

D. BRODERICK.
FURNACE CHARGING APPARATUS.
APPLICATION FILED APR. 5, 1911.

1,043,395.

Patented Nov. 5, 1912.

2 SHEETS—SHEET 1.

Fig. 2.

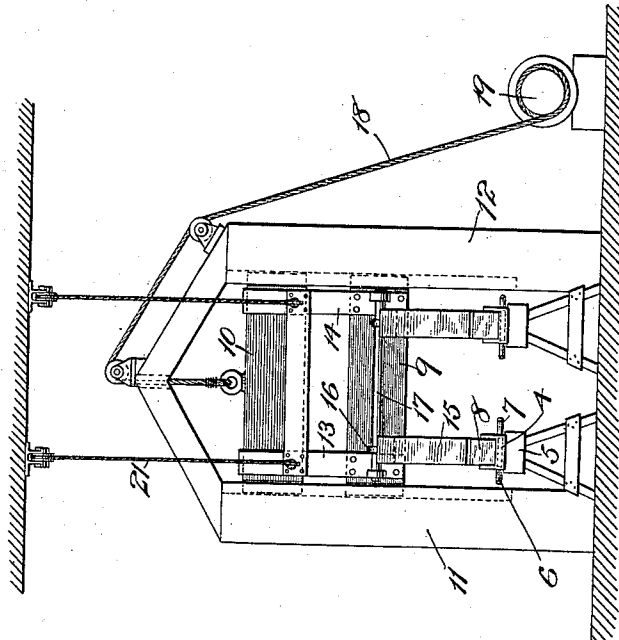
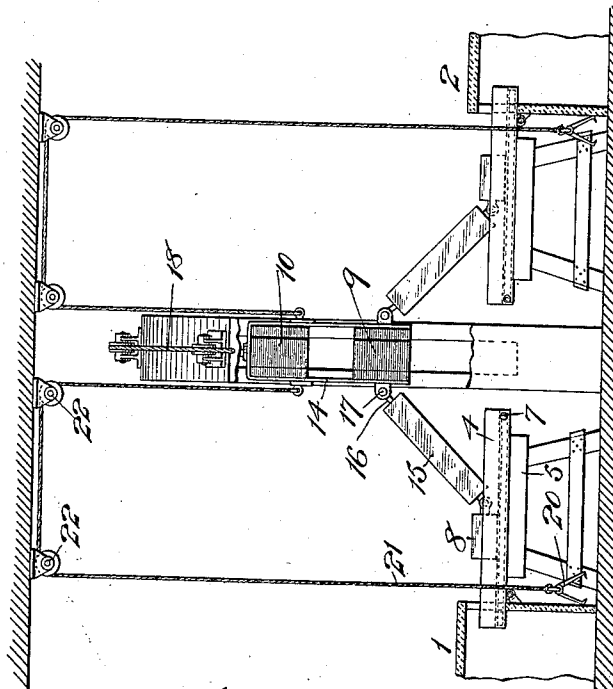


Fig. 1.



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2 SHEETS-SHEET 2.

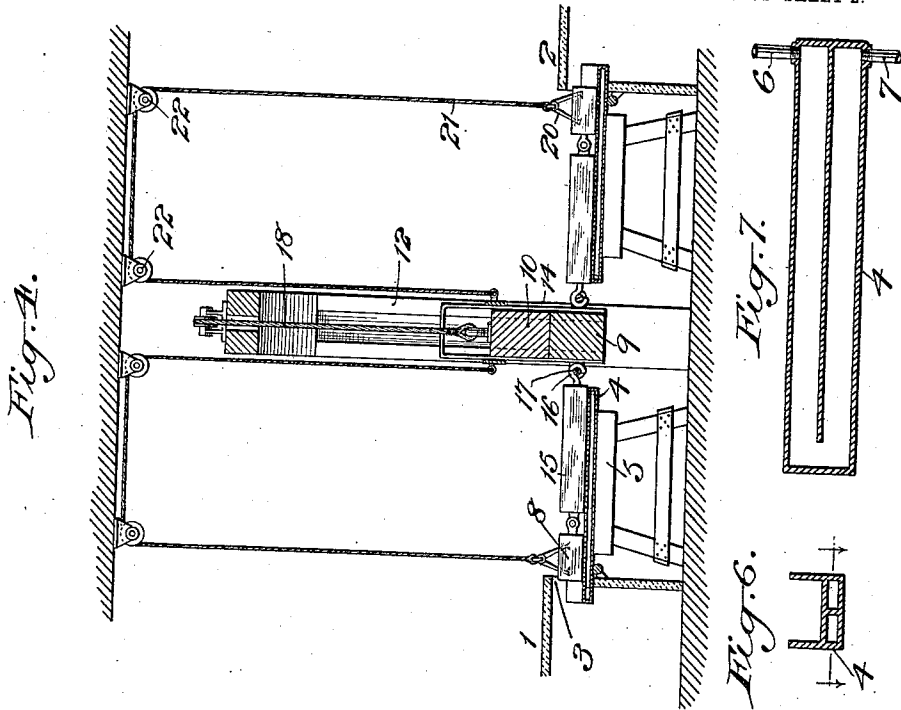


Fig. 7.

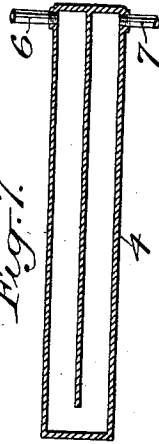
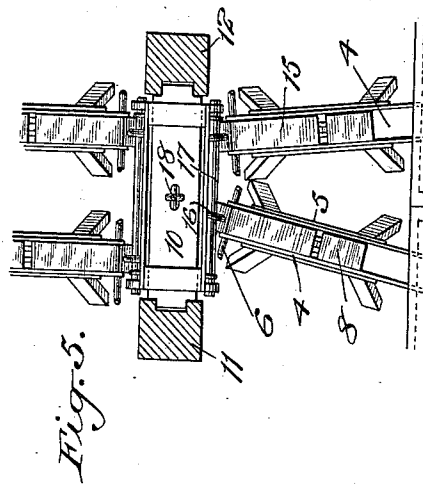
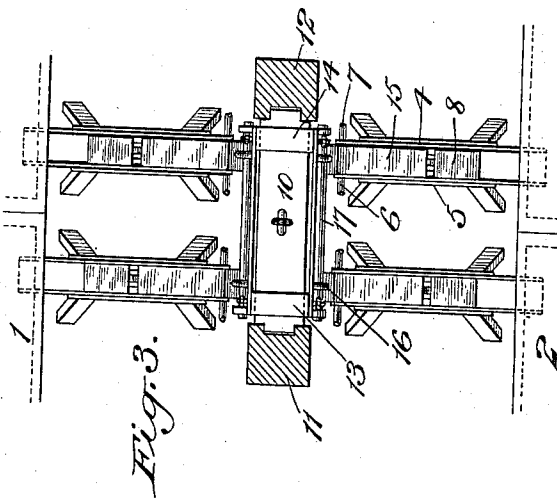
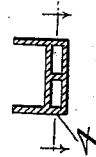


Fig. 6.



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UNITED STATES PATENT OFFICE.

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FURNACE-CHARGING APPARATUS.

1,043,395.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed April 5, 1911. Serial No. 619,119.

To all whom it may concern:

Be it known that I, DANIEL BRODERICK, a citizen of the United States, and resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Furnace-Charging Apparatus, of which the following is a specification.

The object of my invention is to provide a very simple and effective furnace charging apparatus, the parts being so arranged that the material may be projected into the top of the furnace to any desired point within the same.

A further object is to provide an apparatus which may be used for charging any number of furnaces simultaneously.

A practical embodiment of the invention is represented in the accompanying drawings, in which,

Figure 1 represents in end elevation an apparatus suitable for charging two furnaces, the charging pushers being shown in their withdrawn position. Fig. 2 is a side view of the apparatus. Fig. 3 is a transverse horizontal section through the apparatus. Fig. 4 is a transverse vertical section through the apparatus, the charging pushers being shown in their forward position. Fig. 5 is a detail transverse horizontal section showing two of the charging pushers arranged to project the material into the furnace to other points than those indicated in the other figures. Fig. 6 is an enlarged transverse section through the water jacketed feed trough, and Fig. 7 is a longitudinal horizontal section through the same.

Two banks of oppositely arranged furnaces are indicated herein, the furnaces of one bank being denoted by 1 and of the other bank by 2. Each furnace is provided with a charging hole 3. A trough 4 of the desired length is supported in a horizontal manner upon a suitable trestle or other support 5. This trough is preferably water-jacketed and is provided with suitable inlet and outlet pipes 6 and 7, for insuring a circulation of water between the inner and outer walls of the trough. This trough 4 may be projected into the furnace through the charging hole 3, to any desired extent and at various angles in a horizontal plane, so as to cause the charging material to be directed to different points within the furnace when projected from the trough by the

charging pusher. The charging pusher for each trough is denoted by 8 and it is moved back and forth along the trough by the following mechanism. A weighted block comprising a lower member 9 and an upper member 10, is fitted to slide vertically along suitable tracks in uprights 11, 12. U-shaped straps 13, 14, embrace the upper member 10 of the weighted block and have their lower ends suitably secured to the lower member 9, so as to suspend the lower member from the upper member and permit a limited sliding movement of the upper member with respect to the lower member. The lower member 9 is connected to the charging pusher 8, by an arm 15, which arm is hinged at its lower end to the rear end of the pusher 8, and is hinged at its upper end by means of an eye 16, to a bar 17 extending along the face of the lower member 9 of the weighted block. The hinge connection between the arm 15 and the member 9 may thus be adjusted to different positions along the weighted member to suit different angular positions of the charging trough and pusher, as clearly illustrated in Fig. 5. The upper member 10 is connected by a cable 18 to the winding drum of a suitable hoisting engine, indicated diagrammatically at 19, which engine may be provided with tripping mechanism of well known or approved form for permitting the block to drop from its raised to its lowered position. The connection of the arm 15 with the pusher 8 and lower member 9 of the block, is such that when the block is raised, the arm 15 will extend in a diagonally upward and rearward direction from the pusher 8 to the member 9, and when the block is in its lowered position, the arm 15 will occupy a horizontal position between the pusher and lower member.

I have also provided means for automatically raising a new charge of material from the floor to the plane of the trough as the weighted block 9, 10, is lowered, which means is shown as a lifting hook 20 secured to one end of a cable 21, the other end of which is attached to the block, in the present instance to one of the cross straps 13, 14. This cable 21 passes around one or more over-head pulleys 22, for securing the proper lead to the cable.

While I have described in detail only one of the charging devices, it is to be under-

stood that any number of these charging devices may be included in one apparatus. In the accompanying drawings I have shown four of these charging devices arranged in opposite pairs, all operated from a single weighted block and hoisting engine.

In operation it will be understood that the material is placed in each of the troughs 4 in front of the pusher 8, when the pusher is in its withdrawn position due to the raising of the weighted block, to the limit of its forward movement. As the weighted block 9, 10, drops, each pusher 8 is moved rapidly forward, thus projecting the material in front of the pusher into the furnace at considerable speed. By having a lost motion connection between the upper and lower members of the block, it will be seen that if the lower member slows up in its movement due to the weight of the material being projected into the furnace, the upper member will drop with considerable force on to the lower member and thus complete the projecting of the material into the furnace by said blow.

It is obvious that various changes might be resorted to in the construction, form and arrangement of the various parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the structure herein set forth, but

What I claim is:

1. In a furnace charging apparatus, a trough, a pusher and a gravity operated weighted sliding block connected to the pusher for sliding the pusher forwardly along the trough to project the material into the furnace as the block drops.

2. In a furnace charging apparatus, a trough, a pusher, a gravity operated weighted sliding block and an arm hinged to the block and pusher for sliding the pusher forwardly along the trough to project the material into the furnace as the block drops.

3. In a furnace charging apparatus, a plurality of troughs, pushers therefor and a common gravity operated means for sliding the pushers forwardly along the troughs to project the material into the furnaces.

4. In a furnace charging apparatus, a plurality of troughs, pushers therefor and a gravity operated weighted sliding block connected to the pushers for sliding them forwardly along the troughs to project the material into the furnace as the block drops.

5. In a furnace charging apparatus, a plurality of troughs, pushers therefor, a gravity operated weighted sliding block and arms hinged to the block and pushers for sliding the pushers forwardly along the troughs to project the material into the furnace as the block drops.

6. In a furnace charging apparatus, a

trough movable to different angular positions with respect to the furnace, a pusher and a gravity operated weighted sliding block connected to the pusher for sliding the pusher along the trough to project the material to any desired point within the furnace as the block drops.

7. In a furnace charging apparatus, a trough movable to different angular positions with respect to the furnace, a pusher, a gravity operated weighted sliding block and an arm horizontally adjustable on the block and connected to the pusher for sliding the pusher forwardly along the trough to project the material to any desired point within the furnace as the block drops.

8. In a furnace charging apparatus, a plurality of troughs independently movable to different angular positions with respect to their furnaces, pushers for the troughs and a common gravity operated means for sliding the pushers forwardly along the troughs to project the material into any desired position within the furnaces.

9. In a furnace charging apparatus, a plurality of troughs independently movable to different desired angular positions with respect to their furnaces, pushers for the troughs and a gravity operated weighted sliding block connected to the pushers for sliding them forwardly along the troughs to project the material into any desired position within the furnaces as the block drops.

10. In a furnace charging apparatus, a plurality of troughs independently movable to different desired angular positions with respect to their furnaces, pushers for the troughs, a gravity operated weighted sliding block and arms horizontally adjustable along the block and hinged to the pushers for sliding the pushers forwardly along the troughs to project the material into any desired position within the furnaces as the block drops.

11. In a furnace charging apparatus, a trough, a pusher and a gravity operated block comprising upper and lower members having a lost motion connection, the lower member being connected to the pusher for sliding it forwardly along the trough as the block drops.

12. In a furnace charging apparatus, a hoisting engine, a trough, a pusher and a gravity operated weighted sliding block connected to the pusher and to the hoisting engine.

13. In a furnace charging apparatus, a hoisting engine, a trough, a pusher and a gravity operated block comprising a lower member connected to the pusher and an upper member connected to the hoisting engine, the two members having a lost motion connection.

14. In a furnace charging apparatus, a

trough provided along its bottom with a water jacket, a pusher, and a gravity operated weighted sliding block connected to the pusher for sliding the pusher forwardly
5 along the trough to project the material into the furnace as the block drops.

In testimony, that I claim the foregoing

as my invention, I have signed my name in presence of two witnesses, this twenty-seventh day of March 1911.

DANIEL BRODERICK.

Witnesses:

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HENRY C. THIEME.

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