

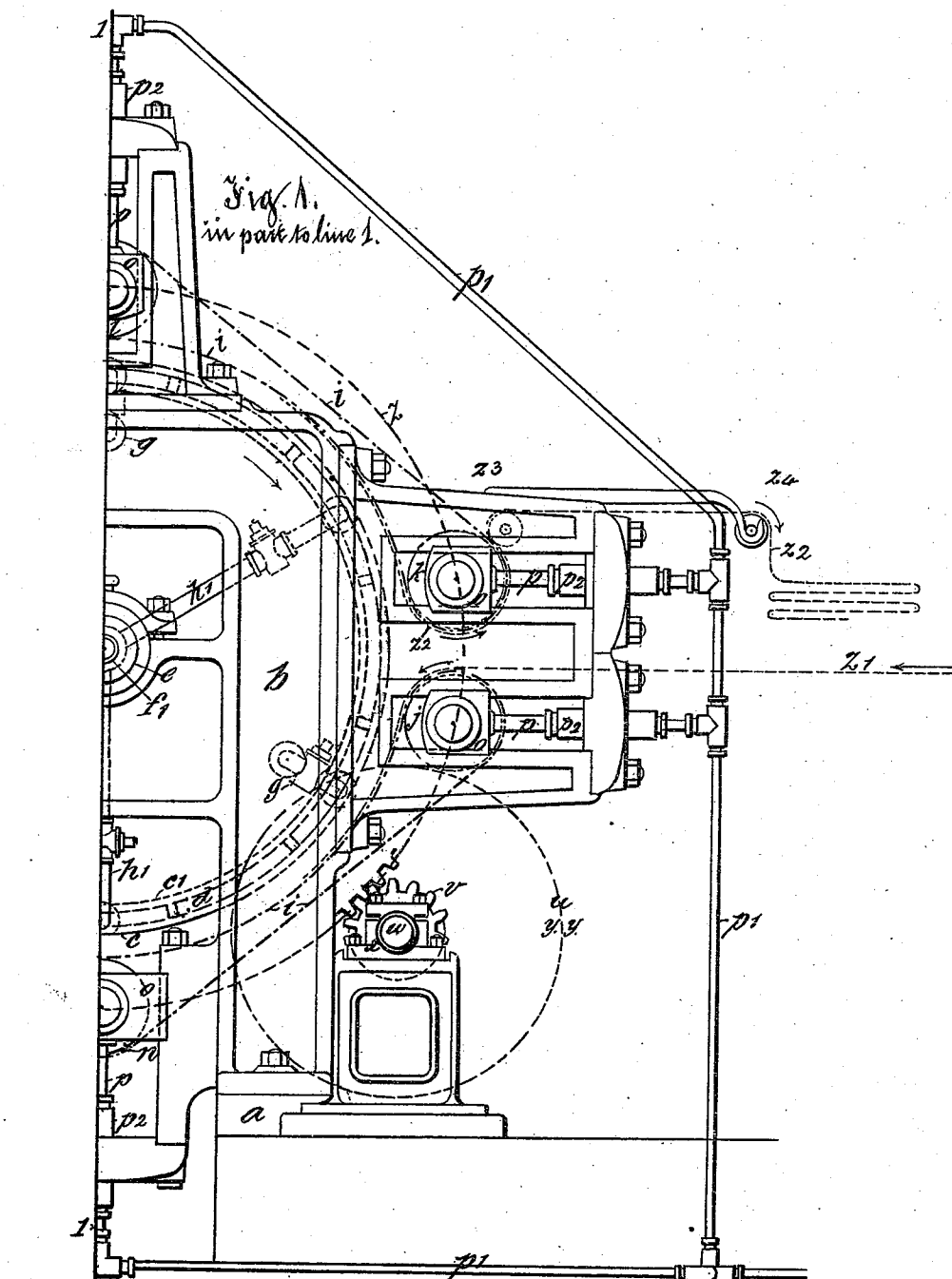
(No Model.)

4 Sheets—Sheet 1.

J. KIRK & B. LEE.
CLOTH PRESSING MACHINE.

No. 501,349.

Patented July 11, 1893.



Witnesses

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(No Model.)

4 Sheets—Sheet 2.

J. KIRK & B. LEE.
CLOTH PRESSING MACHINE.

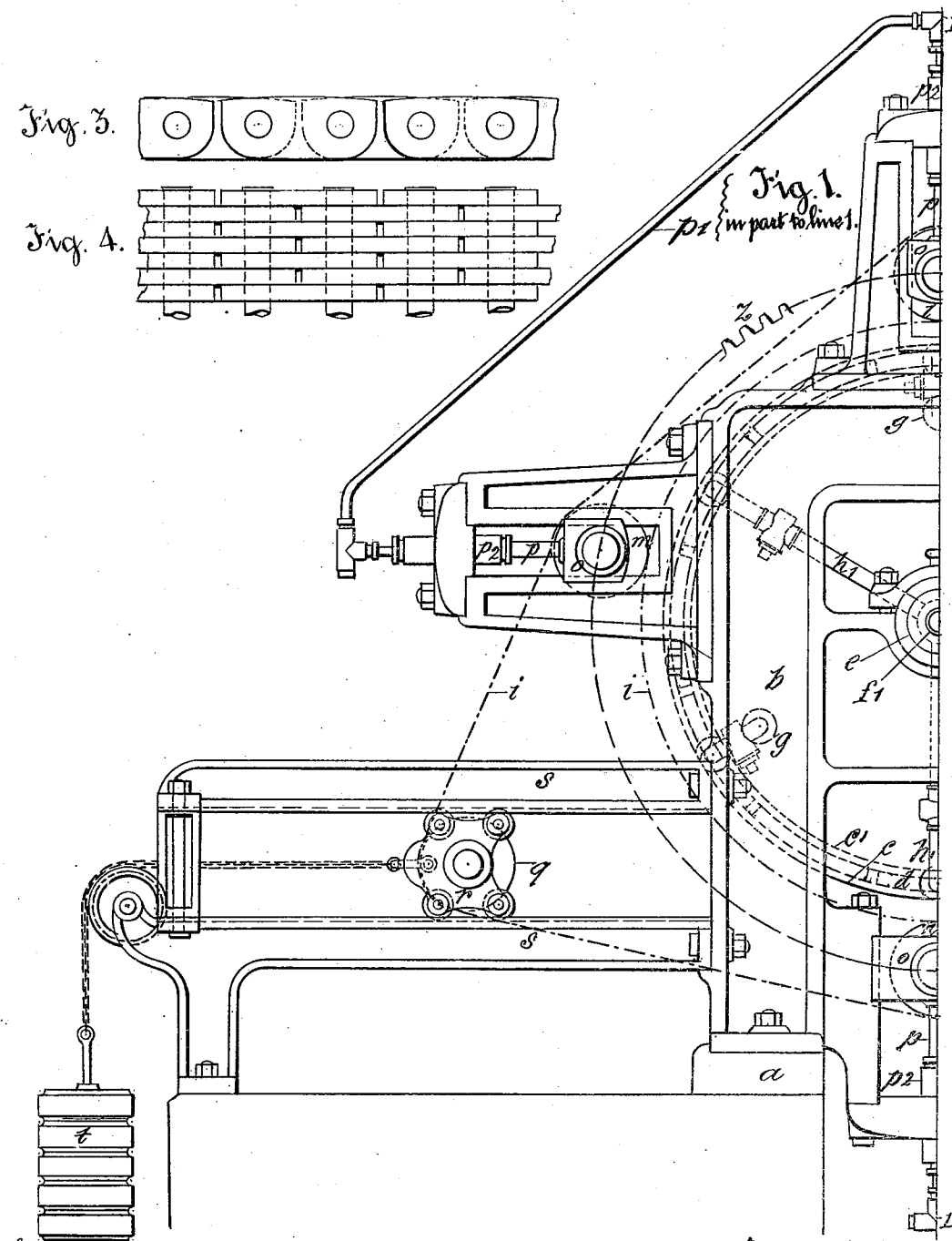
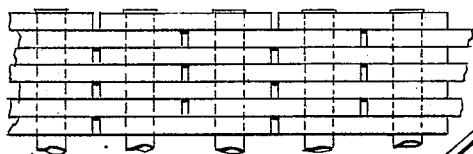
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Fig. 3.



Fig. 4.



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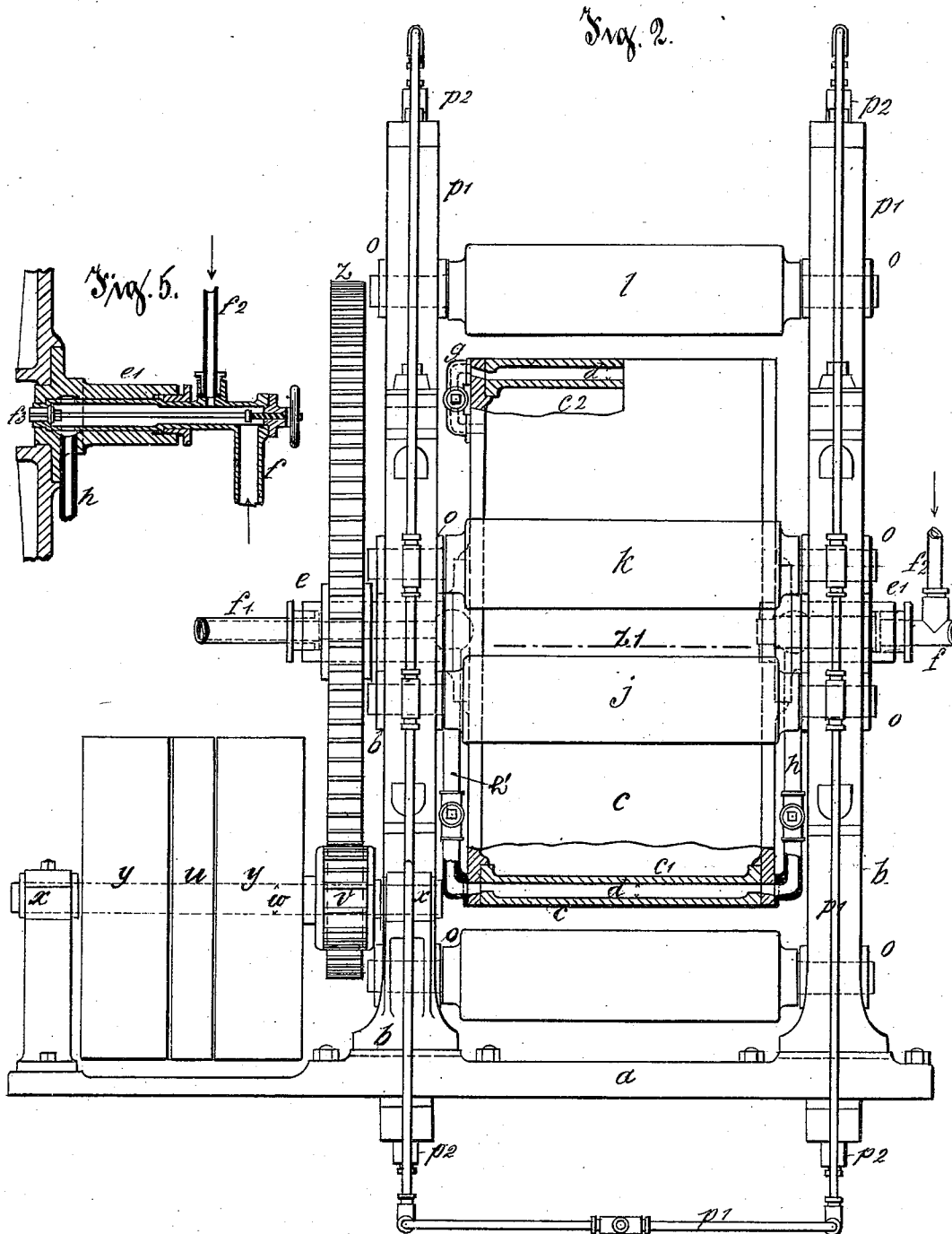
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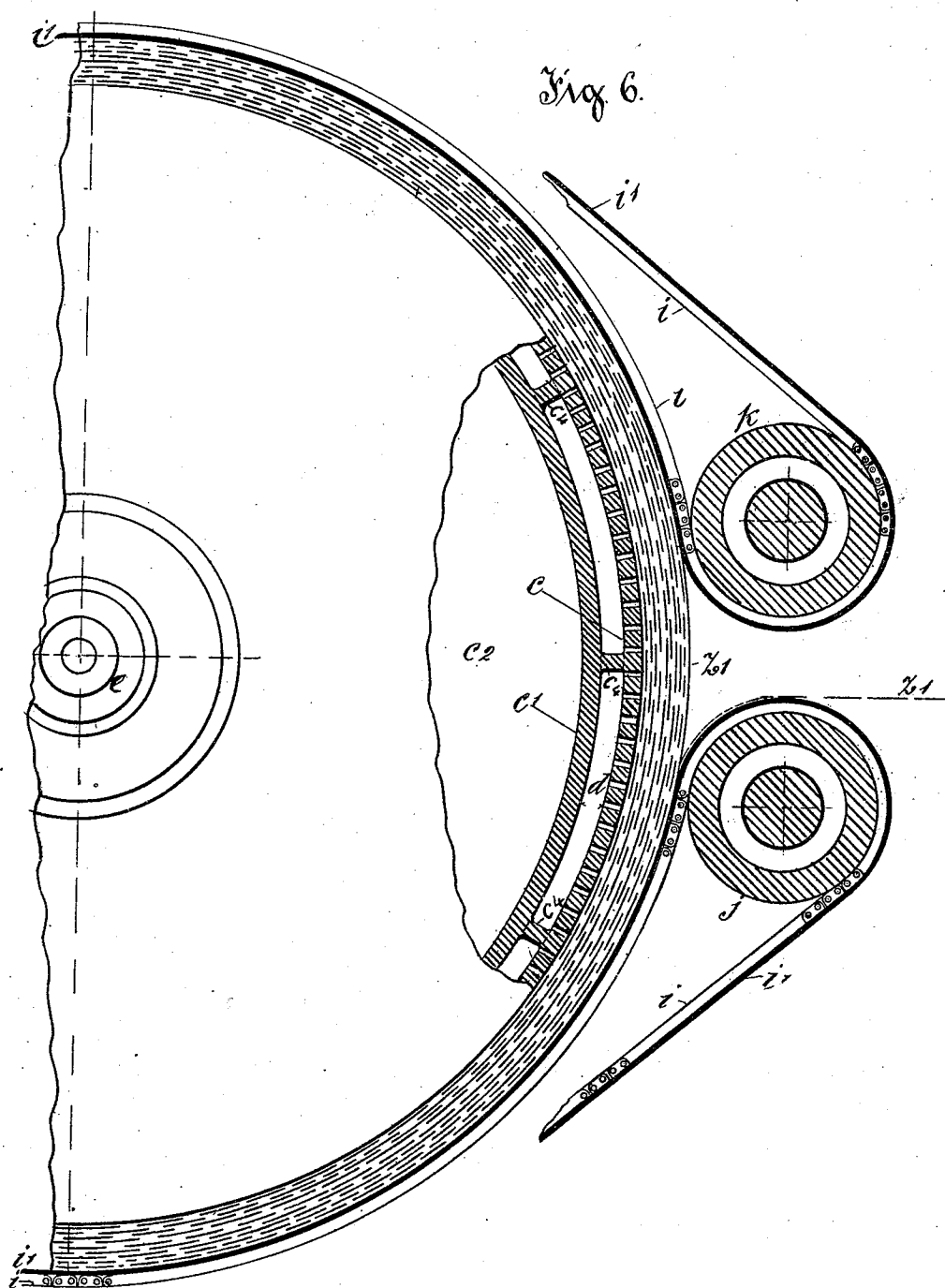
(No Model.)

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J. KIRK & B. LEE.
CLOTH PRESSING MACHINE.

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Patented July 11, 1893.



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UNITED STATES PATENT OFFICE.

JOHN KIRK AND BENJAMIN LEE, OF LEEDS, ENGLAND.

CLOTH-PRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 501,349, dated July 11, 1893.

Application filed February 11, 1891. Serial No. 381,110. (No model.)

To all whom it may concern:

Be it known that we, JOHN KIRK and BENJAMIN LEE, subjects of the Queen of Great Britain and Ireland, residing at Leeds, in the county of York, England, have invented new and useful Improvements in Cloth-Pressing Machines, of which the following is a specification.

Machinery constructed according to this invention comprises a double rimmed and hollow metallic cylinder capable of rotating in fixed bearings in either direction, and having an annular jacket or space between the said two rims. The periphery may either be perforated or solid and heated by steam, the axles or trunnions being pierced axially and suitable arrangements being made for the admission of steam and the escape of water resulting from condensation thereof. A number of pressing rollers are located in suitable positions around the cylinder, which are capable of simultaneous movement toward it by fluid pressure. The above are in combination with an endless sheet of metal, woven wire or it may be composed of suitably formed metallic links joined together by rods, pins or rivets. This sheet together with an elastic protective sheet (or otherwise) nearly surrounds the cylinder around which the fabric under treatment is wound, (it may be in several thicknesses) and being acted upon in a tensile direction by a tightening roller embraces the fabric between it (or them) and the cylinder and thus in conjunction with the pressing rollers exerts or exert an enormous circumferential pressure thereon.

In the annexed drawings, Figure 1 (in two parts) is an elevation as seen from the driving side of the machine, constructed according to our invention, the driving gear being shown in dotted lines only. Fig. 2 is a front elevation partly in section. Figs. 3, 4 and 5 are detail figures hereinafter referred to. Fig. 6 shows partly in section and partly in elevation a modification hereinafter described.

Similar letters refer to similar parts wherever they occur.

a, is the base or foundation plate upon which the superstructure is erected.

b, b, are the housings or side-frames that carry the main cylinder and pressure rollers

and to which are attached other parts of the machine.

c, is the main cylinder with the annular space *d*, between its outer periphery and the inner ring of metal *c'*.

e, e', are the axles or trunnions upon which the cylinder rotates and which are pierced axially as previously stated. Steam is admitted through one of them (*e'* shown in section in Fig. 5) by the pipe *f*, and the stop valve *f³*, to the central compartment *c²*, from which it can be conveyed to the said annular space *d*, by pipes such as *g*, with taps. The axle *e*, and pipe *f'*, form the outlet for water resulting from condensation of the steam in the cylinder. The said axle or trunnion *e* may either be provided with a stop valve similar to *f³*, or its piercing need not pass through it. The pipe *f'* may be bent downward so as to form the longer leg of a siphon, the shorter leg of which terminates within the cylinder near the bottom portion thereof. By this arrangement condensation can be readily removed from the cylinder when necessary.

f², is an inlet for cold water when it is required to cool the cylinder.

h, h, are pipes with taps for admitting steam from the pipe *f*, direct to the annular space *d*, that is:—when the axial orifice in the induction trunnion *e'*, is closed at its inner end either by the valve *f³* or otherwise.

h', h', are pipes and taps similar to *h, h*, and each constituting the shorter leg of the siphon referred to for conveying water from the annular space *d*, or from the part *c²* of the cylinder *c*, to the outlet pipe *f'*. The condensed water is removed from the cylinder while the machine is at rest, this being effected by closing the cocks on all the radial pipes *g*, and placing the cylinder so that the pipes *h* and *h'* are in the bottom position. Then the steam entering the cylinder through the pipe *f*, trunnion *e'*, and pipe *h*, forces the condensed water out of the cylinder through the pipe *h'*, trunnion *e* and pipe *f'* and away. After all the water has been removed the cocks on the radial pipes *g* are again opened, and the machine set in motion ready for work. It has been found only necessary to do the above operation at starting since any water which may afterward accumulate finds its way out

along with the stream passing through the pipe f' . The double walls $c c'$ serve to prevent the water of condensation formed in the inner space of the cylinder coming in contact with the outer wall c thereof, this water being of course cooler than the steam itself.

i is the endless metallic sheet of thin metal or woven wire or a built up chain as shown to an enlarged scale in Figs. 3 and 4.

j, k, l, m, n , are the pressing rollers each carried in movable bearings o , and pressed toward the main cylinder c , by the rams p , of a hydraulic cylinder p^2 .

p' , are pipes for supplying water under pressure from any convenient source simultaneously to all the hydraulic cylinders p^2 , for actuating the rams p , for the purpose mentioned.

j , and k , are the rollers between which the fabric enters the machine to be coiled round the main cylinder c , where it is embraced by the portion of the said endless sheet i , which passes nearly round the cylinder c , and the fabric, the remaining portion passing around the pressure rollers j, k , and then outside of the rollers l, m, n , and the tightening roller q . The roller q , is carried by bearings r , in frames arranged to work horizontally in guides s , and is drawn backward for tightening the endless sheet i , by the action of the weights t , or by equivalent means.

u , is the driving pulley and v , the driving pinion both fixed on the shaft w , carried in the bearings x, x .

y, y , are loose or carrying pulleys for cross and open straps for driving the machine in either direction.

z , is a spur wheel on the axis e , of the main cylinder c , and driven by the pinion v .

z' , is the fabric entering the machine and z^2 , shows it leaving the machine and being either wound upon the roller z^3 , or passing over it and over z^4 for being cuttled.

In treating some kinds of fabrics that require a high degree of heat we intercept the steam in its passage to the central compartment of the cylinder by providing a stop valve f^3 , at or otherwise closing the inner ends of the axial orifices of the trunnions and providing an induction passage or passages direct to and exhaust from the said annular space d .

In cases where the fabric requires to be both steamed and pressed we use a cylinder with its periphery perforated so that steam may pass through it and the fabric. An arrangement of this kind is shown in Fig. 6 in which c^2 are the perforations in the outer wall or periphery c of the cylinder and z' is the fabric under treatment which may be wound either once or many times around the cylinder. A small portion only of the pressure required on the fabric is effected by the rollers $j k l m n$, located at intervals around the main cylinder, but in some cases the said roller pressure being of such little value may be dispensed with after the fabric has been

placed upon the main cylinder. The principal pressure is effected by means of the said metallic sheet i , which is drawn in a powerful manner and caused to tightly embrace the fabric around and upon the cylinder, such pressure being much greater than heretofore given by the usual method of pressing. At the same time steam is caused to pass through the aforesaid perforations of the cylinder and through the fabric which is consequently subjected to the combined action of steaming and powerful hot pressing whereby the finish imparted thereto is rendered greatly superior to that obtained by any previously known machine and the pressing is effected in much less time than has heretofore been usual.

When simply hot pressing is required, the cylinder is merely heated by steam admitted into the central compartment and the pressing effected by means of the powerful embrace of the metallic sheet as above mentioned and the above named protective sheet, according to the texture of the fabric to be pressed.

It is to be distinctly understood that the principal part of the pressure is effected over the whole surface and substance of the fabric formed by coiling it upon the cylinder, the amount of pressure depending upon the degree of tightness of the endless metallic sheet and not by the nip alone of the hydraulically moved rollers in their movement toward the main cylinder, this latter kind of pressure being the only one available in machines of the roller construction.

When the fabric is of a delicate texture and liable to become marked by the endless metallic sheet i , owing to the nature of its construction shown to an enlarged scale in Fig. 6,—an endless and strong protective sheet i' of somewhat elastic material as for example Mackintosh cloth, which may be of the same length as the endless metallic sheet, is placed between such metallic sheet and the fabric under treatment.

Many and great advantages are attained by having the double wall to form annular space d . The valves in all the pipes h, h' and g , communicating with the annular space d , are shut off, steam is turned into the main chamber of the cylinder and the machine is set in motion. There will be some water of condensation until the cylinder is entirely heated but this will be discharged by the pipes h' and f' as before described. When the cylinder has been thoroughly heated the steam can be turned into annular chamber d , and there will be no water of condensation to lower the temperature. This is a point of great advantage. Furthermore if it is not desired to heat the fabric with a great heat the steam need not be turned into the space d . Furthermore after the inner space of the cylinder has been thoroughly heated up by closing all valves in pipes h, h' and g , and admitting steam through valve f and discharging water of condensation through pipe f' if

it be desired to steam and finish fabrics in one operation, steam is admitted to annular space d , by opening valves in pipes h , h' and g , and passes through small holes in periphery C to the material. Any small quantity of water that may collect in space d passes through pipe g into the inner space C^2 and out through pipe f' . This machine thus is capable of both pressing and steaming fabrics without removing them.

What we claim is—

1. In a machine for finishing fabrics, the combination of a hollow metallic rotary cylinder having inner and outer walls or peripheries forming an intervening space, and hollow trunnions, a steam pipe f , extending into one of the said trunnions, a pipe f' , extending into or through the other hollow trunnion, one or more pipes or conduits in communication with said pipe f' , and with the interior of the cylinder and the space d , one or more pipes such as g , for placing the interior of said cylinder in communication with said annular space, and cocks for controlling each of said pipes substantially as herein described.

2. In a machine for the purposes set forth the combination of a hollow metallic rotary cylinder having inner and outer walls or peripheries forming an intervening space, and hollow trunnions, a steam pipe f , extending into one of said trunnions, a pipe f' , extending through the other hollow trunnion, one or more pipes or conduits in communication with said pipe f' , and with the interior of the cylinder and the space d , one or more pipes h , for placing said annular space in direct communication with the interior of the hollow trunnion into which steam is admitted, and cocks for controlling each of said pipes substantially as herein described for the purposes specified.

3. In a machine for finishing fabrics, a hollow metallic rotary cylinder having double walls to form a steam jacket, hollow trunnions for entrance of steam and exit of water to and from the cylinder, means for admitting steam to the chambers of the cylinder the outer wall of said cylinder being perforated for exit of steam substantially as herein described for the purpose specified.

4. In a fabric finishing machine the combination of a hollow metallic rotary cylinder, means for rotating the same, pressing rollers located in suitable positions around said cylinder and capable of being forced toward the same, a tightening roller and means for operating the same in one direction, an endless non-extensible metallic sheet or band passing partly around said cylinder between the same and said pressing rollers and thence over or

around said pressing and tightening rollers and a protective sheet or band of elastic material interposed between said endless non-extensible sheet or band and said cylinder, substantially as herein described for the purpose specified.

5. In a machine for finishing fabrics, the combination of a rotary hollow cylinder provided with an annular steam space just within its periphery, the periphery forming the outer wall of said space, means, substantially as described for admitting steam into the interior of the cylinder and into said annular space, and means substantially as described for pressing the fabric on the periphery of the cylinder, substantially as set forth.

6. In a machine for finishing fabrics, the hollow rotary cylinder having the double rim or periphery forming the annular space d , just within the outer wall of the cylinder to prevent water of condensation collecting in contact with the outer wall, and steam passages into the center of the cylinder, and an exhaust, as and for the purpose set forth.

7. The combination of the rotary cylinder having the double rim forming the intermediate space, means for admitting steam thereinto, pipes for exhausting therefrom, and means for admitting steam into the central portion of the cylinder and disengaging it therefrom into such space, as and for the purposes set forth.

8. The combination of the rotary hollow metallic cylinder having the double rim forming the intermediate annular steam space, passages for admitting steam into the central portion of the cylinder, branch pipes for admitting steam into said annular space, valves for cutting off the steam to discharge it into said annular space or into said central portion, and an exhaust pipe from said annular space, substantially as described.

9. In a fabric presser, the combination of a hollow rotary cylinder formed into central chamber c^2 , an annular steam space d , within the rim and having the hollow trunnions, the pipes g , from the central chamber c^2 , into annular space d , the steam pipe f , opening into the central chamber, a steam passage from pipe f , to space d , a valve, as f^3 at the steam entrance into the central chamber, and exhaust pipes h' , f' , as set forth.

Leeds, January 28, 1891.

JOHN KIRK.
BENJAMIN LEE.

In presence of—

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JAMES ARTHUR CRAVEN,
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