

(No Model.)

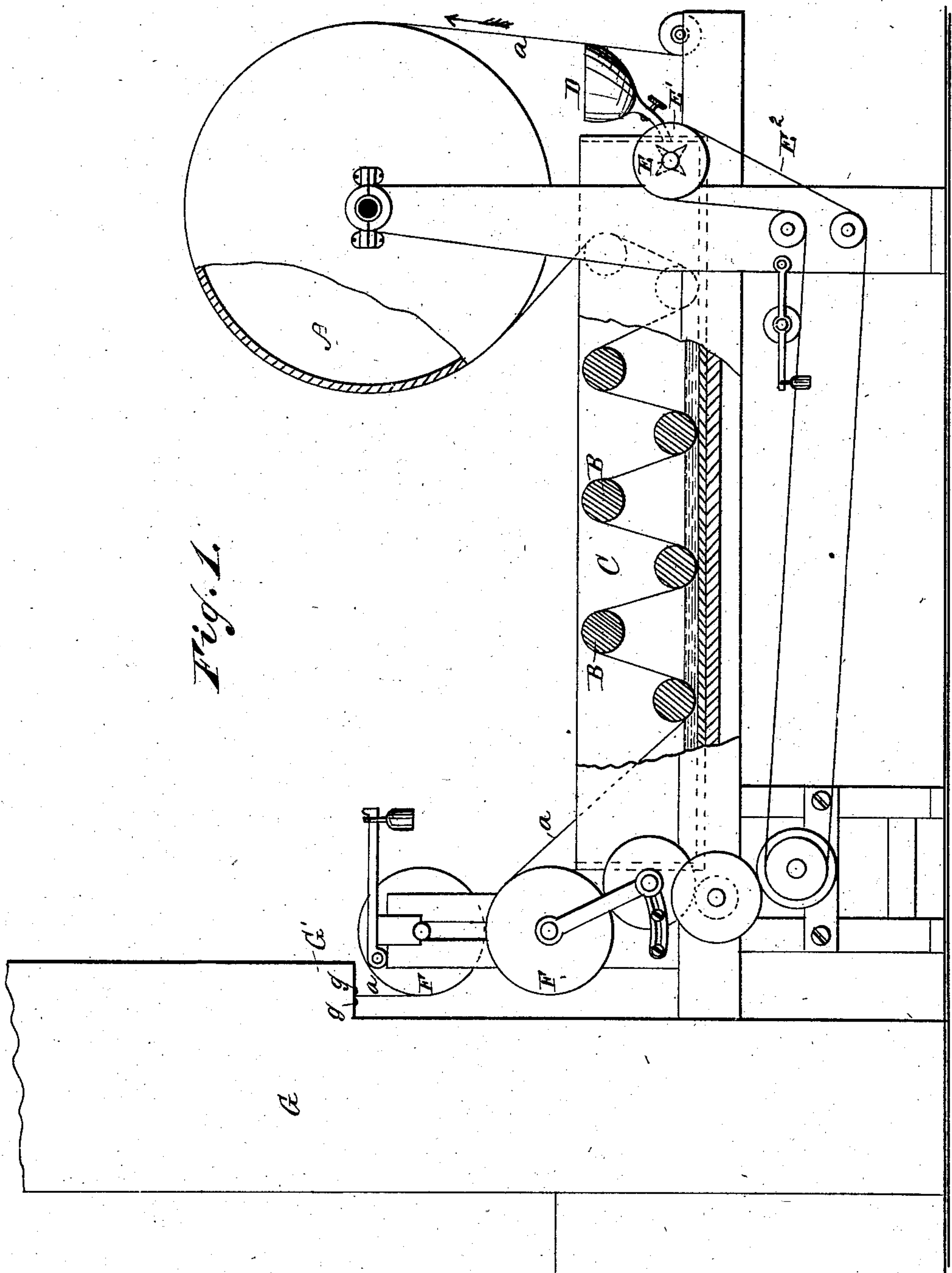
2 Sheets—Sheet 1.

E. RAU.

APPARATUS FOR DYEING WITH HYDROCARBONS.

No. 290,110.

Patented Dec. 11, 1883.



WITNESSES:

Theo. G. Hostr.
C. Sedgwick

INVENTOR:

E. Rau
BY *Mum & Co*
ATTORNEYS.

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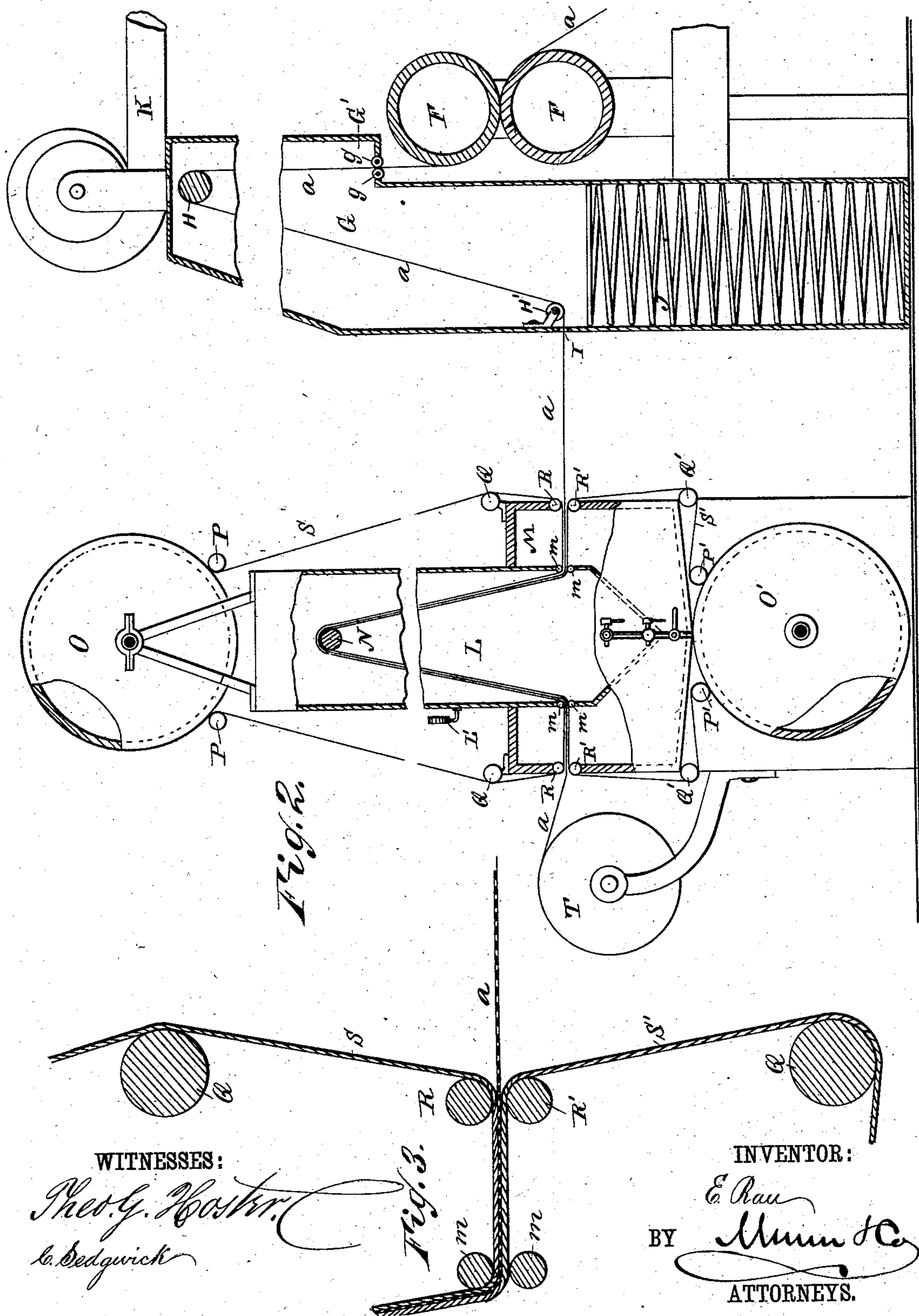
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Theo. G. Foster.
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INVENTOR:

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UNITED STATES PATENT OFFICE.

EUGEN RAU, OF HARTFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF TO
EDGAR HALLIDAY, OF BROOKLYN, NEW YORK.

APPARATUS FOR DYEING WITH HYDROCARBONS.

SPECIFICATION forming part of Letters Patent No. 290,110, dated December 11, 1883.

Application filed May 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, EUGEN RAU, of Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Dry-Dyeing Machine, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved machine for dyeing silks, mixed fabrics, or other fabrics by means of the dry process and benzine colors.

The invention consists in a dry-dyeing machine constructed with an apparatus for saturating the previously-dried fabric in a color dissolved in benzine and oil, which apparatus is provided with a wringer for wringing the surplus of color out of the fabric, which is then passed into a drying-chamber, and from there between two endless blankets through a highly-heated finishing-chamber, in which it is subjected to steam under pressure, whereby the color will be fixed and the fabric finished.

The invention also consists in various parts and details and combinations of the same, as will be fully described and set forth hereinafter.

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

Figure 1 is a longitudinal elevation of my improved dry-dyeing machine, parts being broken out and others shown in section. Fig. 2 is a cross-sectional elevation of the drying and finishing apparatus. Fig. 3 is an enlarged detail sectional view of part of the finishing apparatus, showing the arrangement of the blankets or felts.

The fabric *a* to be dyed is passed over a hollow heated drum, A, suitably journaled in one end of the machine, and provided with hollow pivots or other suitable devices for conducting heat or steam into the said drum. From the drum the fabric *a* is passed over a series of rollers, B, journaled alternately at the top and bottom of a longitudinal vessel, C, the bottom rollers being so arranged that the fabric is dipped into color dissolved in benzine and oil, which coloring-liquid is to be contained on the bottom of the vessel C. A funnel, D,

is provided at one end of the vessel C, through which funnel the coloring-liquid is filled, and is then admitted into the vessel C at the proper time. Below the lower end of the spout of the funnel D an agitator or mixer, E, is provided, on one end of the shaft of which a pulley-wheel, E', is mounted, which is operated by a belt, E'', from the driving-shaft, which continually mixes and agitates the color. After the fabric has been passed through the vessel C, it is passed between two wringing-rollers, F, journaled in standards at that end of the machine opposite the one at which the drum A is journaled, the said wringing-rollers being provided with weights, springs, or other appliances for regulating the pressure. As the fabric *a*, which is saturated with color, passes through between the wringing-rollers F, the surplus of the color is wrung out and flows back into the vessel C, so that there will be no waste of color. The drum A must be heated, so that the fabric will be thoroughly dried before it is passed into the vessel C containing the dyeing-liquid.

Adjoining the wringing-rollers F, I have provided a high box or compartment, G, which is provided directly above the wringing-rollers with an offset, G', in which two rollers, *gg*, are journaled, between which the fabric *a* passes upward into the compartment or box G, then passes over a roller, H, at the top of the box or compartment, and from there is passed downward over a roller, H', on the side of the compartment, and through a slot, I, in the side of the compartment. A coil, J, for heating, by means of steam or hot air, is arranged in the bottom of the compartment or box G, and on the top of the box or compartment a blower, K, is provided; or the top of compartment can be connected with a flue or with a suction-pipe of the blower, so that a draft will be created in the compartment. Under certain circumstances the blower may be dispensed with, the hot air produced by the heated coil being sufficient to create a draft. In the box or compartment G the dyed fabric is thoroughly dried, and all moisture and vapors are carried off by the ventilator or by a draft created by a flue. From the drying apparatus—that is, the

box G—the fabric *a* passes into the fixing and finishing apparatus. The same consists of a high box or chamber, L, into which steam is admitted under pressure, which pressure is indicated by the gage L'. The lower part of the compartment L is surrounded by a chest, M, to prevent the steam that escapes from the compartment L from passing into the room in which the apparatus is located. A roller, N, is journaled in the upper part of the box or compartment L, and rollers *m* are journaled on the edges of the side slots in the bottom of the box or compartment L, through which slots the fabric passes in and out of the said box. A hollow drum, O, adapted to be heated by means of hot air or steam, is journaled in suitable standards on the top of the box or compartment L, and a like drum, O', is journaled below the chest M. An endless blanket or piece of felt, S, passes over the drum O, over rollers P, journaled at the sides of and below the said drum, which rollers P hold the blanket on the surface of the drum, over rollers Q on the chest M, over rollers R on the upper edges of the side slots in the chest M, over the rollers *m* on the side slots of the box or compartment L, and over the roller N in the upper part of the box or compartment L. A like endless blanket, S', is passed over the drum O', is held on the same by rollers P', then passes over rollers Q' at the lower edges of the chest M, over rollers R' on the lower edges of the side slots of the chest M, over the rollers *m* on the lower edges of the side slots of the box or compartment L, and over the roller N, journaled in the box or compartment L. The fabric *a*, which has been dried in the drying-compartment G, is passed between the rollers R R' and between the two endless blankets S S', and with them is carried over the roller N and out at the other side of the compartment or box L, and is wound on a drum, T. The manner in which the fabric is passed between the two blankets is clearly shown in Fig. 3. The fabric is at all times held between the two blankets while passing through the box or compartment L, and its surface is at no time exposed to the action of the steam. The steam in the box L fixes the color and finishes the fabric. By the drying and finishing process every particle of the benzine is evaporated, and all the fumes and smells of the benzine are thoroughly removed from the fabric and the color is fixed in the said fabric.

By means of the above-described apparatus silk and other fabrics can be dyed very rapidly and can be dyed, dried, and finished in one continuous operation, and there is no waste of color.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an apparatus for dry-dyeing, the combination of a heated drum for drying the fabric, a

chamber for drying the dyed fabric, and a chamber for fixing the color or finishing the fabric, substantially as herein shown and described, and for the purpose set forth.

2. In a machine for dry-dyeing, the combination of a vessel for immersing the fabric in the color, a heated drum for drying the fabric before it is passed through the said vessel, a wringer for wringing the color out of the fabric that is passed through the coloring-vessel, and of chambers for drying and finishing the dyed fabric, substantially as herein shown and described, and for the purpose set forth.

3. In a machine for dry-dyeing, the combination, with the vessel C, of the rollers B, journaled therein alternately at the top and bottom, the heated drum A, and the wringing-rollers F for wringing the remaining color out of the fabric after it has been passed through the vessel C, substantially as herein shown and described, and for the purpose set forth.

4. In a dry-dyeing machine, the combination, with the chamber G, provided in its bottom with devices for heating the air and on its top with a ventilator, of the roller H, journaled in the top of the chamber, and the roller H', near the lower part of the same, substantially as herein shown and described, and for the purpose set forth.

5. In a machine for dry-dyeing, the combination, with the drying-chamber G, provided with a slot in the bottom of an offset, G', through which slot the fabric can pass vertically, of the roller H, journaled in the top of the chamber G, and the roller H', journaled on the inner surface of one of the sides of the chamber G, which chamber is provided with a slot, I, adjoining the roller H', substantially as herein shown and described, and for the purpose set forth.

6. In a machine for dry-dyeing, the combination, with a chamber, of two endless belts, of felt or fabric, passing through the said chamber, of which belts one passes over a roller on the top of the chamber, and the other over a roller on the bottom of the chamber, both of which belts pass over a roller in the upper part of the interior of the chamber, substantially as herein shown and described, and for the purpose set forth.

7. In a machine for dry-dyeing, the combination, with a steam-chamber L, of the drum O, journaled on the top of the same, the drum O', journaled below the chamber, the endless fabric or felt belts S S', passing over the rollers P P' Q Q', respectively, and of the roller N, journaled in the upper part of the chamber, over which roller N both belts pass, substantially as herein shown and described, and for the purpose set forth.

8. In a machine for dry-dyeing, the combination, with the steam-chamber L, of the drums O O', journaled, respectively, above and below it, the rollers P P', Q Q', and T, the endless belts S S', made of felt or fabric, and the

roller N, journaled in the upper part of the chamber, substantially as herein shown and described, and for the purpose set forth.

9. In a machine for dry-dyeing, the combination, with the chamber L, of the chest M, surrounding the lower part of the same for the purpose of preventing the steam in the chamber from passing into the room in which the

chamber is located, substantially as herein shown and described, and for the purpose set forth.

EUGEN RAU.

Witnesses:

OSCAR F. GUNZ,
C. SEDGWICK.