

No. 736,513.

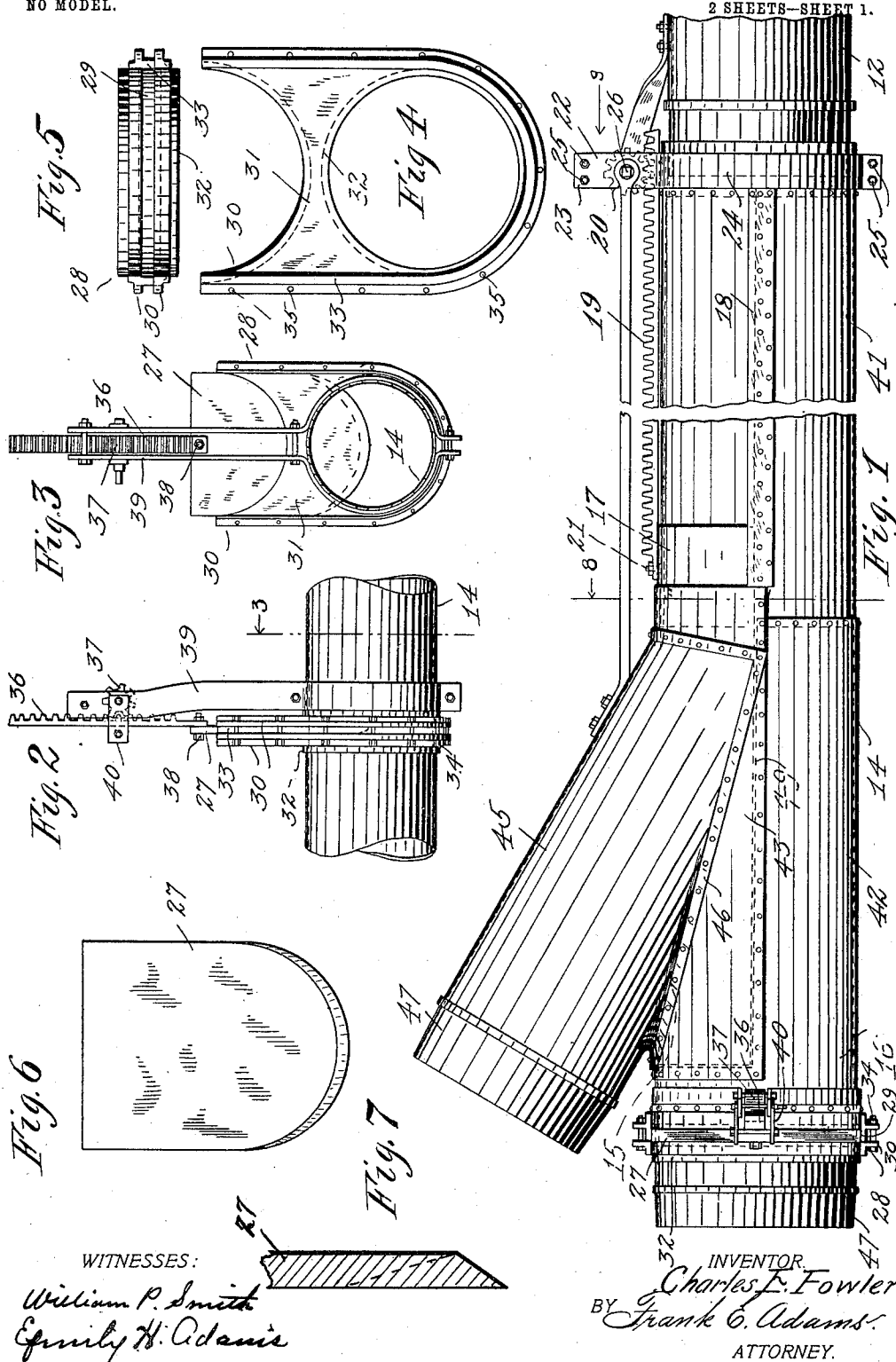
PATENTED AUG. 18, 1903.

C. E. FOWLER.
PIPE LINE VALVE.

APPLICATION FILED APR. 14, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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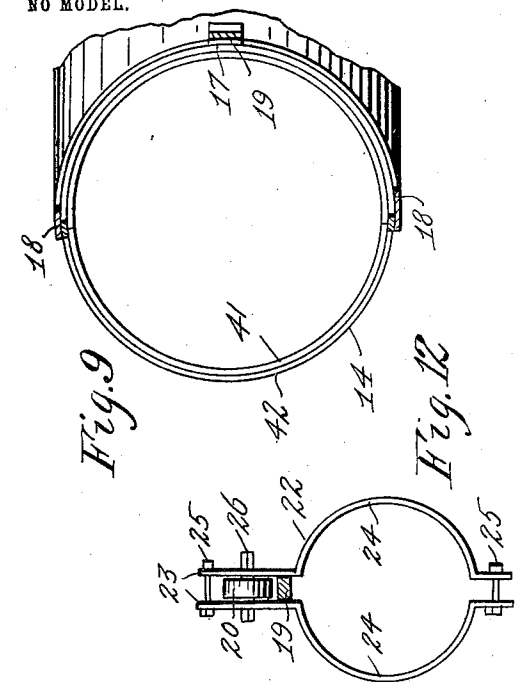
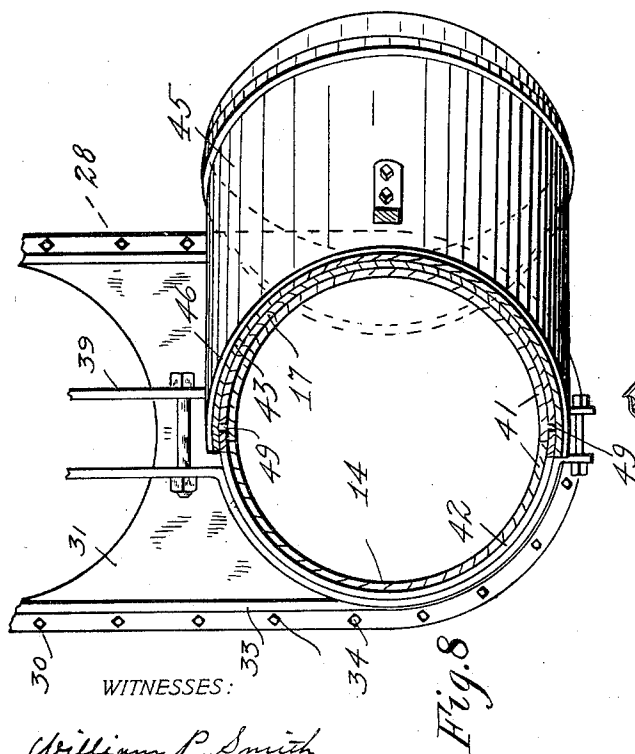
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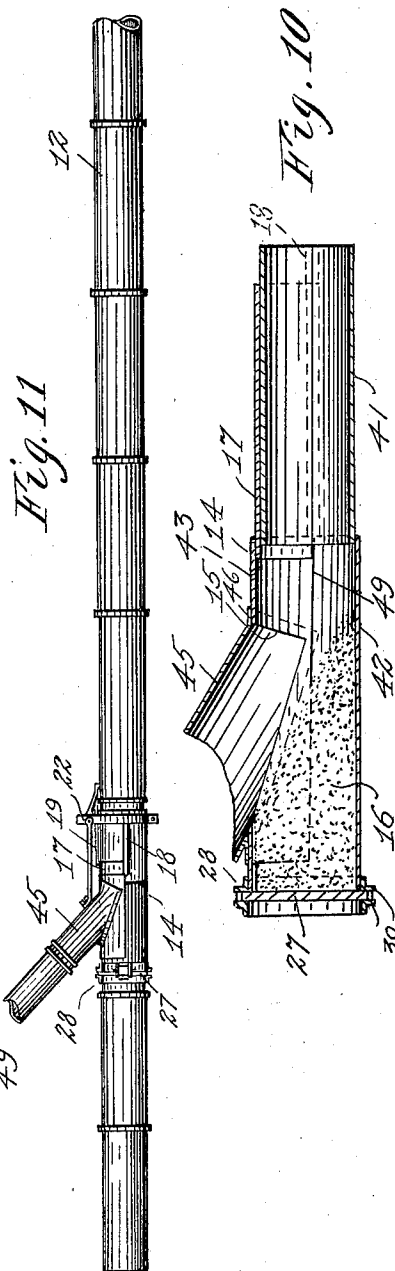
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NO MODEL.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES E. FOWLER, OF SEATTLE, WASHINGTON.

PIPE-LINE VALVE.

SPECIFICATION forming part of Letters Patent No. 736,513, dated August 18, 1903.

Application filed April 14, 1902. Serial No. 102,983. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. FOWLER, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Pipe-Line Valves, of which the following is a specification.

My invention relates to improvements in valves, and has special reference to a contrivance of this class adapted to control the flow in a pipe-line.

Among numerous objects attained by this invention, and which will be readily understood from the following specification and accompanying drawings included as a part thereof, is the production of a simple and inexpensive valve especially adapted for use in extensible pipe-lines to divert the flow during repairs, alterations, or extensions of the discharge end thereof and including in its construction essential features of adaptability, utility, and general efficiency, which render the valve capable of embodiment in numerous ways, facilitates its operation, prolongs its usefulness, and renders it capable of adjustment to divert the line of flow without reducing the area of the pipe in cross-section and with minimum frictional resistance to the passage of the fluid.

The above-mentioned and numerous other objects equally as desirable are attained by the construction, combination, and arrangement of parts, as disclosed by the drawings, set forth in the following specification, and succinctly pointed out in the appended claims.

With reference to the drawings filed herewith and bearing like reference characters for corresponding parts throughout, Figure 1 is a plan view of the valve as preferably embodied and indicates same with a portion of the body broken out and a portion of a pipe connected at one port. Fig. 2 is a side elevation of a portion of the shell or body of the valve, indicating the stop-gate in position and the mechanism preferably employed to operate the same. Fig. 3 is a transverse section of said shell portion on line 3 of Fig. 2 viewed as the arrows fly and indicates said mechanism with the stop-gate in partial open position. Fig. 4 is a view of one face of one of

the sections comprising the seat for the stop-gate. Fig. 5 is a top edge view of said gate-seat. Fig. 6 is a view of one face of the stop-gate; and Fig. 7 is a transverse section of said gate, taken at the entering edge. Fig. 8 is a transverse section of the valve on large scale, taken on line 8 of Fig. 1, viewed as the arrows indicate and shown with portions of the valve broken away. Fig. 9 is an end view of the valve shell or body looking from the right of Fig. 1 as indicated by the arrow and figure, with a portion of its branch broken away and the gate-operating mechanisms removed. Fig. 10 is a longitudinal section of a valve similar to the one disclosed in the foregoing figures indicated with the stop-gate closed and the spill-port open and an accumulation of gritty materials in the chamber at the diverting-point. Fig. 11 is a plan view, on reduced scale, of the discharge end of a pipe-line, indicating my improved valve embodied therewith and a portion of conduit attached to the branch thereof; and Fig. 12 is a side view of the standard adapted to support the pinion of the gate-operating mechanism.

In the present embodiment of my invention the valve is indicated in a pipe-line, as Fig. 12, which as now considered is adapted to convey an admixture of water and gritty material—such as is produced in hydraulic mining, dredging, or the like—to a point more or less remote—as, for example, in dredging and filling by the hydraulic method.

The pipe 12 as now considered represents a discharge-conduit, which is extended in length as desired during progress of the work by adding sections thereto, and the valve is suitably connected in the line adjacent the discharge end thereof for the purpose of deflecting the flow during such extensions or when making alterations or repairs, so that the flow may continue uninterrupted, and thereby expedite the completion of the work to be performed and render the labor of altering the pipe less disagreeable.

The valve is rendered with a comparatively long tubular body or shell, as 14, having a straight bore for the passage of fluid under normal conditions, and this body is preferably made of suitable plate metal, as sheet-steel, which is conveniently brought to a cy-

lindrical form with an interior diameter substantially equal to that of the pipe in line 12. In the wall of this shell or body a spill-port 15 is suitably formed and preferably located closely adjacent the discharge end or port of the valve; so should said port be closed by a suitable gate or the like a chamber, as 16, will be formed beyond the spill-port, in which a percentage of the gritty materials conveyed by the flow will accumulate until a bank of materials is deposited whose active surface will conform to the most natural course of the fluid flow as deflected, and thus serve to reduce frictional resistance, maintain the area of cross-section of the flow unbroken, and protect the material of which the valve is formed at this point or angle from abrasion.

The spill-port is formed in the present instance by cutting away or leaving out a portion of the wall of the valve-body of suitable size to produce an opening with a capacity for discharge somewhat greater than the capacity of the pipe 12, and said port is preferably rendered triangular in outline, with the base extended approximately half the circumference of the valve-body at one side thereof, Fig. 10.

As now considered, the spill-port 15 is controlled by a sliding gate 17, which is rendered with its inner face concaved in conformity with the wall of the valve-body and preferably consists of a rectangular section of plate metal conveniently brought to a semicircular form whose shortest radius is substantially equal to that of the external surface of body 14 and whose width is slightly greater than the spill-port at its base, so that the edges of the gate will lap beyond the margin of said port when closed. This gate is movably mounted on the valve-body, so that it may be easily adjusted to open and close the spill-port, and is suitably positioned to cause the concaved face to lie concentric said body and substantially in the same plane with the inner surface of the bore thereof, and is preferably arranged for movement longitudinally of the body. In the present instance the gate 17 is supported when in open position by oppositely-disposed guides, as 18, of suitable construction to slidably embrace respective side edges of the gate. These guides extend in the direction of the movement of the gate and are preferably secured to the valve-body and formed of plate-metal strips, each having a rabbet in the under inner corner to receive a respective edge of the gate.

In the present embodiment gate 17 is moved by a rack and pinion, as 19 and 20, respectively, the former being secured in any convenient manner to the gate, as by a bolt 21, and the latter rotatably mounted in engagement with the rack on a suitable standard, as 22, which preferably comprises an annular-like clamp adapted to embrace the valve-body and having laterally-projecting ears, as 23, between which the pinion operates and

by which the rack is guided. This standard is formed of two semicircular parts or bars 24, each having an ear or lug at each end with apertures for bolts, as 25, whereby the parts are drawn toward each other and brought to clamp the valve-body, and the ears 23 are provided with suitable apertures to receive a shaft 26, on which pinion 20 is fixed, and which is squared at the ends to facilitate operation of the pinion by application of a wrench or handle to said ends.

At the discharge-port of the valve a stop-gate, as 27, is conveniently disposed transversely the body and is adapted to close said port, and thereby effect discharge from spill-port 15. As now considered this gate is positioned beyond the spill-port a convenient distance to form a chamber, as 16, at the angle of deflection of suitable depth to collect a percentage of granular material from the flow when said gate is closed, as heretofore described. This stop-gate comprises a section of plate metal having one end rendered semicircular to conform to the internal surface of the valve-body, and said end is preferably made wedge-shaped in transverse section to facilitate proper seating of the gate as closed by rendering it capable of dividing any deposit which may have accumulated at the base of the gate-seat. As now considered this gate 27 is mounted in a seat 28, which consists of a substantially U-shaped body having a channel 29 formed therein to receive the gate. This seat is preferably divided longitudinally into two sections, as 30, each having a web, as 31, connecting the stems thereof, and an annular flange 32 on the outer surface concentric the base, adapted to receive the end of the valve-body or a pipe, fitting, or the like, when the same can be secured by suitable rivets passed through the flange and the said end. Between these sections a rib 33 is disposed to hold them separated, and thereby conveniently form the channel 29, and suitable bolts, as 34, are employed to secure the sections together, and these bolts are fitted to suitable apertures, as 35, formed in the margins of the sections.

To operate the stop-gate, a rack and pinion, as 36 and 37, are employed, and the former is conveniently secured to the gate by a bolt, as 38, while the latter is mounted on a standard 39, which is of similar construction to the one heretofore described for the pinion of the spill-gate, with the exception that the ears which support the axle of the pinion are extended in length and have lugs, as 40, extended from one side edge to embrace and guide the rack.

In the present construction of the valve-body 14 a tubular section 41 is first formed of sheet metal, and the abuttingside edges of the plates employed are conveniently secured by riveting the guides 18 thereto. At one end of this section a second section 42 of large diameter is conveniently secured in overlapping position and has a rectangular portion cut away

to receive the spill-gate 17 when closed, and over the opening, as 49, formed by the removal of this portion of the section a semi-circular plate 43 is secured to section 42, and in this plate the spill-port 15 is conveniently formed by cutting away a portion of the metal over the opening 49.

If desired, a branch 45 may be added to the valve-body at the spill-gate, and the branch conveniently consists of a tubular plate-metal body having one end cut at a desired angle and formed with a laterally-projecting flange 46 at this end, which extends beyond the margin of the spill-port, whereby this branch may be conveniently fastened to the plate 43 by rivets or the like.

If desired, suitable fittings, as 47, may be secured in any convenient way to the valve-body at the port of discharge and also at the free end of branch 45 to receive the ends of suitable sections of conduit.

When using this valve to control the discharge from a hydraulic dredger or the like, it is placed in the discharge-line closely adjacent the free end, which may be extremely remote from the dredger; so should it be necessary to alter or extend that portion of the line beyond the valve it is simply necessary to open the spill-port and close the stop-gate, thus allowing the dredger to continue operating during the work of repairing or extending the line.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States of America, is—

1. In a pipe-line adapted to transport fluids carrying a percentage of solid matter; a tubular body having a straight bore substantially equal in diameter throughout to that of the said pipe; a spill-port arranged in said body for discharge laterally therefrom, means to effect a closure of said pipe beyond the port whereby a chamber is formed for the accumulation of a portion of solid matter, and means to effect a closure of said port.

2. In a pipe-line adapted to transport fluids carrying a percentage of a solid matter; a tubular body having a straight bore substantially equal in diameter throughout to that of said pipe having a spill-port in the wall, an operative gate at the port, and a stop-gate in the line beyond the said port but closely adjacent thereto whereby a chamber is formed for the accumulation of a portion of solid matter when said stop-gate is closed.

3. In a pipe-line adapted to transport fluids carrying a percentage of solid matter; a tubular body having a straight bore substantially equal in diameter to that of said pipe and a spill-port in the wall, a gate for the port with its under surface fitting the exterior surface of the body, means to slidably support said gate, and a stop-gate arranged in said line beyond the said port whereby a chamber adapted to accumulate a portion of said matter is formed in the body when the stopping means is closed.

4. In a pipe-line adapted to transport fluids carrying a percentage of solid matter; a tubular body having a straight bore substantially equal in diameter throughout to that of said pipe and a spill-port in the wall of substantially equal capacity of discharge at the pipe, a gate at said port having its under surface formed to slidably fit the exterior of said body, guides for the gate arranged on the body, and a stop-gate mounted in the body slightly beyond the said port whereby a chamber adapted to accumulate a portion of said matter is formed in the body when the stop-gate is closed.

5. In a valve of the nature indicated; the combination with a slidable gate; of a rack secured thereto, a pinion meshing with the rack and a shaft secured in the pinion, a stand adapted to support said pinion and consisting of oppositely-disposed semicircular bars having ears at each end and journals for said shaft in one pair of the ears and means to clamp said bars about the valve-body.

6. A valve of the nature indicated; comprising a tubular shell or body having a spill-port in the wall, a stop-gate disposed transversely said body slightly beyond said port, a gate at the spill-port having its under surface formed to slidably fit upon the exterior of said body and guides for said spill-gate secured to the body.

7. A valve of the nature indicated; comprising a tubular shell or body composed of sheet metal and having a spill-port in the wall adjacent one end, a stop-gate disposed transversely the body at said end, a gate at the spill-port comprising a section of sheet metal slidably fitting upon said body, a guide for the spill-gate secured to the body, and independently-operable means to adjust each gate.

8. A valve of the nature indicated; comprising a cylindrical shell or body composed of sheet metal and having a spill-port in the wall adjacent one end, a stop-gate disposed transversely the body at said end, a gate at the spill-port comprising a section of sheet metal bent to slidably fit the wall of said body, guides for said gate disposed longitudinally the body, and independently-operable means to adjust each gate.

9. A valve of the nature indicated; comprising a shell or body composed of a tubular section formed of semicircular plates of sheet metal and guide-strips secured along the abutting edges of said plates, a second tubular section overlapping the first at one end and formed with a portion cut away in prolongation of said guide-strips and a semicircular plate secured to said second section over the cut-away portion and having a spill-port formed therein, a gate comprising a semicircular plate slidably mounted in said guides and a stop-gate disposed transversely said body beyond the spill-port.

10. A valve of the nature indicated; comprising a shell or body composed of a tubular

section formed of semicircular plates of sheet metal and guide-strips secured along the abutting edges of said plates, a second tubular section overlapping the first at one end and
5 formed with a portion cut away in prolongation of said guides and a semicircular plate secured to said second section over the cut-away portion and having a spill-port formed therein, a gate comprising a semicircular
10 plateslidably mounted in said guides, a valve-seat disposed transversely the end of said body beyond the spill-port and comprising oppositely-disposed U-shaped sections each formed with a web connecting the stems and
15 an annular flange on the outer surface, a rib disposed adjacent the marginal edge of the seat between the sections, means to fasten said sections together and a gate comprising

a section of plate metal slidably mounted between said sections. 20

11. A valve of the nature described, comprising a tubular shell or body having a spill-port in the wall, a stop-gate disposed transversely of the body slightly beyond the said port, and a curved gate mounted on the body 25 at the spill-port adapted to conform to the shape of the tubular shell or body so as to give the valve-body at this point substantially the same area in cross-section that it has throughout its length. 30

Signed at Seattle, Washington, this 17th day of February, 1902.

CHARLES E. FOWLER.

Witnesses:

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