

March 15, 1932.

S. R. BLACKWELL

1,849,903

PUDDLING MACHINE

Filed Feb. 12, 1931

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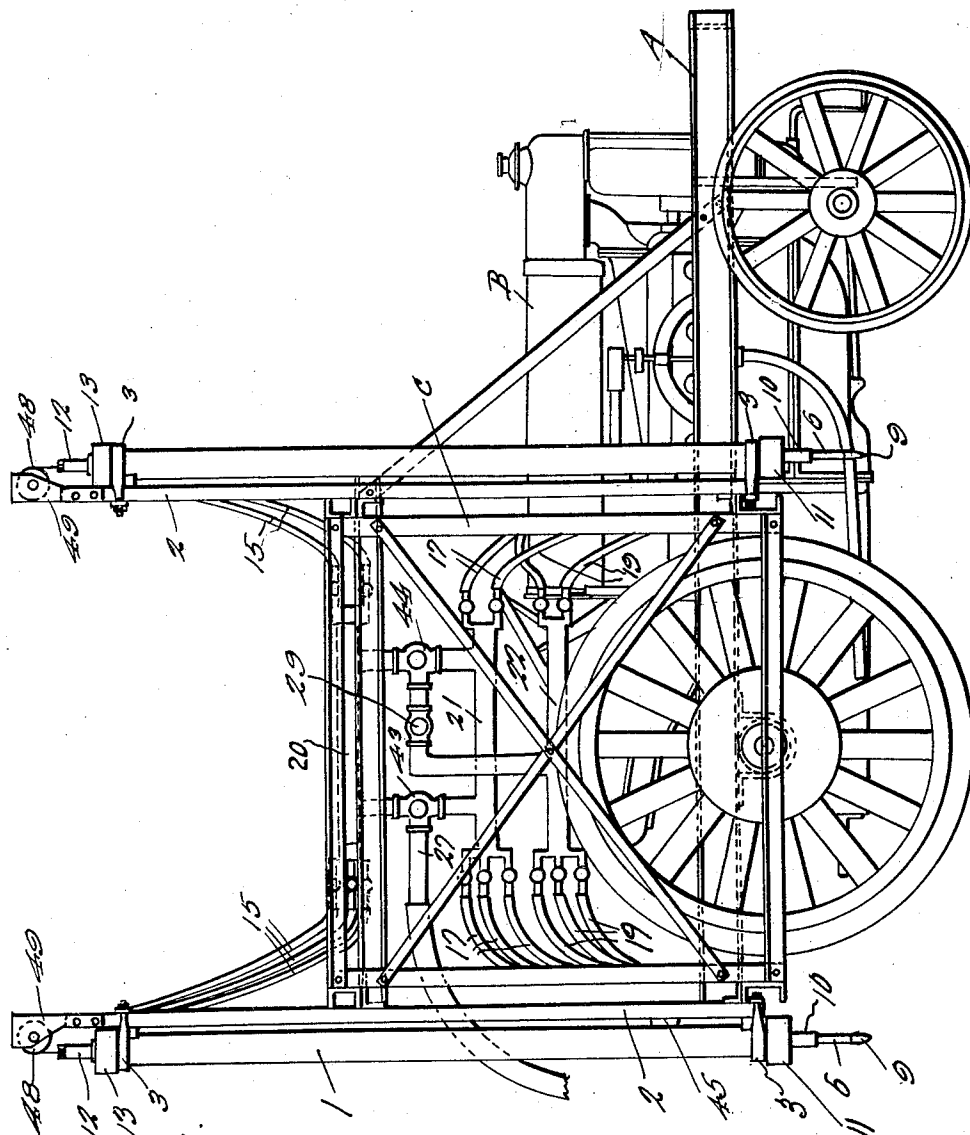


Fig. 1.

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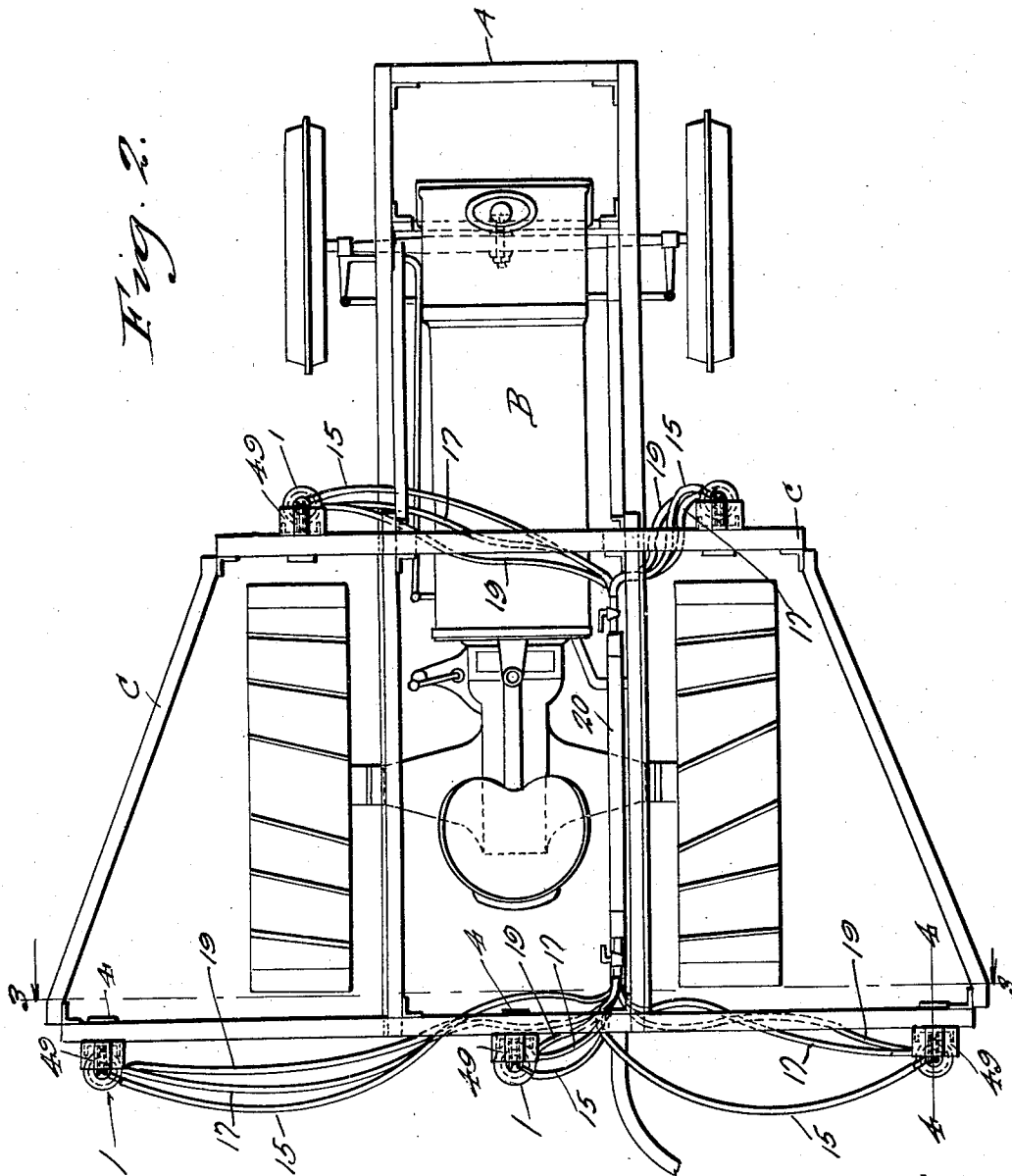
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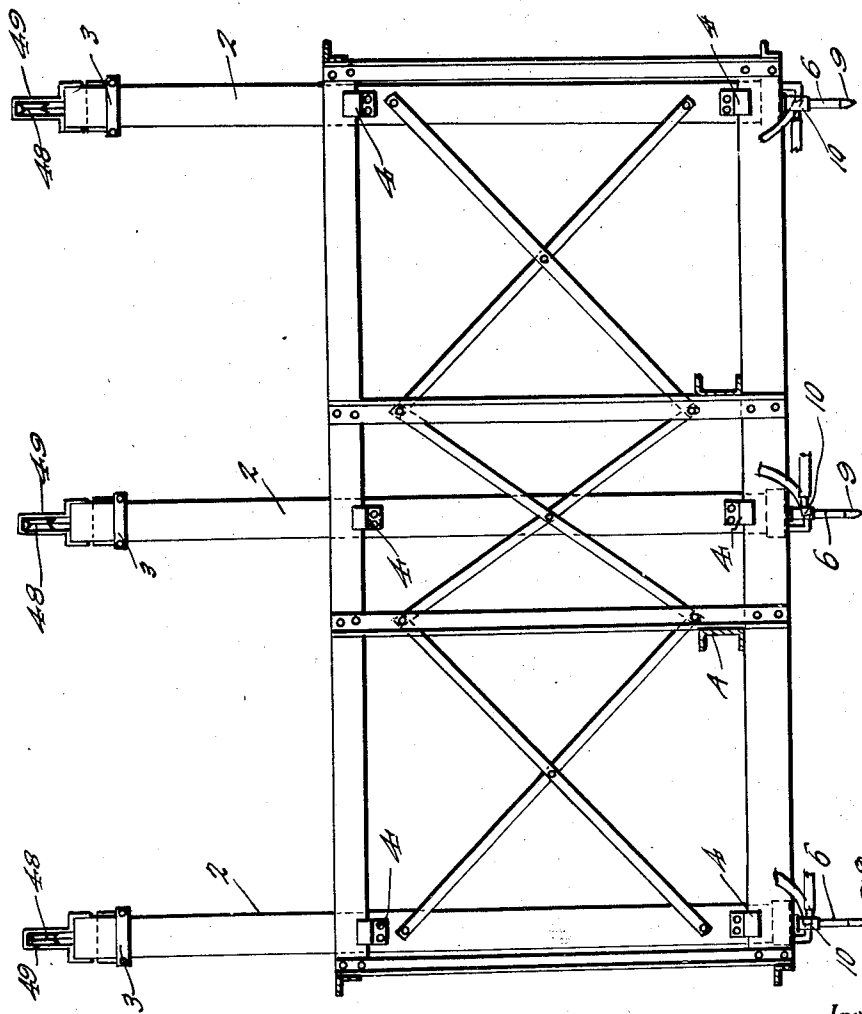
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Fig. 8.



Fig. 3.



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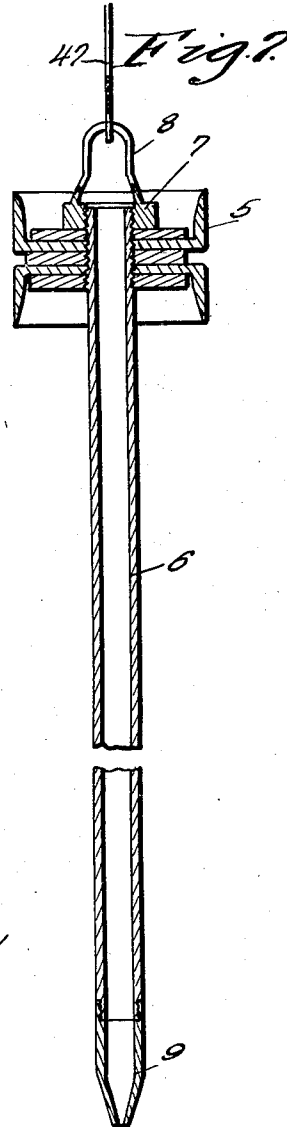
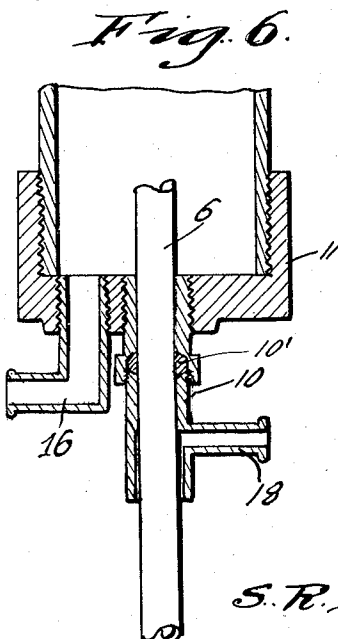
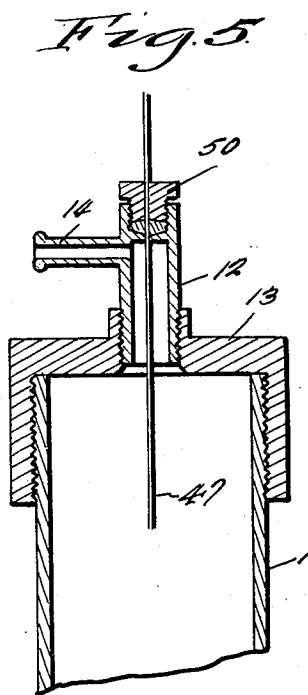
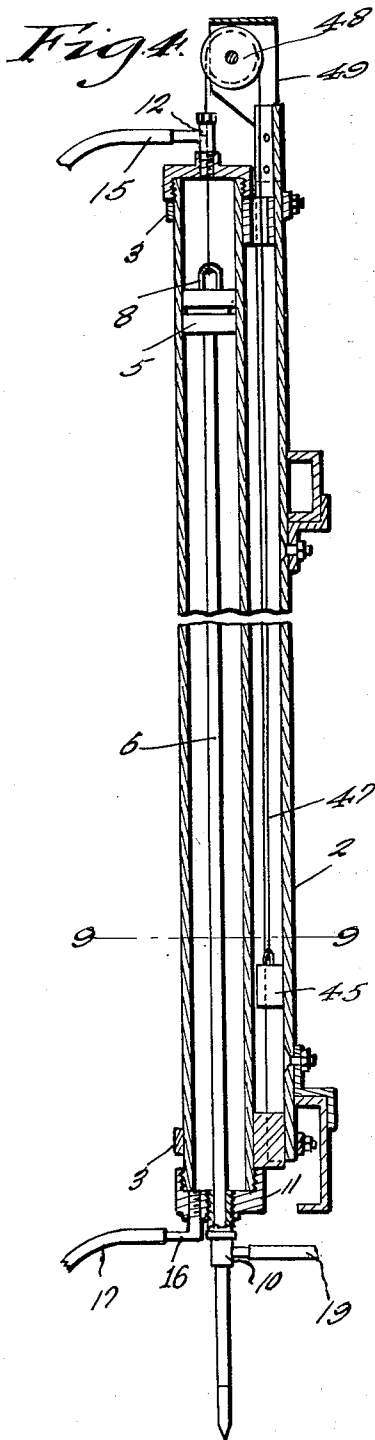
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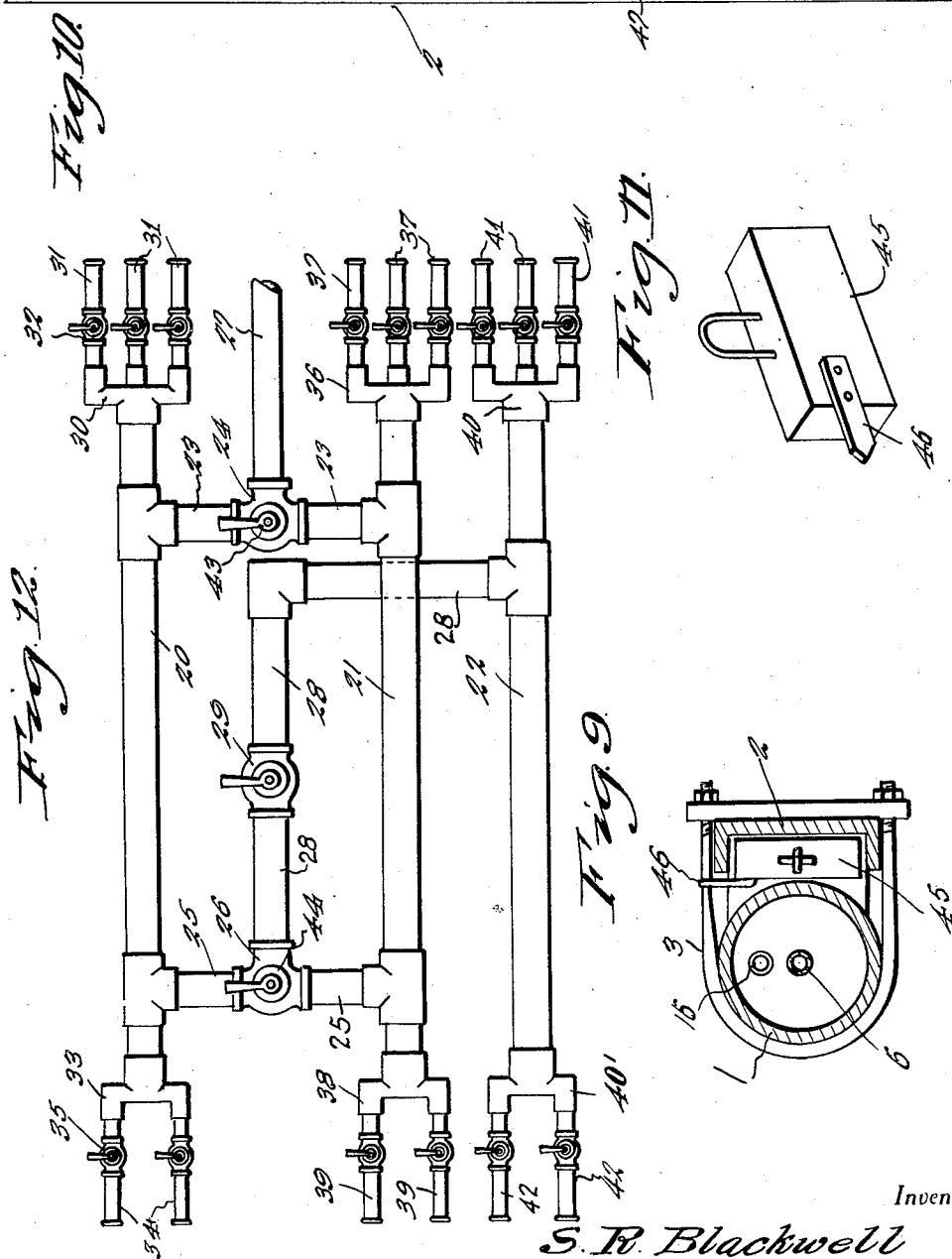
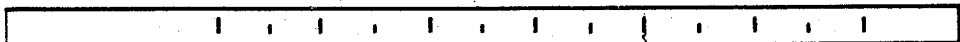
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PUDDLING MACHINE

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UNITED STATES PATENT OFFICE

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PUDDLING MACHINE

Application filed February 12, 1931. Serial No. 515,391.

This invention relates to a puddling machine for saturating and settling earth in highways and railroad fills, levies, etc., the general object of the invention being to provide a frame which may be placed on a tractor or the like, and which supports a plurality of cylinders, each of which contains a piston having a jet tube connected therewith and passing through the lower end of the cylinder, with means for introducing water into the top of the cylinder to force the piston and jet tube downwardly and cause water to flow through the jet tube, so that the lower end of the tube will penetrate the earth and the water will flow through the tube into the earth.

Another object of the invention is to provide means whereby water can be introduced in to either end of the cylinder to raise and lower the piston thereof, with valve means for permitting the water to flow from one end of the cylinder when the water is being introduced into the other end thereof, and means for regulating the flow of water from the lower end of the cylinder so that the water in the lower end of the cylinder acts as a cushion to control the downward movement of the piston.

Another object of the invention is to provide means whereby water flowing from the apparatus will be forced against the upward moving jet tube so as to clean the same and thus prevent dirt from being carried by the tube into the cylinder.

Another object of the invention is to so arrange the valve means of the apparatus that the water to and from the cylinders can be so controlled as to operate all the pistons or any desired number of pistons.

A further object of the invention is to provide indicator means for indicating the distance that each jet tube has entered the embankment or fill.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, ref-

erence will be had to the accompanying drawings wherein like characters of reference denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is an elevation of the apparatus placed on a tractor.

Fig. 2 is a plan view of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Fig. 5 is an enlarged sectional view of the upper end of one of the cylinders.

Fig. 6 is a similar view of the lower end of one of the cylinders.

Fig. 7 is a sectional view showing one of the pistons and its jet tube.

Fig. 8 is a view of the lower end of one of the jet tubes and showing the jet nozzle or cap separated from the tube.

Fig. 9 is a section on line 9—9 of Fig. 4.

Fig. 10 is a view of the scale strip.

Fig. 11 is a perspective view of one of the indicator weights.

Fig. 12 is a side view of the valve arrangement and the pipes for controlling the circulation of water to the cylinders.

In these drawings, the letter A indicates a horizontal frame supported by the tractor B and the letter C indicates an upright frame work supported on the rear part of the frame A. A plurality of cylinders 1 is supported by the framework, the drawings showing three cylinders at the rear of the frame work and two at the front thereof, but it will of course be understood that any desired number of cylinders can be used.

Each cylinder is connected to a channel member 2 by the clamps 3, the channel member being vertically arranged and connected to the frame work by the brackets 4 so that the cylinders can be readily removed from the frame work or adjusted thereon to different positions.

A piston 5 is located in the cylinder, each piston being of preferably the construction shown in Fig. 7. A jet tube 6 has its upper end passing through each piston and said upper end is preferably threaded through the piston and to the base 7 of the bail 8 so that the bail is connected with the piston.

A jet cap or nozzle 9 is threaded to the

lower end of the tube and said tube passes thru a sleeve 10 which has its upper end threaded in a hole formed in the center of the lower cap 11 of the cylinder. A sleeve 12 has its lower end threaded in a hole formed in the center of the top cap 13 of each cylinder and said sleeve is formed with a lateral nipple 14 for receiving one end of a hose 15.

An L-shaped nipple 16 is threaded in a hole in the bottom cap of each cylinder, for receiving a hose 17 and a nipple 18 is formed on the sleeve 10 of each cylinder for receiving one end of the hose 19.

Three horizontal and parallel pipes 20, 21 and 22 are supported by the frame work at one side thereof and the pipes 20 and 21 are connected together by the pipes 23 and the valve casing 24 and by the pipes 25 and the valve casing 26. A supply pipe 27 is connected with the valve casing 24, and the pipes 28 connects the valve casing 26 to the pipe 22, and one of these pipes 28 contains a valve casing 29.

A coupling 30 is connected with the rear end of the pipe 20 and carries the three nipples 31, each of which contains a valve 32. Each of these nipples 31 is connected by a hose 15 to the upper part of each of the three rear cylinders. A similar coupling 33 is connected with the forward end of the pipe 20 and carries the two nipples 34, each of which contains a valve 35. The nipples are connected by hose 15 to the upper ends of the two front cylinders. The pipe 21 has at its rear end a coupling 36 carrying three valve equipped nipples 37 which are connected by the hose 17 to the lower ends of the three rear cylinders and coupling 38 at the front and carries two valve equipped nipples 39 and has its nipples connected by hose 17 to the lower end of the two front cylinders.

The rear end of the pipe 22 has attached thereto a coupling 40, carrying three valve equipped nipples 41, connected by hose 19 to sleeves 10 at the lower ends of the three rear cylinders and a coupling 40' is connected with the front end of the pipe 22 and carries the two valve equipped nipples 42 which are connected by hose 19 to the sleeve 10 of the two front cylinders.

The valves 43 and 44 in the casings 24 and 26 are two-way valves so that the valve 43 can be turned from a position closing communication of the supply pipe 27 with the apparatus to a position where the water from the supply pipe will flow to one of the pipes 23 into the pipe 20 and to another position where the water from the supply pipe will flow through the other pipe 23 into the pipe 21.

The valve 44 can be moved to a position to place the pipe 28 into communication with either the pipe 20 or the pipe 21.

With the valves 43 and 44 in the position they occupy in Fig. 12, the water will flow

from the supply pipe 27 through the valve casing 24 and the upper tube 23 into the pipe 20, the upper pipe 25 being closed by the valve 44.

Thus the water flowing into the pipe 20 will flow through the couplings 30 and 33 and the nipples 31 and 34 connected to these couplings through the tubes or hose 15 to the upper end of the cylinders. This water flowing into the upper end of each cylinder will act on the piston 5 of the cylinder and force said piston and the jet tube downwardly and some of the water will pass through the tube 6 and its jet or nozzle 9 and thus enter the earth of the fill or embankment, and this flow of water from the nozzle or jet facilitate the downward movement of the tube and piston.

The water in the cylinder being displaced by the downward moving pistons flows through the hose or tubes 17 into the nipples at the ends of the pipe 21 through the lower pipe 25, valve casing 26, into the pipes 28 and from these pipes 28 the water will flow into the pipe 22 through the nipples carried by the couplings 40 and 41 into the hose 19 and escape through the sleeves 10 at the lower ends of the cylinders, so that this water will wash any dirt or mud sticking to the tubes and thus prevent this dirt or mud from entering the cylinders.

When the cylinders are to be raised, the valves 43 and 44 are reversed from the position they occupy in Fig. 12, so that the water from the supply pipe 27 will pass through the casing 24, through the lower pipe 23 into the pipe 21 and thus pass thru the couplings 36 and 38 and their nipples and through the tubes or hose 17 into the bottom of the cylinders so as to force the pistons therein upwardly.

The water forced from the cylinders by the upward moving pistons will flow through the hose 16 and through the couplings 30 and 33 and their nipples into the pipe 20 and through the upper pipe 25 and valve casing 26 into the pipe 28 into pipe 22 and thus this water will pass through the couplings 40 and 41 and their nipples, and the hose 19 through the sleeves 10.

By adjusting the valve 29, the flow of water from the lower ends of the cylinders can be regulated, so that the water in the lower end of the cylinders can be used as a check for the downward moving pistons.

By providing a valve in each of the nipples carried by the coupling, any desired cylinder or a number of cylinders can be rendered inactive by closing the valve leading to the said cylinder or cylinders which controls the circulation of the water to such cylinder or cylinders.

A weight 45 is slidably arranged in the channel members 2 and carries a pointer 46 cooperating with a scale strip 47 which is

connected with one side of each of the members 2. One end of the flexible member 47 is connected with said weight, and this member passes over the pulley 48 supported in a bracket 49 at the top of the member 2 and then the cable passes through a packing gland 50 in the top of the sleeve 12 through the sleeve where it is connected with the bail 8 of the piston. Thus movement of the piston will be communicated to the weight, and the pointer 46 on the weight cooperating with the scale 47 will indicate the distance the jet tube has entered the embankment or fill.

The sleeve 10 is provided with a packing 15 and the pressure in supply pipe 27 should be sufficient to cause the water plowing from such jet to cut the earth away from the jet point so that the water will not interfere with the downward movement of the jet tubes.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

Having thus described my invention, what I claim as new is:—

1. A puddling machine comprising a vertically arranged cylinder, a piston therein, a jet tube having its upper end connected to the piston and passing through the same, said tube passing through the lower end of the cylinder, a pipe connected with the upper end of the cylinder, a pipe connected with the lower end thereof, means for introducing water into one pipe and discharging it from the other and vice versa to lower and raise the piston, the water introduced into the upper end of the cylinder flowing through the tube, a sleeve at the lower end of the cylinder through which the tube passes, a pipe in communication with the bore of the sleeve and means for causing the water discharged from both ends of the cylinder to flow into said pipe, and means for indicating the amount of movement of the piston whereby the amount of penetration of the tube in the earth will be indicated.

2. A puddling machine comprising a wheel supported frame, a number of vertically arranged cylinders at the rear of said frame, a number of vertically arranged cylinders in front of said frame, a piston in each cylinder, a jet tube connected with the piston and having its upper end passing through the piston, the tube passing through the lower end of the cylinder, a tube connected with the upper ends of each cylinder, a tube connected with the lower end thereof, a manifold pipe having a number of branches at each end thereof, each branch at one end being connected to the

tubes which are connected with the upper ends of the front cylinders, and the branches at the other end of the manifold being connected with the tubes which are connected with the upper ends of the rear cylinders, a second manifold having branches at its ends connected with the tubes leading to the lower ends of the front and rear cylinders, a supply pipe, valve means for connecting the supply pipe with either one of the manifold pipes, a discharge pipe, and valve means connecting either manifold pipe with the discharge pipe.

3. A puddling machine comprising a wheel supported frame, a number of vertically arranged cylinders at the rear of said frame, a number of vertically arranged cylinders in front of said frame, a piston in each cylinder, a jet tube connected with the piston and having its upper end passing through the piston, the tube passing through the lower end of the cylinder, a tube connected with the upper end of each cylinder, a tube connected with the lower end thereof, a manifold pipe having a number of branches at each end thereof, each branch at one end being connected to the tubes which are connected with the upper ends of the front cylinders, and the branches at the other end of the manifold being connected with the tubes which are connected with the upper ends of the rear cylinders, a second manifold having branches at its ends connected with the tubes leading to the lower ends of the front and rear cylinders, a supply pipe, valve means for connecting the supply pipe with either one of the manifold pipes, a discharge pipe, and valve means connecting either manifold pipe with the discharge pipe, and a valve in the discharge pipe for regulating the flow of water from the lower ends of the cylinders whereby said water will act as check means for the downward moving pistons.

4. A puddling machine comprising a wheel supported frame, a number of vertically arranged cylinders at the rear of said frame, a number of vertically arranged cylinders in front of said frame, a piston in each cylinder, a jet tube connected with the piston and having its upper end passing through the piston, the tube passing through the lower end of the cylinder, a tube connected with the upper end of each cylinder, a tube connected with the lower end thereof, a manifold pipe having a number of branches at each end thereof, each branch at one end being connected to the tubes which are connected with the upper ends of the front cylinders, and the branches at the other end of the manifold being connected with the tubes which are connected with the upper ends of the rear cylinders, a second manifold having branches at its ends connected with the tubes leading to the lower ends of the front and rear cylinders, a supply pipe, valve means for connect-

ing the supply pipe with either one of the manifold pipes, a discharge pipe, valve means connecting either manifold pipe with the discharge pipe, a valve in the discharge pipe for regulating the flow of water from the lower ends of the cylinders whereby said water will act as check means for the downward moving pistons, and a valve in each branch of each manifold.

5. A puddling machine comprising a wheel supported frame, a number of vertically arranged cylinders at the rear of said frame, a number of vertically arranged cylinders in front of said frame, a piston in each cylinder, a jet tube connected with the piston and having its upper end passing through the piston, the tube passing through the lower end of the cylinder, a tube connected with the upper ends of each cylinder, a tube connected with the lower end thereof, a manifold pipe having a number of branches at each end thereof, each branch at one end being connected to the tubes which are connected with the upper ends of the front cylinders, the branches at the other end of the manifold being connected with the tubes which are connected with the upper ends of the rear cylinders, a second manifold having branches at its ends connected with the tubes leading to the lower ends of the front and rear cylinders, a supply pipe, valve means for connecting the supply pipe with either one of the manifold pipes, a discharge pipe, valve means connecting either manifold pipe with the discharge pipe, a valve in the discharge pipe for regulating the flow of water from the lower ends of the cylinders whereby said water will act as check means for the downward moving pistons, a valve in each branch of each manifold, and means whereby the water from the discharge pipe is conveyed to points adjacent the lower ends of the cylinders to contact the tubes below the cylinders.

6. A puddling machine comprising a wheel supported frame, a number of vertically arranged cylinders at the rear of said frame, a number of vertically arranged cylinders, at the front of the frame, a piston in each cylinder, a jet tube connected with the piston and having its upper end passing through the piston, the tubes passing through the lower ends of the cylinders, a tube connected with the upper ends of each cylinder, a tube connected with the lower end thereof, a manifold pipe having a number of branches at each end thereof, each branch at one end being connected to the tubes which are connected with the upper ends of the front cylinders, the branches at the other end of the manifold being connected with the tubes which are connected with the upper ends of the rear cylinders, a second manifold having branches at its ends connected with the tubes leading to the lower

ends of the front and rear cylinders, a supply pipe, valve means for connecting the supply pipe with either one of the manifold pipes, a discharge pipe, valve means connecting either manifold pipe with the discharge pipe, a valve in the discharge pipe for regulating the flow of water from the lower ends of the cylinders whereby said water will act as check means for the downward moving pistons, a valve in each branch of each manifold, means whereby the water from the discharge pipe is conveyed to points adjacent the lower ends of the cylinders to contact the tubes below the cylinders, and indicator means for each cylinder to indicate the amount of penetration of the jet tubes.

In testimony whereof I affix my signature.

STEPHEN ROY BLACKWELL.

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