

No. 662,767.

Patented Nov. 27, 1900.

P. L. CROWE.

MECHANISM FOR RAISING OR LOWERING GRATES.

(Application filed Mar. 12, 1900.)

(No Model.)

Fig. 1.

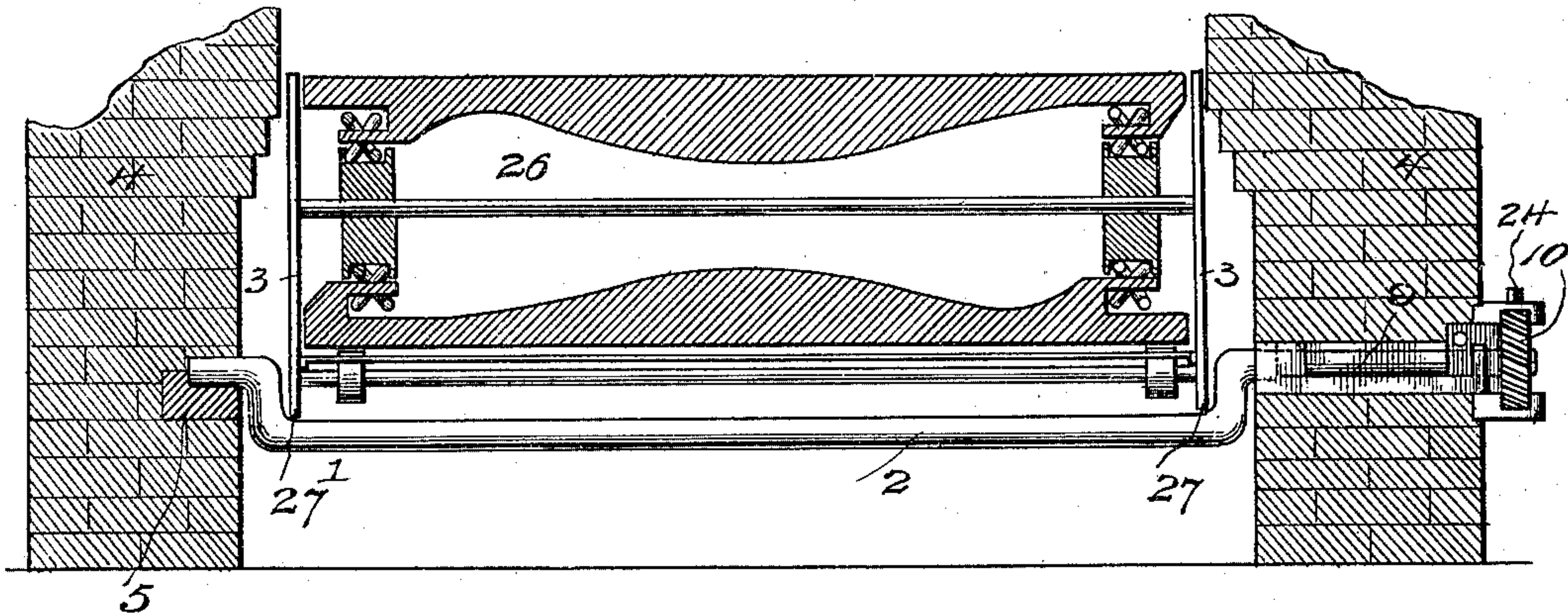


Fig. 5.

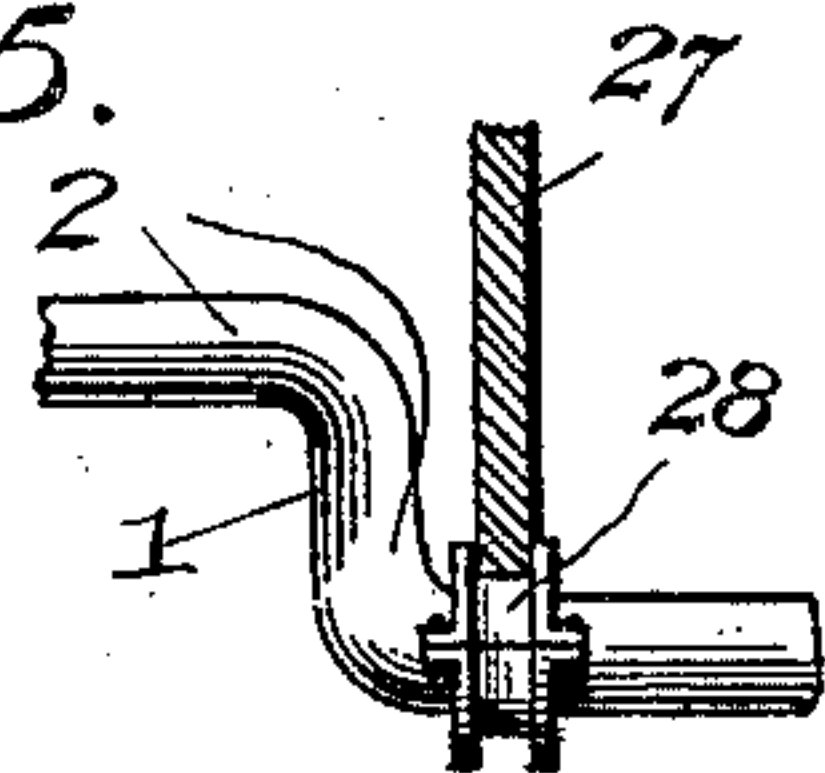


Fig. 2.

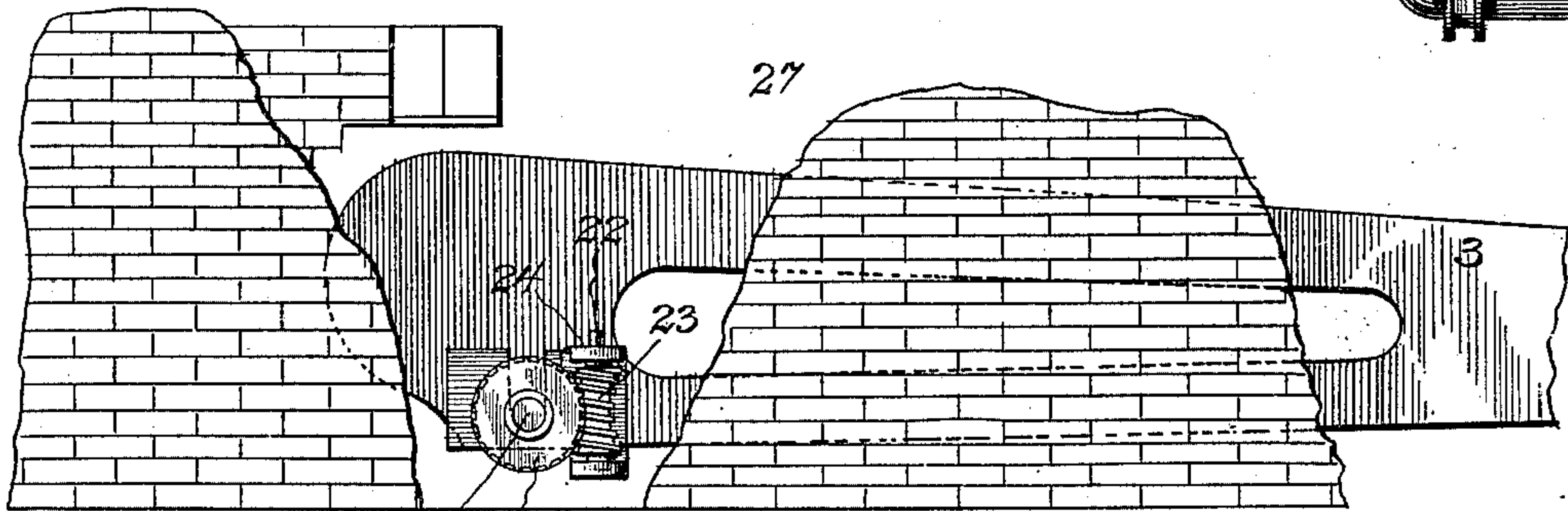


Fig. 3.

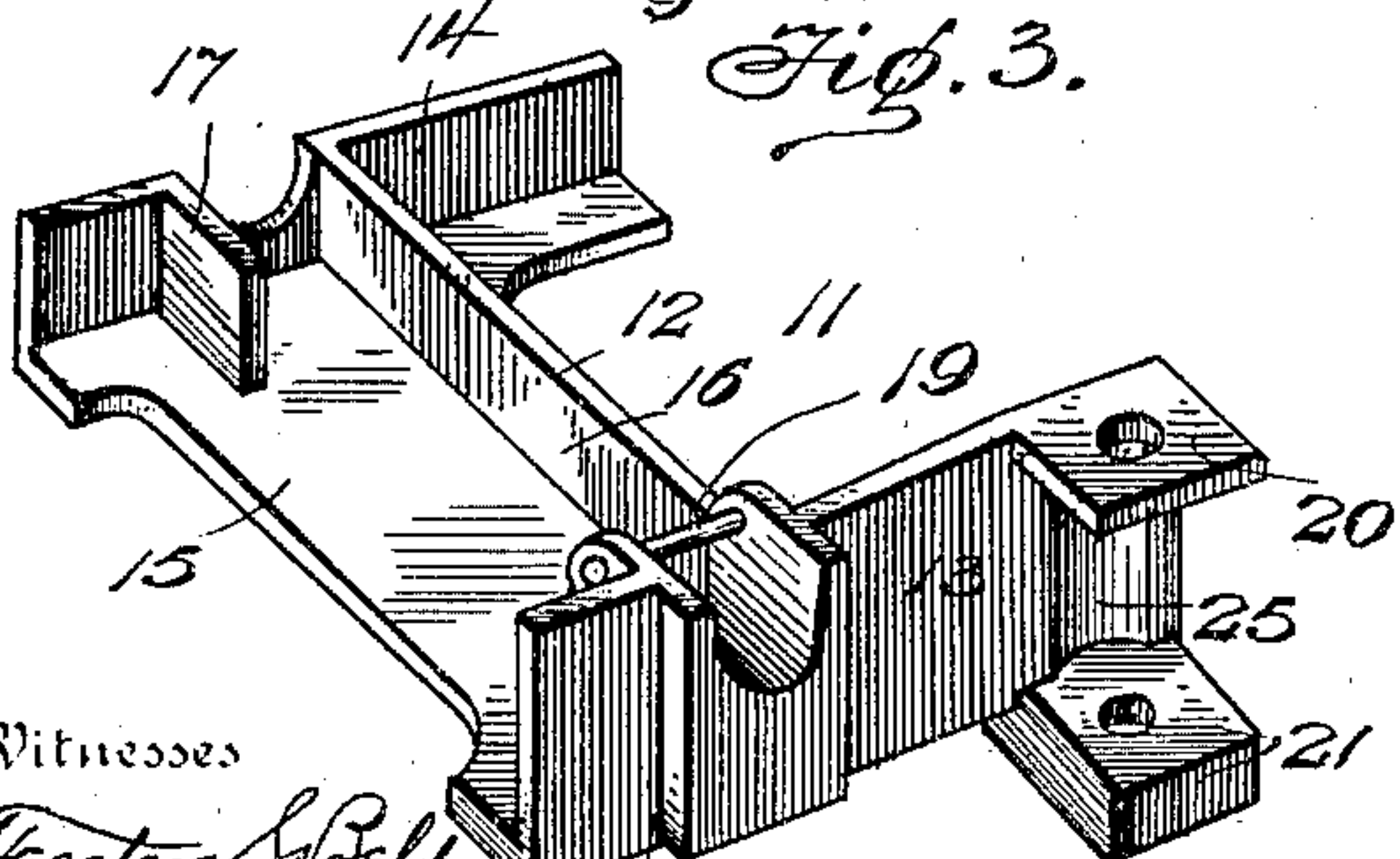
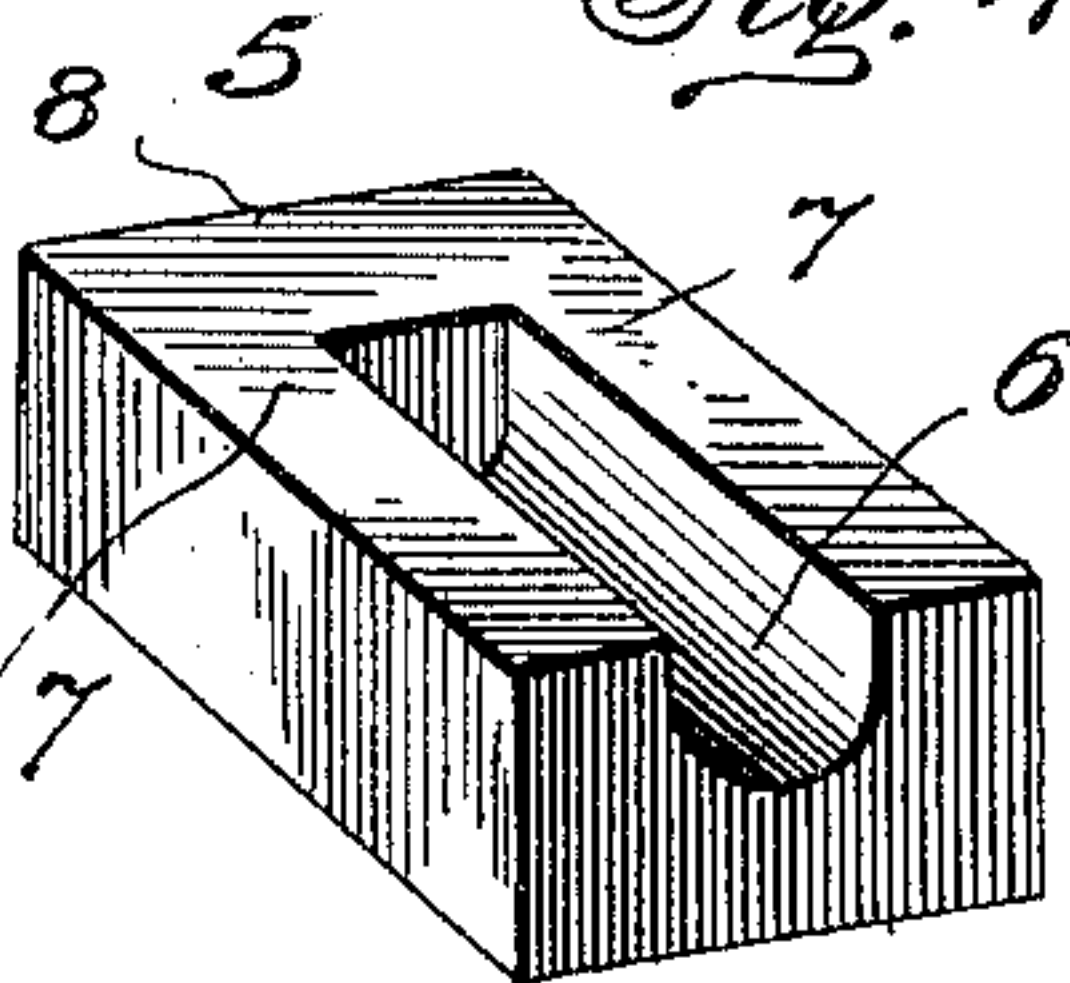


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

PAUL LOUIS CROWE, OF DULUTH, MINNESOTA.

MECHANISM FOR RAISING OR LOWERING GRATES.

SPECIFICATION forming part of Letters Patent No. 662,767, dated November 27, 1900.

Application filed March 12, 1900. Serial No. 8,329. (No model.)

To all whom it may concern:

Be it known that I, PAUL LOUIS CROWE, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, (whose post-office is Duluth, Minnesota,) have invented certain new and useful Improvements in Mechanism for Raising or Lowering Grates; and I do hereby 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.

My invention relates to improvements in means for raising and lowering traveling grates.

It consists in a crank-shaft journaled at its ends in the side walls of a furnace and having an elongated crank portion for receiving the weight of a grate-frame and means for engaging one end of the said crank-shaft ends for rotating it to raise and lower the grate-frame.

It also consists in certain novel constructions, combinations, and arrangements of parts hereinafter fully described and specifically claimed.

In the accompanying drawings, Figure 1 represents a vertical section upon the line of a crank-shaft mounted in a furnace beneath the grate thereof, a portion of the furnace being broken away. Fig. 2 represents a side elevation of a portion of the grate-frame, showing the means for operating the crank-shaft. Fig. 3 represents a perspective view of one of the bearing-boxes for supporting the crank-shaft. Fig. 4 represents a perspective view of another bearing-box of said shaft; and Fig. 5 represents a detail view of one end of the crank-shaft, showing an idler or loose antifriction-wheel interposed between the crank-shaft and the frame of the grate.

My improved mechanism is adapted for use in connection with any grate which it is desired to adjust with respect to the bridge-wall of a furnace. I preferably use it, however, in connection with a traveling grate, the mechanism being suitable for raising or lowering one end of the traveling grate, which projects beneath the bridge-wall, so as to vary the width between the two parts. This is a desirable construction in traveling grates, particularly because there may be different depths

of fuel upon the grate at different times and it may be necessary to have a greater space between the bridge-wall and the grate at one time than at another.

In carrying out the features of my invention I preferably employ a crank-shaft, as 1, which is provided with an elongated crank portion, as 2, extending a sufficient distance to receive and support the weight of a grate-frame, as 3, together with the grate carried thereby. The ends of the crank-shaft 1 are preferably journaled in the side walls 4 4 of the furnace, one end of said shaft engaging the half-bearing, as 5, which is embedded in the masonry of the wall and incloses the end of the crank-shaft upon three sides. An enlarged perspective view of this bearing will be found in Fig. 4 of the drawings, in which it will be seen that a bearing-surface, as 6, is formed to support the weight of the shaft, and sides 7 7 extend upwardly a sufficient distance upon each side of the said shaft to hold it upon the bearing. The end of the bearing is also inclosed by means of an end wall 8. The other end, as 9, of the shaft is preferably made sufficiently long to extend entirely through the wall 4 and carries at its outer end a worm-gear, as 10, by which the said shaft may be rotated, the said gear being keyed to the shaft. The end 9 of the shaft is supported, preferably, upon a combined bearing and bracket piece, as 11, which is provided with vertical walls, as 12, 13, and 14, and a strengthening-web or base portion, as 15. The wall 12 forms one side of a bearing 16 for receiving the end 9 of the shaft, the other side of said bearing being formed by a wall 17 and a wall or flange 18. The flange 18 is preferably made continuous, extending down upon one side of the shaft beneath the same and up upon the other side, so as to inclose the shaft upon three sides.

A bolt or pin, as 19, may be passed through suitable openings in the vertical walls above the shaft portion 9 to hold the same in its bearing. The vertical wall 13 is preferably provided at one end with horizontal laterally-projecting plates or lugs, as 20 and 21, which are apertured to receive a vertical shaft, as 22. The shaft 22 carries a worm 23, adapted to mesh with the worm-gear 10 upon the end of the crank-shaft 1. One end of the shaft

22 may be squared, as at 24, to receive a crank or handle of some sort, whereby the said shaft may be rotated to alter the position of the shaft 1 through the agency of the worm-gear.

5 A recess or socket, as at 25, is preferably formed in the wall 13 to accommodate the worm 23. This combined bearing and bracket is preferably built into the masonry of the wall 4, the parts being thereby firmly held
10 in place.

While the worm-gear has been shown upon the outside of the wall, yet it might be arranged interiorly thereof, if desired, without departing from the spirit of my invention.
15 The worm-gearing makes it possible to adjust the crank-shaft to a greater or less extent, and thereby raise and lower the grate-frame 3, which rests thereon. The worm mechanism cannot be actuated by means of the shaft 1, so that the shaft will always remain in the
20 position to which it is adjusted until the shaft 22 is again actuated. While a crank-shaft of this kind may be applied beneath any kind of a grate, yet I usually use the same in connection with a traveling grate, as 26. The
25 traveling grate illustrated in the drawings is mounted upon a frame consisting of side plates, as 27, 27, suitably held together and provided with wheels or pulleys for supporting
30 a traveling grate. The lower edges of the side plates 27 rest upon the crank portion 2 of the shaft 1, preferably directly engaging the same. It may, however, be desirable to interpose antifrictional means between the
35 said frame and the said crank-shaft, and, as shown in Fig. 5 of the drawings, I contemplate using, when desired, idler-pulleys, as 28, loosely mounted upon the crank portion of the shaft and supporting the lower edges
40 of the side plates of the grate.

It will be apparent from the above description that my improved mechanism for adjusting the height of a grate is exceedingly simple, and yet it is positive in its action, remaining exactly where it is adjusted without
45 the use of other means than adjusting-gearing. This means may be also used to adjust the grate when in use without interfering with the fire which is used in the furnace.

50 Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A supporting mechanism for raising and lowering grates comprising a crank-shaft having an elongated crank portion upon which
55 the grate and its frame rest, the offset shouldered portions forming said crank being arranged sufficiently far apart to come entirely

outside the grate and its frame, journals formed at the ends of the said shaft, journal- 60 bearings mounted in the walls of a furnace for supporting the said journals, and means engaging the said shaft for rotating the same, whereby the crank portion may be adjustably held at different angles to support the grate 65 and its frame at different heights.

2. A mechanism for raising and lowering the end of a grate comprising a crank-shaft, journals formed upon the ends thereof, a journal-bearing mounted in one wall of a furnace 70 for engaging one end of the said crank-shaft, the said bearing having inclosing walls upon three sides, and a combined journal-bearing and bracket-plate engaging the journal at the other end of the shaft, and means mounted 75 upon the said journal and bracket for actuating the said shaft, substantially as described.

3. Means for adjusting the distance between the end of a grate and a bridge-wall 80 comprising a crank-shaft journaled in the walls of a furnace, an elongated crank portion formed upon the said shaft for supporting the frame of the grate, bearing blocks or pieces mounted in the furnace-wall and supporting the ends of the said shaft, walls forming a strengthening bearing portion, and lateral lugs forming a bracket for supporting a gearing, a worm-gearing mounted upon the said shaft and in the said bracket for actuating 85 the shaft, substantially as described.

4. In a mechanism for raising and lowering a grate with respect to the bridge-wall of a furnace, the combination with a grate-frame, of a shaft supporting the same, the said shaft 95 having a central crank portion, bearings under each end of the said shaft, one of said bearings being formed with a base-plate, vertical strengthening-walls, a bearing formed between some of said walls, a pin for holding 100 the shaft in place in the said bearing, a bracket formed upon the said bearing-piece, a shaft mounted in the said bracket, a worm carried by the said shaft, a worm-gear upon the end of the crank-shaft for engaging the said worm, 105 whereby it may be adjusted to different positions for altering the height of the crank and thereby raising or lowering the grate-frame, substantially as described.

In testimony whereof I hereunto affix my 110 signature in presence of two witnesses.

PAUL LOUIS CROWE.

Witnesses:

JAMES T. WATSON,
PHINEAS AYER.