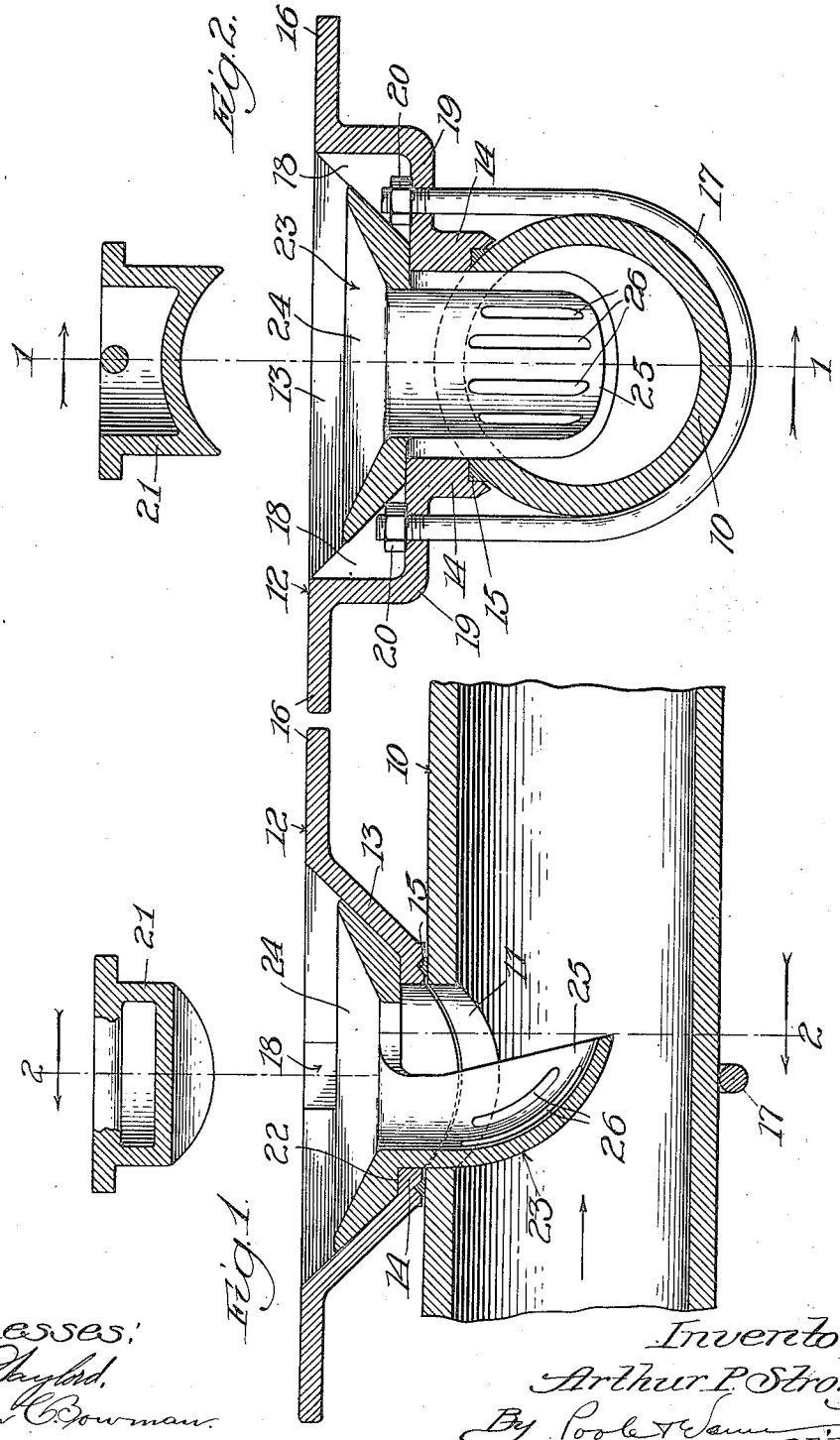
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INTAKE FITTING FOR CONVEYING SYSTEMS.

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INTAKE-FITTING FOR CONVEYING SYSTEMS.

1,243,892. Specification of Letters Patent. Patented Oct. 23, 1917.

Application filed January 29, 1917. Serial No. 145,202.

To all whom it may concern:

Be it known that I, ARTHUR P. STRONG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Intake-Fittings for Conveying Systems, of which the following is a specification.

This invention relates to improvements in intake fittings for pneumatic conveying systems for ashes and like abrasive materials, and more particularly to a device associated with the intake fitting and serving to facilitate the introduction of the material into the conduit.

In conveying systems of the character described, the intake openings are ordinarily situated at various positions along a horizontal conduit extending in front of, or in convenient proximity to, the ash discharge of a furnace or furnaces. The intake openings are preferably provided with funnel-like fittings, set flush in the floor, and into which the ashes are shoveled or introduced and thence fall by gravity into the conduit, the current of air within the conduit immediately "picking up" or moving the mass of ashes along the conduit to the point of disposal.

In the practical operations of conveying systems, difficulty is often experienced in effecting the removal of the ashes as rapidly as they are discharged into the conduit, for the reason that the velocity or pressure of the air in the conduit is adequate to displace but a limited amount of the material, so that if an excessive amount is discharged into the conduit through a single intake fitting, there results a partial obstruction or choking of the passage, the material remaining unmoved on the bottom of the conduit for a considerable interval of time, until it is gradually "picked up" by the air and carried onward. The temporary stoppage of the conduit manifestly reduces the efficiency of the system, inasmuch as the force of the air is expended in forcing its way through the mass and regaining its normal velocity, as well as moving the mass of material from a state of rest. Furthermore, on account of the inability of the air current to instantly move the ashes forward, the wear upon the surface of the conduit is materially increased, for the reason that the ashes are carried for some distance along the bottom of the conduit before they attain the velocity of the air, and hence capable of suspension, in the central portion of the conduit.

The purpose of this invention is to provide a device adapted to partially restrict the passage adjacent the intake opening, thereby increasing the air pressure or velocity at that point, and, further, to discharge the ash more centrally of the conduit, thereby permitting the air to pass beneath the material, so as to produce a lifting effect, which will carry the material forward as rapidly as it is discharged into the pipe.

The device is hereinafter fully described and illustrated in the accompanying drawings, wherein—

Figure 1 is a view in longitudinal section taken on line 1—1 of Fig. 2, through a conduit and intake fitting, showing the device in position; and

Fig. 2 is a view in cross-section taken on line 2—2 of Fig. 1, showing a part of the device in front elevation.

The intake opening or fitting of an ash conveying system is preferably located in a horizontal length of pipe or conduit 10, provided in its wall with a circular and upwardly facing intake opening 11. Above the opening 11 is mounted an intake fitting or casting 12, comprising a member having upwardly and outwardly diverging wall 13, forming a circular, funnel-shaped passage terminating at its lower end in an opening adapted to register with the opening 11 of the conduit and preferably formed by the provision of a cylindric neck portion 14 having its lower margin shaped and beveled to conform with the contour of the conduit, thereby providing an air tight joint between the intake fitting and the margins of the opening 11 in the conduit. To assure a tight joint between the conduit and the intake fitting, there is provided in the downwardly facing surface of the neck portion 14 a groove 15, adapted to contain a ring of suitable packing material. Surrounding the upper margins of the diverging wall 13 is provided an integral marginal flange 16, rectangular in shape and adapted to be embedded in the floor and flush with the surface thereof.

The intake fitting or casting 12 is re-

movably connected to the conduit by means of a U-shaped bolt or yoke 17, which extends or surrounds the conduit and is provided at its ends with screw-threaded extremities, whereby the bolt or yoke is connected to the intake fitting, the latter being provided with oppositely disposed depressions or recesses 18, formed in the wall 13 immediately above the neck portion 14, said recesses forming horizontal bottom walls 19, 19 provided with apertures through which the extremities of the yoke 17 extend. The screw-threaded extremities of the yoke are surmounted by nuts 20, 20, which bear downwardly against the upper surface of the walls 19, 19 and serve to securely hold the intake fitting in position.

The registering openings in the conduit and intake fitting are normally closed by a removable closure or plug 21 which rests or is seated upon a circular seat or shoulder 22 surrounding the opening at the lower end of the intake fitting and formed at the upper margins of the neck portion 14. The plug is removed when it is desired to introduce ashes into the conduit, but at all other times the plug is in closed position, thereby sealing the entrance to the conduit.

Referring now to the construction of the device embodying the invention, the same may be considered as a deflecting member 23, adapted to be inserted in the opening and to form a portion of the passage of the intake fitting. The deflecting member 23 comprises a base member 24, consisting of an annular ring-shaped member having a tapered or beveled outer surface, bearing flatwise against the inclined surface of the fitting 12, and a similarly beveled inner surface, the base member forming in effect a lining or bushing for the funnel-like passage of the intake fitting. The opening in the base member is of substantially the same diameter as the openings of the intake fitting and conduit, and has registering relation therewith. The base member is further provided with a downwardly facing, annular shoulder, adapted to engage and seat upon the annular seat 22 of the intake fitting.

Integral with the base member 24 is the deflecting member proper or plate 25, the same consisting of an integral curved wall depending from the under surface of the base member and surrounding substantially one-half of the circumference of the opening thereof. In vertical section the deflecting plate 25 is curved downwardly and inwardly from the margins of the opening toward the vertical axis of the base member, through an angle of approximately 90°, the lower portion of the plate being substantially horizontal and parallel with the conduit. In cross section the plate is semicircular in contour, thus conforming to the curvature of the opening. The lower margin of the deflecting plate is substantially straight, though rounded at the corners, and terminates below the intake opening and in the central portion of the conduit, a short distance below the central axis thereof. Formed in and extending through the deflecting plate are preferably provided a series of parallel and vertically arranged perforations or slots 26, spaced apart laterally throughout the central portion of the plate in the conduit.

The ash deflecting member 23 is preferably of a removable character and designed to be inserted within the intake opening only at such times when the ashes are to be introduced into the conduit, the plug being removed, as before suggested, and the deflecting member inserted in its place, the base member resting upon the seat 22 and within the lower portion of the funnel-shaped passage of the intake fitting. In positioning the deflecting member within the intake fitting, the deflecting plate 25 extends transversely of the passage and from one side of the intake opening, so that its inner or concave surface faces in the direction in which the ashes will move upon entering the conduit, and its outer or convex surface faces in the direction from which the current of air approaches the intake opening.

The purpose of the deflecting member will be understood from the following description of the performance within the conduit when ashes are introduced through the intake opening. Let it be assumed that a current of air is passing through the conduit from left to right, as indicated by the arrow, and the pressure or velocity of the air is sufficient to carry a quantity of ashes in suspended condition, that is, out of contact with the walls of the conduit. Now, if a quantity of ash is introduced into the opening, it will be carried downwardly in contact with the deflecting plate 25, and, by virtue of the curvature of the surface of the deflecting plate, the downward movement of the ash is not only retarded, but is diverted from a vertical direction to a more nearly horizontal direction parallel to the axis of the conduit and in the direction of movement of the air current. Thus, the ashes upon leaving the deflecting plate have attained a certain initial velocity in a direction parallel with the direction of flow of the air current, thus facilitating the forward movement of the ash under the influence of the air current. Furthermore, the presence of the deflecting plate restricts the passage immediately below the opening, and as a result the velocity of the air must necessarily be increased at this point, the greater portion of the air current being deflected downwardly beneath the deflecting

plate and likewise beneath the ash as it leaves the deflecting plate. This restriction and deflection of the current of air produces, not only an increased air velocity, but also an upward current of air just beyond the deflecting plate, with the result that the tendency of the ashes is to be lifted by the current of air passing beneath the mass. Hence it is obvious that the ash does not fall to the bottom of the conduit, but is carried forward in a horizontal direction and with sufficient force to assure its suspension in the air current.

The function of the slots 26 in the deflecting plate is to permit sufficient air to pass through the plate to afford the necessary initial velocity in a horizontal direction and to assure the continuous downward movement of the material from above, thereby avoiding the possibility of the opening becoming choked by reason of the slow discharge of the ashes from the deflecting plate.

From the foregoing description of the device, it is manifest that the use of such a device in connection with an intake fitting greatly increases the ease and convenience of discharging the ashes into the conduit and, furthermore, materially increases the efficiency of a system, inasmuch as it avoids the choking of the conduit, the consequent loss of air pressure, as has heretofore been suggested, as well as the wear upon the conduit.

Although a specific construction for a device embodying the invention has been described and illustrated, it is manifest that such construction can be modified, without sacrificing the desirable features. For this reason the scope of the invention includes all such devices embraced by the language of the appended claims.

I claim as my invention:

1. In a conveying system, the combination of a conduit, provided with an intake opening and a tapered passage surrounding said opening, a deflecting member comprising a base member provided with a beveled surface, permitting said base member to seat in said passage, and a central opening adapted to register with said intake opening, and a deflecting plate depending from said base member.

2. In a conveying system, the combination with a conduit provided with an intake opening, an intake fitting surrounding said opening and provided with a funnel shaped passage, of a deflecting member comprising an annular base member provided with beveled surfaces conforming to the contour of the passage of said intake fitting, and a central opening adapted to register with said intake opening, and a curvilinear deflecting plate integral with and depending from said base member.

3. In a conveying system, the combination of a conduit provided with an intake opening and a funnel shaped wall surrounding said opening, and a deflecting member adapted to be removably mounted in said opening and comprising an annular base member provided with beveled inner and outer surfaces conforming to the contour of said wall, said inner beveled surface surrounding a central opening registering with said intake opening, and a curved deflecting plate integral with the base member and depending from the under surface thereof.

4. In a conveying system, the combination of a conduit provided with an intake opening, an intake fitting surrounding said opening and provided with a funnel shaped passage registering with said opening, a closure for said opening adapted to seat in said passage, and a deflecting member comprising an annular base member provided with a central opening and beveled surfaces conforming to the contour of said passage and adapted to seat within said passage and surround the intake opening when said closure is removed, and an integral deflecting plate depending from said base member.

In witness that I claim the foregoing as my invention, I affix my signature in the presence of two witnesses, this 30th day of December, A. D. 1916.

ARTHUR P. STRONG.

Witnesses:
HERMAN A. POPPENHUSEN,
JAS. M. HARRIET.