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HYDRAULIC SYSTEM FOR HANDLING ASHES AND THE LIKE

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Fig. 1.

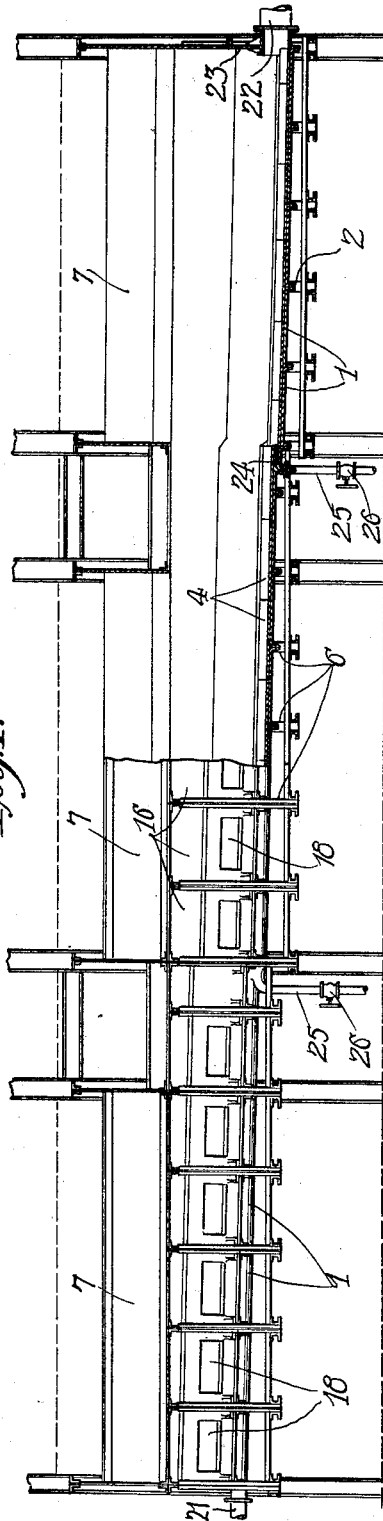
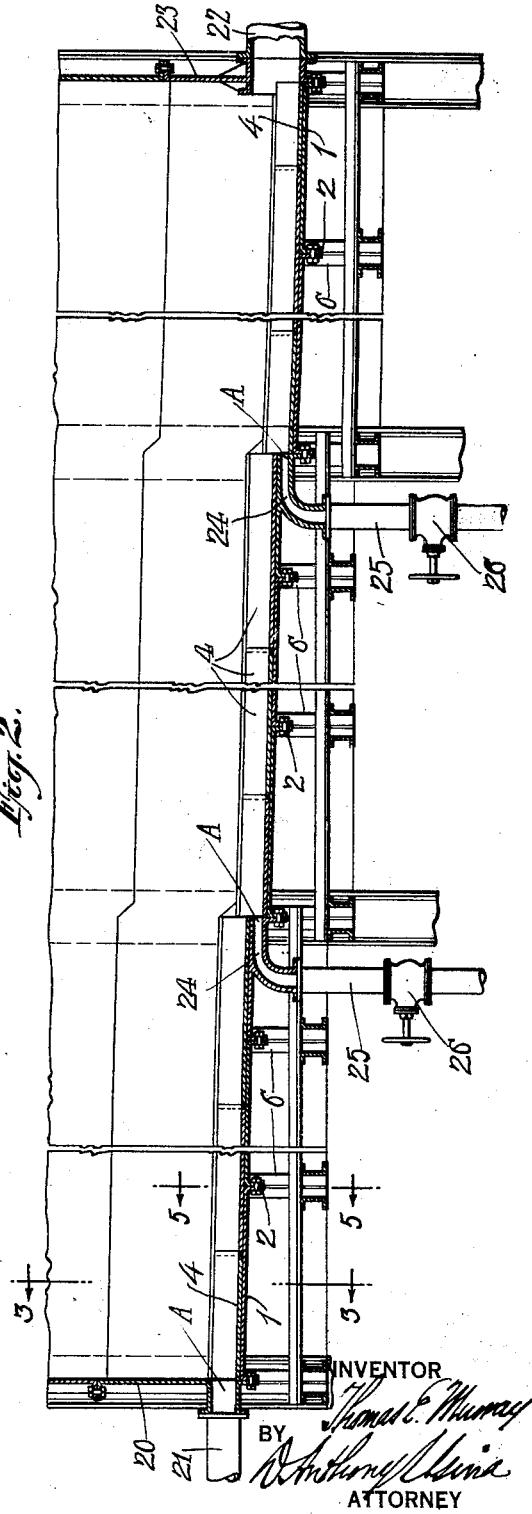


Fig. 2.



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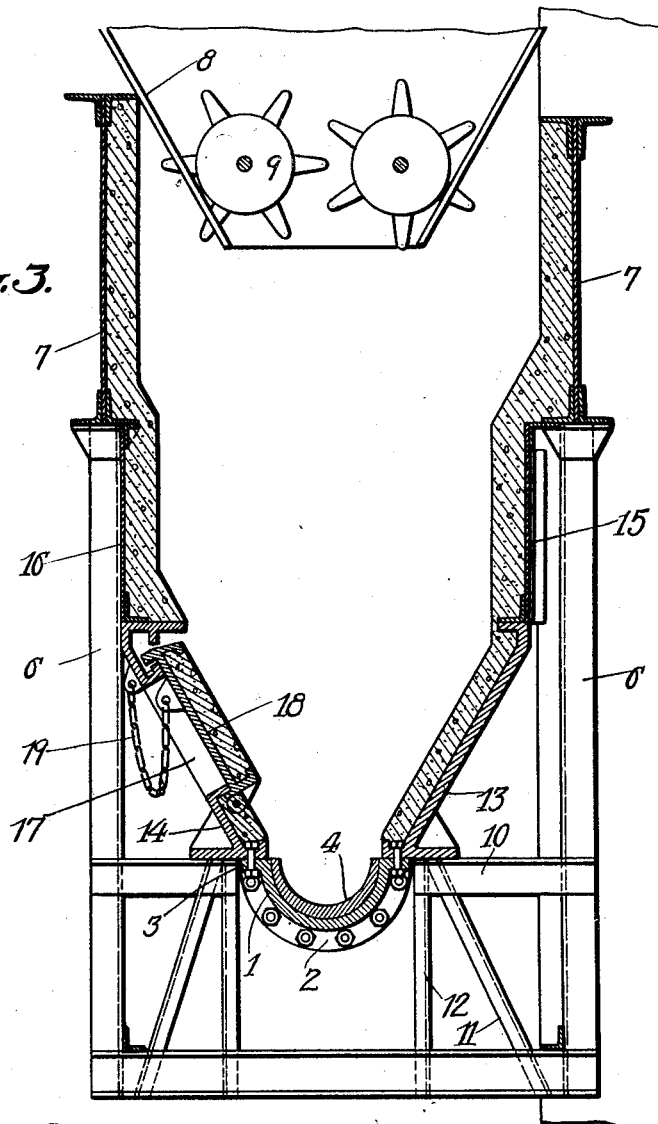
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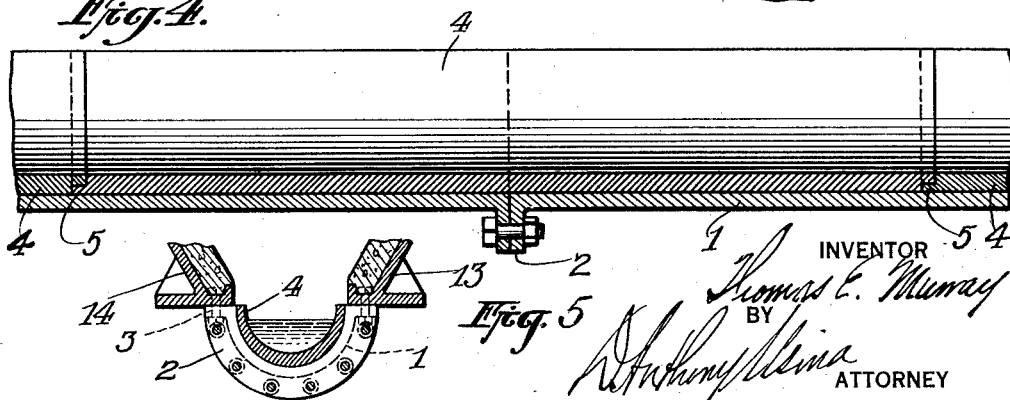
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*Fig. 3.*



*Fig. 4.*



*Fig. 5.*

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## UNITED STATES PATENT OFFICE

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## HYDRAULIC SYSTEM FOR HANDLING ASHES AND THE LIKE

Application filed February 8, 1923, Serial No. 617,669. Renewed January 18, 1930.

My invention aims to provide an economical and efficient apparatus designed particularly for handling ashes and the like from the furnaces of power houses and other structures where such material accumulates.

The accompanying drawings illustrate an embodiment of the invention.

Fig. 1 is a side elevation partly in section;

Fig. 2 is a longitudinal section broken at intervals;

Fig. 3 is a cross-section approximately on the line 3—3 of Fig. 2;

Fig. 4 is a longitudinal section of one of the removable wear plates and the cast iron trough;

Fig. 5 is a cross-section through the trough at a point indicated by the line 5—5 of Fig. 2.

The ashes are carried by a stream of water down an inclined trough into which they are dropped at intervals from the various ash pits served by the apparatus. The trough is composed of cast iron sections 1 bolted together by means of transverse flanges 2 at their ends and having also flanges 3 on its longitudinal edges by which it is supported from a structure hereinafter described.

This cast iron trough is provided with a removable and renewable liner composed of cast sections 4 with overlapping joints 5 (Fig. 4) alternating with the joints of the sections 1 which form the permanent body of the trough.

The trough is arranged between columns 6 at opposite sides, which may be the columns of the building carrying floor girders 7. A hopper 8 is indicated with spiked rollers 9 which break the cinders and regulate the feed of the ashes from one of the pits to the trough. Between the lower ends of the columns 6 is a framework of beams 10 supported by struts 11 and 12 and supporting flanged cast iron plates 13 and 14 which are lined with concrete and form diverging upward extensions from the sides of the conveying trough. The sections 1 of the trough are fastened to and suspended from the lower longitudinally inclined edges of these plates 13 and 14, as indicated in Fig. 3. The sides 13 and 14 and the columns 6 also carry plates 15 and 16 and these plates, together with the girders 7 form

side wall extensions of the trough clear up to the hopper 8, and are preferably lined with concrete as shown.

At one side openings are provided for securing access easily to the trough to clean it or repair it, or to release any accumulation which may choke it. For this purpose the plates 14 are provided with man holes 17 provided with covers 18, of cast iron lined with concrete, which are hinged at their lower edges and arranged to swing inward. In the closed position, Fig. 3, such doors are held in place by gravity. When access is desired to the trough, the door can be pushed open, its downward movement being preferably limited by the chain 19. Such doors may be arranged continuously or at frequent intervals, one in fact for each section of the trough as shown in Fig. 1. Or they may be placed at less frequent intervals.

At the upper end of the trough it is closed by an end wall 20, Fig. 2, bolted at its lower edge to the flange on the uppermost trough section 1 and formed with an opening registering with the bottom of the trough through which a strong stream of water is directed from a pipe 21. The water conveys the ashes down the inclined trough and out through a larger exit pipe 22 at the lower end fastened to the lower end wall 23.

Ordinarily the stream of water will fill the trough approximately to the upper edge of the liner 4, as shown in Fig. 5, and the inclination will be such as to create a current switch enough to carry off the ashes. Where a long trough has to be installed with a comparatively short drop from one end to the other, I propose to provide boosters at intervals in the stream. These may consist for example of nozzles 24 pointing down stream and supplied with water from pipes 25. The trough itself may have a drop from a higher to a lower level at this point, so as to bring the mouth of the nozzle as shown substantially in line with the lower portion of the trough. These boosters may be placed at intervals depending on the inclination and the volume of water and the character of the ashes or other material to be handled. They are preferably placed adjacent to the points

where the supply of ashes is deposited in the trough. Even where the conditions are not such as to require a constant use of boosters of this sort they may be provided for emergencies and equipped with valves 26 and may be opened only in case of a blocking or choking of the trough to give an extra force to the stream.

The complete apparatus is substantially dust proof. In case of emergency on account of choking of the trough it can ordinarily be restored to proper operation by opening one or more of the boosters referred to. Or if this is not sufficient a workman can easily get into it and break up any stoppage. By replacing the liners or wear plates 4 from time to time, the necessity of any extensive stoppage for repairs is obviated. These liners are removed by merely lifting them out of place between the plates 13 and 14, which are spaced apart sufficiently to permit this, as shown in Fig. 5.

Though I have described with great particularity of detail a certain specific embodiment of my invention, yet it is not to be understood therefrom that the invention is restricted to the particular embodiments disclosed. Various modifications thereof in detail and in the arrangement of the parts may be made by those skilled in the art without departure from the invention as defined in the following claims.

What I claim is:

1. An ash handling apparatus comprising a trough open at the top, means for introducing water to convey the ashes along the trough, side walls extending upward therefrom and doors at intervals in said side walls giving access to said trough.

2. An ash handling apparatus as in claim 1, in combination with ash pits from which the ashes are dropped into said trough at intervals in its length.

3. An ash handling apparatus comprising a trough open at the top, means for introducing water to convey ashes along the trough, side walls extending above said trough and enclosing the space above the same, ash pits arranged at intervals along the length of the apparatus and above said side walls and discharging ashes into the space between said side walls and thence into the trough, and doors at intervals in the side walls giving access to the space within said trough.

4. An ash handling apparatus comprising a trough open at the top, means for introducing water to convey ashes along the trough, side walls extending above said trough and enclosing the space above the same, ash pits arranged at intervals along the length of the apparatus and above the side walls and discharging ashes into the space between said side walls and thence into said trough, supporting framework outside of the trough and side walls, the side walls comprising plates

carried by said framework, and doors at intervals in the side walls giving access to the space within the trough.

5. An ash handling apparatus comprising a trough open at the top, means for introducing water to convey ashes along the trough, side walls extending above said trough and enclosing the space above the same, ash pits arranged at intervals along the length of the apparatus and above said side walls and discharging ashes into the space between said side walls and thence into the trough, doors at intervals in the side walls giving access to the space within said trough, and boosters comprising water supply means at intervals along the length of the trough to prevent choking of the same.

6. An ash handling apparatus comprising a trough open at the top, means for introducing water to convey ashes along the trough, liners composed of sections adapted to rest in said trough and to be removed by lifting out of the open top thereof, and separate side wall plates extending upwardly from the edges of said trough and diverging upwardly, the lower portions of said side walls being offset outwardly from the edges of said liners so as to leave the latter free to be lifted out.

7. An apparatus for handling the ashes from a line of furnaces comprising a comparatively narrow trough, ash pits of the several furnaces arranged at intervals along the length of the trough, a structure separate from said trough and comprising side walls above the trough and below the ash pits with a space between them which is adapted to receive ashes from said pits, which is of a width at the top to provide easy passage of ashes from said pits and which converges at the bottom to approximately the width of said trough so as to guide the ashes from the pits into the trough, said apparatus having openings in addition to those leading from the ash pits, said additional openings giving access to the space above the trough.

8. An ash handling apparatus comprising a trough adapted to receive ashes from a pit above it, means for regulating the flow of ashes into the trough and means for introducing water to convey ashes along the trough, said apparatus having openings in addition to those leading from the ash pits, said openings being located at intervals in the length of the apparatus and giving access to the space above the trough.

In witness whereof, I have hereunto signed my name.

THOMAS E. MURRAY.