

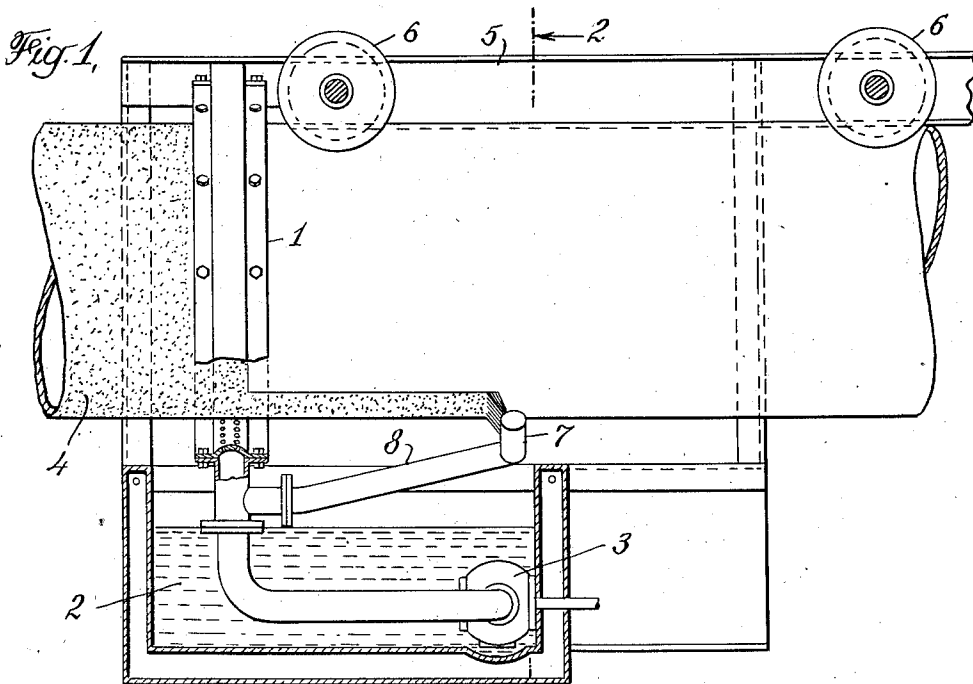
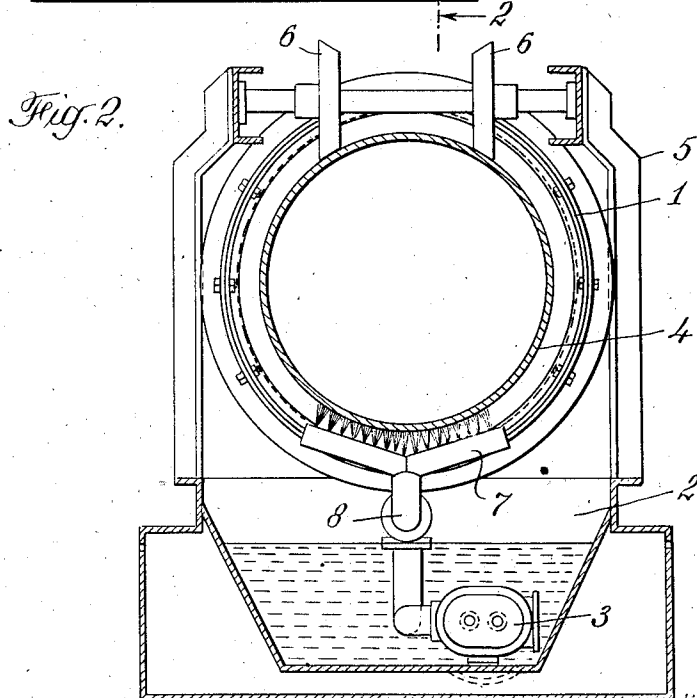
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METHOD FOR COATING PIPE

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METHOD FOR COATING PIPE

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In my Patent No. 2,288,316, June 30, 1942, I have described a method and apparatus for coating metal pipe with hot, liquid bitumen. The apparatus comprises generally a jet ring encircling the pipe and provided with a plurality of jet orifices extending about its inner face. The hot liquid bitumen is pumped under pressure from an open air-jacketed sump below the ring, and, through the jet orifices, against the pipe in a plurality of fine radial streams, the excess draining back into the sump. The molten bitumen is poured into the sump at the desired temperature and viscosity and maintained in that condition by means of hot air forced through the annular air-jacket and thence through the air-jacket of the sump. The ring and its connections are supported upon a carriage designed to move upon the pipe being coated. Although this method and apparatus represent a great improvement over prior methods and apparatuses for coating pipe with bitumen, some difficulty has been experienced in obtaining perfect coats on the bottom surfaces of the pipe. Excess bitumen flowing from the pipe and dripping from the under surface congeals, forming projecting teats. Sometimes small craters form between the teats and extend through the coat to the pipe itself. Thus despite the teats, the effective coat on the bottom of the pipe is thinner and of poorer quality than that on the top and sides.

I have discovered that by applying a preliminary coat of bitumen to the under side of the pipe in advance of the coat applied by the jet ring, the craters are eliminated, the number of teats considerably reduced, and a more uniformly coated pipe is produced. I have found that this preliminary coat may be applied by means of an auxiliary, multiple jet nozzle lying in advance of the jet ring, but not beyond the forward wall of the sump, through which jets of bitumen are forced upwardly over the under side of the pipe along a strip extending about 35° on each side of the center. Bitumen is supplied to the auxiliary nozzle through an upwardly sloping pipe branching from the pump line just below the jet ring.

In the accompanying drawing I have illustrated an apparatus for performing the method of my invention. In the drawing Figure 1 is a side elevation of a pipe coating apparatus provided with an auxiliary, multiple jet nozzle, mounted upon a pipe to be coated, and Figure 2 is a transverse section of the apparatus taken along line 2-2 of Figure 1. In these figures the driving means for the carriage and the furnace for supplying hot air to the air-jackets are not shown; nor are

the air-jackets shown in any detail. For these, the reader may refer to my Patent No. 2,288,316.

The jet ring, by means of which the pipe is coated about its periphery, is indicated by the reference character 1. This ring receives molten bitumen from a sump 2 in which is mounted a pump 3 which forces hot liquid bitumen into an annular duct within the ring, through a plurality of circumferentially spaced orifices and against the pipe 4 which is of metal, usually steel, in a number of radial jets the excess draining back into the sump. The bitumen in the sump and in the duct is maintained in liquid condition by means of hot air chambers with which both the sump and the ring are provided, as set forth in some detail in my patent. The jet ring and sump are mounted upon a carriage 5 supported and driven by two pairs of wheels 6, designed to run upon the pipe as a trackway. The movement of the carriage, as it is illustrated in Figure 1 is to the right so that the wheels roll over the uncoated pipe. The foregoing constitutes a brief description of the pipe coating machine illustrated in my patent.

In accordance with the present invention I apply a strip of bituminous coating to the bottom of the pipe in advance of the main coating operation. This is done, when using the apparatus illustrated, by means of the jet auxiliary, multiple jet nozzle 7 extending forwardly of the jet ring and below the pipe 4 and supported by a pipe 8 sloping downwardly from the nozzle to a point of juncture with the pump line. The nozzle 7 is provided with a plurality of upwardly and backwardly facing orifices through which jets of bitumen are squirted upon the lower face of the pipe over an arc extending approximately 35° on either side of the vertical center line of the pipe, as shown most clearly in Figure 2. The hot liquid bitumen is forced through the orifices of the nozzle by means of the pump 3.

Although the jet ring and sump are provided with hot-air jackets to maintain the bitumen in liquid condition and prevent clogging of the jet orifices of the ring, I have found that the auxiliary jet nozzle need not be air-jacketed. In its sheltered position below the pipe and above the sump, the auxiliary nozzle does not tend to clog and when the pump is stopped any bitumen in the nozzle and its connections immediately flows back into the sump through the downwardly sloping pipe 8. In any event, the nozzle and its pipe 8 can be readily detached and cleaned if, for any reason, clogging should occur.

In operation, as the carriage 5 is moved to the

right along the pipe 4, as shown in Figure 1, hot liquid bitumen is forced through the auxiliary, multiple nozzle against the bottom of the pipe so that a strip of coating is applied along the bottom in advance of the application of the main coat through the jet ring. This main coat is applied very soon after the preliminary bottom coat, and as the jet ring applies a coat around the periphery of the pipe, the bottom is coated twice. While it is not absolutely necessary that the location of the nozzle be such that the material is still hot or semi-liquid when the second coat is applied, it is desirable for the reason that it tends to make for better fusion of the two coats of bitumen and does not permit any foreign substance to come between the two applications. By means of this double coating operation it is possible to obtain a substantially uniform thickness of bitumen around the full circumference of the pipe.

This application is a division of my application Serial No. 415,273 filed October 16, 1941, issued as Patent No. 2,347,316, April 25, 1944, in which I have claimed the apparatus illustrated and described herein.

I claim:

1. The method of coating metal pipe with hot

liquid bitumen which comprises applying a strip of coating to the bottom of the pipe and then projecting a second coat over the entire periphery of the pipe.

5 2. The method of coating metal pipe with hot liquid bitumen which comprises applying a strip of coating to the bottom of the pipe and then coating the entire periphery of the pipe by means of jets.

10 3. The method of coating metal pipe with hot liquid bitumen which comprises applying a strip of coating to the bottom of the pipe by means of upwardly directed jets, and then applying a coat by means of a plurality of radial jets impinging upon the pipe about its periphery.

15 4. The method of coating metal pipe with hot liquid bitumen which comprises applying a strip of coating to the bottom of the pipe by means of upwardly directed jets while effecting a relative movement of the pipe and the jets longitudinally of the pipe, and then applying a coat by means of a plurality of radial jets impinging upon the pipe about its periphery, the radial jets being spaced from the strip-applying jets and following them
25 in the relative movement.

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