Our invention is directed to improvements in air drying equipment, and has for some of its objects the provision of a method of and apparatus for drying air which is relatively inexpensive to install and operate, remarkably rapid and efficient in operation and which can be operated continuously when desired over extended periods of time.

The invention is adapted for many uses, in fact for all uses practically where dry air is to be supplied continuously or intermittently as desired.

One field for which our invention is particularly well adapted, however, is in the drying of pipe lines of electric cable systems. A well known type of electric cable system comprises a relatively large metal pipe line into which the cable conductors, sheathed in oil permeable material such as paper insulation, are drawn. The pipe line is then filled with oil which is thereafter maintained at suprathermophetic pressure. It is essential that this pipe line be thoroughly dry before the conductors and oil are placed therein, the presence of water, even although in minute quantities, eventually causing breakdown.

The present invention is ideal in this connection inasmuch as the dried air as it is being produced by our method and equipment can be passed continuously through the pipe line and the air being in a thoroughly dry condition is highly hygroscopic and will readily take up any moisture within the pipe line. This very materially speeds up installation of the cable system thereby effecting appreciable savings in installation costs, with the production of a much more perfect job. Under present methods of installing these systems it is customary to drag cloth swabs through the pipe line and to pass heated air through the line. By such methods it does not appear to be possible thoroughly to dry the line. The swabs cannot reach and remove all of the water deposited in and on the walls of the pipe line, while moisture contained in the heated air condenses out as the hot air strikes the relatively cool walls of the line.

An embodiment of our invention has been illustrated in part sectional elevation in the accompanying drawing.

Referring to the drawing in detail: In the embodiment illustrated our invention comprises an air drying chamber 2 which is supplied by air compressor 4 when our apparatus is in operation. In the line 5 leading from the compressor to the bottom of the drying chamber we provide water extractor 8 to catch the moisture condensing out of the air to be processed on its passage to the drying chamber. The air to be dried is compressed appreciably by the compressor 4 and as a result considerable moisture is removed in the extractor 8 before the partially dried air goes into the drying chamber 2. The compressor 4 places the air under a pressure as high as say one hundred and fifty pounds per square inch. This effect a concentration of the moisture contained in the air so that considerable moisture will be precipitated in the extractor 8.

The drying chamber 2 as illustrated, takes the form of an elongated closed tank. Within the drying chamber and extending practically the full length of the same is a cooling coil 10, a suitable coolant such as any of the well know refrigerants being circulated through this cooling coil by refrigerating unit 12.

Packed about the coil 10 is a suitable heat conducting material such as metal wool, bronze wool, for instance, which we have designated 14. The capacity of the cooling coil is sufficient to maintain the wool 14 at a temperature at least as low as the dewpoint of any moisture entrained in the air being processed.

Leading from the top of the drying chamber 2 is outlet or discharge pipe 16. In this line we provide an Aridifier 18, which may be of the well known commercial type, the processed air passing out of the top of the Aridifier to use. For example, in installing a cable system such as that above referred to, the dried air as it discharges from the Aridifier 18 is passed directly into the pipe line to be dried.

Traps 20 are provided for the moisture taken out of the air in its passage through the extractor 8 and the drying chamber 2, while another trap 22 is provided for moisture extracted by the Aridifier 18. These traps are all conveniently connected to a water drain line 21.

In operation the air to be dried is maintained under pressure in the compressor tank 24, the pressure employed being of the order of 150 lbs. per sq. in. With the refrigerating unit 12 and Aridifier 18 in operation, the valve 26 in the discharge line from the extractor 8 is cracked to allow the compressed air to expand into the drying chamber. By compressing the air, considerable moisture is removed therefrom before it passes to the drying chamber 2, because of moisture concentration due to the 10:1, for example, reduction in volume of the air. As the compressed, partially dried air expands into the drying chamber 2 toward the outlet thereof it must...
pass through the voids in the wool mass 14. This wool, as above pointed out is chilled by the cooling coil 10 to a temperature at least as low as the dewpoint of any moisture remaining entrained in the air, so that this moisture will condense and be deposited upon the wool. Any traces of moisture remaining in the processed air as it leaves the drying chamber is removed by the Aridifier 18 and the now thoroughly dry air may then pass by conduit 23 into and through a pipe line which is to be dried as above explained, or to any other use desired.

From time to time the equipment may be shut down to permit of the moisture removed from the air to be drained off at the traps 20 and water drain line 21.

From all of the foregoing it will be seen that we have provided an exceedingly simple process and apparatus for drying air, which is rapid and efficient in operation, which does not deteriorate or lose its effectiveness in use, and which may be operated over long periods of time.

It is to be understood that changes may be made in the details of construction and arrangement of parts hereinabove described without departing from the spirit and scope of the invention.

What we claim is:

In apparatus for drying pipe lines, the combination of an air-drying tank, an air compressor and cooperating compressed air tank for supplying compressed air to said air-drying tank, a refrigerating unit, coils therefor positioned in said air-drying tank, and metal wool packed about said refrigerating coils, the capacity of the refrigerating coils being such as to maintain the metal wool at a temperature at least as low as the dewpoint of any moisture entrained in the air supplied to the air-drying tank from the compressed air tank so that this moisture will condense and deposit upon the wool, and an outlet from the air-drying tank for the passage of the processed air to a pipe to be dried.

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