adapted to be lifted and lowered into position to serve as an abutment for a collar 34 whereby the shaft will be held in position to either cause gear 29 to mesh with gear 30 or gear 31 to mesh with gear 32. By lifting dog 33 and pushing shaft 27 inwardly from the position shown in Fig. 3, gear 29 will be disengaged from gear 30, and gear 31 will be shifted into engagement with gear 32. A gear wheel 36 is secured to the outer end of shaft 27 and meshes with a pinion 37, to which is connected a crank 38, by which said gears may be operated to rotate shaft 27. Resultantly, when drum 20 has been operated to wind up the cables 18 to draw the clean-

ers through the flues in one direction, shaft 27 may be shifted to operate drum 19 in the opposite direction and cause the cables to be drawn in the opposite direction and wound upon the drum 19. The outer end of shaft 27 extends to the outside of the side-wall of the furnace, so that the drum and cables and cleaners can be operated from the outside of the furnace and while the furnace is in operation.

All of the cleaners are normally disposed in the furnace, at the front and back of the heater, and will at all times be in readiness for operation. Assuming the cleaners to be in position shown in Fig. 3, into which position they have been shifted by the operation of drum 20, the operator will lift up dog 33, push shaft 27 inwardly and lower the dog to the outer side of collar 34, so that the shaft will be held into position to cause gears 31 and 32 to remain in engagement or operative relation. Crank 38 will then be turned, which will cause drum 19 to wind up cables 18 and draw cleaners 16 at the back, forwardly through the flues and the cleaners 16 at the front, backwardly through the flues. When the position of the cleaners is reversed, shaft 27 will be moved outwardly to bring gears 29 and 30 into operative relation. Operation of crank 38 will then operate drum 20 to draw cables in reverse direction. This operation may be repeated as frequently as desired until the flues have been thoroughly cleaned.

The invention thus provides flue cleaners which are normally disposed in the furnace in readiness for operation from the outside and which may be quickly operated to simultaneously clean all of the flues without materially interrupting or interfering with the operation of the boiler.

The invention is not to be understood as

restricted to the details set forth since these can be modified within the scope of the appended claims without departing from the scope and spirit of the invention.

I claim—

1. The combination with a furnace, and a boiler provided with flues, of a series of cleaners sustained to be drawn longitudinally of said flues, flexible elements to which said cleaners are secured each extending back and forth and longitudinally of a series of flues, and mechanism for operating said elements to move said cleaners longitudinally of said flues.

2. The combination with a furnace, and a heater therein provided with flues, of cables extending back and forth and longitudinally of said flues, cleaners on said cables, guide rollers adjacent the opposite ends of the heater, drums to which the ends of said cables are connected, and mechanism for alternately operating said drums to wind the cables in opposite directions.

3. The combination with a furnace, and a water heater provided with flues, of cables extending back and forth through said flues, cleaners on the cables, guide-rollers for said cables disposed at opposite ends of said heater, drums to which the ends of said cables are connected, and gear mechanism for alternately operating said drums to wind the cables in opposite directions consisting of a shaft extending to the outside of the furnace and longitudinally shiftable to alternately gear with said drums, means for locking said shaft in either adjusted position, and means for rotating said shaft.

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