L. A. MAPEL.

AUTOMATIC MECHANICAL STOKER.

APPLICATION FILED AUG. 15, 1908.

945,469.

Patented Jan. 4, 1910.

2 SHEETS—SHEET 1.

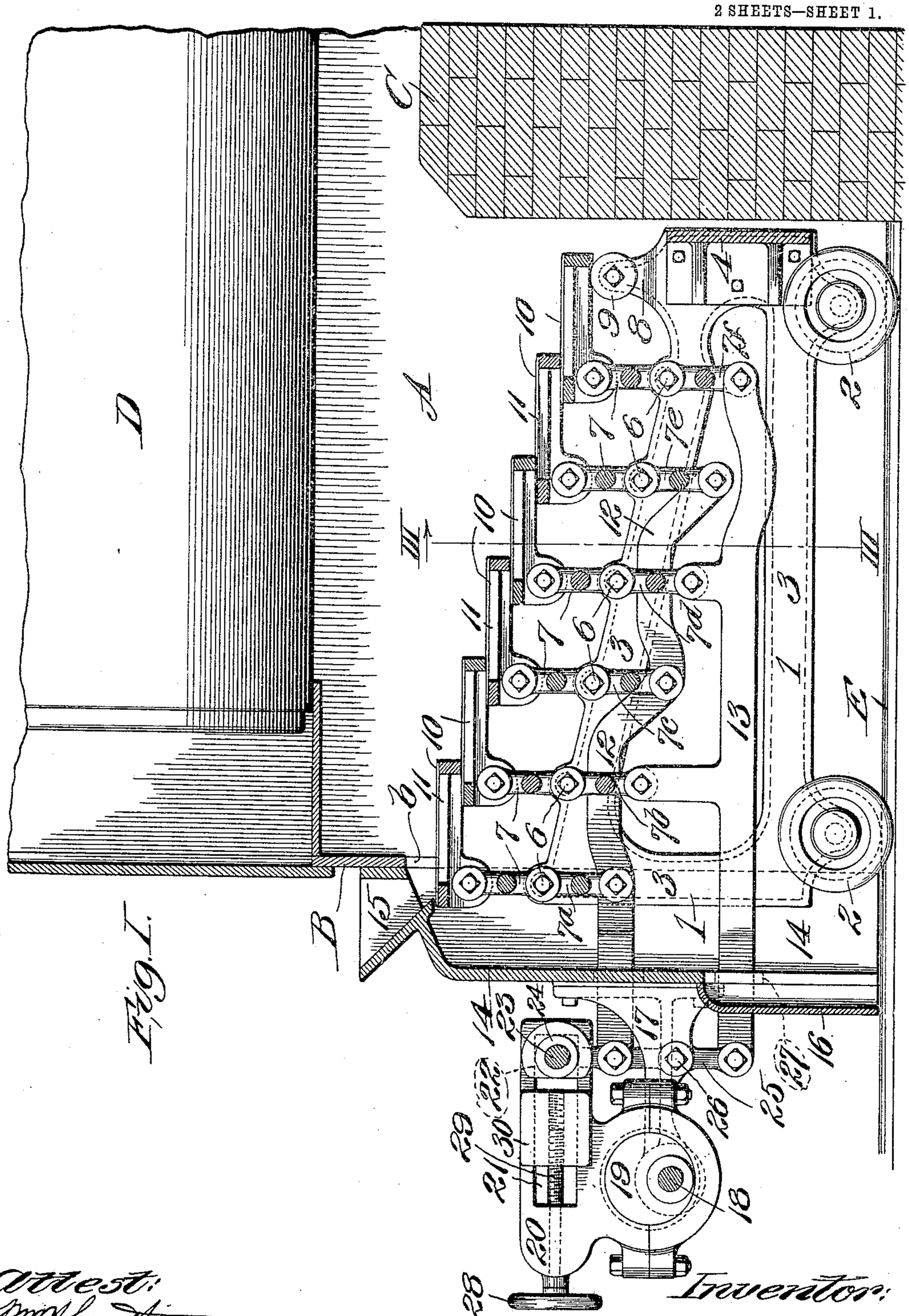

Fig. 1.

Witnesses:
Wm. H. Scott.
Lily Rost

Inventor:
Lewis A. Mapel,
by Geo. H. Knight Atty.

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2 SHEETS—SHEET 2.

Fig. II.

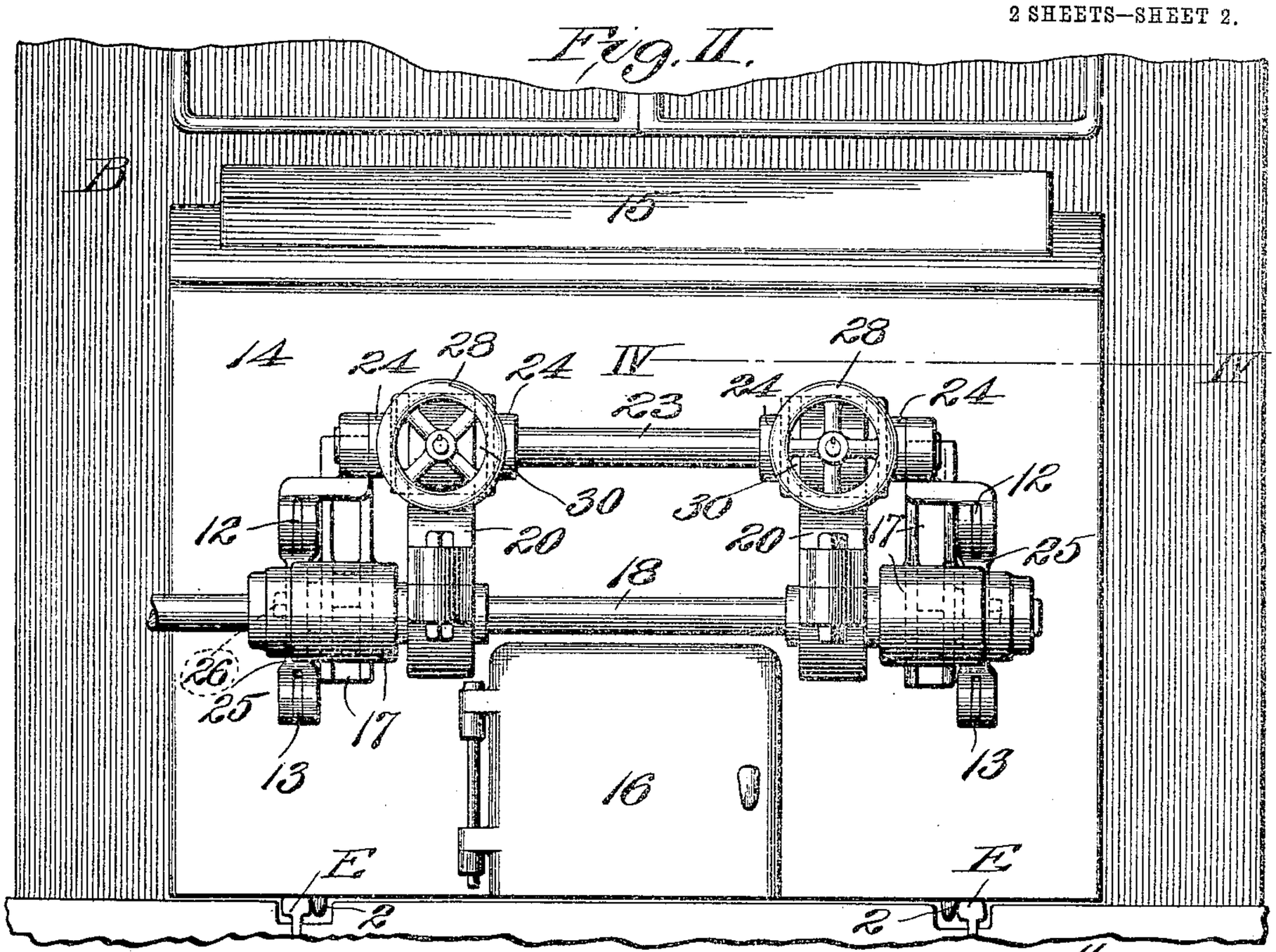
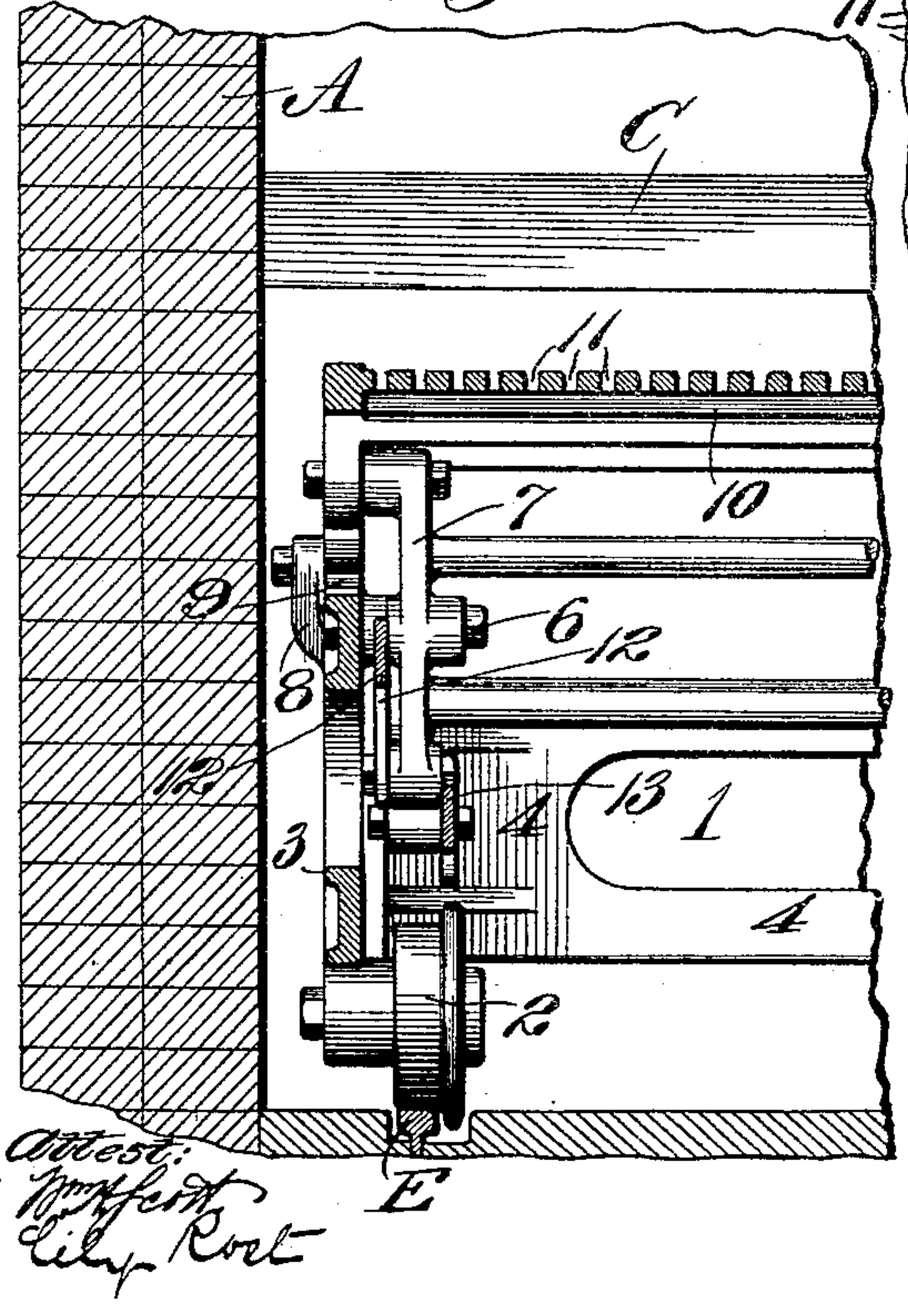



Fig. III.



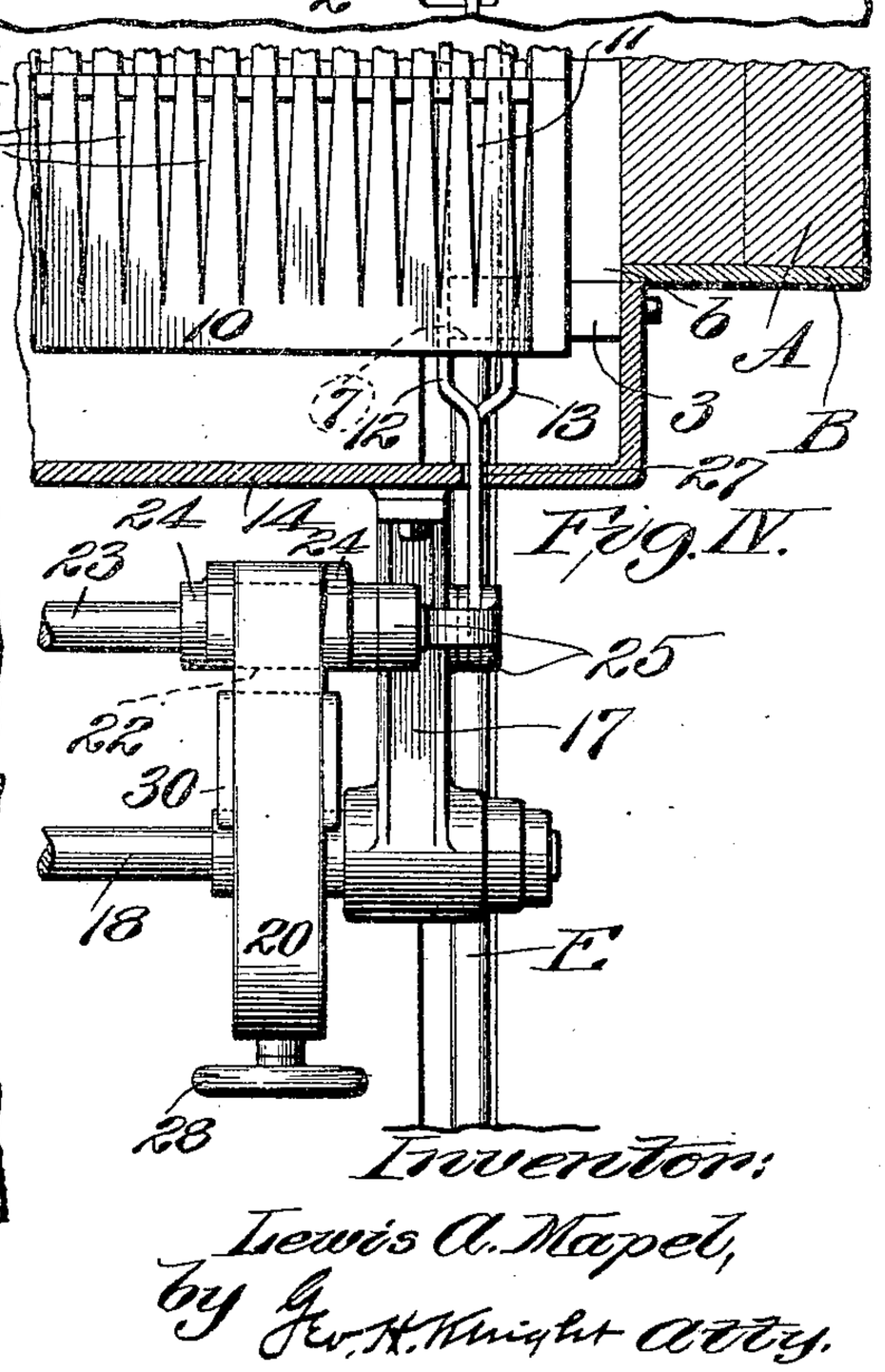




Fig. IV.




Witnesses:
Wm. Keith
Lily Root

Inventor:
Lewis A. Mapel,
by Geo. H. Knight Atty.

# UNITED STATES PATENT OFFICE.

LEWIS A. MAPEL, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-SIXTH TO WM. J. TUCHER, ONE-SIXTH TO PERRY W. FALLIS, ONE-SIXTH TO PATRICK M. QUIRKE, ONE-SIXTH TO W. CLARENCE WOOD, AND ONE-SIXTH TO CHAS. H. JONES, ALL OF ST. LOUIS, MISSOURI.

## AUTOMATIC MECHANICAL STOKER.

945,469. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed August 15, 1908. Serial No. 448,720.

*To all whom it may concern:*

Be it known that I, LEWIS A. MAPEL, a citizen of the United States of America, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Automatic Mechanical Stokers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a new and useful improvement in automatic mechanical stokers, and has for its object to produce a furnace grate having movable grate-bars therein, alternately advanced and retracted or vice versa and lowered and raised, whereby the fuel may be fed within a fire chamber onto succeeding grate-bars, and to provide novel means for actuating said grate-bars.

Figure I is a vertical longitudinal section taken through my improved stoker together with a portion of the rear end of a furnace to which it is applied. Fig. II is a front elevation of the stoker. Fig. III is a transverse vertical section of one half of the stoker taken on line III—III, Fig. I. Fig. IV is a horizontal section of the rear end of one half of the furnace, the view being taken on line IV—IV, Fig. II, a portion of the device being shown in top plan.

A designates the side walls of the furnace, B the furnace front, C the bridge wall, and D the boiler. The furnace front B is provided with an opening *b*, and the ash-pit floor or bottom of the furnace rear of the bridge wall is provided with two parallel tracks E, which tracks extend a suitable distance beyond the furnace front.

1 designates a truck, as an entirety, which is provided with wheels 2 that rest upon the tracks E, and 3 are side frames mounted upon the journals of the wheels 2, said frames 3 being preferably tied together at their forward ends by a bar or plate 4. The side frames 3 are formed with inclined upper faces which are highest at their rear ends and slant downwardly toward the bridge wall. Along the upper edge of these inclined side frames are arranged a plurality of horizontally disposed perforations designed to receive bolts 6 which bolts are also pivots for a plurality of double-armed levers 7.

8 designates brackets carried by the side frames 3 and located near the inner ends of said side frames, and which have journaled thereto rollers 9.

10 designates the grate bars proper each of which is supported on and pivoted at its rear end to the upper arm of a corresponding lever 7. The innermost grate bar is so arranged that its free end rests upon the rollers 9 while each next adjacent grate bar rearwardly thereof is so arranged that its free end rests upon or overlaps the grate bar next forwardly thereof at a point near its pivot point. These grate bars are provided with slots 11 to provide for the passage of air therethrough as will be readily understood.

The lower ends of the double-armed levers 7 are pivoted to operating bars 12 and 13 in the following manner: The double-armed levers which I will designate as $7^a$, $7^c$, and $7^e$ are pivoted to the operating bar 12 while the alternately disposed bars $7^b$, $7^d$, and $7^f$ are pivoted to the operating bar 13.

14 designates an auxiliary furnace front which is designed, when the device is in proper position for use, to close the opening *b* formed in the main furnace front, said auxiliary furnace front 14 being bolted or otherwise secured to the side frames 3 of the truck 1. This front 14 is provided upon its upper end with a hopper 15 into which fuel is fed to the furnace, said front being also provided at its lower portion with an ash-pit door 16.

17 designates a pair of brackets secured to the front 14 and journaled in said brackets is a main driving shaft 18.

19 designates a pair of eccentrics secured to the shaft 18 and each of which is provided with a strap 20 provided with a portion having a slot 21. In each of the slots 21 is arranged a slidable box 22 in which is journaled a rock shaft 23, said boxes 22 being held against lateral movement by collars 24.

25 designates a pair of double-armed levers pivoted at 26 to the brackets 17, the upper ends of which levers are secured to the ends of the rock shaft 23 and at a point

on said upper arm intermediate the pivot point 26 and the said shaft 23 is pivoted one end of the operating bar 12, while to the lowermost arm of the lever 25 is pivotally connected one end of the operating bar 13.

28 designates hand wheels which have secured thereto feed screws 29 mounted in the eccentric straps 20 and so located as to project into the slots 21 and engage screw-threaded limitation blocks 30 also arranged within the said slots 21, whereby upon proper manipulation of the feed screws, these blocks will be so adjusted as to limit the amount of movement of the boxes 22, whereupon the full stroke of the eccentrics may, when desired, only operate the levers 25 to a desired degree.

The operating bars 12 and 13 each pass through suitable slots 27 formed in the auxiliary furnace front 14 and after passing through said slots into the furnace proper are offset or bent in opposite directions from each other in order that the said bars 13 will be arranged one on each side of the levers 7, and so engage their respective levers in such manner that one bar will not interfere with the movement of the other one.

In operation, the truck 1 and its carried parts having been passed through the opening *b* in the furnace front proper, and properly positioned beneath the boiler, a fire having been started, fuel is fed into the hopper 15 and is deposited upon the rearmost grate bar and when the main driving shaft is set in motion, the grate bars are moved alternately forwardly and rearwardly and lowered and raised, by the mechanism before described, and the fuel is gradually fed forwardly in such quantities as to produce approximately complete combustion.

I claim:—

1. The combination of a plurality of transversely arranged overlapping grate bars, a plurality of vertically disposed movable supports therefor, each of said supports being fulcrumed beneath said grate bars, the rear side of each grate bar being pivotally connected to the upper part of its respective support and the front side thereof resting on the next succeeding grate bar, and means for simultaneously rocking said supports.

2. The combination of a plurality of transversely arranged overlapping grate bars, a plurality of vertically disposed movable supports therefor, each of said supports being fulcrumed beneath said grate bars, the rear side of each grate bar being pivotally connected to the upper part of its respective support and the front side thereof resting on the next succeeding grate bar, and means for simultaneously rocking said supports, each alternate support being rocked in the opposite direction to the other supports.

LEWIS A. MAPEL

In the presence of—
H. G. Cook,
Wm. A. Scott.

Correction in Letters Patent No. 945,469.

It is hereby certified that the name of the first-mentioned assignee in Letters Patent No. 945,469, granted January 4, 1910, upon the application of Lewis A. Mapel, of St. Louis, Missouri, for an improvement in "Automatic Mechanical Stokers," was erroneously written and printed "Wm. J. Tucher," whereas the said name should have been written and printed *Wm. J. Tucker;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of February, A. D., 1910.

[SEAL.]

E. B. MOORE,

*Commissioner of Patents.*