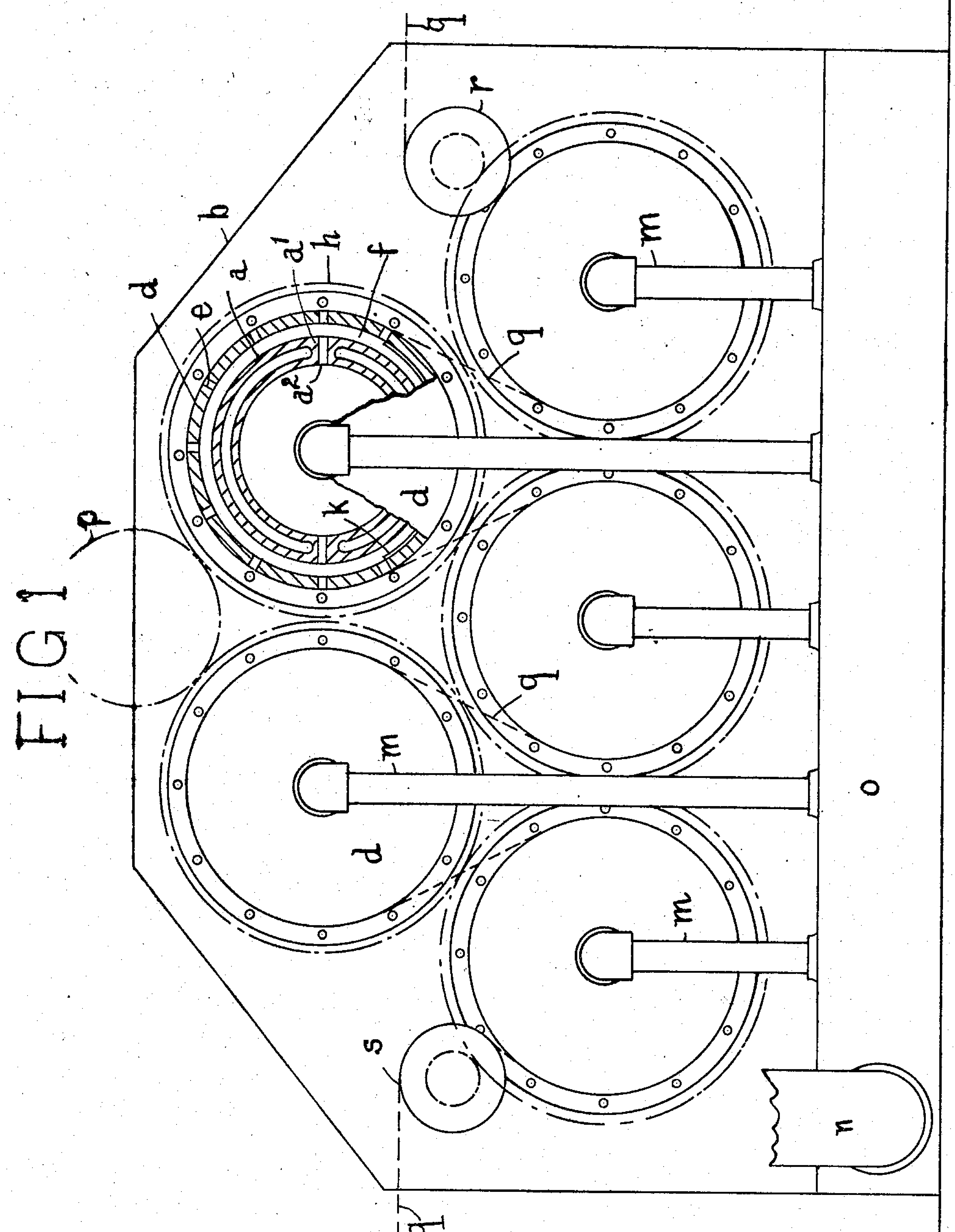
T. HOWARTH & J. V. MUSGRAVE.

DRYING APPARATUS.

APPLICATION FILED SEPT. 14, 1908.

930,756. Patented Aug. 10, 1909.

2 SHEETS—SHEET 1.



Witnesses

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FIG 2

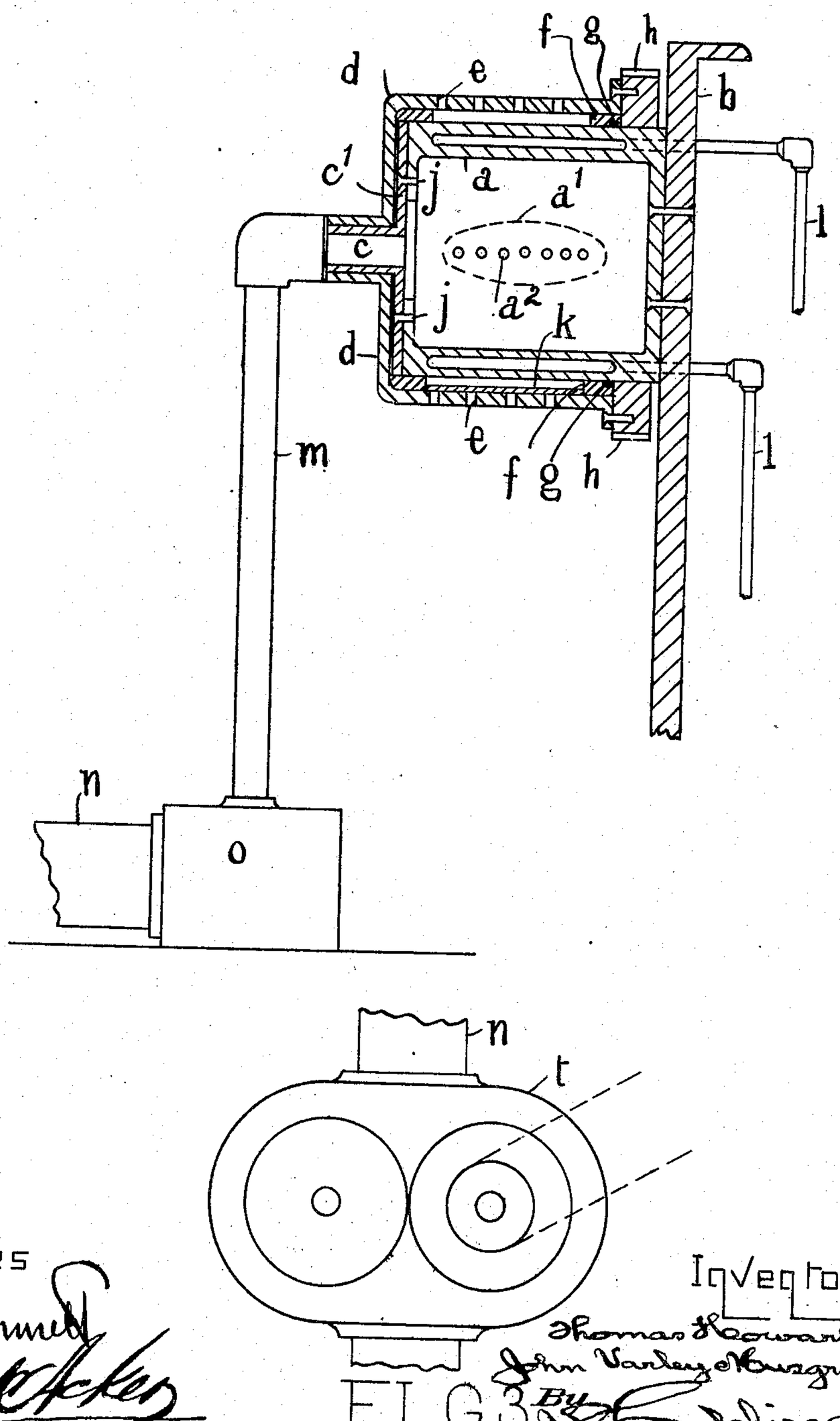

FIG 3

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UNITED STATES PATENT OFFICE.

THOMAS HOWARTH AND JOHN VARLEY MUSGRAVE, OF BRADFORD, ENGLAND.

DRYING APPARATUS.

No. 930,756. Specification of Letters Patent. Patented Aug. 10, 1909.

Application filed September 14, 1908. Serial No. 453,002.

To all whom it may concern:

Be it known that we, THOMAS HOWARTH and JOHN VARLEY MUSGRAVE, subjects of the King of Great Britain, residing at Bradford, in the county of York, in the Kingdom of England, have invented certain new and useful Improvements in Drying Apparatus, for which application has been made in Great Britain, No. 22,325, dated October 10, 1907.

This invention relates to improvements in drying apparatus connected with back-washing machines for washing wool and the like in which the wool in sliver form or other material to be dried is led around rotating perforated cylinders through which heated air is forced.

The object of the present improvements is to obtain as uniform as possible drying effect and at the same time eliminate the possibility of over-heating the wool and thereby lowering its grade or quality. This object is obtained by a special construction or arrangement of the means for heating the air. As herein shown, these means consist of a steam jacket which is annular in form and so arranged that air can be forced into the space inclosed by the annulus in an axial direction and out therefrom by means of a series of small radial holes or orifices connecting the interior of the annulus with the exterior, whence the air passes through the perforated cylinders which carry the wool and are rotated on the steam jackets. It will thus be obvious that a very thorough heating of the air is effected as it passes first into a space surrounded by the steam jacket and then through the same before it comes into contact with the wool.

In the accompanying drawings wherein we have illustrated one embodiment of our improvements:—Figure 1 is an elevation of the machine in partial section showing enough for the comprehension of the invention. Fig. 2 a sectional side view of one of the revolving shells and its appurtenances. Fig. 3 represents a Roots blower to be connected up with Figs. 1 and 2.

In these the steam chest *a* is shown as rigidly mounted upon the plate *b*. The steam chest incloses a space and is provided with a central boss *c* on which is mounted so as to revolve thereon the shell *d* provided with perforations *e* on its periphery. Intermediate to the shell *d* and steam chest *a* are two rings *f* one of which is provided with suitable packing *g*. Secured to the shell and revolving on the steam chest is a spur wheel or gear wheel *h*. The packing *g* prevents oil used for lubricating the wheel *h* from entering the annular space between the shell *d* and steam chest *a*. In the structure herein illustrated the boss *c* is preferably secured to the steam chest by means of a plate c^1 integral with it and screws *j*. Between and secured to the two rings *f* is a stationary baffle plate *k* arranged so as to prevent air from passing out through the apertures or perforations of the shell at such parts as are not normally covered by the wool. Pieces of metal a^1 are interposed between the walls of the steam chest *a* and provided with holes a^2 through which air can pass from the space inclosed by the steam chest to the space between the steam chest and the shell. The pieces a^1 do not extend the whole length of the steam chest so that steam can pass from one part to the other. *l l* are the steam supply connections and *m m* are the air supply connections which are preferably connected up to a Roots blower or other device for supplying air under pressure by means of a pipe *n* which feeds into the gutter *o*.

The device is driven from a suitable spur wheel such as is indicated by the chain dotted line *p* which gears with the gear wheels *h* of the upper two shells which in their turn gear with the gear wheels *h* of the lower set of shells.

The action of the machine constructed as above set forth, when used for drying wool is as follows:—The wool represented by the dotted line *q* as it passes in sliver form from the back-washing machine passes over the guide pulley or wheel *r* then down over and around the first shell *d* then up and around the next and so on till it emerges from the apparatus over the guide pulley or wheel *s*. While the wool is passing through the drier steam is admitted to all the steam chests *a* and air forced through all the bosses *c* after which it is heated and passes by the holes a^2 into the spaces between the steam chests and shells *d* and from thence through the wool about the shells whereby the wool is dried.

We declare that what we claim is—

1. In drying apparatus, a rotatable cylindrical carrier apertured in its perimetral surface and having an interior chamber communicating with its perimetral apertures, means for supplying air to the interior chamber of said carrier, and a steam jacket housed

within said carrier and adapted to heat the air supplied thereto.

2. In drying apparatus an annular steam jacket an end plate on said steam jacket, a boss on said end plate, means for conducting air through said steam jacket in a radial direction, a perforated cylinder mounted on and rotatable on said boss, means for forcing air through said steam jacket.

3. In drying apparatus an apertured annular steam jacket, a central boss on said steam jacket stationary rings about the periphery of the said steam jacket a rotatable perforated cylinder mounted on said boss and bearing on said rings, a spur wheel secured to said cylinder, means for conducting and forcing air into the interior of said steam jacket and through the perforations of said cylinder.

4. In drying apparatus an apertured steam jacket means for forcing air into the space inclosed by said steam jacket and out therefrom radially through said steam jacket means for conducting wool about said steam jacket.

5. In drying apparatus a steam jacket annular in form and arranged to inclose a space means for admitting air axially into the space inclosed by said steam jacket and plates in the steam space of said steam jacket contiguous to the inner and outer walls of the same and provided with radial orifices or passages means for conducting wool about said steam jacket.

6. In drying apparatus an annular steam jacket means for conducting air into said steam jacket and out therefrom in a radial direction a perforated rotatable cylinder mounted on and about said steam jacket, bearing rings intermediate said steam jacket and said cylinder, a stationary baffle plate against the interior wall of said cylinder for the portion of the cylinder normally free from wool, a spur wheel on said cylinder and means for circulating steam in said steam jacket.

7. In drying apparatus a pipe means for forcing air along said pipe a gutter connected to said pipe, a plurality of pipes leading from said gutter, a plurality of annular steam jackets, means for supporting said steam jackets bosses on said steam jackets each connected to one of said plurality of pipes, means for permitting air to pass out of said steam jackets through the walls of the same, a perforated rotatable cylinder on and about each of said steam jackets, means for conducting wool around each of the said cylinders.

8. In drying apparatus a pipe, means for forcing air along said pipe a gutter connected to said pipe, a plurality of pipes leading from said gutter, a plurality of annular steam jackets, means for supporting said steam jackets bosses on said steam jackets each connected to one of said plurality of pipes, means for permitting air to pass out of said steam jackets through the walls of the same, means for leading wool about said steam jackets.

9. In drying apparatus, a perforated rotatable cylinder, an apertured annular steam jacket within said cylinder, and means for forcing air through the apertures of the steam jacket and through the perforations of said cylinder.

10. In drying apparatus, a steam jacket having an axial opening and radial passages in its walls communicating with said opening, a cylinder rotatable on said jacket and provided with perforations, and means for forcing air through the axial opening and passages of the steam jacket and through the perforations of said cylinder.

11. In drying apparatus, a steam jacket annular in form and arranged to inclose a space and provided with peripheral orifices adapted for communication with said space, means for admitting air into the space inclosed by the steam jacket, and means for conducting wool about said jacket.

12. In drying apparatus, a steam jacket annular in form and arranged to inclose a space, means to support said jacket with its axis horizontal, a perforated cylinder rotatable around said jacket, means for forcing air into the space inclosed by the steam jacket, radial passages through said steam jacket for permitting the escape of air from said space and means for conducting wool about said cylinder.

13. In drying apparatus, a steam jacket having radial apertures, means for forcing air through said apertures, a perforated cylinder about said steam jacket, bearing rings intermediate between the steam jacket and cylinder, and means for rotating said cylinder.

14. In drying apparatus, a supporting plate, a plurality of steam jackets annular in form mounted upon the plate and extended horizontally therefrom, a rotatable perforated cylinder around each steam jacket, each of said jackets having an inclosed air space and radial passages leading therefrom, and means for supplying air to the spaces inclosed within the respective steam jackets.

In witness whereof we have hereunto signed our names this 3rd day of September 1908, in the presence of two subscribing witnesses.

THOMAS HOWARTH.
JOHN VARLEY MUSGRAVE.

Witnesses:
HUBERT HUMPHREY,
CHAS. T. HIBBERT.