(No Model.)

F. O. MATTHIESSEN.

APPARATUS FOR KEEPING COOL THE SHAFT BEARINGS IN MILLS.

No. 270,237. Patented Jan. 9, 1883.

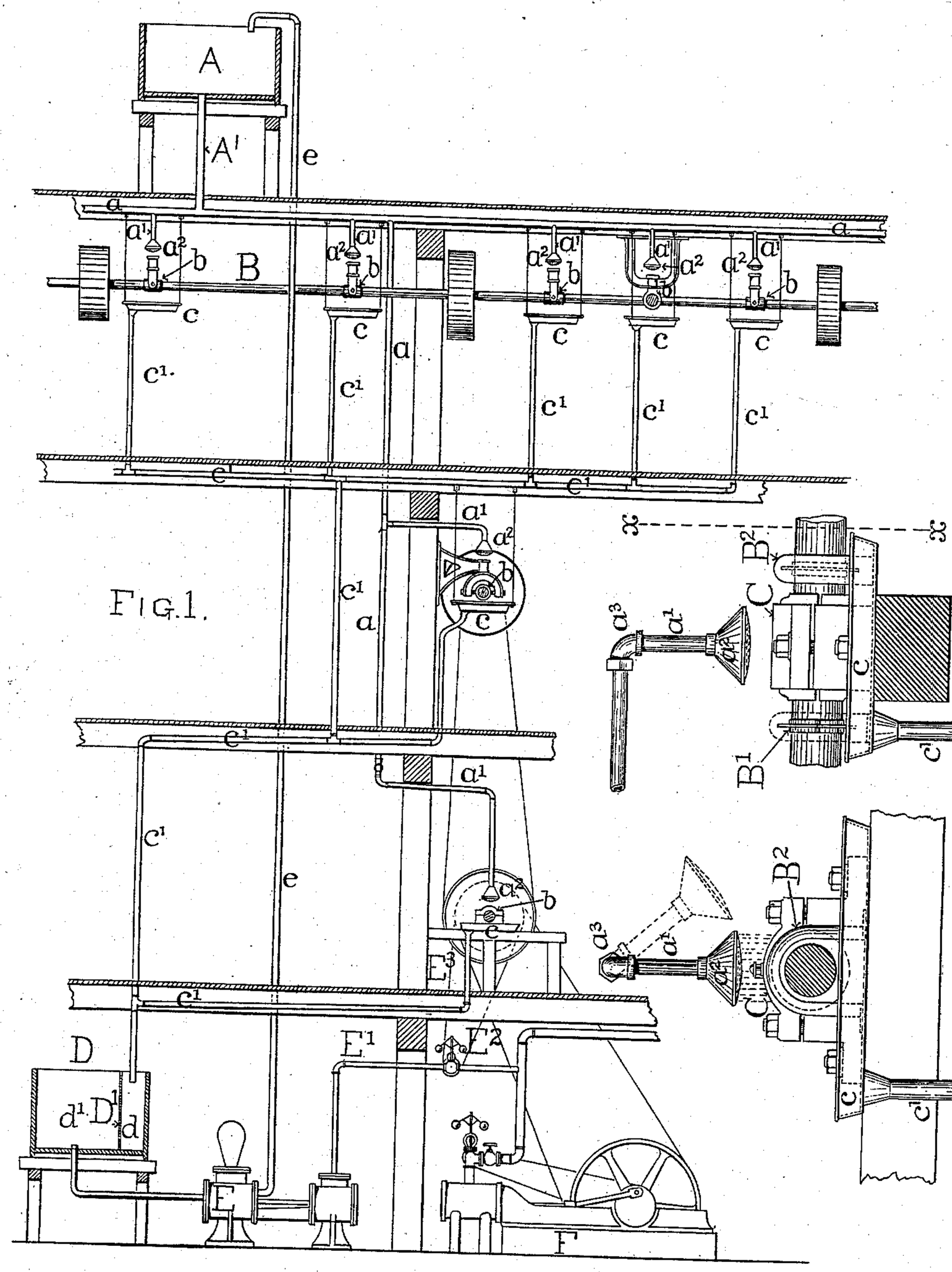

FIG. 1.

FIG 2.

FIG 3.

WITNESSES,
W. F. Heath
Asa Parr,

INVENTOR,
F. O. Matthiessen,
Per Edw. E. Dennis,
Atty.

UNITED STATES PATENT OFFICE.

FRANZ O. MATTHIESSEN, OF IRVINGTON, NEW YORK.

APPARATUS FOR KEEPING COOL THE SHAFT-BEARINGS IN MILLS.

SPECIFICATION forming part of Letters Patent No. 270,237, dated January 9, 1883.

Application filed July 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRANZ O. MATTHIESSEN, of Irvington, New York, have invented Improvements in Apparatus for Keeping Cool the Shaft-Bearings in Mills, of which the following is a specification.

It is the object of my invention to prevent any of the shaft-bearings in a mill from ever becoming sufficiently hot to set fire to contiguous objects or to cause the ignition of the inflammable dust which is usually floating in the atmosphere of flouring-mills. I effect this object by spraying water upon the caps of all the journals during the time while the mill is in operation. To do this I provide for each bearing a sprinkler or rose-nozzle deriving its supply of water from an elevated reservoir through a suitably-arranged system of distributing-pipes. Beneath the bearings I arrange drip-pans, and in connection therewith a system of drain-pipes for collecting the cooling-water and conducting it to a tank at the bottom of the building, from which it is drawn by a steam-pump, which forces it back into the elevated reservoir. The receiving-tank at the bottom of the building is preferably divided into two compartments by means of a vertical partition made of any suitable porous material, so it may act as a filter, the drip-water being discharged into one compartment and being filtered in its passage through the vertical partition into the other compartment, from which it is drawn by the steam-pump. The steam-pipe of the pump is provided with a valve, which is operated by an ordinary centrifugal governor, driven by a belt from any convenient part of the mill-shafting, and so arranged as to close the valve and shut off steam from the pump when the shafting ceases to revolve and to open the said valve when the shafting recommences its rotation.

The accompanying drawings, illustrating my invention, are as follows:

Figure 1 is a vertical section of a portion of a mill, showing the elevated reservoir and a portion of the system of distributing-pipes, with the discharge-pipes provided with rose-nozzles for sprinkling water on the caps of the shaft-bearings, also showing a portion of the system of drip-pans and drain-pipes and the receiving-tank into which the drip-water is discharged, together with the steam-pump for pumping the drip-water back into the elevated reservoir, a steam-engine being represented for driving the mill-shafting. Fig. 2 is a side elevation, upon an enlarged scale, of a section of the mill-shafting, showing one of the bearings provided with a sprinkler, drip-tray, &c. Fig. 3 is a transverse section taken through the line *x x* on Fig. 2.

Referring to Fig. 1 of the drawings, it will be seen that the elevated reservoir A supplies the cooling-water through the discharge-pipe A′ to the system of distributing-pipes *a*, which in turn supply water to the branch pipes *a′*, provided at their ends, respectively, with the rose-nozzles or sprinklers a^2. The nozzles are respectively located immediately over the bearings *b* of the shafting B. The cooling-water is discharged from each nozzle upon the cap C of the journal-box immediately beneath it, as shown on an enlarged scale in Figs. 2 and 3.

The branch pipes *a′* are either made of flexible material or are connected with the distributing-pipe by a swivel-coupling, a^3, as shown in Figs. 2 and 3, so that they may be swung out of the way in case necessity arises for the removal of the cap C.

Beneath each bearing is a drip-tray, *c*, for collecting the cooling-water which has been sprinkled upon the bearing above it. From the drip-trays the drip-water is conducted by the drain-pipes *c′* to a receiving-tank, D, upon the lower floor or in the cellar of the mill. The receiving-tank is divided into two compartments by a vertical partition, D′, of porous material, to serve the purpose of a filter. The drip-water conducted into the receiving-compartment *d* is filtered in passing through the partition D′ into the compartment *d′*, from which it is drawn by the steam-pump E and forced up through the pipe *e* into the elevated reservoir A. The steam-pipe E′ of the pump is provided with a steam-valve, which is operated by a centrifugal governor, E^2, of ordinary construction. The governor E^2 is driven by a belt, E^3, from the mill-shafting. In the drawings the mill-shafting is represented as being driven by a steam-engine, F. It will of course be understood that it may be driven by water or other power.

On either side of each bearing I provide the shaft with a thin collar, B′. I provide for each of the collars B′ a shield, B^2, which extends

up on either side and over the top of the shaft, and is curved so as to present a concave surface toward the collar B′. By this construction any of the cooling-water which may fall upon the shaft on either side of the bearing is thrown off by centrifugal force against the shield B^2, and, being thereby caught, is directed into the drip-tray.

In operation, when the shafting is running, a given quantity of water for sprinkling and cooling the journals is kept in constant circulation, subject only to such loss as may ensue from evaporation, such loss being made up by the supply of the receiving-tank D with the required quantity of water from an outside source. Dust, which would otherwise collect upon the caps of the shaft-journal, is washed off by the cooling-water and conducted by the drain-pipes *c′* to the receiving-compartment *d* of the receiving-tank D. The solid matter which may settle in the compartment *d*, or which may be retained therein by the filter-partition D′, is removed therefrom from time to time, as may be required.

It will of course be seen that if there is an ample supply of water, with a head sufficient of itself to carry the water up into the elevated reservoir A, the pump E may be dispensed with, and the valve operated by the governor E^2 may in that case be applied to the water service-pipe instead of to the steam-pipe of the pump, as shown. Thus, assuming the pipe *e* to be the service-pipe, connected with an outside source of water-supply having sufficient head to reach the reservoir A, the governor E^2, driven by a belt from some convenient portion of the mill-shafting, would be transferred to a valve inserted in the pipe *e*. In this case the drain-pipe *c′* would be connected with a sewer or outside drain for carrying off the drip-water. Under ordinary circumstances, owing to the cost of water, it will be more economical to employ the steam-pump, as shown, and thus use the cooling-water over and over, as has been described.

I claim as my invention—

The apparatus for keeping shaft-bearings cool herein described, which consists essentially of a system of distributing-pipes, with sprinklers arranged respectively in suitable proximity to the shaft-bearings, and a corresponding system of drip-trays and drain-pipes for collecting and carrying off the cooling-water discharged upon the bearings, in combination with a valve for controlling the supply of cooling-water to the system of distributing-pipes, the said valve being operated by a governor driven by power transmitted from the mill-shafting, the whole arranged and operating substantially in the manner and for the purposes set forth.

F. O. MATTHIESSEN.

Witnesses:
E. H. WILLIAMS,
WM. E. QUIMBY.