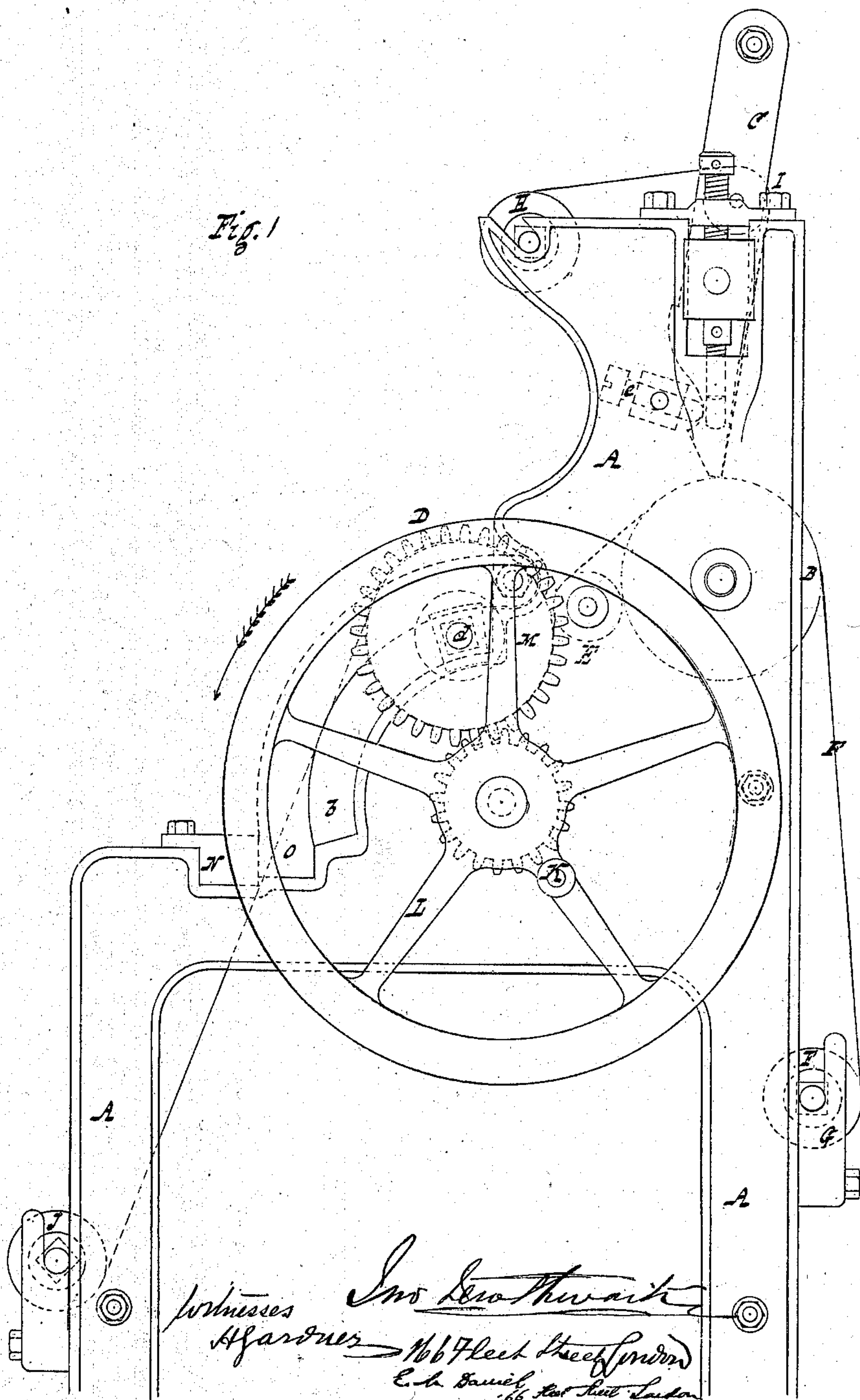


J. LEWTHWAITE.  
COATING FABRICS WITH PARKESINE.

No. 103,209.

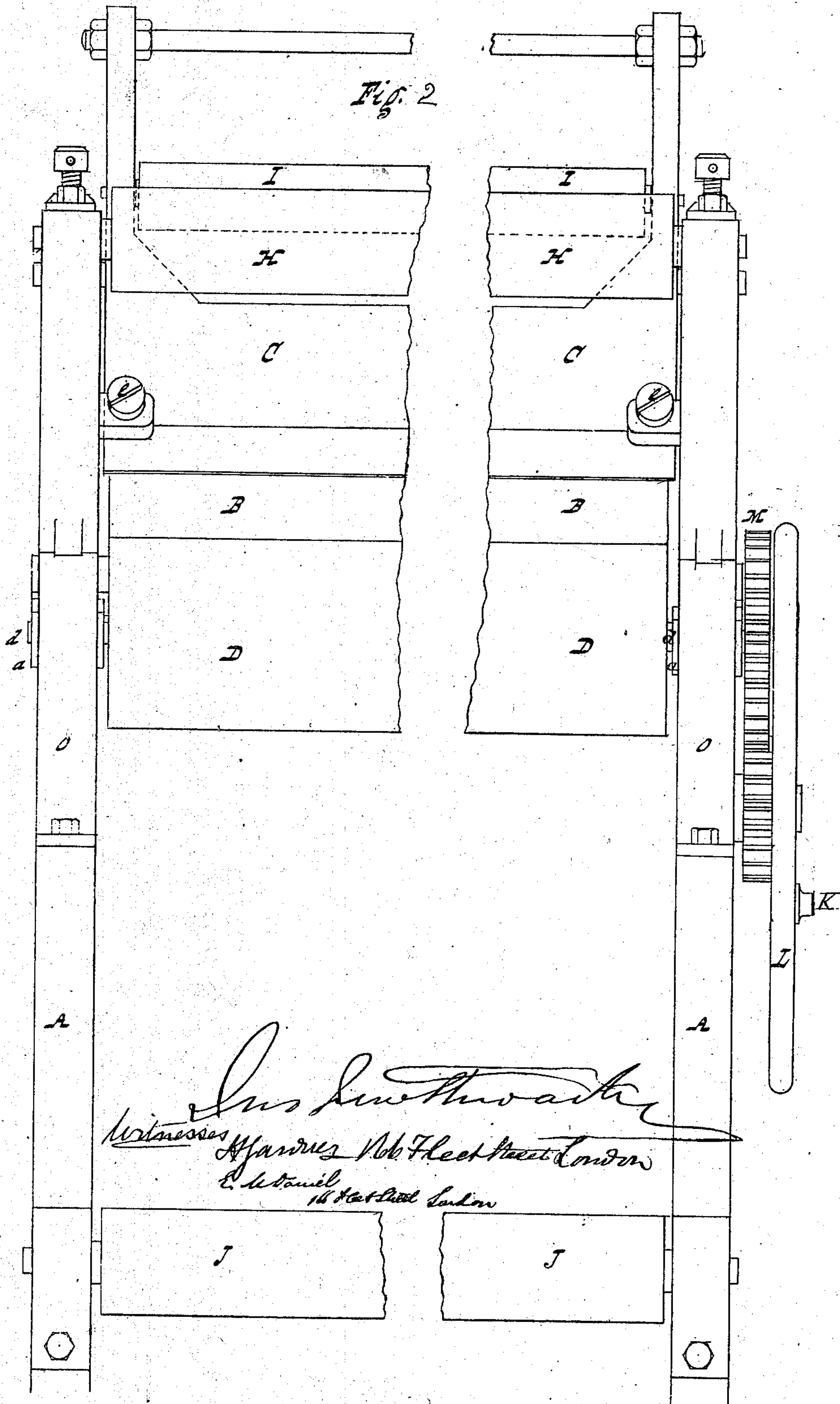
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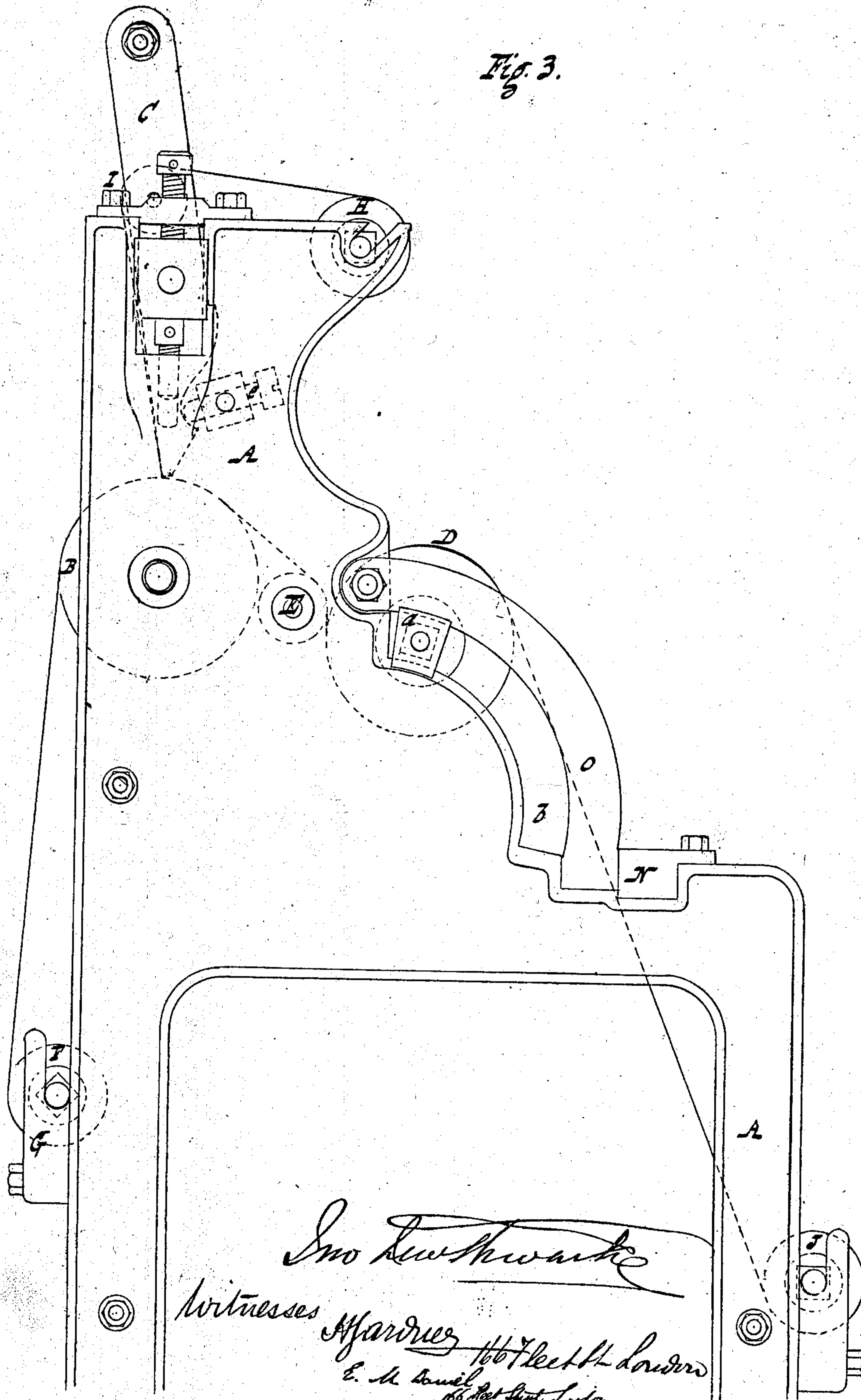


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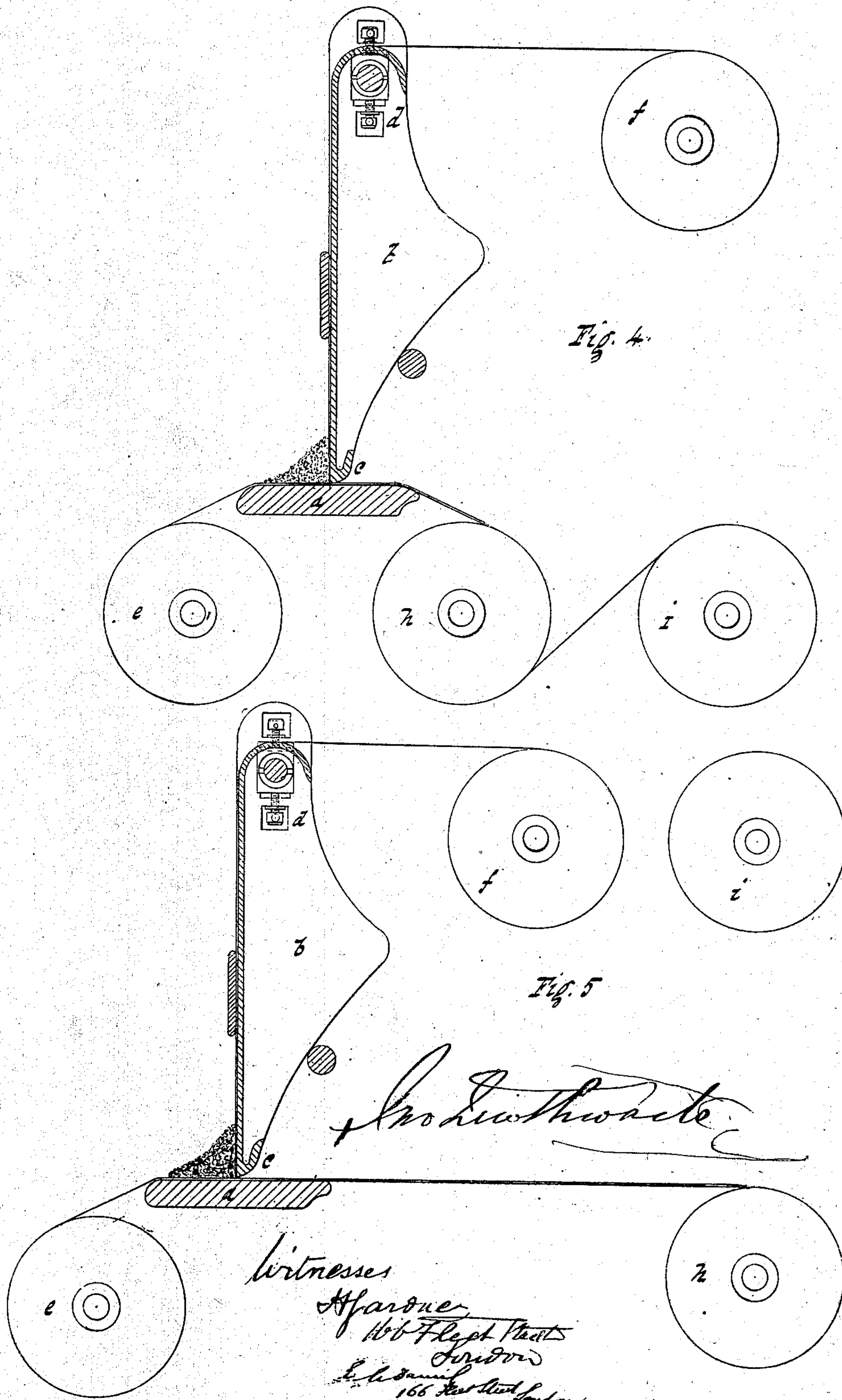
Fig. 3.



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Patented May 17, 1870.





# United States Patent Office.

JOHN LEWTHWAITE, OF WOBURN PLACE, LONDON, ENGLAND.

*Letters Patent No. 103,209, dated May 17, 1870; patented in England March 4, 1868.*

## IMPROVEMENT IN COATING FABRICS WITH PARKESINE.

The Scheme referred to in these Letters Patent and making part of the same.

### *To all whom it may concern:*

Be it known that I, JOHN LEWTHWAITE, of Woburn Place, London, England, have invented or discovered certain new and useful "Improvements in the Manufacture of Fabrics and papers in sheets or lengths, to render them applicable for various useful and ornamental purposes, and in machinery for effecting such manufacture," and that the following is a full, true, and exact description thereof, reference being had to the accompanying drawings.

The object of my improvements is to cover the surface of woolen, cotton, silk, and other fibrous materials, papers, &c., with a composition or compound which is known as Parkesine or xyloinite, or to unite two or more such fibrous materials or paper into one fabric by means of the compound which is spread over the surface of one of them, so that, on pressure being applied, the perfect uniting of the compound to the fabric or fabrics is insured.

The fabric thus manufactured may be impressed with designs or devices, either in relief or intaglio, and may be printed in blank or in colors, as desired, according to the purpose for which the fabric is intended.

The fabrics may be cut up or otherwise acted upon for garments or clothing for both human beings and animals, as well as for many useful and ornamental purposes.

I do not confine myself to any special form of machinery for spreading and uniting the compound to the fibrous material or paper, but I will hereafter explain one construction of my machinery that I have found efficient for the purpose:

A is one of the side frames of a machine in which a number of rollers is placed for carrying the cloth or fibrous material which has to be, or is being operated upon.

The machine shown in the drawings is capable of operating upon one side of a cloth or material, so that the Parkesine or xyloinite may be spread upon it to form an outer coating, or two or more cloths or materials may be united by spreading the Parkesine or xyloinite between them while passing between the roller B and the lower edge of the plate.

One roll F of the material in a plain state is placed upon the forks or supports G, from which it is led up to the spreading-roller B, while the other material from the roller H is led over a guide-bar or roller I, down the face of straight-edge O, where it meets the fabric E, and the Parkesine or xyloinite becomes spread upon the material E at the mouth or meeting place of the two materials.

The materials are then drawn through the space between the roller B and the straight-edge O by the roller D on which they are wound, and which, as it

rotates, may be pressed against a guide-roller, E, so that on filling the roll is made to descend the concentric grooves, thereby permitting the enlargement of the roll and the point of union or compression of the two or more cloths, fabrics, or other materials to be at all times as near as possible to the straight-edge or scraper O, which is very important when perfect adhesion is required. By this means, and such as are hereinafter described, I am able to manufacture a new class of goods for the following valuable uses:

Water-proof garments of all kinds, ship's sails, tents, camp hospitals, emigrant's houses, and roofs for the same, covers for ricks, carts, wagons, and carriages, sails for windmills, materials for upholstery, carpets, and coverings for washing and other machine-rollers, and of rollers for spinning and drawing-frames, &c., belts for wool-combing and other machines, running-bands for driving machinery, imitation leather for covering and lining coaches, carriages, seats, &c., of all kinds, and for blinds or curtains for coaches, carriages, &c., material for the backs of cards to be used instead of leather or India-rubber cloths, for covering backs of books, for knapsacks and pouches, cloths for billiard tables, portmanteaus, traveling-bags, hospital sheeting and bed ticking, for driving-aprons, covering splash or dash-boards, &c., for cartridge-cases, rocket-tubes, impervious linings for casks to contain gunpowder, for making or covering accoutrements of all kinds for ladies and gentlemen, or for use in the army, navy, police, and post-office, for hangings for damp and other walls, for linings for packing-cases, cisterns, &c., hats, caps, boot and shoe uppers, &c., and for colored or printed signs, tablets, advertisements, &c.

In some cases it will be necessary to keep each roll or turn of the fabric apart from the next one, to allow of the gradual escape of the spirit which evaporates from the compound, and to prevent any injury to the fabric by becoming discolored or otherwise, and in order to accomplish this, I provide a roll of material, J, upon the bearings at the front of the frame, and pass it up to between the turns, where it forms a division piece to keep the rolls or turns apart.

Figure 2 is a front view of the machine, and

Figure 3, a view of the side frame opposite to that shown at Figure 1.

This figure shows the means which I prefer to employ for causing the roller D, upon which the materials are wound, to rotate.

K is a crank-handle secured to the wheel L, which is free to revolve in a bearing formed in the side-frame.

This wheel L, with its pinion, is in gear with a toothed wheel, M, fixed on the axle of the roller D, to insure its rotation, and, as the roller D becomes covered with the fabric, it is forced gradually away



from its first position near the roller E, and partakes of a circular falling motion by the bearings *a a* working down the grooves *b b* in the side-frames.

I regulate the pressure which the roller D shall exert against the roller E by means of springs which I prefer should be of India rubber; these are attached in any convenient manner, so as to keep the two rollers in contact.

As this roller D becomes full, or has received the required length of fabric, it is taken from the frame by removing the blocks or wedges N from the lower ends of the strips or bars O, which form guides to the bearings *a a*, then drawing the roller away from the working-bar or spindle *d*.

Another means of regulating the pressure upon the rolls of cloth while under the pasting and winding process, is to pass a strap or band over each of the feeding-rollers F H J, having a weight at one end of it, while the other is made fast to some part of the machine, or otherwise. I may also use a ratchet on the shaft of the taking-up roller, to prevent any back-action which may be likely to occur.

The plate or straight-edge is suspended in the upper part of the framing, and can be fixed from moving in one direction by set-screws *e e*, but is free to move in the reverse direction when required.

The bearings of the straight-edge can be set higher or lower in the frame to determine the thickness of the compound, and to accommodate the varying thickness of materials employed.

It is not absolutely necessary to pass the materials and the compound between a roller and a straight-edge, as above-described, as the material may pass over the surface of a board or table, and the compound, which is spread upon the material on the table, receives its degree of thickness by the distance the straight-edge is set above the table.

Figure 4 shows how this arrangement may be carried into effect, where *a* is the table, and *b* the frame.

The lower edge *c* of the frame forms a straight-edge, and can be raised up or lowered by means of the mechanism *d*.

*e* is a roller, on which one of the materials is wound, being led therefrom over the table *a*.

*f* is another roller, from which a different roll of material is drawn, and led over the top and down the face of the frame, and then under the bottom edge of it.

The Parkesine or xyloinite is placed upon the lower material, and, on motion being communicated by a hand-wheel, as in the previous case, or otherwise, to the roller *h*, which receives the fabric, the material or materials are drawn over the surface of the table, and carry on the face a certain thickness of the compound, which becomes fixed on the surface on being subjected to pressure in its transit.

If it is necessary to place a layer of the same or any other material between the turns or folds of the fabric, as it is being wound upon the roller *h*, I lead one from the roller *i*.

In most cases it is desirable to have the winding-roller *h* as near as possible to the table *a*; but where, as in some instances, it is required to have imperfect adhesion of the fabric, I place the winding on roller *h* at a distance from the table, as shown in fig. 5. Or the two or more cloths or papers, &c., may be passed between two rollers or iron cylinders, with the paste between them, if it is desirable, or of no importance, that the paste should penetrate the cloths or other materials.

The following will explain more minutely how I carry my invention into effect.

I take the Parkesine or xyloinite in a plastic or pasty state, spread it upon the surface to which I wish to apply it, and then immediately subject it to pressure, which must be sufficient to bring it into close

contact with the surfaces. When I require the material to be pliant or supple, I continue the pressure for several days, as I find it important that the evaporation of the spirit contained in the pasty compound, and the consequent absorption of atmospheric air, should be slow and gradual, especially when making imitation leather, in order to prevent brittleness or harshness. For this purpose a layer of cloth may be interposed between the layers or rolls of the fabric, while they are being subjected to pressure. If the surface of the Parkesine or xyloinite thus obtained is required to be polished, I allow it to become sufficiently fixed or dried by exposure to the atmosphere for from, say five days to a month, or otherwise, and I then polish it by rotating brushes, or otherwise. The thickness of the coating of Parkesine will, in all cases, be regulated by the purpose to which it is to be applied, and any number of coatings of Parkesine or xyloinite may be applied, one above another, in order to obtain the required thickness.

To manufacture a printed fabric, or a plain pliable fabric or surface, I take a textile or other fabric of any desired make, smooth, ribbed, or otherwise, pass it from a roller over a table or straight-edge, and cover it with the Parkesine or xyloinite in a pasty or plastic state, in any ordinary manner. From another roller, or other appliance, I carry a sheet of paper lithographed or printed upon, if a printed fabric is desired, and plain, if a plain surface be desired; and immediately upon the fabric being coated, the fabric and paper meet under a straight-edge, by which they are united by the interposed Parkesine or xyloinite, the atmospheric air being pressed out; the united fabric is then wound tightly upon another roller, on which it is left several days, or if preferred, it may, in about two hours, be unwound from the roller, and submitted to pressure for several days in any other convenient manner. In all cases where pliancy is required, I prefer to conduct the process in a heated room, say from 85° to 95°, or thereabouts. If a polished surface be required, the Parkesine is allowed to become fixed, as before-mentioned, and the fabric is then submitted to the action of one or more rotating-brushes immersed, or partly so, in water, whereby the paper is removed from the Parkesine or xyloinite, the surface of which becomes polished, any design which was printed or lithographed on the paper being left on the Parkesine or xyloinite. Sometimes I mix chalk or other material with the water in which the brushes revolve, to facilitate the polishing. For small articles, the cleaning and polishing may be performed by hand.

When smooth surfaces are required, I use a roll or sheet of zinc, or other metal, on which the paste is laid as it passes under the scraper C. Sometimes I paste a smooth embossed or printed paper upon the zinc or metal sheet or roll before putting it under the pasting-process, which is performed as hereinbefore stated, and thus I produce smooth, embossed, or printed imitation leather, having various valuable properties never before attained. I may also use embossed sheets of zinc or other metal for the purpose of producing embossed materials, but, in most cases, I prefer to use the embossed paper, as before explained.

After the Parkesine has become fixed, the sheet is stripped off, and the surface of the Parkesine may then be polished.

When I wish to unite more than two fabrics or surfaces I proceed as follows:

I unite the first two fabrics in the manner before explained, and carry the double fabric over a roller, and a third fabric from a separate roller then passes with the coated double fabric under a straight-edge, as previously described, so that I obtain a triple fabric, which may, in like manner, have one or more other fabrics or thicknesses joined thereto. If the thicknesses thus joined be paper, they may be readily separated by any



stripping process. This stripping should be done before it is completely set. By this means I obtain paper which is made thoroughly water-proof by the Parkesine or xyloinite. When it is desired to afterwards separate several thicknesses of textile fabric, I introduce a film of water between the thicknesses immediately after pasting, and before pressing, or I allow time to elapse before uniting them, so that the adhesion is imperfect. A substitute for parchment or imitation parchment, or leather, may also be obtained by coating a piece of cloth or paper with a suitable thickness of the Parkesine or xyloinite in the manner described. Or I obtain a fabric composed entirely of Parkesine, by coating a piece of sized calico or other sized surface with a suitable thickness of Parkesine or xyloinite in the manner before described; and by stripping off the Parkesine or xyloinite after it has set, this Parkesine fabric may be applied to book-covers and other articles by being glued or otherwise secured thereon. A mode in which I obtain an embossed fabric is by coating a woven fabric with Parkesine or xyloinite with tissue or thin paper, then placing the fabric so covered between two pieces of flannel or other soft fabric, India rubber being, in some cases, placed outside the flannel, and next submitting the whole to pressure, so that the Parkesine or xyloinite and paper are driven by the softness of the fabric and the elasticity of the rubber into the interstices or pattern of the fabric. When the Parkesine or xyloinite has become set and cemented, say in three days, the pressure and the flannel and rubber are removed, and the paper is afterward rubbed off by brushes, or otherwise, leaving an embossed fabric, the surface of which is Parkesine or xyloinite. To apply a design to a surface of Parkesine or xyloinite at any time after such surface has been made according to my invention, I place the paper or surface carrying the design, say a lithograph, upon the Parkesine or xyloinite

surface; the paper and Parkesine or xyloinite being both previously wetted with wood, naphtha, or other suitable spirit; over the paper I place a cloth, and over the cloth a heated iron; I then exert pressure for some time, say two days, I then remove the pressure, and take off the cloth and paper, the design which was on the paper having been transferred to the Parkesine or xyloinite surface.

When I unite materials for water-proof garments, I generally use the smallest possible quantity of paste, as I find that by so doing I produce an entirely new effect, viz., to render the material capable of resisting wet, while it permits free perspiration.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The improvements in the manufacture of fabrics and papers in sheets or lengths to render them applicable for various useful and ornamental purposes, in the manner described and set forth.

2. The modified modes of manufacture of the material or materials, as hereinbefore set forth.

3. The employment of the material or materials, as hereinbefore described and set forth.

4. The special construction of machinery for the manufacture of the material or fabric, as described and shown in figs. 1, 2, and 3 of the drawings.

5. The modified arrangements of machinery for the same purpose, substantially as shown in figs. 4 and 5 of the drawings.

In witness whereof I, the said JOHN LEWTHWAITE, have hereunto set my hand this 29th day of January, 1870.

JNO. LEWTHWAITE.

Witnesses:

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E. M. DANIEL,  
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