

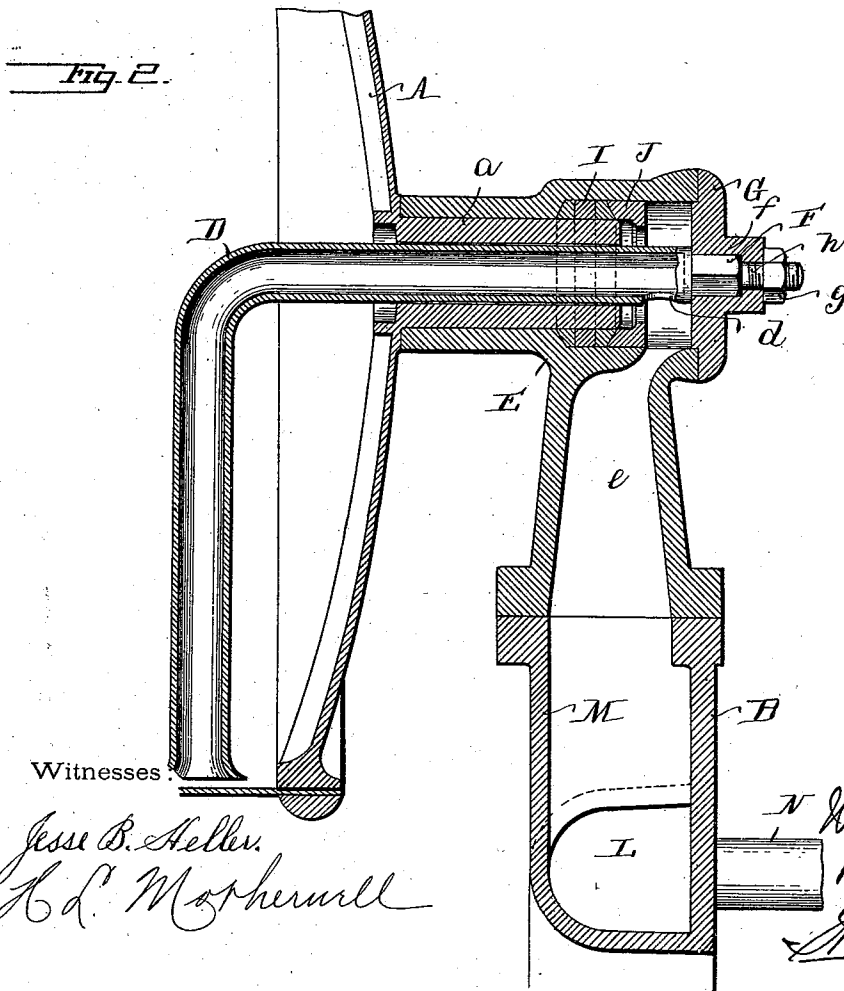
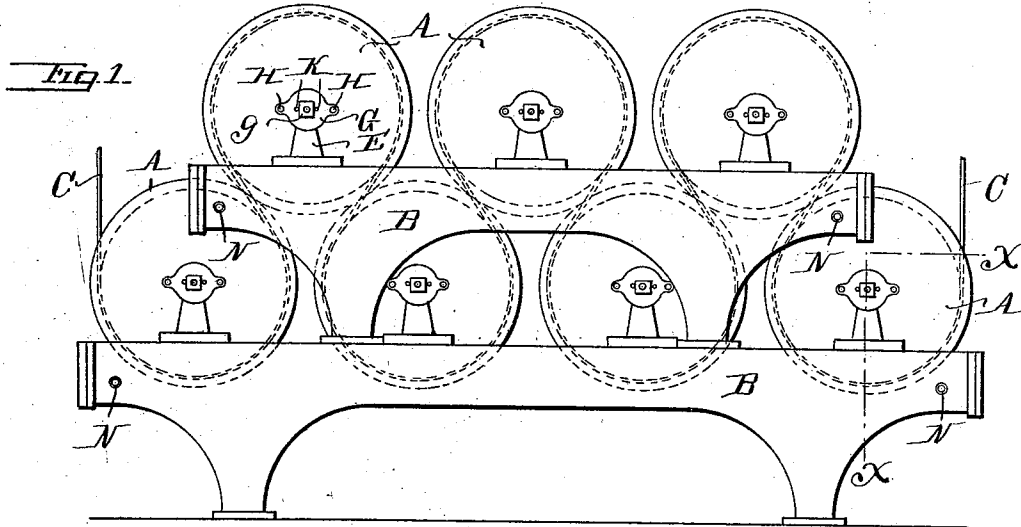
(No Model.)

W. C. MACKINNEY.
DRYING CYLINDER OR DRUM.

2 Sheets—Sheet 1.

No. 514,760.

Patented Feb. 13, 1894.



Witnesses.

Jesse B. Heller.
H. L. Motherwell

Inventor.

W. C. Mackinney

By
Attorney.

(No Model.)

2 Sheets—Sheet 2.

W. C. MACKINNEY.
DRYING CYLINDER OR DRUM.

No. 514,760.

Patented Feb. 13, 1894.

Fig 3

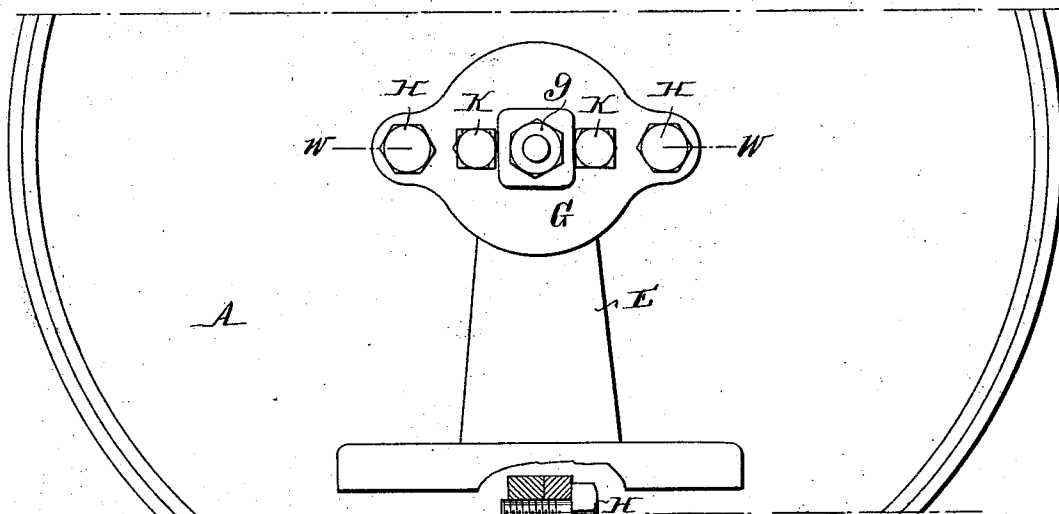


Fig. 4.

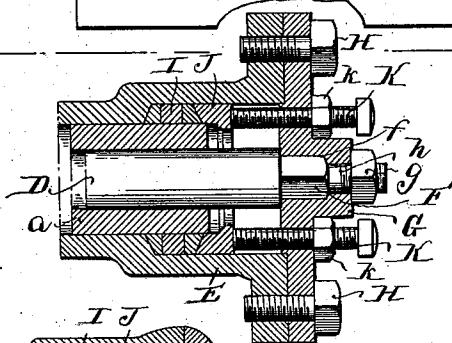


Fig. 5.

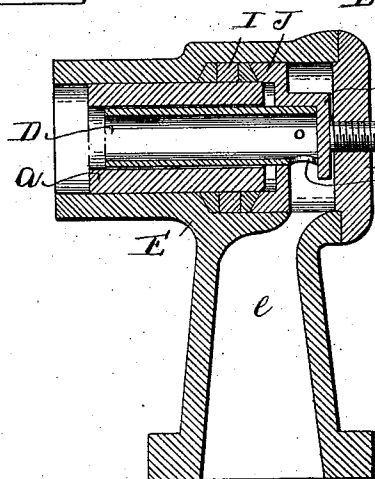
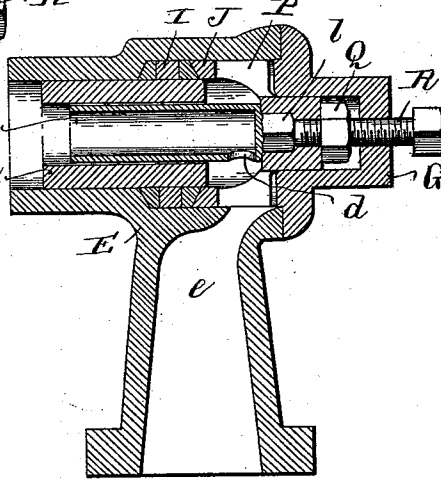


Fig. 6.



Witnesses :

Jesse B. Heller.
H. L. Matherall

Inventor.

Wm. C. Mackinney

By [Signature]
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM C. MACKINNEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE H. W. BUTTERWORTH & SONS COMPANY, OF PENNSYLVANIA.

DRYING CYLINDER OR DRUM.

SPECIFICATION forming part of Letters Patent No. 514,760, dated February 13, 1894.

Application filed August 10, 1893. Serial No. 482,809. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. MACKINNEY, of the city and county of Philadelphia and State of Pennsylvania, have invented an
5 Improvement in Drying Cylinders or Drums, of which the following is a specification.

My invention relates to drying cylinders or drums, and consists of certain improvements which are fully set forth in the following
10 specification and are shown in the accompanying drawings.

To accomplish the drying of textile materials, &c., it is usual to convey the material in a more or less wet condition over hollow
15 rotary cylinders or drums heated by steam introduced in the interior. By the condensation of the steam more or less water of condensation collects within the cylinders or drums, and this must be drawn off or expelled.

20 My invention relates particularly to the means for drawing off or expelling from the interior of the cylinders this water of condensation as it collects therein.

It has been usual to provide the cylinders
25 or drums upon the interior with buckets or troughs communicating with a discharge pipe leading out through the journal of the cylinder so that the water is taken up by the buckets or troughs as the cylinder rotates and
30 passes out through the discharge pipe. The operation of these buckets in discharging the water is intermittent since they can operate to take up the water only when in the lowest position *i. e.* within a comparatively small arc
35 of the rotation of the cylinder; and when the cylinders are rotated at high speed the moment within which the buckets are in position to take up the water in each revolution is so small that they cannot properly operate.

40 It is the object of my invention to overcome this defect by providing the drying drum or cylinder with devices for discharging the water of condensation as it collects, without regard to the rotation of the cylinder
45 so that the latter may be kept substantially free from water.

In carrying out my invention I employ a stationary discharge pipe or tube which extends through the hollow journal of the cylinder or drum into the interior and has its
50 end arranged so as to be always in position

to carry off the water of condensation, without regard to the speed of rotation of the drum.

I shall now refer to the accompanying drawings for the purpose of more particularly describing my improvements.

Figure 1 is a side elevation of a series of drying cylinders or drums. Fig. 2 is an enlarged longitudinal vertical sectional view of
60 a portion of one of the cylinders with its supports on the line *x—x* of Fig. 1. Fig. 3 is an end elevation of one of the cylinders. Fig. 4 is a horizontal sectional view through the journal and bearing on the line *W—W* of Fig. 3; 65 and Figs. 5 and 6 are longitudinal vertical sectional views of the journals and bearings of the cylinders illustrating modifications of the invention.

A are the hollow drying cylinders or drums 70 which may be of any convenient construction. Usually a series of these cylinders or drums is employed and they are journaled in suitable frames B, either in a horizontal position as in Fig. 1, or in a vertical position. The
75 cloth or material C to be dried is fed about the successive drums or cylinders as is shown in Fig. 1.

To the interior of the drums or cylinders steam is supplied, usually through the hollow
80 journals of the drums. It is usual to supply the steam to the cylinders or drums through the hollow journals at one end and to discharge the water of condensation through the hollow journals at the other end as by the buckets
85 and outlet pipe as has been heretofore stated.

So far as has been described the apparatus is of well known construction.

I shall now describe particularly my improvements for discharging the water of condensation from the cylinders or drums A. D
90 is a stationary bent tube or pipe extending through the hollow journal *a* into the cylinder or drum A and having its inner end located preferably adjacent to the interior of
95 the drum or cylinder wall as is shown in Fig. 2. E is the bearing frame or pedestal in which the hollow journal *a* is journaled having a hollow portion or passageway *e* into which the expelled water of condensation from the pipe
100 D may pass through an opening *d* therein. The pipe D is stationary and may be sup-

ported by the bearing frame or pedestal E in any convenient manner.

In Figs. 2, 3 and 4 I have shown a construction in which the end F of the tube or pipe is square or non-circular and fits a complementary recess or seat *f* in a cap G which is bolted to the end of the bearing frame or pedestal E as by the bolts H. The end F is provided with a threaded extremity *h* which extends through an aperture in the cap G and receives a nut *g* by which the pipe may be secured at its outer end and the end F drawn firmly into its seat *f*. By this means the pipe may be firmly supported at its outer end only. It is preferable that there should be no actual contact between the pipe D and the inner surfaces of the hollow journal *a* so that friction and wear may be avoided.

I are the usual packing rings about the journals *a* and J is the gland which may be held by set screws K, extending through the cap G and bearing upon the gland. The set screws K may be held by lock nuts *k* in the usual manner.

It is immaterial how the pedestals or bearing frames E are connected with the frames B. I have shown the frames B provided with outlet passageways L communicating through tubular necks M with the hollow portions *e* of the pedestals and discharging through pipes N (see Fig. 2). In the modified construction shown in Fig. 5 the gland J is provided with an overhanging flange O to which the end of the tube D is secured; and a set screw P' carried by the cap G bears upon the flange O. In Fig. 6 the square or non-circular end *l* of the tube D fits a recess in a spider P which carries the gland J, and a nut Q is carried by the threaded extension *h* of the end of the tube D beyond the spider nut P but within the cap G. The set screw R carried by the cap bears on the end of the nut Q. These modifications merely show some of the different ways in which the pipe D may be supported; but my invention is not limited either to these or other details of construction, which may be varied to suit the requirements of each case or the desires of the mechanic.

The operation of the apparatus will be readily understood. The steam is introduced into the cylinder in a suitable manner, usually through the hollow journal at one end. The water of condensation which collects in the bottom of the cylinder is forced out through

the pipe D by the pressure of the steam in the cylinder, and passes through the opening *d* into the passageway *e* whence it flows into the passageway L and may be led off by the pipes N. As the pipe D is stationary, it will always be in proper position to discharge the water that may collect in the bottom of the cylinder, and no matter what the speed of rotation may be it will discharge the water as soon as it collects in sufficient quantity. The cylinders or drums A may thus be kept substantially free from any material accumulation of water of condensation from the steam used in the act of drying. It is of course immaterial to the invention whether one or more drying cylinders be used.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a rotary drying cylinder or drum having a hollow journal supported in suitable bearings, a discharge pipe supported at one end by the bearing and extending through the hollow journal into the cylinder or drum and having an opening for the discharge of water exterior to cylinder or drum.

2. The combination of a hollow drying cylinder or drum having a hollow journal, a hollow bearing frame for the journal, and a discharge pipe carried by the bearing support and extending through the hollow journal and having an outlet in its end communicating with the hollow bearing support.

3. The combination of a hollow cylinder or drum having a hollow journal, a bearing frame in which said journal is supported, and a stationary discharge pipe extending through the hollow journal without making contact with the surface thereof and supported wholly at its outer end by the frame beyond the hollow journal.

4. The combination with the rotary drying cylinder or drum having the hollow journal, the bearing frame in which the journal is supported, the cap G carried by the bearing frame, and the stationary discharge pipe D carried by the cap G and extending through the hollow journal into the drum or cylinder.

In testimony of which invention I have hereunto set my hand.

WM. C. MACKINNEY.

Witnesses:

ERNEST HOWARD HUNTER,
H. L. MOTHERWELL.