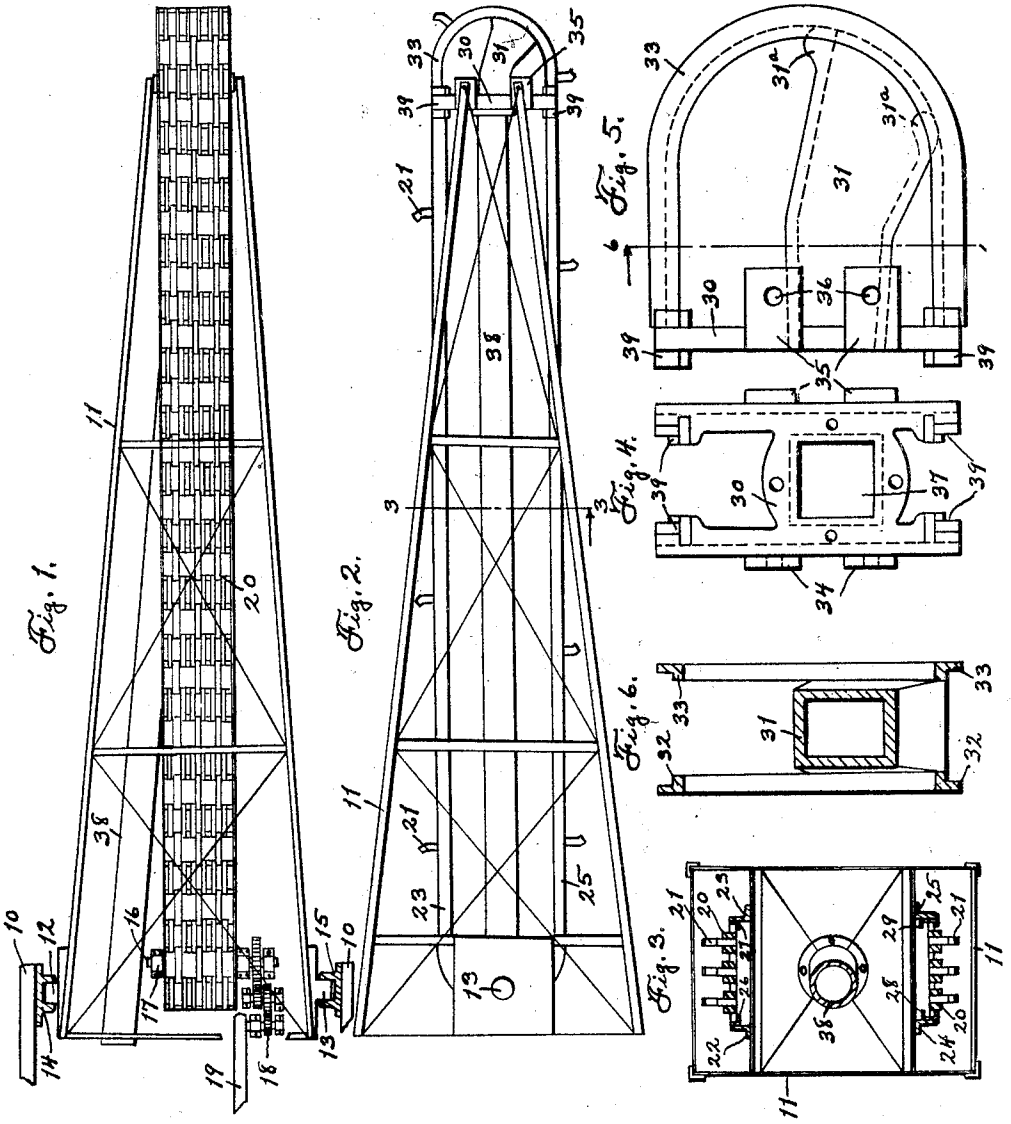
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TRAVELING SCREEN NOZZLE.

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1,426,616. Patented Aug. 22, 1922.



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TRAVELING-SCREEN NOZZLE.

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To all whom it may concern:

Be it known that I, MARTIN SWINTEK, a citizen of the United States of America, and resident of Eddyville, Wapello County, Iowa, have invented a new and useful Traveling-Screen Nozzle, of which the following is a specification.

The object of this invention is to provide improved means for screening the mouth of a nozzle employed in sand-pumping apparatus or dredges, and removing large objects such as stones from said nozzle, which might otherwise clog the nozzle or pipes.

A further object of this invention is to provide a traveling screen traversing the mouth of a suction nozzle, and for supporting said screen in its travel across said mouth.

A further object of this invention is to provide an improved construction for a detachable nozzle for suction pipes.

With these and other objects in view, my invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in my claims and illustrated by the accompanying drawing, in which—

Figure 1 is a plan and Figure 2 a side elevation, illustrating my improvement in position for practical use. Figure 3 is a cross-section on the line 3—3 of Figure 2, on an enlarged scale. Figure 4 is a rear elevation and Figure 5 a side elevation, showing the nozzle detached from the pipe, on a scale enlarged relative to the other views. Figure 6 is a cross-section on the line 6—6 of Figure 5.

In the construction of the apparatus as shown the numeral 10 designates a support, a small portion of which is shown, which support may be carried by or be a part of a barge or other vehicle employed in sand-pumping or dredging operations. A frame 11 is formed of interconnected angle bars and braces and is relatively long and narrow and projects outwardly from the support 10, to which it is pivoted on a horizontal axis. Such pivoting preferably is accomplished by means of trunnions 12, 13 carried by the rear end of the frame 11 and journaled for oscillation in bearings or boxes 14, 15 carried by spaced members of the support, as shown in Figure 1. The frame 11 preferably tapers from end to end in both its vertical and its transverse dimensions, the larger end portion being located adjacent the support. A shaft 16 is arranged transversely and journaled for rotation in bearings 17 carried by the rear portion of the frame 11, and said shaft is operatively connected by a train of gearing 18, belt pulley and belt 19 to a prime mover (not shown) carried by the structure on which the frame is pivoted. Sprocket wheels (not shown) are mounted on and fixed to the shaft 16 and a suitable flexible screen, indicated generally by the numeral 20, extends around and is adapted to be driven by said shaft and sprocket wheels. The flexible screen, which is here shown conventionally, may be of any suitable construction and constitutes a chain belt preferably having projecting lugs 21 thereon at suitable intervals.

Sills 22, 23, 24, 25, preferably formed of angle bars, are arranged longitudinally of the frame 11, are spaced apart in upper and lower pairs substantially tangential to the top and bottom of the sprocket wheels on shaft 16, and are parallel to each other throughout their lengths. The vertical spacing of the sills 22—23 from the sills 24—25 is such, with relation to the taper of the frame 11 in vertical planes, that the forward portions of said sills extend outside of the forward portion of the frame. Angle track members 26, 27 are carried by and between the uppermost sills 22, 23 respectively, and channel track members 28, 29 are carried by and between the lowermost sills 24, 25 respectively, and said track members carry the flexible screen 20 in its travel toward and away from the shaft 16 and sprocket wheels thereon.

A head is fixed to, carried by and projects beyond the outer end of the frame 11 and comprises generally a base member 30 arranged in a transverse plane, a nozzle 31 fixed to and extending forwardly from said base member, and spaced arcuate track members 32, 33 fixed to and carried by said base member and nozzle. At its opposite sides the base member 30 is provided with forwardly projecting side plates 34, 35, apertured at 36 and adapted to be bolted rigidly to forward end portions of the longitudinal members of the frame 11. In its central portion the base member 30 is formed with an aperture 37 communicating with the rear end of the nozzle 31, and said base member is adapted to receive attachment of a supply pipe 38 communicating with said nozzle through said aperture. The pipe 38 extends

rearwardly through the frame 11 and supported thereby, and preferably is inclined laterally slightly to carry its rear portion outside of the vertical plane of the flexible screen 20. The supply pipe 38 leads to a pump (not shown) which may be mounted in any suitable location to operate in a common and well known manner. At its respective corners the base member 30 is provided with angular seats 39 to which the forward end portions of the track members 26, 27, 28 and 29 are adapted to be attached. When so attached the upper track members 26, 27 are in alinement and communicate with upper ends of the arcuate tracks 32, 33 respectively, and the lower track members are in alinement and communicate with lower ends of said arcuate tracks; the latter members extending forwardly through semi-circular arcs and affording communication between the lower and upper track members and supports for the flexible screen as it passes across the mouth of the nozzle 31. The forward portions of the arcuate tracks 32, 33 are formed on or attached to the side walls of the nozzle 31, which side walls terminate substantially coincident with the margins of said tracks, so that the flexible screen 20 in the foremost point of its travel is guided across the mouth of said nozzle by said tracks. The upper and lower walls of the nozzle 31 preferably are thickened and rounded upwardly at their forward margins, as indicated at 31^a in Figure 5, which parts are contacted by the flexible screen in its upward travel.

In use the nozzle and forward portions of the frame and screen may be moved vertically in the usual or any suitable manner, oscillating on the horizontal axis of the trunnions 12, 13. The forward end of the nozzle and the curved portions of the tracks 32, 33 rest on the bottom of a body of water, and the flexible screen is driven by the shaft 16 through the means provided, and simultaneously the pump is operated to create suction through the pipe 38 and nozzle. The lugs 21 on the screen stir and agitate the sand or gravel bed and facilitate entrance to the nozzle and pipe. At the same time the traveling screen prevents entrance to the nozzle and pipe of any large and undesirable objects such as stones, sticks and other fragments such as lumps of clay, the lugs engaging and removing such objects away from the nozzle. Thus is provision made for screening the mouth of the nozzle and removing obstructions therefrom, which insures obtaining a cleaner product and minimizes delays often necessary to clear the pipe line when such screening is not employed.

Particular attention is called to the unitary structure of the nozzle head, detachable and removable readily relative to the supporting frame; to the fact that the forward end of the traveling screen is carried entirely by smooth track members without the use of any gears, wheels or the like which might become clogged; and that the forward track members are carried by the head structure and attached to and guide and screen around the mouth of the nozzle, thus insuring proper travel of the screen relative to the nozzle mouth.

I claim as my invention—

1. In an apparatus of the class described, a nozzle head comprising a base member formed with an opening, a nozzle secured to and extending forwardly from said base member and communicating with said opening, and spaced parallel arcuate track members rigidly secured at their ends to upper and lower corners of said base member and having their curved portions secured to opposite sides of the forward end of said nozzle, said track members being adapted to support and guide a flexible screen in travel around the mouth of said nozzle.

2. In an apparatus of the class described, a nozzle head comprising a base member formed with an opening, a nozzle secured to and extending forwardly from said base member and communicating with said opening, means for securing said base member to a support, means for securing a communicating pipe to said base member in register with the opening therein, and spaced parallel arcuate track members rigidly secured to said base member and extending forwardly therefrom and having their curved portions rigidly secured to side walls of said nozzle, said track members adapted to support and guide a flexible screen in travel around the mouth of said nozzle.

3. In an apparatus of the class described, a base member formed with angular seats adapted to receive attachment of angular track members, spaced arcuate track members rigidly secured to said base member and extending forwardly from said seats, and a nozzle extending forwardly from said base member and secured at its forward margin to the curved portions of said arcuate track members, together with a flexible screen adapted for travel on said track members, said nozzle having its upper and lower walls thickened and rounded at their forward ends for contact by said flexible screen during such travel.

4. An apparatus of the class described, comprising a frame and a head structure removably and replaceably secured to the forward end of said frame, said structure including a base member transversely arranged and formed with side plates for attachment to said frame and a nozzle secured to said base member and projecting forwardly therefrom and arcuate track members rigidly secured to corner portions of

said base member and projecting forwardly on opposite sides of and secured rigidly to said nozzle, said base member also being formed with angular seats at its corners, said frame carrying parallel tracks adapted to be secured at their ends to said seats and to aline and cooperate with said arcuate tracks, and a flexible screen mounted for travel on the parallel tracks and arcuate track members and guided by the latter around and over the mouth of said nozzle.

Signed at Des Moines, in the county of Polk and State of Iowa, this 15" day of March, 1921.

MARTIN SWINTEK.