

No. 768,690.

PATENTED AUG. 30, 1904.

T. PRATT, C. KING & J. E. HAMMOND.

MACHINE FOR PRESSING AND FINISHING TEXTILE FABRICS.

APPLICATION FILED FEB. 5, 1900.

NO MODEL.

2 SHEETS—SHEET 1.

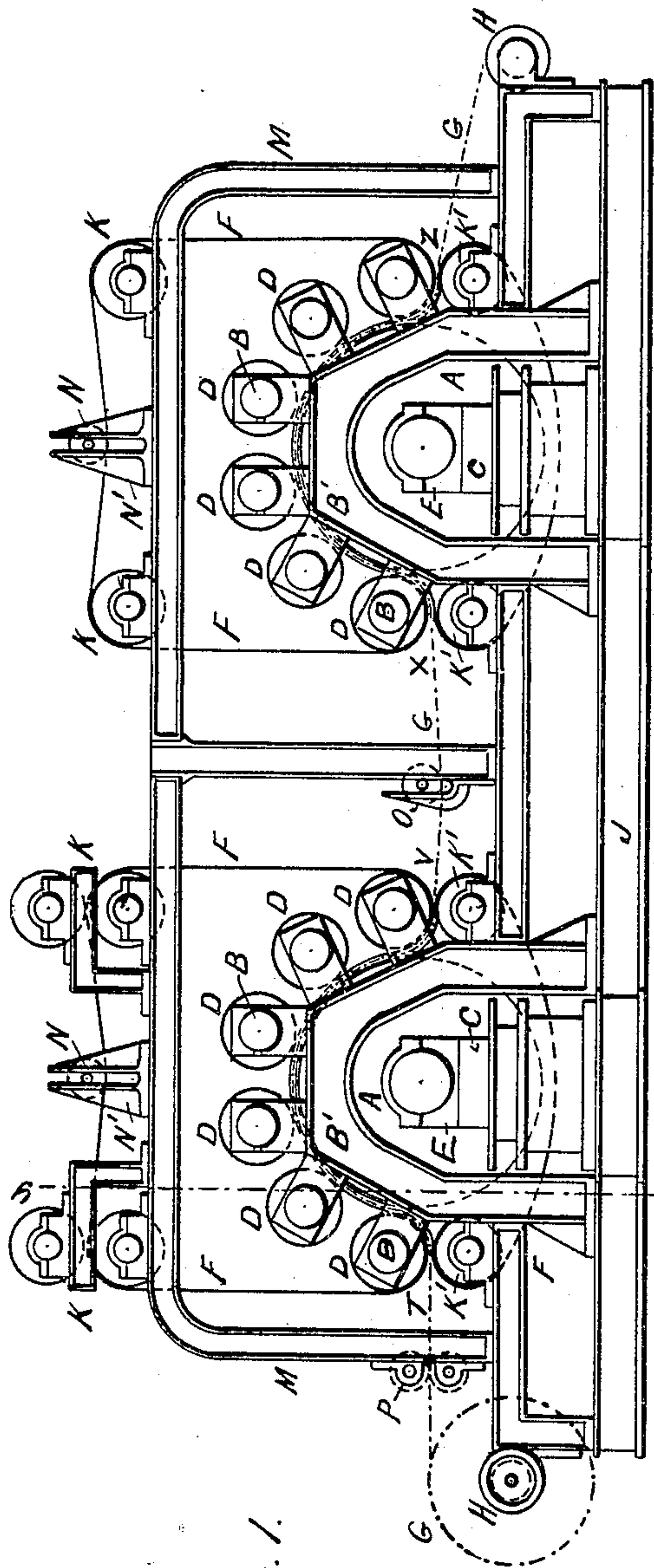


Fig. 1.

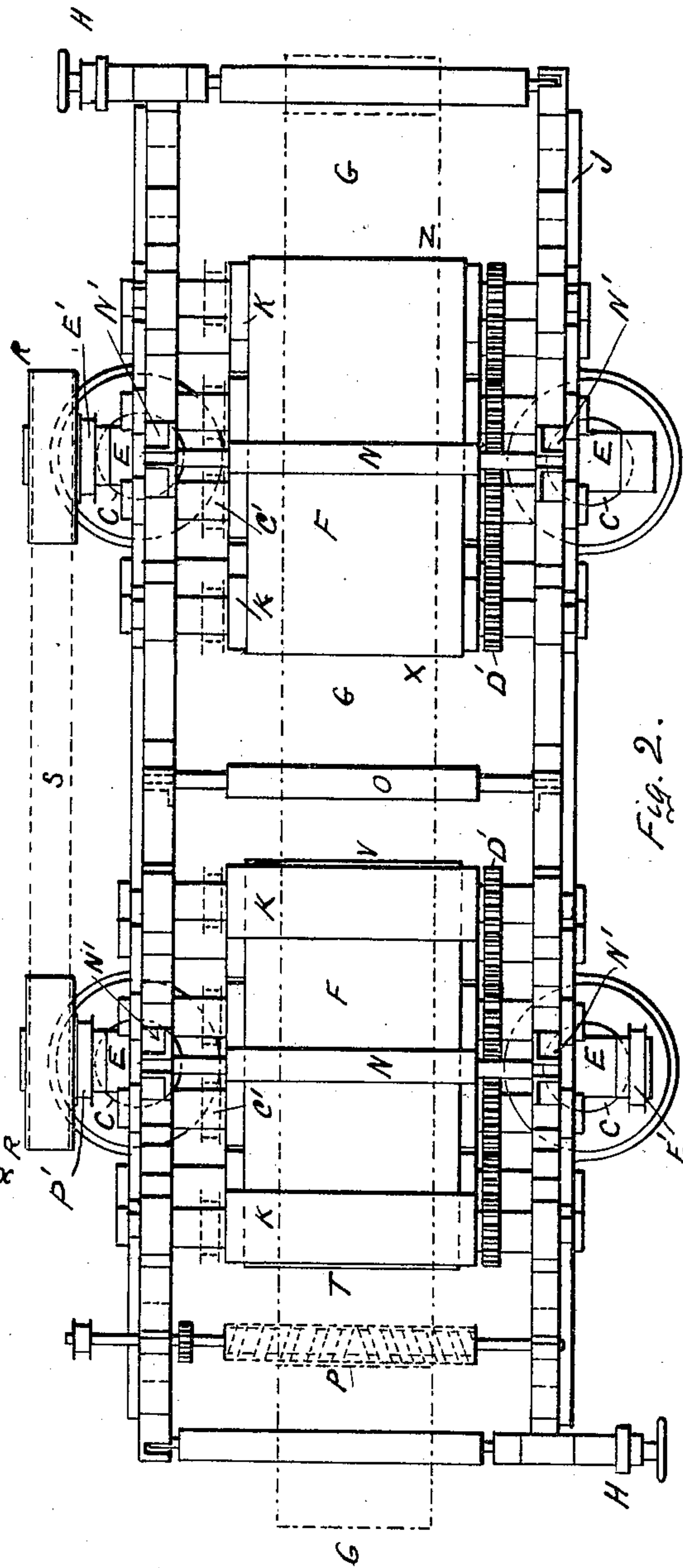


Fig. 2.

Witnesses

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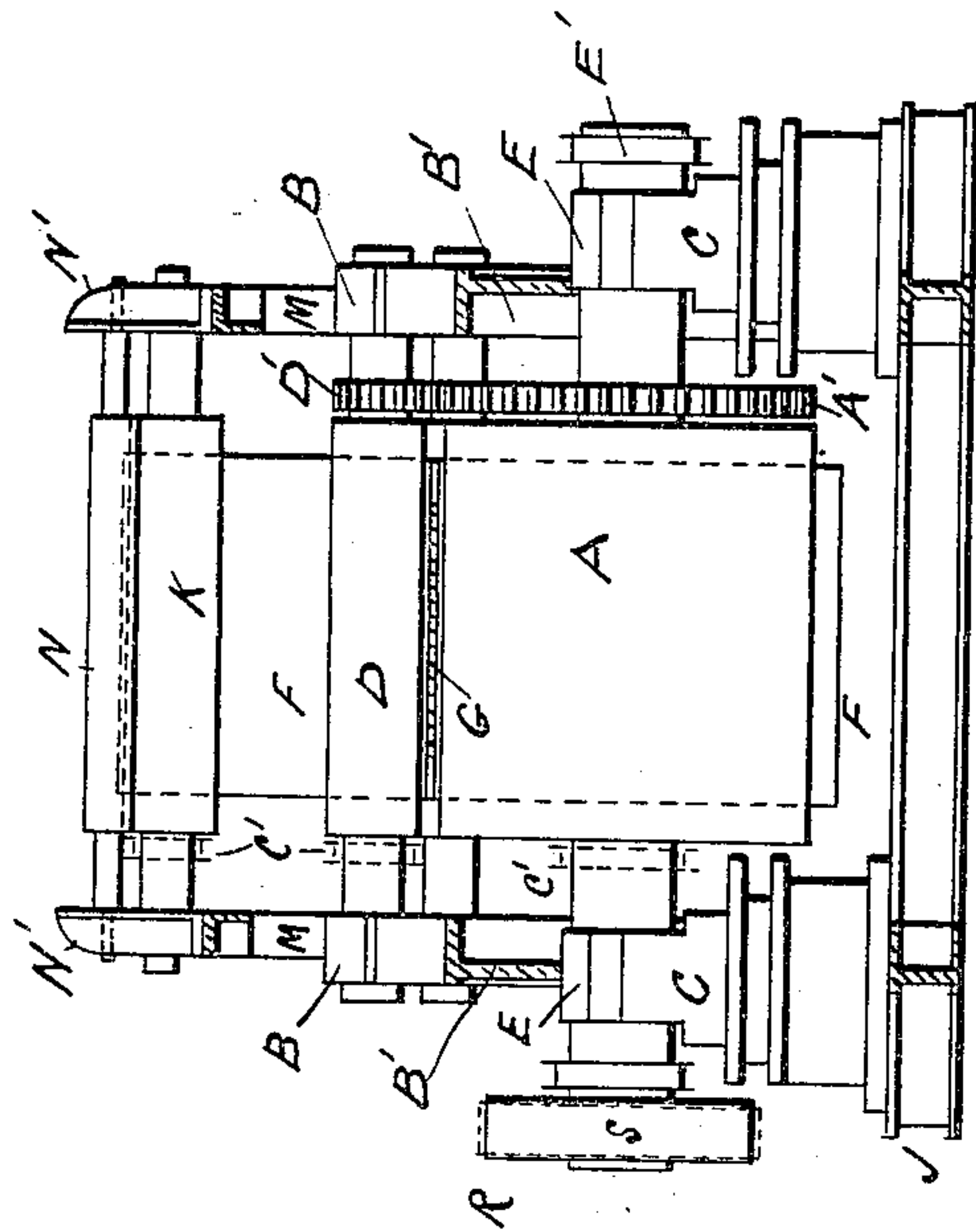


Fig. 4.

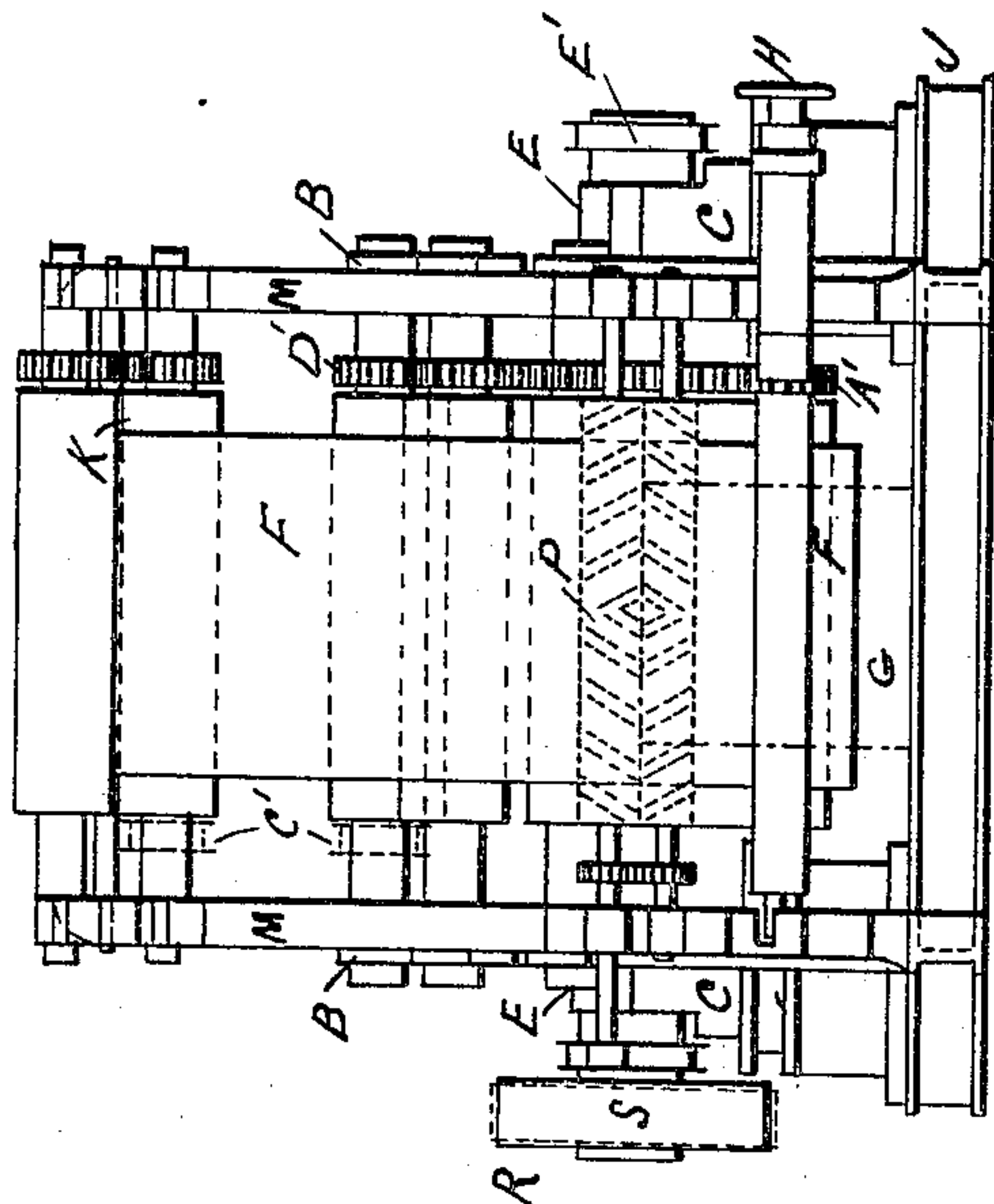


Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

TOM PRATT, OF SHIPLEY, CHARLES KING, OF BRADFORD, AND JAMES E. HAMMOND, OF BAILDON, ENGLAND.

MACHINE FOR PRESSING AND FINISHING TEXTILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 768,690, dated August 30, 1904.

Application filed February 5, 1900. Serial No. 4,034. (No model.)

To all whom it may concern:

Be it known that we, TOM PRATT, engineer, residing at 28 Westgate, Shipley, CHARLES KING, publican, residing at City Hotel, City Road, Bradford, and JAMES EZRA HAMMOND, manufacturer, residing at Fairfield, Baildon, in the county of York, England, subjects of the Queen of Great Britain and Ireland, have invented an Improved Method of Finishing and Pressing All Kinds of Cloths and Like Materials, of which the following is a specification.

This invention relates to improvements in machinery for imparting a finish of various kinds to manufactured goods of a textile nature, the object of the improvements being to effect the finishing of the cloth in a continuous operation, and therefore with a considerably less expenditure of time than is the case with finishing machinery such as is at present in use.

Prior to the date of our invention many methods of finishing cloth were in vogue, the chief methods being (a) to lay the cloth in folds and place between them smooth sheets of press-papers or mill-board, which were afterward placed in a hydraulic press and subjected to very great pressure; (b) to pass the cloth between two surfaces which were suitably heated and to which considerable pressure could be applied by hydraulic or other means, the said surfaces generally consisting of a hollow cylinder and one or more concave beds partially enveloping the cylinder and between which the cloth was passed; (c) the use of hollow rollers heated or cooled, as may be required, one set of rollers being used to give the finish to the cloth and the other, or cold rollers, being used to set the finish on the cloth after leaving the heated rolls; and (d) the use of a centrally-mounted heated cylinder surrounded by several smaller cylinders, the cloth being passed to receive the finish between the large and small rollers; but to give the finish and to prevent the cloth coming in direct contact with the rollers two endless sheets or webs of paper surround the cloth while it is being passed through the rollers.

After being passed between the heated pressing-rollers the cloth, together with the endless paper bands, is passed round a series of cooling-rollers, the whole forming a continuous operation. All of these processes are more or less defective in that (a) is an intermittent process, and therefore slow. (b) is also an intermittent process and has the same defect. (c), while being continuous, has such a small contact of finishing-surface in operation that production is very greatly limited; and (d), while being also a continuous process, has the very grave defect that the endless webs or bands are not sufficiently heated after coming from the cooling-rollers and before coming into contact with the cloth to be finished, a feature which also restricts the output of the machine and prevents a finish being obtained that is at present necessary with a large number of fabrics.

Our invention relates more particularly to the class of machinery such as is referred to under (d,) our object being not only to obtain a continuous operation, but to avoid all the defects at present inherent to the processes above referred to.

To this end our invention consists, essentially, in the use of a centrally-heated cylinder surrounded by a number of smaller heated cylinders, in combination with two endless sheets of press-paper, felt, or other suitable material capable of giving a finish to the cloth passed between them, the said endless sheets of paper being heated prior to their coming into contact with the cloth by one or more pairs or one or more singly-operated rollers between or round which the endless sheets are passed, said apparatus being designed to impart a finish to the fabrics.

Our invention also consists in the combination with the mechanism just described of an independent series of parts of a similar character to those just referred to for the purpose of setting the finish obtained in the first part of the apparatus, the second set of parts remaining cold or capable of being still further cooled by artificial means, and our invention further relates to the general construction and

arrangement of machine embodying the means referred to.

Our invention will be fully described with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a finishing-machine constructed in accordance with our invention; Fig. 2, plan of same; Fig. 3, elevation of the entering end of the machine, and Fig. 4 an elevation in cross-section on line *xy* of Fig. 1 looking from the same end.

In the drawings, A represents the central drums or cylinders resting in the bearings E of the hydraulic rams C, mounted on the bed-plate J, the said rams C being operated by pumps or other suitable means.

D represents the smaller cylinders, fixed in the adjustable bearings B, which in turn are carried by a frame B', bolted to the bed-plate J. The rollers D are caused to revolve at the same superficial speed as the central drum A by means of spur-wheels D', gearing into larger wheels A'; fixed to the central drums A.

F represents two endless paper aprons, which pass between the surfaces of the small cylinders D and the central cylinders A of both the hot pressing and cold setting portions of the apparatus. The upper of these aprons F is passed between rollers K, mounted in suitable bearings carried by the framework M, these rollers serving to keep the bands F at the required degree of tension and to feed them at the proper rate of speed between the cylinders A and rollers D.

The rollers are heated by steam or any other suitable medium and are driven by means of straps or bands from any convenient part of the machine, such as C'. The lower aprons or bands F are carried by rollers K', which are also heated in a similar manner to K and are also driven from any convenient part of the principal machine. Tension-rollers N, revolving in steady brackets N', also assist to keep the upper aprons F at a suitable degree of working stretch.

H represents the batches at either end of the machine for letting off and collecting the pieces on their passage through the machine and which are driven in any suitable way from some convenient part of the machine, such as the pulley E'.

A tension-roller O is supported in brackets fixed to the framework M between the two main parts of the machine and keeps the cloth suitably stretched in its passage from the first or hot finishing portion of the machine to its second or cold setting portion.

G is the cloth to be finished and is distinctly shown in Figs. 1 and 2 as it appears in the machine when being operated upon, and P represents spiral brushes between which the cloth passes from the first batch H to the hot cylinders, these brushes being designed to work the cloth in opposite directions from their centers toward their outer ends, and so remove dirt or

loose matter and take out the creases prior to the cloth being subjected to heat and pressure. These brushes are driven from P'.

Cylinders A and rollers D, K, and K' of the primary finishing or hot portion of the machine are heated, as before described, by any suitable means—such as steam, gas, or the like—which is conveyed to their interiors by pipes passed through their axes, any suitable provision being made to make tight joints between the pipes and rollers and to regulate the degree of temperature necessary for the particular finish required for the cloth under operation.

The portion of the apparatus shown at the right-hand end of Figs. 1 and 2 is in all respects similar to that at the left-hand end, except that it is entirely distinct from the first portion and its rollers and cylinder remain cold or at the same temperature as the room in which they work, or they may be artificially cooled to the necessary degree by passing through them cold air, water, or a refrigerating medium, the object of the cooled rollers being to permanently set the finish put upon the cloth by the heated rollers in the first portion of the apparatus.

R represents pulleys fixed on the axes of the central drums A for driving the two portions simultaneously by means of a strap S. The machine generally is driven by steam-power.

In finishing cloth by means of our invention it is first of all rigged and batched in the usual way and is then fixed in the front end of the machine at H. The machine is then set in motion, and the end of the piece is then inserted between the spiral brushes P, from which it is passed forward, so as to be taken between the heated surfaces of the paper aprons F at T. Meanwhile a slight pressure has been brought to bear on the rollers D by the cylinder A and the rams C, so as to cause sufficient nip between them to draw the cloth in when presented at T. The necessary heat also having been applied to the cylinder A and rollers D a suitable increased pressure is then further brought to bear on the aprons and cloth, so as to obtain the required degree of finish. The cloth is then passed forward until it has gone between all the rollers of that set and is delivered at V, from which point it passes under the tension-roller O and enters the second set of rollers at X, where it is again subjected to further pressure between the second set of paper aprons and rollers, during which passage it is subjected to the cooling action of such rollers and papers and which results in a permanent setting of the finish obtained in the hot portion of the apparatus. It is finally delivered at Z and collected on the batch H at the rear end of the machine.

It will be seen that by the means described we are enabled to finish cloth in a continuous

manner, and consequently obtain a very large output of cloth—in fact, an output which is greater than that obtained by any other machine at present in existence. This is chiefly attributable to the fact of our keeping the endless press-papers continuously heated before they come into contact with the cloth in the hot pressing portion of the apparatus and continuously cold in the cold setting portion of the apparatus, which is a distinct advantage over the process referred to under (d), in which the endless press-papers are alternately heated and cooled.

In conclusion, we would have it understood that we do not claim the finishing of cloth by heated and cold rollers nor the use of concave beds in conjunction with rollers, nor do we claim, broadly, the use of endless press-papers for finishing purposes. Neither do we claim the use of hydraulic means for moving the central cylinders A toward and from the small cylinders D; but, on the other hand,

What we claim as our invention, and desire to protect by Letters Patent, is—

1. In machinery for imparting a finish of various kinds to manufactured goods of a textile nature the combination of frame M and J, central movable cylinders A mounted in bearings E, hydraulic rams C capable of moving said bearings and cylinders, two series of rollers D located round cylinders A, wheels A' mounted on said cylinders and gearing with wheels D' mounted on the ends of rollers D,

pulleys R mounted on the axes of cylinders A and connected by a strap S, a pair of continuously-heated aprons F located above and below the first cylinder A, a pair of continuously-cooled aprons F located above and below the second cylinder A, two pairs of positively-driven heated rollers K supporting upper apron F, positively-driven heated rollers K' supporting lower apron F, positively-driven cooled rollers K supporting upper apron F, in the cold setting portion of the machine, and positively-driven cooled rollers K' supporting the lower apron F in the cold setting portion of the machine, batch-rollers H, spiral brushes P, and tension-rollers N and O substantially as described.

2. In a machine for imparting a finish to textile fabrics, the combination with cylinders mounted in movable bearings, of a pair of press-sheets for each cylinder, a series of rollers arranged in arc formation above each cylinder and forming antifriction-beds into which the cylinders fit, and means for regulating the temperature of each pair of press-sheets independently of the others.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

TOM PRATT.
CHARLES KING.
JAS. E. HAMMOND.

Witnesses:

GEO. C. REID,
GEORGE HY. FIRTH.