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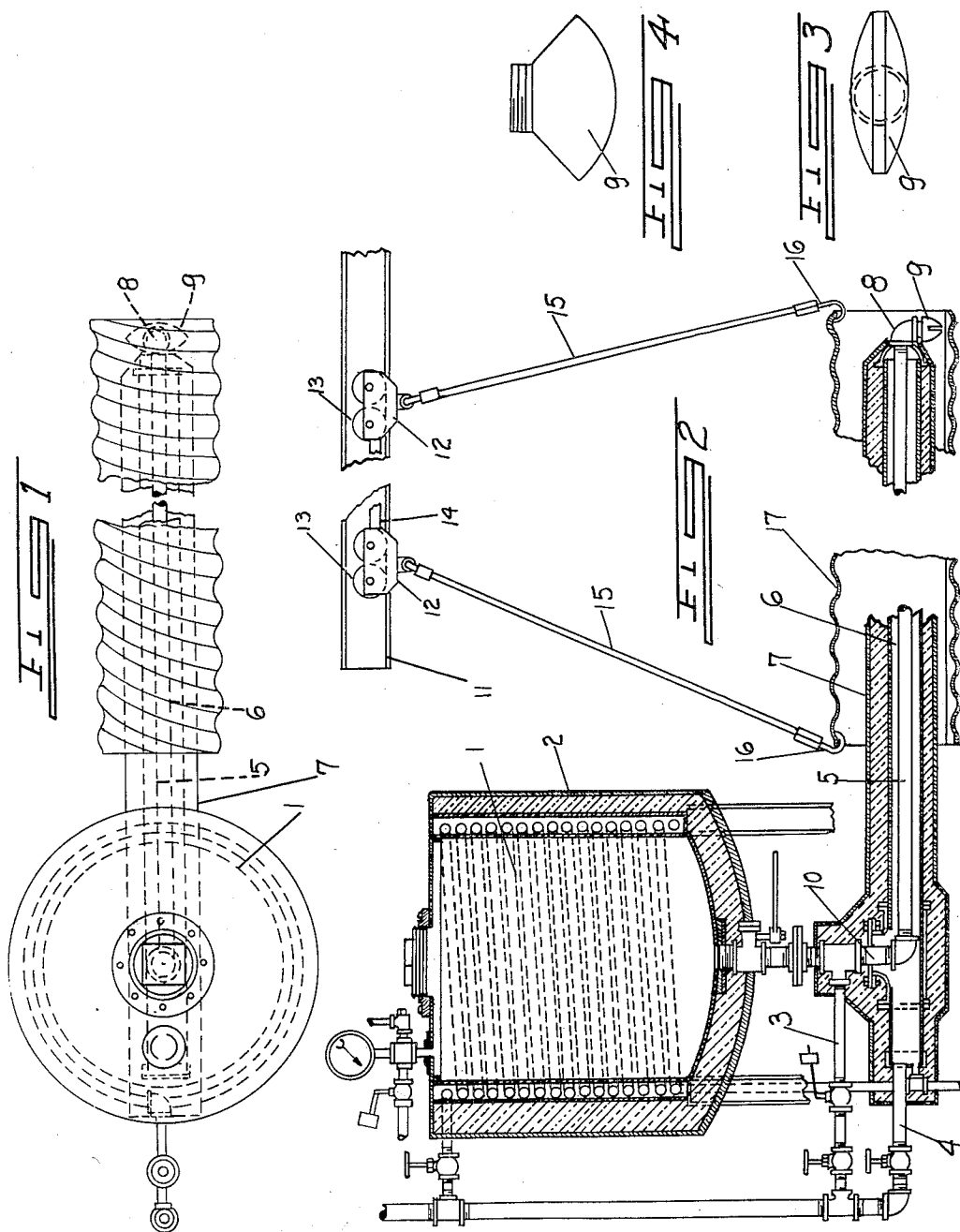
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MACHINE FOR INTERNALLY COATING CULVERT PIPES

Filed Aug. 5, 1925

2 Sheets-Sheet 1



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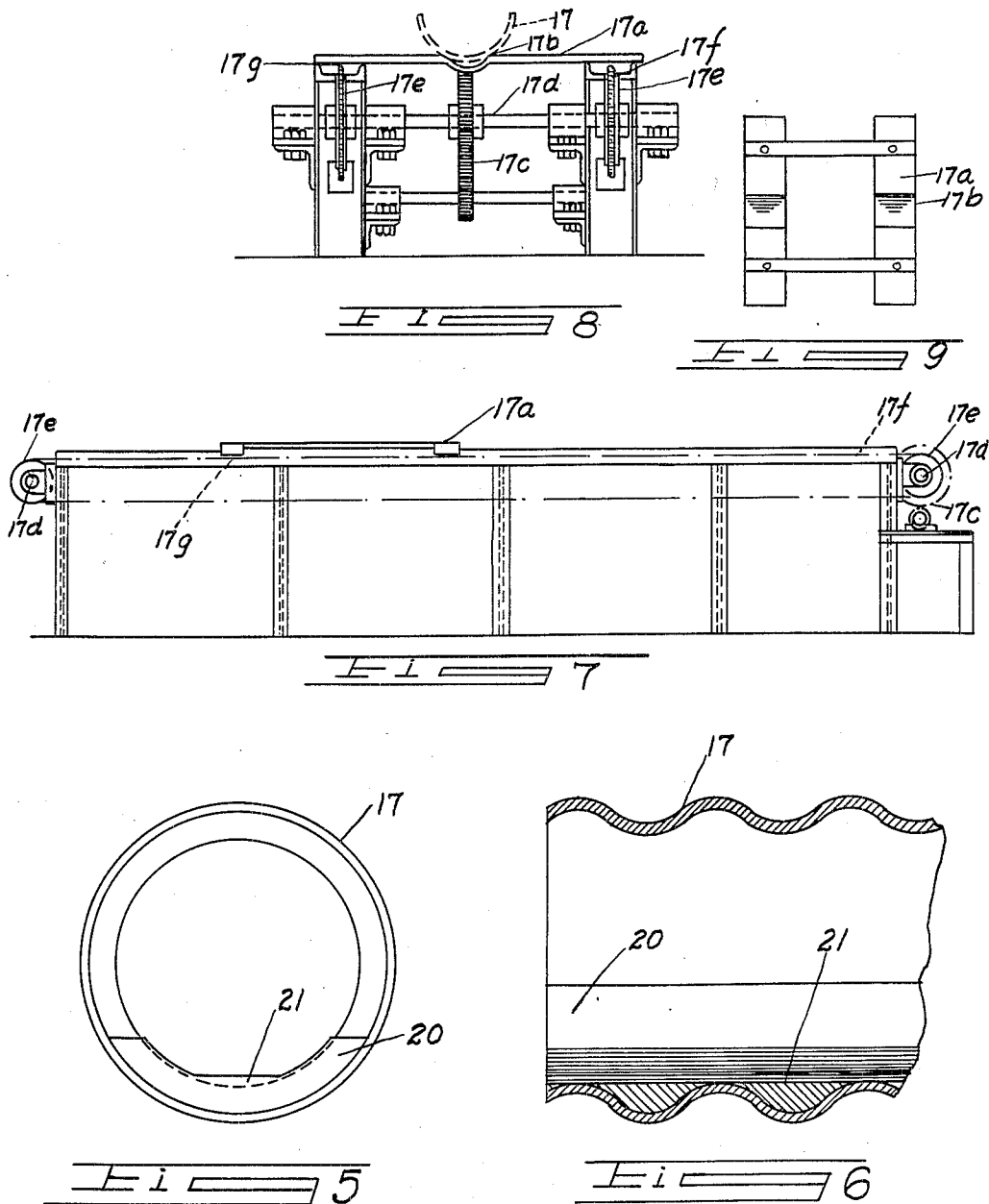
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MACHINE FOR INTERNALLY COATING CULVERT PIPES

Application filed August 5, 1925. Serial No. 48,400.

My invention relates to devices for forming a specific form of internal coating in culvert pipes, particularly corrugated culverts.

Dr. Allerton S. Cushman in his application for patent Serial No. 9,021, filed February 13, 1925, describes a method of safeguarding corrugated culverts from abrasion by materials such as sand, pebbles, and the like, which are carried through the culverts by surface water.

The particular coating advanced by Dr. Cushman was to flow into the culvert a film of an asphaltic or bituminous material which would coat a portion of the sides of the pipe, and would settle in a level pool in the bottom of the pipe so as to form a level floor. The filling up of the corrugations in this manner in no way cuts down the strength of the pipe, and at the same time prevents the eddying of water over the bottoms of the corrugated pipes, and provides a smooth floor, without ledges, over which the sand, pebbles and the like pass without harming the metallic portion of the culvert, and, if the asphalt is of the proper quality, without breaking down the asphaltic floor to the culvert.

It is a problem of considerable difficulty to get a proper Cushman floor in a corrugated culvert because the pipes are long, and flow must be regulated and maintained, and temperatures controlled to the end that the proper asphaltic culvert floor will be provided. It is my object to provide a mechanism for this purpose, and to that end my invention is directed.

I accomplish my object by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings,

Figure 1 is a plan or top view of the device.

Figure 2 is a central vertical section thereof.

Figure 3 is a horizontal plan or bottom view of the nozzle.

Figure 4 is an end elevation of the nozzle.

Figure 5 is an end elevation of a culvert pipe having an asphaltic floor.

Figure 6 is a cross section of a portion of a

coated pipe showing the extent of the asphaltic floor.

Figure 7 is a side elevation of an alternate method of supporting the culvert pipe.

Figure 8 is an end elevation of the traction table illustrated in Figure 7.

Figure 9 is a plan view of the table shown in Figures 7 and 8.

It will be understood that while the connections shown for the several heating elements of my device are for steam, other means of heating will serve the same purpose.

A vessel or tank 2 with a steam coil 1 for heating it is filled with a suitable bitumen, such as a properly blended asphaltic. The steam or hot air pipes for heating the coil have a connection 3 to the coil and a connection 4 to the nozzle arm.

The nozzle arm is formed of a stiff, long pipe 5, which extends far enough from the tank to permit a culvert pipe to be placed over it. This pipe is surrounded by another pipe 6 which acts as a jacket, and into which the connection 4 is inserted. A covering 7 of heat insulating material is mounted over the pipe arrangement, so as to be spaced therefrom, and the whole nozzle pipe assembly projects outwardly from the tank without support except near the tank.

The nozzle at the end of the pipe 5 is formed with an L-shaped body 8, and a fan-shaped lower portion 9, in which a slot is cut to act as the jet-forming device. A fan-shaped spray of liquid asphalt is projected from this nozzle in a downward direction.

A pipe connection 10 connects the pipe 5 to the interior of the asphaltic tank.

A suitable mechanical device to support the culvert pipe is indicated in Figure 2.

In this device an overhead track 11 is provided, formed of suitable beams, and on this track a double truck trolley device is carried. This device is formed of two trucks 12 having trolley wheels 13, that engage the track. The trucks are connected by a bar 14, so that their spacing is fixed. Cables 15 hung from each truck are provided with hooks 16, to engage and support a culvert pipe 17, that is to be treated.

Another suitable means for supporting and moving the culvert pipe is indicated in Figures 7, 8 and 9. In this structure the pipe 17 is supported on a carrying frame 17a with a groove 17b in which the round outer periphery of the pipe rests. Suitable power is supplied to a train of gears 17c which rotate a shaft 17d on which sprocket wheels 17e are mounted. A chain 17f may be engaged with the sprockets and secured to the table as at 17g so that longitudinal movement may be imparted to the carrying frame by the rotary movement of the gear train.

The operator arranges the culvert pipe in position of being supported by the mechanical carrying device and in case the double truck trolley device is used, the culvert will then be in the position illustrated in Figures 1 and 2, and with the nozzle at what may be considered the outer end of the culvert. The operator then admits the asphaltic into the nozzle pipe, and asphaltic liquid will be discharged in a fan-shaped spray against the inside lower portion of the culvert. A film of the asphalt will adhere to the sides of the culvert and the surplus will flow down into the corrugations at the bottom of the culvert, forming a flat floor across the bottom on the inner side, and filling the bottoms of the corrugations as will be further described.

The operator now operates the carrying device to move the pipe slowly enough to get the correct amount uniformly distributed throughout the length of the pipe.

Due to the discharge pipe being enveloped in a heated jacket the asphaltic compound will be in liquid state, in which condition it is maintained by the outer insulation around the pipe.

As illustrated in Figures 5 and 6, the asphaltic film 20 will cover the sides of the pipe, part of the way up, and the body 21 of the asphaltic compound, flowing by gravity to the base of the pipe, will fill up and cover the corrugations at this point and form a level floor of asphalt as shown at 21, which as previously described does away with practically all of the abrasion due to use of the culvert for drainage purposes.

The mechanical devices for carrying the culvert pipe while being coated can be adjusted for the smallest diameters of culvert and the nozzle pipe for the greatest length of pipe. When a culvert of larger diameter is being coated, the bottom of the culvert will be further from the nozzle, and in a larger culvert a larger spread in the asphaltic spray is also desirable.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a machine for internally coating culverts, the combination with a source of supply of heated bitumen, such as an asphaltic

compound, a pipe projecting from the said supply sufficiently for a culvert to be placed over it, a nozzle device on the pipe located at the end thereof, and adapted to coat in one operation a substantial arc of the inside circumference of said culvert but less than half thereof, means for heating the said pipe, and means for insulating the outside of the heated pipe for the retention of the heat necessary to keep the bitumen in the proper liquid state without overheating the culvert.

2. In a machine for internally coating culverts, the combination with a source of supply of heated bitumen, such as an asphaltic compound, a pipe projecting from the said supply sufficiently for a culvert to be placed over it, a spraying device connected with the end of said pipe for projecting a downward spray of the bitumen, a support movable in the line of said pipe, and means on the support for supporting in a culvert pipe in a horizontal plane, and moving the culvert pipe with relation to the spraying device, and means for inhibiting a rotary movement of said culvert pipe.

3. In a machine for internally coating culverts, the combination with a source of supply of heated bitumen, such as an asphaltic compound, a pipe projecting from the said supply sufficiently for a culvert to be placed over it, a spraying device at the outer end of said pipe for projecting a downward spray of the bitumen, a support movable in the line of said pipe, and means on the support for supporting a culvert pipe in a horizontal plane, with means of moving the support and the culvert pipe with relation to the spraying device, said means adapted to move the culvert pipe longitudinally, while inhibiting a rotary motion thereof.

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