

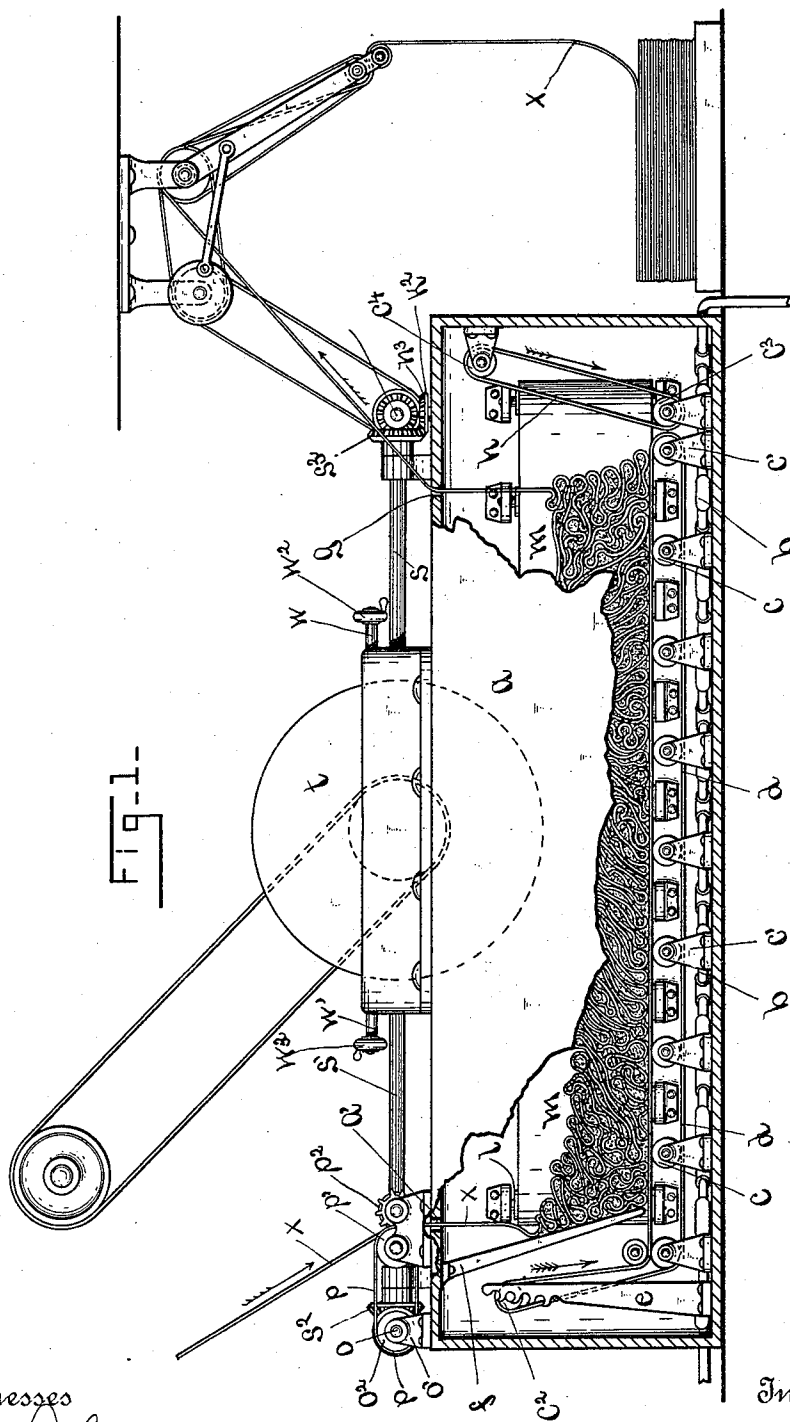
(No Model.)

3 Sheets—Sheet 1.

A. McNICOL.  
OXIDIZING APPARATUS.

No. 581,362.

Patented Apr. 27, 1897.



Witnesses  
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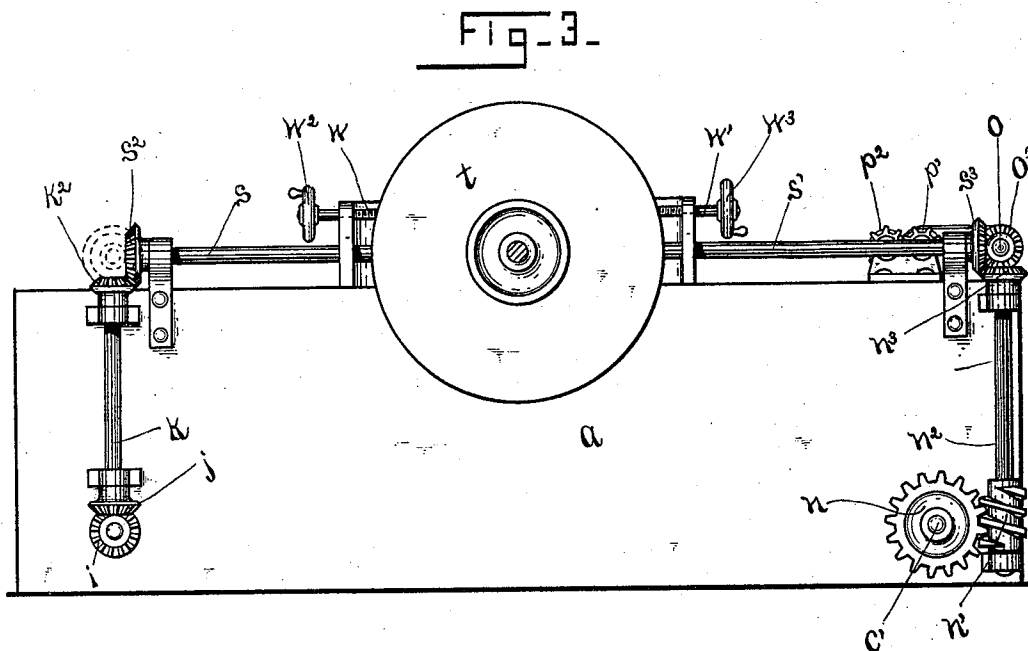
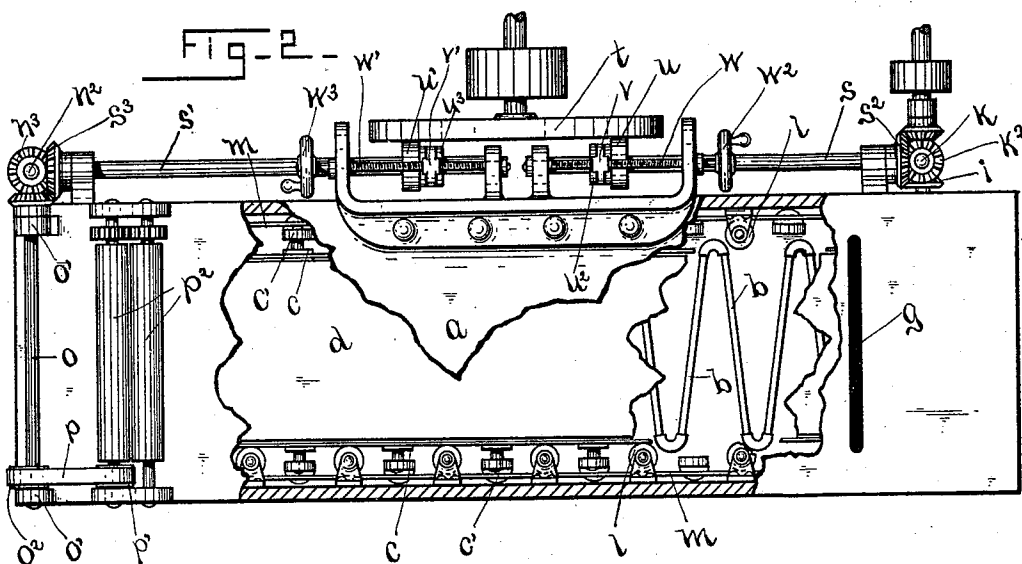
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3 Sheets—Sheet 2.

A. McNICOL.  
OXIDIZING APPARATUS.

No. 581,362.

Patented Apr. 27, 1897.



Witnesses

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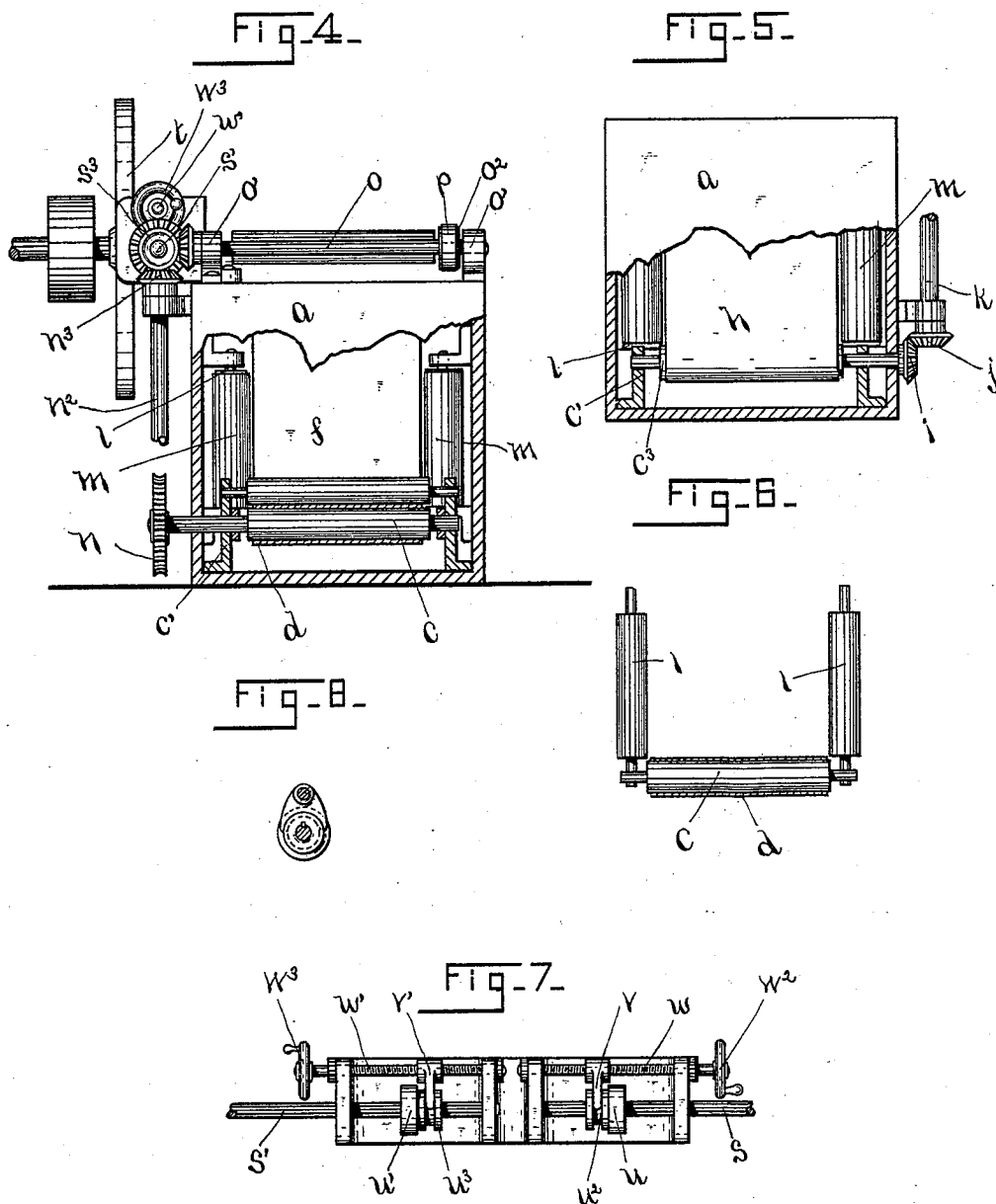
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3 Sheets—Sheet 3.

A. McNICOL.  
OXIDIZING APPARATUS.

No. 581,362.

Patented Apr. 27, 1897.



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# UNITED STATES PATENT OFFICE.

ARCHIE McNICOL, OF JEWETT CITY, CONNECTICUT.

## OXIDIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 581,362, dated April 27, 1897.

Application filed February 17, 1896. Serial No. 579,676. (No model.)

*To all whom it may concern:*

Be it known that I, ARCHIE McNICOL, a citizen of the United States, residing at Jewett City, New London county, State of Connecticut, have invented certain new and useful Improvements in Steam and Hot-Air Chambers, which improvements are fully set forth and described in the following specification, reference being had to the accompanying sheets of drawings.

This invention has for its object the production of simple apparatus for drying, steaming, or fumigating cloth in continuous lengths, paper in the web, or strips of other similar material.

My invention is specially valuable for use in bleacheries and dyeing establishments where woven fabrics are handled in great lengths—as, for example, in the operation of oxidizing or “setting” the color in dyed goods—and I have therefore shown the said invention as adapted for such service.

Heretofore it has been most common to hang the fabrics in folds on traveling rollers which are occasionally revolved to vary the position of said fabric, but such an arrangement does not allow the steam readily to penetrate the inner folds.

My present invention presents the cloth to the steaming or drying chamber in a single sheet or loose web and thus permits the steam or hot air to act more quickly, thoroughly, and uniformly than heretofore.

Briefly stated, my invention consists of a steam-box of considerable length, having mounted to travel therein one or more endless aprons upon which the fabric rests in open loose folds and is slowly carried the entire length of said chamber. Means are also provided for feeding the fabric into and out of said chamber and for providing variable driving mechanisms for the feeding apparatus.

The drawings annexed hereto illustrate my invention.

Figure 1 is a side elevation of the same with one side wall broken away to expose to view the operative parts within the steam-chamber. Fig. 2 is a plan view of the same, partly broken away; and Fig. 3 is an elevation of the side opposite that shown in Fig. 1. Figs. 4 and 5 are end elevations of the steam-chamber and certain parts connected

therewith, and Fig. 6 shows the relative positions of certain rolls that support the traveling aprons in said chamber. In Figs. 7 and 8 I have illustrated mechanisms for varying the speed of the fabric-feeding devices.

In the drawings the letter *a* indicates the steam-chamber proper, the same being of wood, iron, or other suitable material, of proper size and shape to receive the cloth or other material to be steamed or dried. Steam-pipes *b* are disposed along the bottom of said chamber, and immediately over said pipes are a number of rolls *c*, that are journaled in stands *c'* and serve to support an endless belt or apron *d*, which when set in motion provides a movable or traveling bottom in the steam-chamber.

At one end of the chamber the double portion of the apron passes over an idler *c<sup>2</sup>*, hung in open bearings in stands *e*, said stands being formed with a number of such bearings in order that the idler *c<sup>2</sup>* may be raised to take up the slack of the apron *d*, as will be understood by reference to Fig. 1 of the drawings. Adjacent to stands *e* is a plate *f*, that is secured to the top wall of chamber *a* and serves both as a shield for the stands and take-up roll *c<sup>2</sup>* and as a guide for the strip of fabric *x*, which is introduced into the chamber through a slot *a'* in said top wall over plate *f*, the relative positions of the slot *a'*, plate *f*, and apron being such that the entering fabric is deposited upon said apron, which when the apparatus is in use travels very slowly in the direction indicated by the arrow in Fig. 1. Near the opposite end of chamber *a* is a slot *g*, through which the fabric is discharged and may go thence to folding mechanism, as in Fig. 1, or may be caused to pass to the next succeeding operation in the finishing of the fabric. At the delivery end of chamber *a* is a roll *c<sup>3</sup>*, that is in the same plane as the series of rolls *c*, and near the top of said chamber is a similar roll *c<sup>4</sup>*. Around these rolls *c<sup>3</sup>* *c<sup>4</sup>* is an endless apron *h*, that travels in the direction indicated and serves to prevent the fabric from passing down around the doubled portion of the bottom apron *d*. The means provided for driving roll *c<sup>3</sup>* is best illustrated in Figs. 3 and 5, and consists of a miter-gear *i* on the outer end of the journal of said roll, said gear being engaged and driven by a like

gear  $j$ , secured to a vertical shaft  $k$ . The means of driving shaft  $k$  I shall refer to later.

Along each side of chamber  $a$  I have shown vertical rolls  $l$ , that support endless aprons  $m$ , serving as movable side walls, which may yield and travel with the moving mass of fabric, thus reducing frictional resistance at the sides of the chamber and preventing the disarrangement of the folds of fabric.

Referring now to Fig. 4, it will be seen that the journal of the end roll of the lower series  $c$  extends outward through the casing of the chamber and bears a worm-gear  $n$ , that meshes with and is driven by a worm  $n'$  on a vertical shaft  $n^2$ . The upper end of said shaft bears a miter-gear  $n^3$ , that meshes with and drives a like gear on a shaft  $o$ , that is mounted in stands  $o'$  on the top of chamber  $a$ . Shaft  $o$  bears a pulley  $o^2$ , that is connected by a belt  $p$  with a similar pulley  $p'$  on the journal of one of a pair of geared feed-rolls  $p^2$ , located immediately over the slot  $a'$ , through which the fabric  $x$  is introduced into the chamber  $a$ .

The vertical shafts  $k$  and  $n^2$  are driven by horizontal shafts  $s s'$  by means of miter-gears  $s^2 k^2$  and  $s^3 n^3$ , as shown, and said shafts  $s s'$  are driven by a constantly-revolving disk  $t$ , one of whose faces engages (frictionally) certain pulleys  $u u'$  on shafts  $s s'$ . These pulleys  $u u'$  are splined on their respective shafts and are formed with annularly-grooved hubs  $u^2 u^3$ , that are engaged by forks  $v v'$ , mounted on screw-shafts  $w w'$ . Each of the screw-shafts  $w w'$  is provided with an operating-crank or hand-wheel  $w^2 w^3$ , and by properly revolving the screw-shafts the forks and connected pulleys  $u u'$  may be caused to travel toward or away from the axial center of the driving-disk  $t$  to vary the speed of the shafts  $s s'$  and their connected parts. It is thus made possible and convenient to regulate the speed of said shafts relatively to each other, so as to properly feed the strip of fabric into chamber  $a$  at one end and remove it from the other end. The diagonally-disposed apron  $h$ , which

has already been described, travels in the direction indicated by the arrows in Fig. 1 and moves somewhat faster than the bottom or main apron  $d$ , so that the loosely-folded fabric at the delivery end of the main apron will be carried upward when it comes in contact with apron  $h$  and thus be prevented from passing downward between the aprons and clogging the apparatus.

My described apparatus provides a very practicable and convenient means for "oxidizing" dyed goods in continuous lengths and when once adjusted works automatically with the best results possible.

Having thus described my invention, I claim—

1. In combination, a chamber, an endless apron extending from end to end of the bottom of said chamber, an apron at the delivery end of said bottom apron, and mechanism for driving said aprons at different speeds, substantially as specified.

2. In combination, a chamber having inlet and outlet slots as set forth, feed-rolls whose contact-surfaces are in vertical alinement with said inlet-slot, an endless apron in the bottom of said chamber, a diagonally-disposed apron  $h$  at the delivery end of said bottom apron, and mechanism for driving said feed-rolls and aprons at different speeds, all substantially as specified.

3. In combination, a chamber having inlet and outlet slots as set forth, an endless apron covering the major portion of the bottom of said chamber and having means at one end for taking up the slack of the apron, a diagonally-disposed apron,  $h$  at the delivery end of the bottom apron, and mechanism for driving said aprons at different speeds, all substantially as specified.

ARCHIE McNICOL.

Witnesses:

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