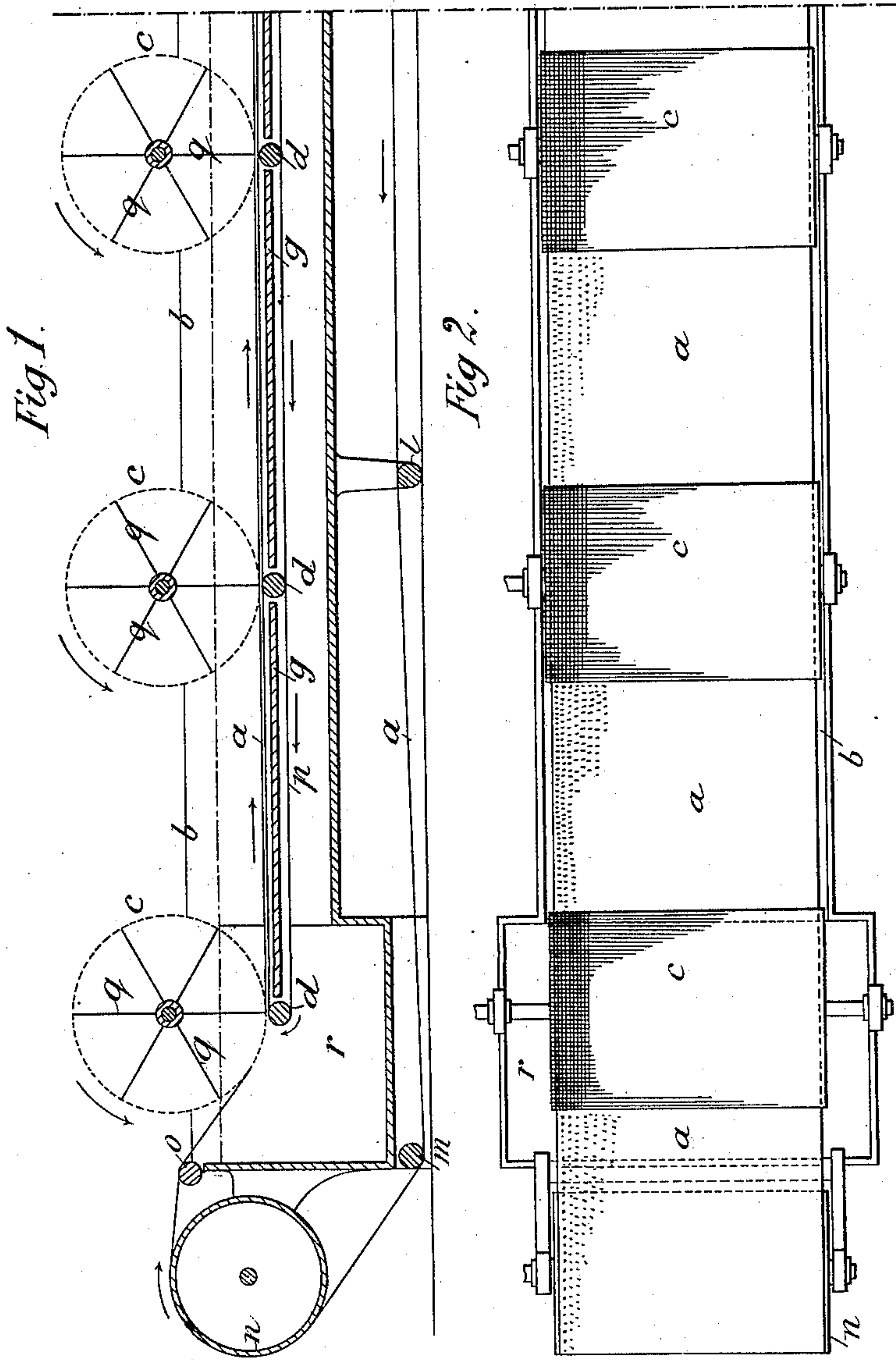


W. COOK.

MACHINERY FOR WASHING WOOL.

No. 383,515.

Patented May 29, 1888.



Witnesses:
c. Will T. Norton
Thos. Bell

Inventor:
Walter Cook
by John J. Husted & Son.
his Attys.

(No Model.)

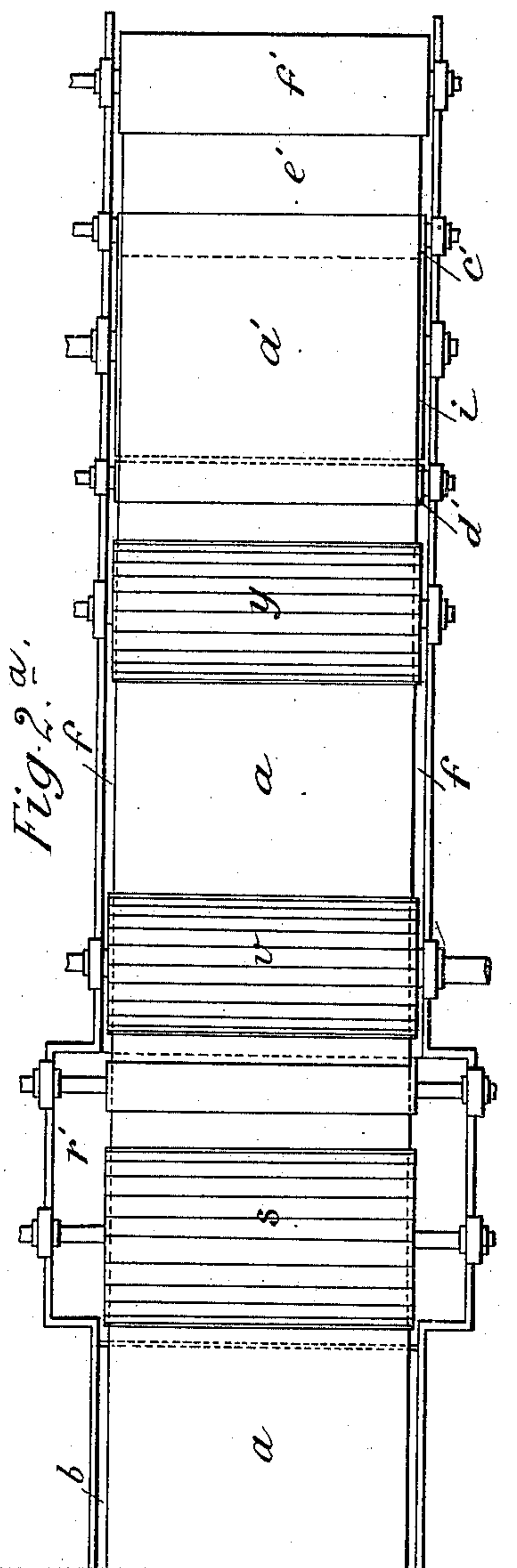
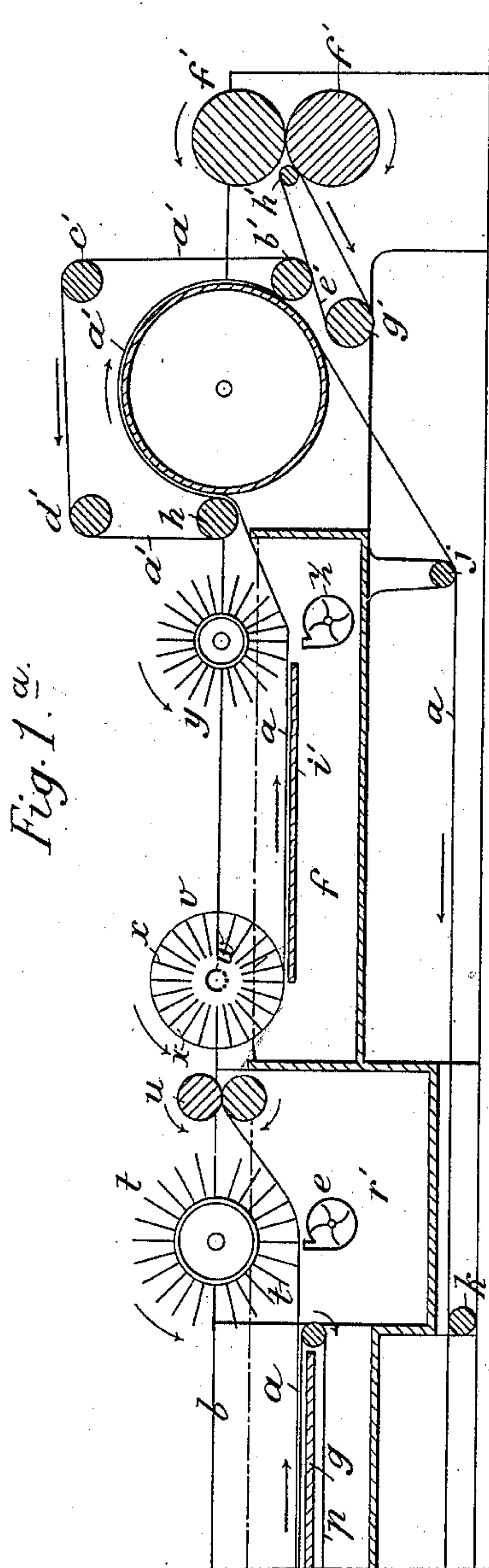
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

WALTER COOK, OF CHRISTCHURCH, CANTERBURY, NEW ZEALAND.

MACHINERY FOR WASHING WOOL.

SPECIFICATION forming part of Letters Patent No. 383,515, dated May 29, 1888.

Application filed January 19, 1886. Serial No. 189,090. (No model.) Patented in New Zealand May 5, 1884, and September 2, 1884; in England March 30, 1885, No. 4,028; in France September 22, 1885, No. 171,287, and in Belgium September 30, 1885, No. 70,363.

To all whom it may concern:

Be it known that I, WALTER COOK, a subject of the Queen of Great Britain, residing at Christchurch, Canterbury, New Zealand, have
5 invented new and useful Improvements in Machinery for Washing or Scouring Wool, (for which I have obtained patents in the following countries, namely: New Zealand, dated May 5, 1884, and September 2, 1884, respectively;
10 Great Britain, No. 4,028, dated March 30, 1885; France, No. 171,287, dated September 22, 1885; and Belgium, No. 70,363, dated September 30, 1885,) of which the following is a specification.

My invention relates to improvements in
15 machinery for washing or scouring wool, whereby the wool can be cleansed or scoured, either in whole fleeces or portions of fleeces, in such a manner as to preserve the staple intact. For this purpose I place the wool to be
20 scoured on an endless traveling belt or feeding-aprons, such as are hereinafter described, which carries or carry it into a long trough or troughs containing the necessary washing water or fluid. While in the trough or troughs
25 the wool leaves the said traveling belt and floats in the water or washing-fluid, which is made to travel at the same speed and in the same direction as the belt and carries the wool with it. The wool, as it passes along, is at
30 intervals subjected to a squeezing action under the water by means of a series of hollow perforated drums, as hereinafter described, and one or more streams or jets of the washing fluid or water can be forced through the wool
35 by means of one or more small water-fans, as hereinafter described. In some cases a trough or tank is provided for holding clean water for rinsing the wool after it comes from the washing trough or troughs. When an endless
40 band or belt is employed, I make it of the same width as the inside width of the main portion of the trough, and cause it to travel over rollers or drums at each end of the machine under the above-named squeezing-drums
45 and along the top of a false bottom in the washing-trough. This belt should be made of a material which will allow the water to pass freely through it. I prefer to use an open-meshed brass wire-cloth; but any other suit-

able material can be used which is sufficiently 50 strong to stand the wear and tear. Around the said false bottom (when the said endless band is employed) travels a canvas or other endless belt or apron stretched on a series of small rollers. This belt acts as an anti-friction belt 55 for the main belt hereinbefore described; and it also serves to carry on any sand or dirt that may fall out of the wool and to throw it into a well at the end of the washing-trough.

The hereinbefore-described hollow squeez- 60 ing drums or cylinders are each divided into a number of radial sections, so as to act as fans or paddles, for the purpose of propelling the water along the washing-trough, or separate fans or paddles can be employed for this pur- 65 pose. The water thus propelled returns underneath the false bottom, and the whole of the water in the trough is thus kept in constant circulation. The said drums are made of the same width as the main endless belt, and 70 their peripheries are made of perforated metal, wire-cloth, or other similar material, the object being to allow the fluid to pass freely through, and they are kept in their cylindrical form in any suitable manner, such as by 75 two or more circular disks or rings. The drums are made to revolve at such a speed that their peripheries or surfaces shall travel at the same speed as the main endless belt or feeding-aprons, and they serve the double 80 purpose of propelling the water along the trough and of squeezing the wool as it passes under them.

The well or sand-receptacle, when such is employed, (at one or both ends of the wash- 85 ing-trough,) is deeper and wider than the main part of the trough, and at or near the bottom of these wells there is a mud-hole door for cleaning purposes. The small water-fans are so constructed as to send up a jet or stream of 90 the washing fluid or water the full width of the main belt through the wool, which is held down at short intervals by a wheel or drum which is provided with a number of radial fans or blades. This jet or stream of water 95 passing through the wool in this manner washes out any loose dirt or the like, which is carried away by the flow of water between the

blades on each side. The wool on leaving the washing-trough passes between a small pair of wringing-rollers, which squeeze out the greater portion of the dirty soapy water or other washing-fluid, and, if found necessary, the wool can then be carried into a rinsing-trough and under another wheel or drum having radial fans or blades, which drum revolves on a water-pipe. This pipe is perforated on the under side and is supplied with water coming from a cistern or other source, so as to rinse the wool as it passes under the same. The wool then passes on through the rinsing-trough and passes under another wheel or drum having fans or blades, where it is again washed by a stream of water being forced through it from underneath by another water-fan. The wool is then conveyed to an elevating-apron, which feeds to wringing-rollers; or the wool can be carried out from the washing-trough or from the rinsing-trough in any other suitable manner.

In order to enable my invention to be fully understood I will proceed to describe the same by reference to the accompanying drawings, in which—

Figures 1 and 1^a represent a longitudinal section, but cut in two transversely for want of space on the sheet, and Figs. 2 and 2^a a plan similarly cut in two, of a machine for washing or scouring wool constructed according to my invention.

Similar letters in all the figures represent similar or corresponding parts.

Referring to Figs. 1 and 2, *a* is the endless traveling belt, on which the wool to be scoured is placed, and which serves to carry it into and out of the trough *b*, containing the necessary washing water or fluid. The said endless band is perforated and operates as hereinafter described.

c c c are the series of hollow drums, of about the same width as the belt *a*, and having their peripheries made of perforated metal, wire-cloth, or other similar material, so as to allow the fluid to pass freely through. By these drums *c* the wool is subjected at intervals, as it passes along through the trough, to a squeezing action under the water by passing between the said hollow drums *c* and the rollers *d d d*.

e shows one of the water-fans for forcing a stream or jet of the washing fluid or water through the wool as it passes along.

f is the trough or tank for holding clean water for rinsing the wool after it comes from the trough *b*.

g is the false bottom of the washing-trough *b*, between which and the drums *c* the endless band *a* travels. The said band is of the same width as the inside width of the trough *b*, and after leaving the drums *c* passes under the drums with radial arms and through the wringing-rollers, hereinafter described, to the rollers *h* and *i* at one end of the machine, whence it passes under the roller *j* at the bottom of the machine, over the rollers *k* and *l*, under the roller *m*, and over the rollers *n* and *o*.

p is the endless belt or apron which travels around the false bottom *g*, and is stretched on the small rollers *d d*, hereinbefore described.

r and *r'* are the wells at each end of the trough *b* for receiving the sand or dirt which falls out of the wool, the said wells being deeper and wider than the main part of the trough.

q q are the radial plates dividing the drums *c* into sections and forming fans or paddles for propelling the water along the trough *b*.

s is one of the wheels or drums having a number of radial fans or blades, *t*, serving to hold the wool down at short intervals, while the water-fan *e* sends up a jet or stream of the washing fluid or water through it the full width of the belt *a*.

u u are the wringing-rollers through which the wool then passes as it leaves the washing-trough *b*, and whereby the greater portion of the dirty soapy water or other washing-fluid is squeezed out, the wool being conducted to the said rollers *u* by the endless band *a*.

v is the wheel or drum revolving on a water-pipe, *w*, in the rinsing-trough *f*.

x x are the radial fans or blades of the wheel or drum *v*. The pipe *w* is perforated on its under side, as shown, and is supplied with water coming from a cistern or other source, so as to rinse the wool as it passes under the same.

y is a wheel or drum, and *z* a water-fan (similar to the drum *s* and water-fan *e* at the end of the trough *b*) by which the wool is again washed by a stream of water being forced through it.

a' is the belt between which and the belt *a* the wool then passes. The belt *a'*, after passing under the roller *h*, travels with the belt *a* over the drum *i*. It then passes round the rollers *b'*, *c'*, and *d'* to the roller *h*.

e' is the belt for elevating the wool as it comes from between the belts *a* and *a'* to the final wringing-rollers, *f' f'*. The belt *e'* travels over rollers *g' h'*.

i' is a false bottom in the rinsing-trough *f*.

Suitable means are provided for giving the required pressure to the various squeezing-rollers and drums, and the various parts of the machine are operated by any suitable arrangement of gearing, as will be well understood.

The operation of the machine is as follows: The various rollers and other parts of the machine having been put in motion, so as to rotate in the direction shown by the arrows, the belts or bands *a* and *p* will be carried along also in the direction indicated by the arrows, the water or washing-fluid being caused by the fans or paddles *q* to flow in a like direction. The wool or fleece is fed into the machine from over the roller *n*, whence it will be carried by the first drum *c* and belt *a* (receiving at the same time a squeezing action while in the water) into the trough *b*, containing the washing water or fluid, and a portion of the sand and dirt in the wool will fall into the well *r*.

It then floats in the said water or fluid, which, by the action of the fans or paddles *q*, is made to travel at the same speed and in the same direction as the belt and carries the wool with it. The wool is then drawn down by the next perforated hollow drum *c* and subjected to another similar squeezing action under the water. The wool then again floats in the liquid and is a third time subjected to a squeezing action under water. Meanwhile the sand and dirt which have fallen from the wool through the belt *a* onto the belt *p* will have been drawn along to the end of the false bottom *g*, and will be deposited in the well *r'*. The wool then passes on under the radial fans or blades *t* of the wheel or drum *s*, where a stream or jet of the liquid in the trough is forced through it by the water-fan *e*. The wool is then conducted up to and through the wringing-rollers *u u*, by which the greater portion of the soapy water or fluid is squeezed out of the wool; it is then drawn in under the water in the rinsing-trough *f* by the drum *v*, the supply of rinsing-water meanwhile being syringed onto it by the perforated pipe *w*. The wool passes along over the false bottom *i'* and under the drum *y*, where a stream of the rinsing-water is forced through it by the fan *z*. It is then drawn along under the roller *h* and between the belts *a* and *a'* over the drum *i'*. It then falls onto the elevating-belt *e'*, whereby it is carried to the final wringing-rollers, *f' f'*, and the washing or scouring operation is complete.

It will be obvious that the number of drums *c* and rollers *d* can be varied according to requirements.

The cleansing of the machines may be readily effected by passing through them streams or currents of water or steam, so as to remove all deposits of dirt or other matters that may adhere to the various parts; or other suitable methods of cleansing may be employed.

By my improvements the necessity of employing rakes or forks for carrying the wool through the washing or scouring machine is obviated and the wool is continually subjected to a cleansing action during its passage through the trough or bowl by means of the perforated drums and rollers, which allow the grease and dirt, as it is squeezed out, to pass through the perforations into the water or washing-fluid.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

In a machine for washing or scouring wool, the combination of the following elements, namely: a trough, a feeding-belt, squeezing-rollers which nip or squeeze the wool under water in said trough, a false bottom in the trough below the water-line, and paddles or fans *q* above said false bottom and serving to drive forward the water and the wool above the false bottom to wool-receiving mechanism and to create a circulation and return-current of the water beneath the false bottom.

WALTER COOK.

Witnesses:

THOMAS KYLE,

CHARLES HY. CLARKE,

Both of Elmwood Mills, Leeds.