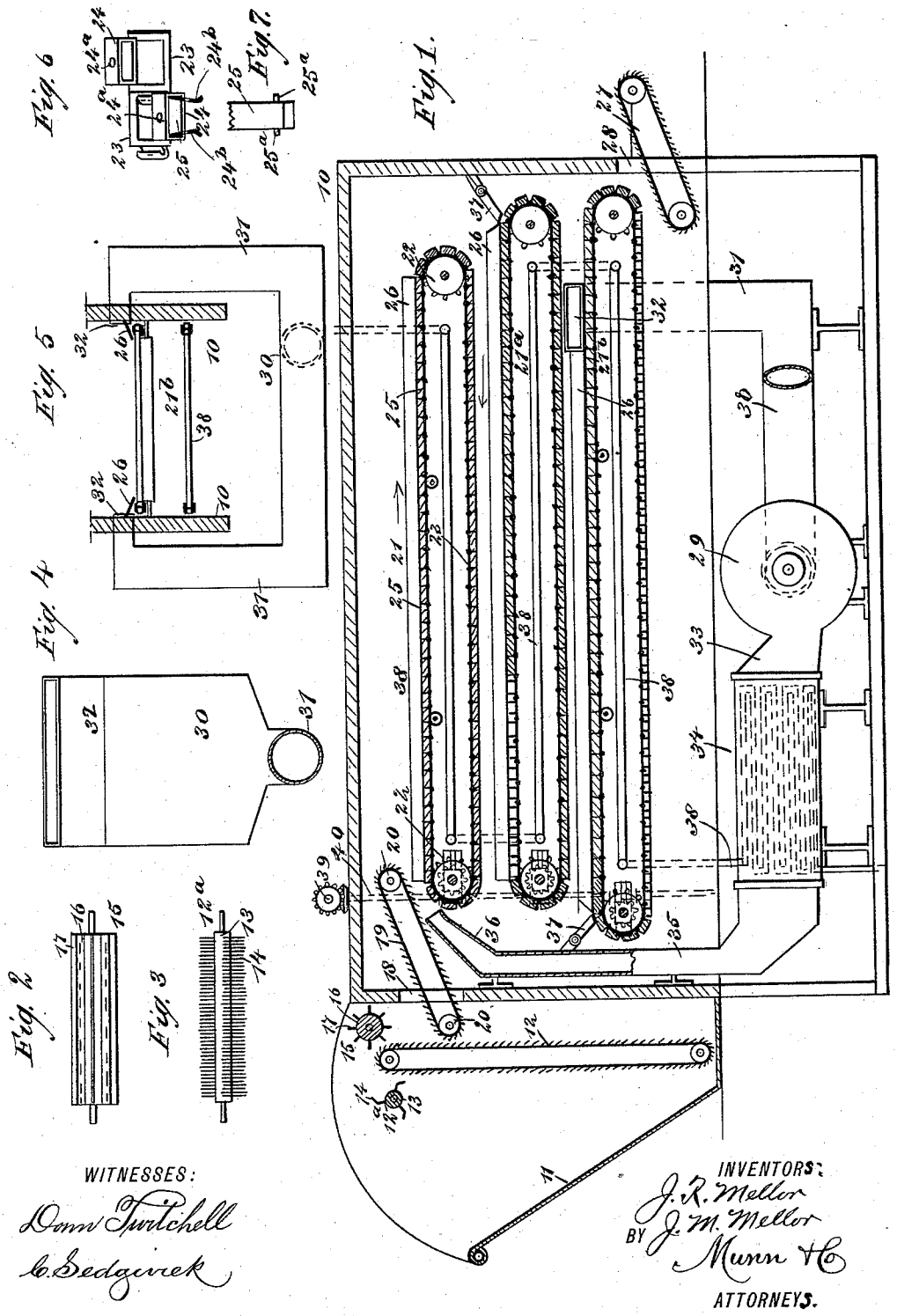
(No Model.)

J. R. & J. M. MELLOR.

WOOL DRIER.

No. 470,582. Patented Mar. 8, 1892.



WITNESSES:

Dann Twitchell

C. Sedgwick

INVENTORS:

J. R. Mellor

J. M. Mellor

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN R. MELLOR AND JAMES M. MELLOR, OF CLIFTON HEIGHTS, PENNSYLVANIA.

WOOL-DRIER.

SPECIFICATION forming part of Letters Patent No. 470,582, dated March 8, 1892.

Application filed September 2, 1891. Serial No. 404,549. (No model.)

To all whom it may concern:

Be it known that we, JOHN R. MELLOR and JAMES M. MELLOR, both of Clifton Heights, in the county of Delaware and State of Pennsylvania, have invented a new and Improved Wool-Drier, of which the following is a full, clear, and exact description.

Our invention relates to improvements in wool-drying machines; and the object of our invention is to produce a simple, easy-running, and compact machine which will thoroughly dry a large quantity of wool, which will lighten up the wool and dry it in such a manner that its fiber will not be injured, and which may be kept at the required temperature with a comparatively small amount of steam.

To this end our invention consists in a wool-drier, the construction of which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a vertical longitudinal section of the machine embodying our invention. Fig. 2 is a detail side elevation of the feed-brush. Fig. 3 is a detail side elevation of the feed-comb. Fig. 4 is a detail sectional elevation of one of the branch exhaust-pipes. Fig. 5 is a detail sectional view showing the guards for the main apron and showing also the manner in which the exhaust-pipes connect with the main frame or case. Fig. 6 is a detail perspective view showing the manner in which the apron-slats are secured to the carrying-chains, and Fig. 7 is a broken detail view of one end of a carrier-slat.

The machine is provided with a main box or case 10, which also forms the machine-frame, and at one end of this case is a hopper 11, in which hopper is a common form of spike-apron 12, which is arranged vertically in the hopper near the front end of the case and which raises the wool from the hopper, so as to feed it into the machine.

Near the upper end of the hopper and on the front side is a comb 12^a, which comprises a revoluble roller 13 and three series of projecting curved teeth 14. The roller is mounted on the ordinary adjustable bearings, so that it may be made to give a light or heavy feed, and it is turned by a gear connection with the driving-shaft. (Not shown in the drawings.) This comb serves to lighten up the fibers of the wool, so that it may be quickly acted on by the heat in the main case.

A little above the feed-apron 12, and between it and the main case, is a brush 15, which brushes the wool from the spike-apron, and the brush comprises a revoluble roller 16 and a series of projecting strips 17, which are preferably of leather. This brush is arranged above the opening 18 in the main case, which opening is near the top of the case and on the front side, and extending through this opening is an intermediate carrying-apron 19, which runs on the usual rollers 20, one end of the apron being arranged beneath the brush 15 and the other end above the upper main carrying-apron 21. This apron 21 comprises a revoluble sprocket-wheel 22, arranged at each end, the ordinary link-chains 23, which are carried by the sprocket-wheels, the rectangular chairs 24, arranged on opposite sides of alternate links and having central brads 24^a to project into the apron-slats, and the cross-slats 25, which slats are placed close together and have their ends inserted in the chairs 24. The chairs have also projecting spring-straps 24^b, as shown in Fig. 6, which straps are perforated to receive the pins 25^a on the sides of the slats 25 near the ends. This makes a simple form of apron, and in case any of the slats become broken they may be easily replaced. The apron is further strengthened by the usual carrying-rollers. (Shown in Fig. 1.) The apron 21 delivers on a similar apron 21^a immediately beneath it, and this delivers on another apron 21^b in the lower portion of the case, and, if desired, a greater number of aprons may be used. The sprocket-wheels on the aprons 21^a and 21^b should be mounted in adjustable bearings, and the aprons should be driven by differential gears, so that their speed may be regulated. These aprons travel in different directions, so as to give a continuous movement to the wool, as indicated by the arrows in Fig. 1.

To prevent the wool from spreading and falling off the aprons guard-strips 26 are used, which strips run longitudinally through the

case opposite the upper sides of the aprons, and the strips are hinged so as to rest lightly upon the aprons. At the rear end of the machine and beneath the end of the lower apron 21^b is an outlet 28, in which is a common spike carrying-apron 27, the apron being arranged so as to receive the dried wool from the main carrying-apron 21^b and carry it out of the machine.

Beneath the floor of the case is an exhaust-blower 29, which has an inlet-pipe 30, said pipe connecting with branch pipes 31, which pipes are widened near their upper ends at 32, and these ends enter the case 10 through opposite walls near the rear upper end of the carrying-apron 21^b, and this arrangement causes the moist air to be drawn in the blower. The outlet-pipe 33 of the blower is enlarged to form a cylinder 34, in which coils of steam-pipe are placed, and beyond the cylinder the pipe is flattened, as shown at 35, and projects upward into the front end of the case 10, where it terminates in a bent nozzle 36, which delivers above the upper carrying-apron 21. The shape of this pipe and nozzle breaks the force of the air, so that it will not blow the wool about, and it is given a direction which coincides with the direction that the wool is carried by the aprons, as indicated by the arrows, and in order that the air may follow the wool and have the best possible effect hinged air-guides 37 are arranged at opposite ends of the case, one being arranged to rest lightly on the front end of the apron 21^a and another to press lightly on the front end of the apron 21^b. These air-guides also serve to prevent the wool from falling off the aprons. The guides are hinged so that they will rest lightly on the aprons and yield under pressure of any inequalities of the aprons.

The circulation-pipes 38 are arranged so as to partially fill the cylinder 34, and they are also arranged in coils between the various carrying-aprons, as shown in Fig. 1. The machine has a driving-shaft 39, which extends across the top near the front, and a vertical shaft 40 is geared to this and serves to drive the sprocket-wheels and aprons.

The operation of the machine is as follows: The wet wool is fed into the hopper 11, and it will be carried upward by the spike-apron 12, will be combed up lightly at the upper end of the apron by the comb 12^a, which comb also prevents too large a body of wool from being carried into the machine, and as the wool passes the top of the apron 12 it is brushed by the brush 15 upon the intermediate apron 19, and is delivered by the said apron upon the upper carrying-apron 21. It will be noticed that the light wool as it drops upon the apron will be exposed to a volume of air from the nozzle 36 and the air and wool will move on together, the wool dropping from the apron 21 upon the apron 21^a, and from said apron upon the lower apron 21^b, from whence it will be delivered upon the apron 27 and carried out of the machine. As the wool dries, the air in the case 10 becomes moist and is exhausted by the blower 29 and made to re-enter the upper end of the case; but it will be heated by the coils of pipe in the cylinder 34, so that a constant current of comparatively cool moist air is passing out of the case and a constant stream of hot air passing into it. It necessarily follows that the wool may be very rapidly dried with a comparatively small amount of heat. Moreover, the wool is dried by the direct radiation of heat from the pipes 38.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. A wool-drier comprising a main case having a wool-inlet at one end near the top and a wool-outlet at the opposite end near the bottom, a series of carrying-aprons arranged horizontally in the case and adapted to deliver one upon another, hinged guard-strips mounted on the inner walls of the case and adapted to rest upon the aprons near the sides, a blower arranged adjacent to the case, exhaust-pipes leading from the lower portion of the case to the blower, a supply-pipe leading from the blower to the upper front portion of the case, and a heating-coil within the supply-pipe, substantially as shown and described.

2. The combination, with the main case, the carrying-aprons therein adapted to deliver one upon another, and an air-supplying apparatus, of side guards hinged to the case and adapted to rest longitudinally upon the carrying-aprons, and air-guides hinged to the case and adapted to rest upon the end portions of the aprons and direct the air-supply so that it will follow the aprons, substantially as shown and described.

3. The combination, with the main case having a series of wool-carrying aprons therein and the hopper arranged at one end of the case and connected therewith by an opening, of a vertical spike-apron arranged in the hopper adjacent to the opening, a revoluble comb mounted in the hopper in front of the spike-apron, a revoluble brush mounted in the hopper between the spike-apron and the case, and an intermediate apron arranged to move through the opening in the case and deliver upon the carrying-aprons, substantially as described.

JOHN R. MELLOR.
JAMES M. MELLOR.

Witnesses:
FRED KAUFFMANN, Jr.,
SIDNEY R. SMITH.