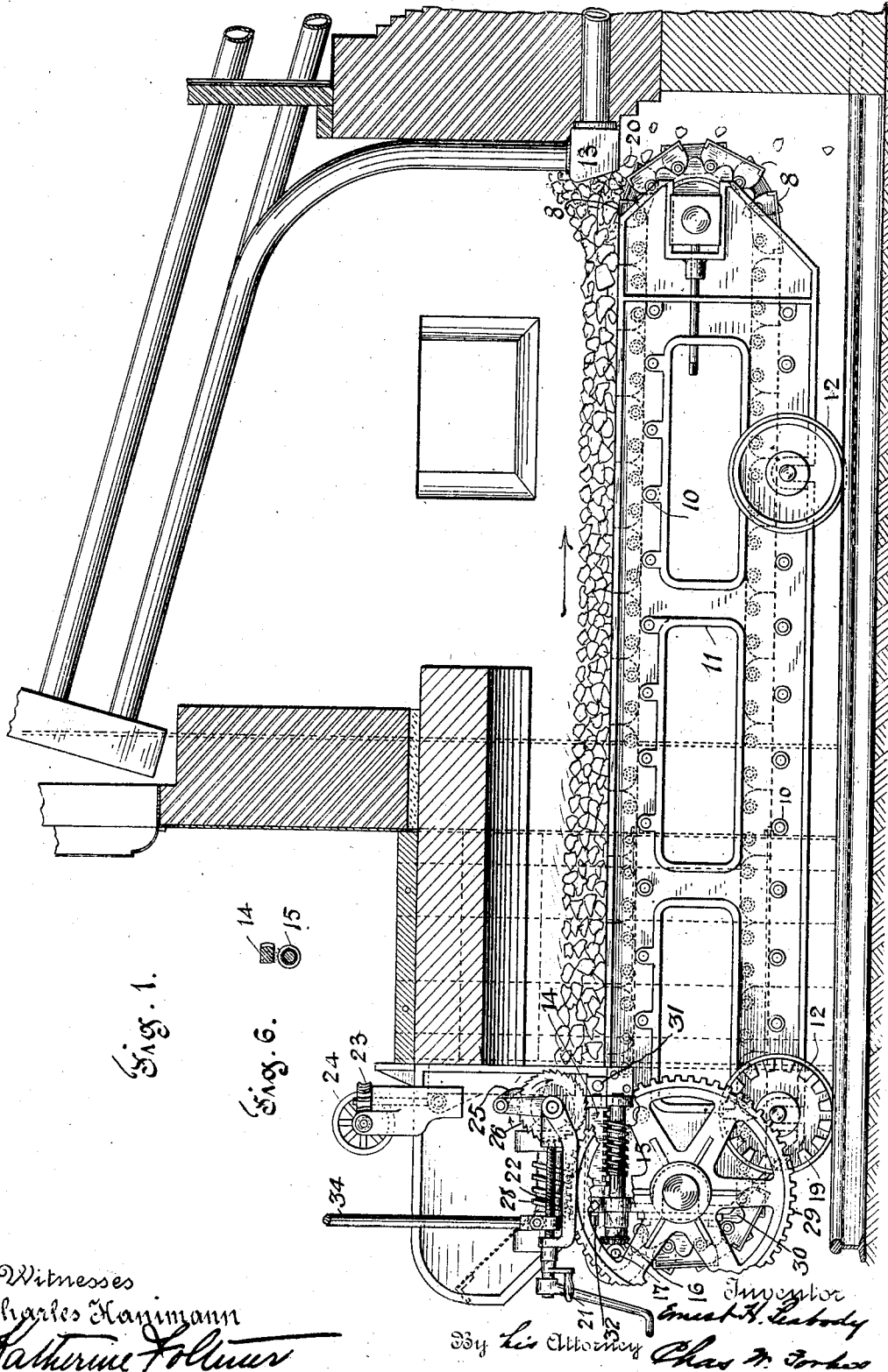


E. H. PEABODY.
MECHANICAL STOKER.
APPLICATION FILED APR. 6, 1906.

1,033,192.

Patented July 23, 1912.

3 SHEETS-SHEET 1.



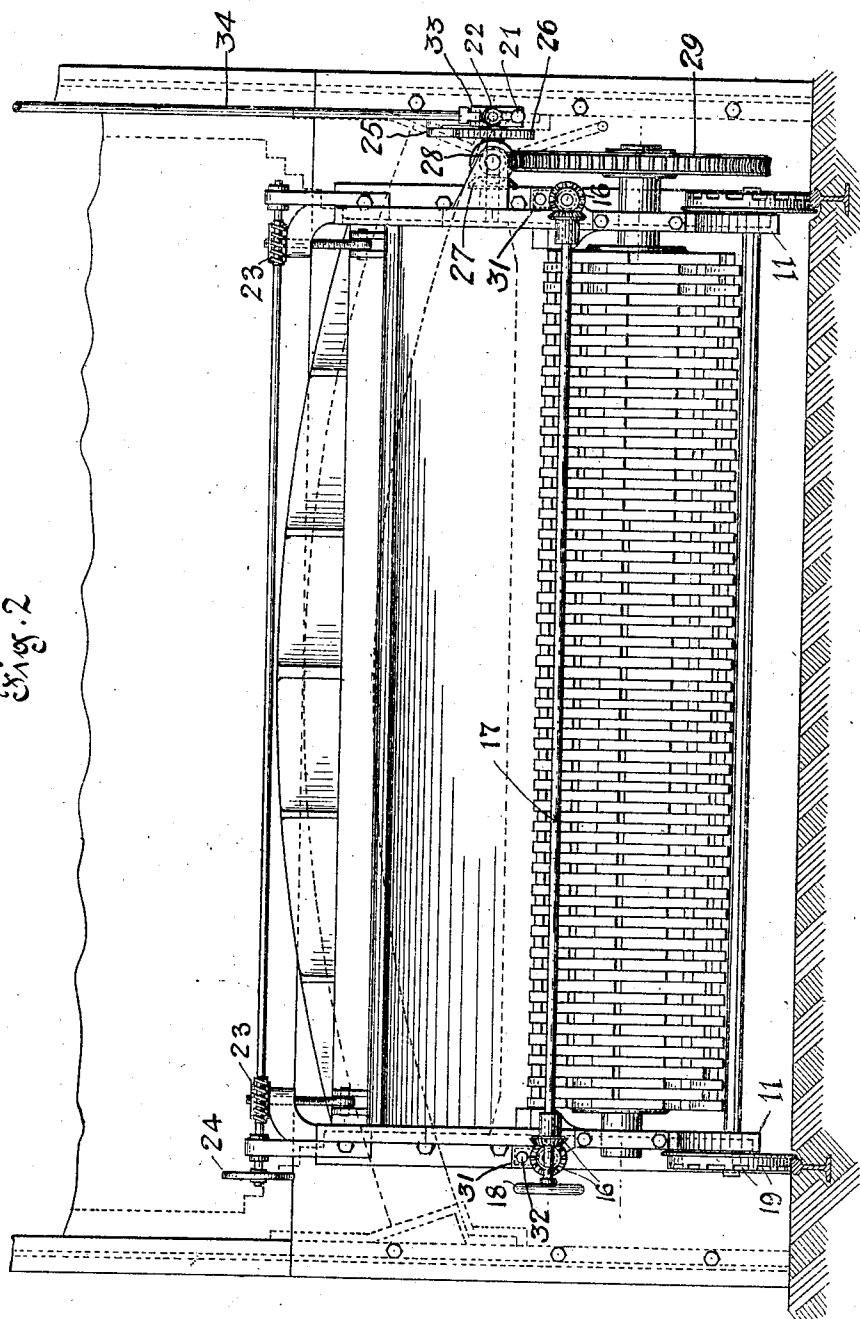
1,033,192.

E. H. PEABODY.
MECHANICAL STOKER.
APPLICATION FILED APR. 6, 1908.

Patented July 23, 1912.

3 SHEETS—SHEET 2.

Fig. 2



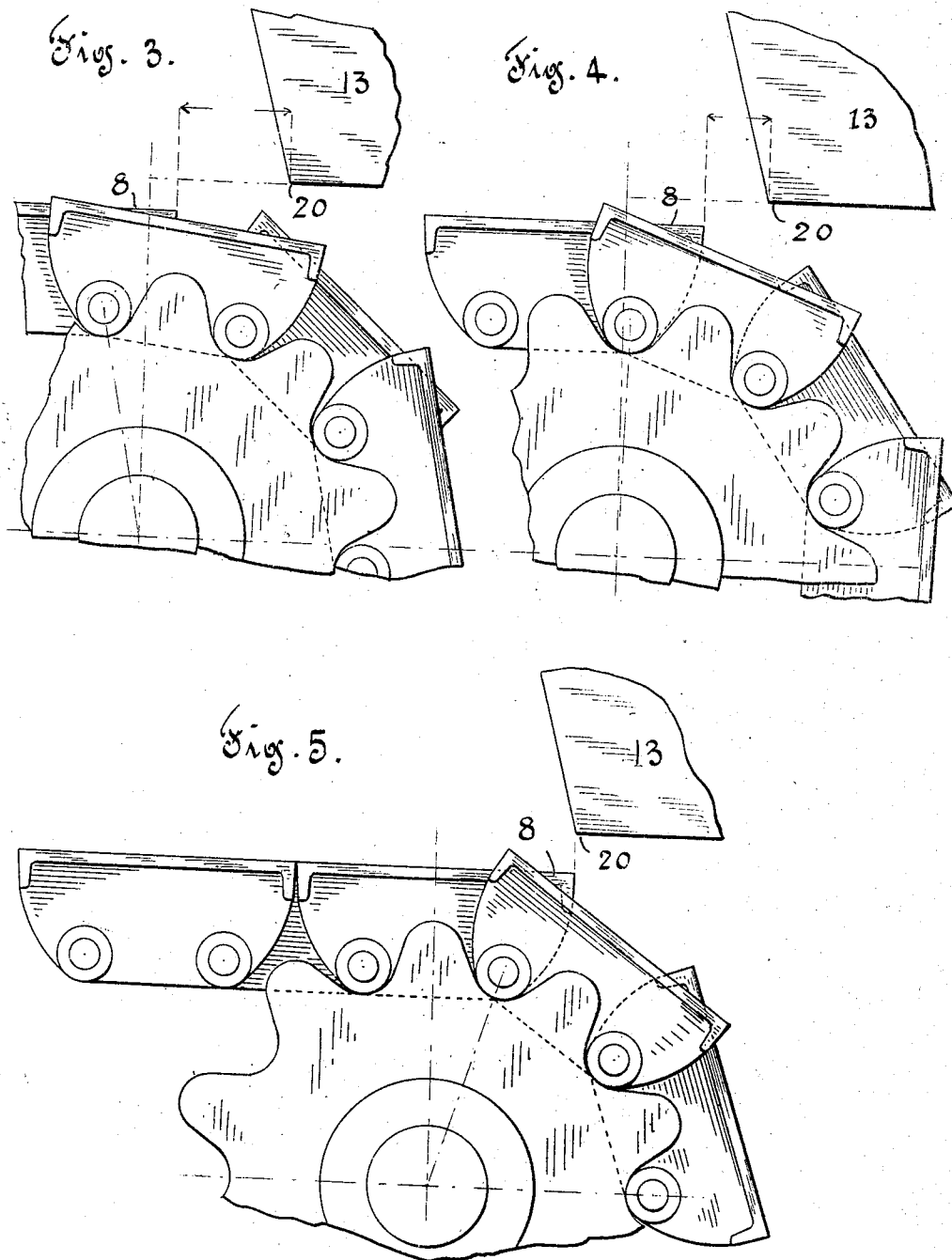
Witnesses
Charles Haymann
Katherine Foltner

Ernest H. Peabody Inventor
By His Attorney Ross H. Carter

1,033,192

E. H. PEABODY.
MECHANICAL STOKER.
APPLICATION FILED APR. 6, 1906.

Patented July 23, 1912.
3 SHEETS—SHEET 3.



Witnesses
Charles Kammann
Katherine Folmer

Ernest H. Peabody
Inventor

By his Attorney
H. M. Foster

UNITED STATES PATENT OFFICE.

ERNEST H. PEABODY, OF NEW YORK, N. Y., ASSIGNOR TO THE BABCOCK & WILCOX COMPANY, OF BAYONNE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MECHANICAL STOKER.

1,033,192.

Specification of Letters Patent.

Patented July 23, 1912.

Application filed April 6, 1906. Serial No. 310,276.

To all whom it may concern:

Be it known that I, ERNEST H. PEABODY, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Mechanical Stokers, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to mechanical stokers and it consists of certain novel parts and combinations of parts severally specifically pointed out in the claims concluding this specification.

The following is a description of a structure involving the several features of my invention in the forms which are at present preferred by me but it will be understood that various modifications and changes may be made in the mechanism without departing from the spirit of my invention and without exceeding the scope of my several claims.

In the accompanying drawings forming a part of this specification the invention is illustrated in association with a furnace of a water tube steam generator, in which—

Figure 1 shows a part of a boiler furnace in section and a side view of a chain grate stoker with a mechanism for operating and adjusting the same. Fig. 2 is a front elevation of the stoker. Figs. 3, 4 and 5 are partial and enlarged side views showing the varying position of the chain links and relative location of the links with the adjacent part of the boiler structure whereby the clinkers are crushed by the continually advancing links. Fig. 6 is a detail section showing the open position of the device used for locking the stoker in adjusted position in the furnace.

Referring to the drawings in which the corresponding parts in the figures are indicated by the same numerals, the stoker comprises a chain grate composed of pivoted grate links 8 mounted on sprocket wheels, and rollers 10 connected with a frame 11 and which is supported by four truck

wheels 12 running on rails to facilitate the withdrawal from or the insertion of the stoker in the furnace. This stoker when inserted in the furnace is held and locked therein and rendered adjustable so as to vary the size of the opening at the discharge end of the stoker between the traveling grate links 8 and an adjacent part of the boiler, as the water box 13. The adjusting mechanism comprises the racks 14—14, secured to the hopper attached to the furnace front and which engage with the worms or screw-threads 15—15, located at the forward or outer end of the stoker and arranged in sets on each side of the stoker, and which are connected together by pairs of bevel gears 16—16 and a front shaft 17 which is provided with a hand-wheel 18 for the simultaneous and equal adjustment of both sides of the grate as shown in Fig. 2. The worms 15—15 are right and left threaded respectively, and not only adjust the frame 11 and chain grate 7 in or out, thereby decreasing or increasing the size of the opening at the discharge end of the stoker as desired for variable qualities of coal, but also hold it stationary after adjustment against the tendency of the crushing action to move it.

To facilitate the withdrawal of the stoker the frame 11 can be quickly unlocked from its adjusted position by turning up the racks 14—14 out of engagement with the worms 15—15, as shown in the detail section, Fig. 6, in which position the stoker is free to be moved in or out. The racks 14 are supported in brackets on the side of the hopper and are capable of being turned out of engagement with the worms 15 by a wrench applied to the heads 32 at the forward ends of the racks. The front wheels of the truck or frame 11 are provided with slots or grooves 19 for the insertion of turning bars.

In Fig. 1 the top line of the grate link 8 is in line with the edge 20 of the boiler water box 13, and is adapted for coal from which small clinkers are formed, while in Figs. 3, 4 and 5 (shown enlarged) the top

line of the link is shown located below the clinker breaking edge 20 of the water box, and which is better suited in the use of large clinker forming coal. In both cases the clinker-breaking edge is located rearwardly of the flat surface of the grate. When clinkers are located between the advancing edge of the grate link 8 (Fig. 3) and the edge 20 of the water-box, they are crushed or broken by the reduction of the distance between these parts in the advancing movement of the grate links and undergo a repeated crushing by the action of the links and resisting surface of the water-box.

15 The amount of fuel fed to the grate depends upon the speed of the grate and upon the adjustment of the opening of the discharge door of the hopper which admits more or less fuel to the grate.

20 With the mechanism shown, the travel of the grate is effected by the following means. A screw 22 is supported in a frame 33 pivoted on the shaft of a ratchet wheel 26, said frame carrying a pawl 25 engaging the teeth of said wheel. On the shaft of wheel 26 is a beveled gear 27 meshing with a similar gear on the shaft of a worm 28. The latter meshes with a large worm wheel 29 to the shaft of which is secured a sprocket wheel 30 which engages with the links of the chain grate. The screw 22 passes through a threaded head pivoted to the end of a rod 34 to which a reciprocating motion is imparted by any suitable mechanism.

35 Owing to such reciprocating movement the frame 33 will effect an intermittent rotation of ratchet wheel 26 by means of pawl 25 and, through the train of mechanism described, a movement of the chain grate.

40 When it is desired to vary the rate of travel of the grate it may be done by turning the crank 21 to thereby adjust the threaded head of the rod 34 along the screw 22.

The adjustment of the door regulating the feed opening from the hopper is effected by means of the worm gears 23 and hand-wheel 24.

In mechanical stokers of the general type hereinbefore described the opening at the discharge end of the stoker through which the fuel refuse passes to the ashpit is at the present time made large enough to keep the rear end of the grate substantially clear of refuse. To do this it has to be made large enough to take care of the largest clinker that will be formed and it is, therefore, very wasteful of combustible material, for a considerable quantity of combustible matter is lost with the refuse and also an excess of air is allowed to flow through the bed of fuel at the rear. By restricting the size of the discharge opening, as hereinbefore described, the fuel is banked up at the discharge end, thereby arresting fuel which

has not been entirely consumed and affording time for complete combustion before it is discharged. The cake of clinker is forced down upon the grate links by the weight of fuel above it and is broken up by the advancing movement of the grate links before it enters the discharge opening and is thereby reduced to a size which will readily pass therethrough.

Different grades of coal form clinkers of different size and quantity and it is therefore desirable, in order to effect the advantageous results above set forth, to provide means for varying the size of the discharge opening, which means are afforded by the mechanism above described.

What I claim and desire to secure by Letters Patent is:—

1. In a furnace in which the fuel is caused to travel within the combustion chamber, a grate, an abutment at the rear of and in proximity to said grate to provide a restricted outlet for the ash and fuel refuse, and means for moving said grate and abutment relatively to each other to produce a crushing action on the clinkers previous to passing through said outlet.

2. In a mechanical stoker, the combination of a traveling grate of the link type, an abutment located rearwardly of and in close proximity to the flat surface of the grate, whereby when the links reach the rear end of the grate the fuel-bearing surface thereof will be swung in the direction of the abutment thereby producing a crushing action on the clinkers, and means for supplying fuel to the grate.

3. In a mechanical stoker, the combination of a traveling grate of the link type, an abutment located rearwardly of and in close proximity to the flat surface of the grate and in substantially the same plane thereof, whereby when the links reach the rear end of the grate the fuel-bearing surface thereof will be swung in the direction of the abutment thereby producing a crushing action on the clinkers, and means for supplying fuel to the grate.

4. The combination with a furnace structure, of a traveling grate so located with respect to a part or element of the furnace as to provide a restricted outlet for the ash or fuel refuse, the grate bearing such a relation to said part or element as to crush the clinkers passing through the outlet, and means for adjusting said grate with respect to said part or element.

5. In a mechanical stoker, the combination of a traveling grate, an abutment located rearwardly of the flat surface of the grate whereby a discharge opening is formed between the grate and abutment, the grate bearing such relation to said abutment as to crush the clinkers passing through the

discharge opening, means for longitudinally adjusting said grate, and means for supplying fuel to the grate.

6. The combination with a furnace structure, of a traveling grate so located with respect to a part or element of the furnace as to provide a restricted outlet for the ash or fuel refuse, the grate bearing such a relation to said part or element as to cause a banking of the fuel at the discharge end

and to crush the clinkers passing through the outlet, and means for adjusting said grate with respect to said part or element.

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

ERNEST H. PEABODY.

Witnesses.

N. E. LEWIS.

JOHN A. W. DIXON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."