

(No Model.)

3 Sheets—Sheet 1.

C. F. LEAKE.
MANUFACTURE OF FLOOR CLOTH.

No. 255,798.

Patented Apr. 4, 1882.

Fig.1,

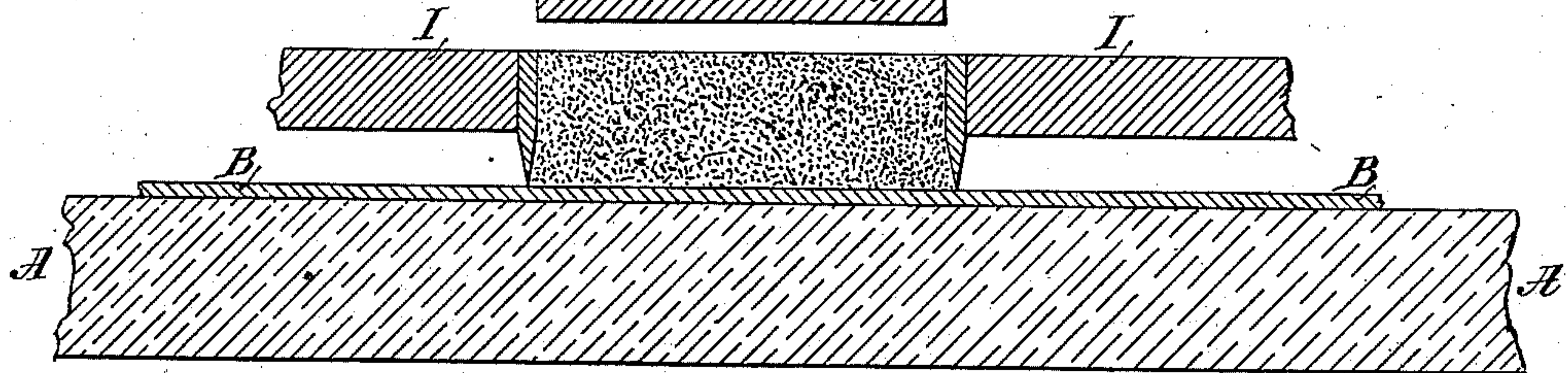
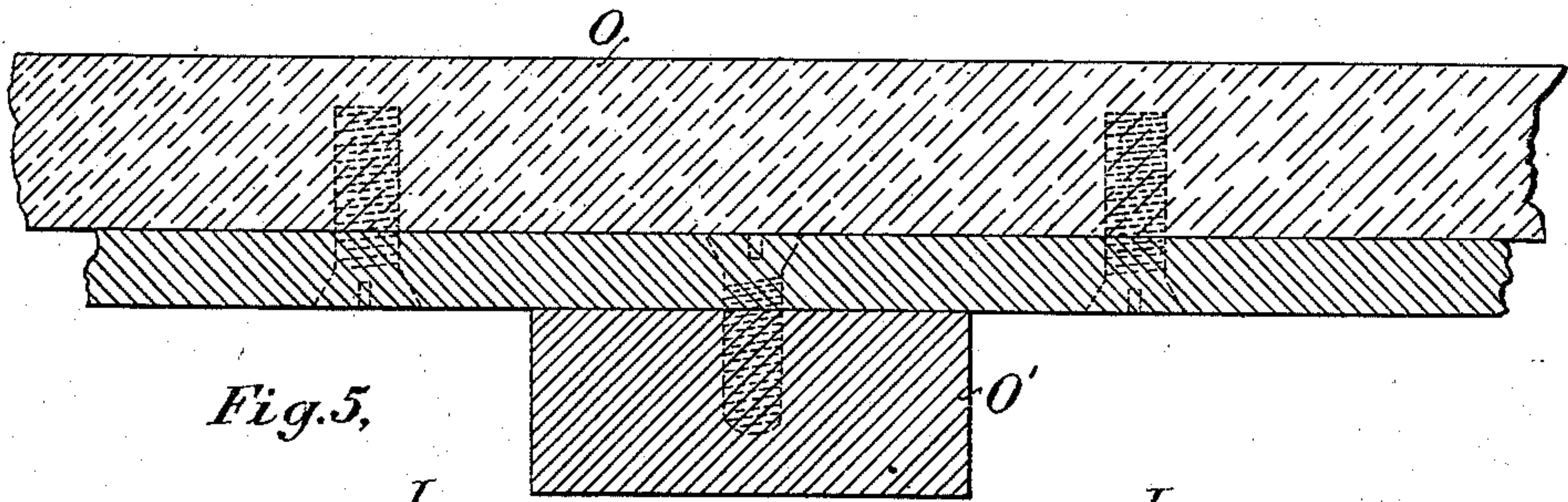
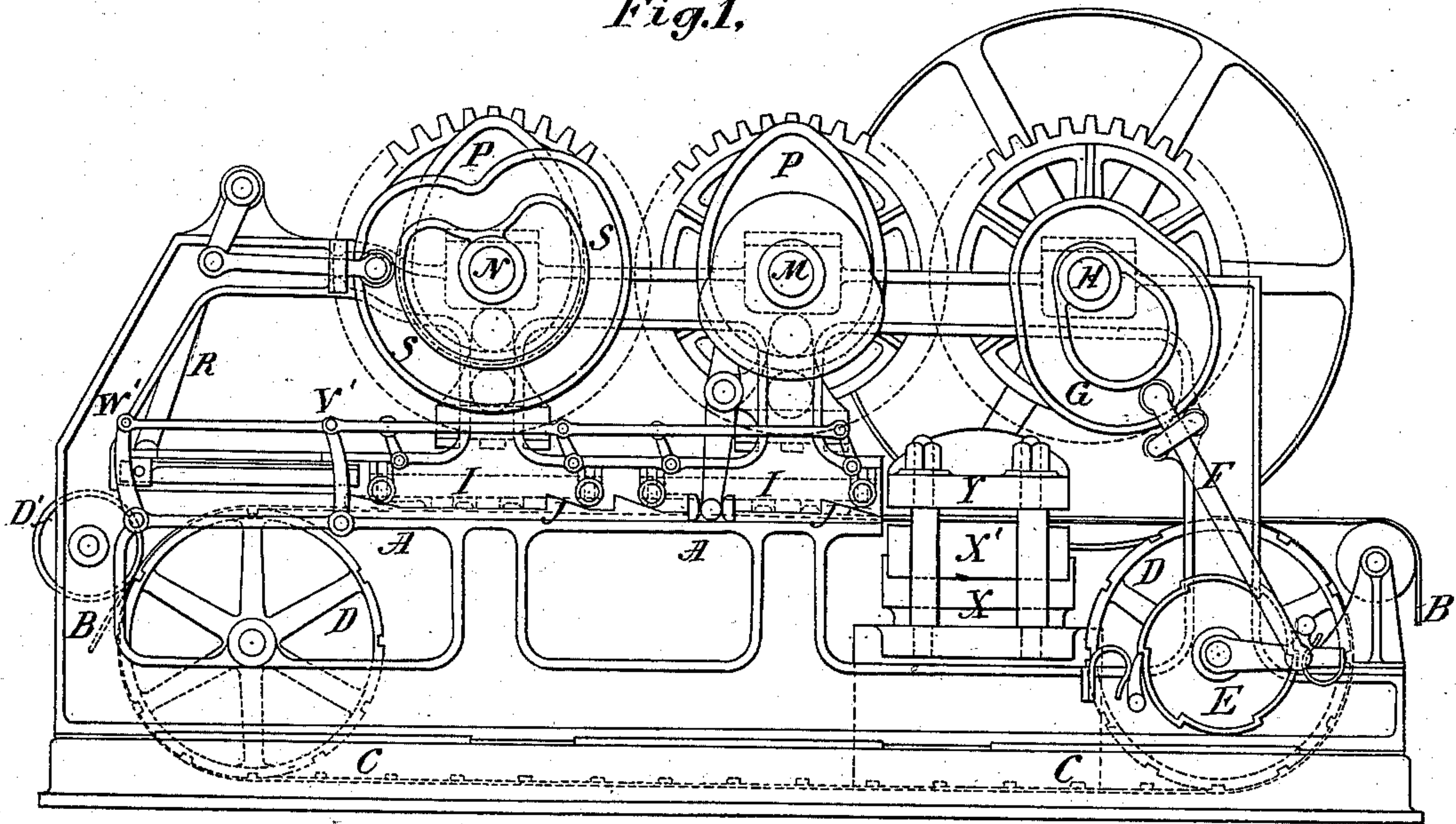
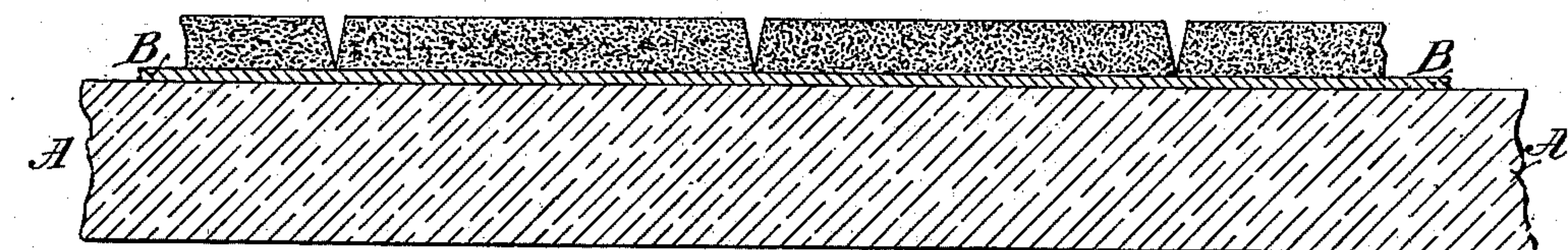


Fig.10,



WITNESSES

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Fig. 2.

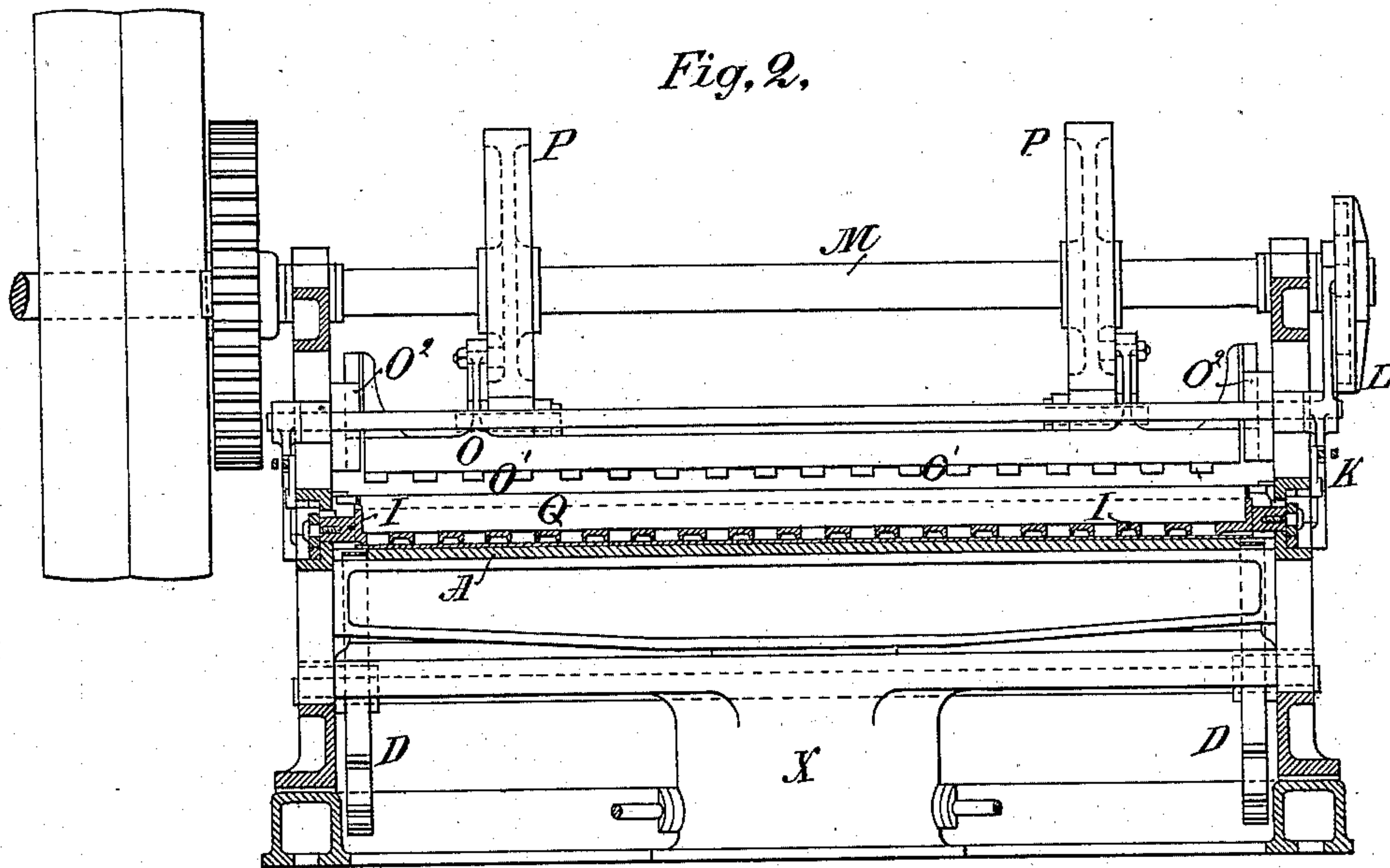


Fig. 11.

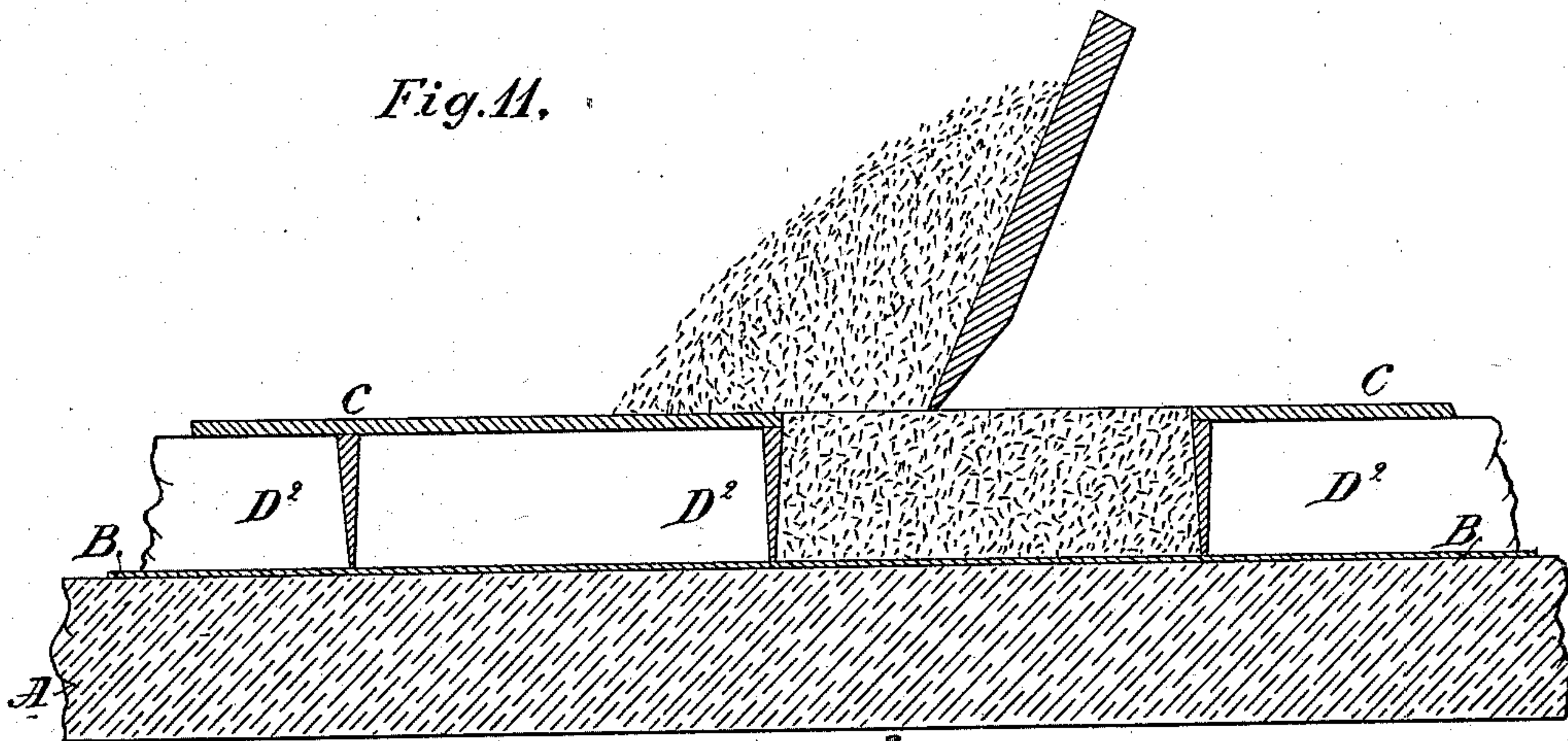
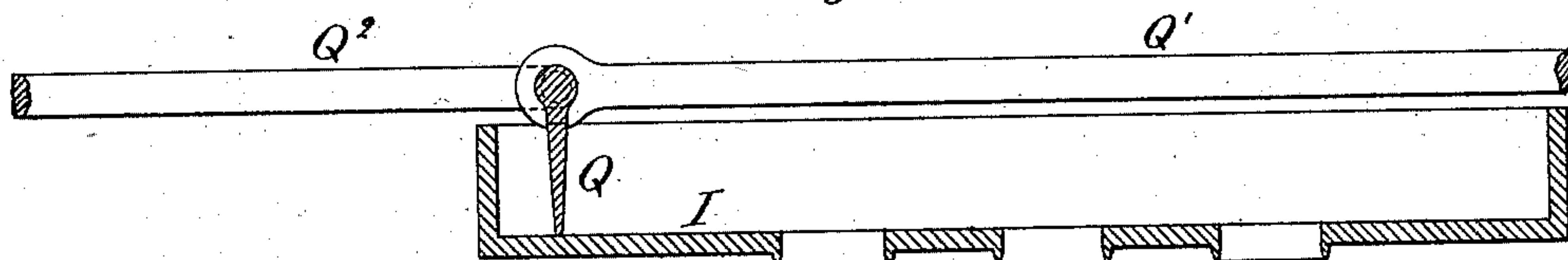


Fig. 4.



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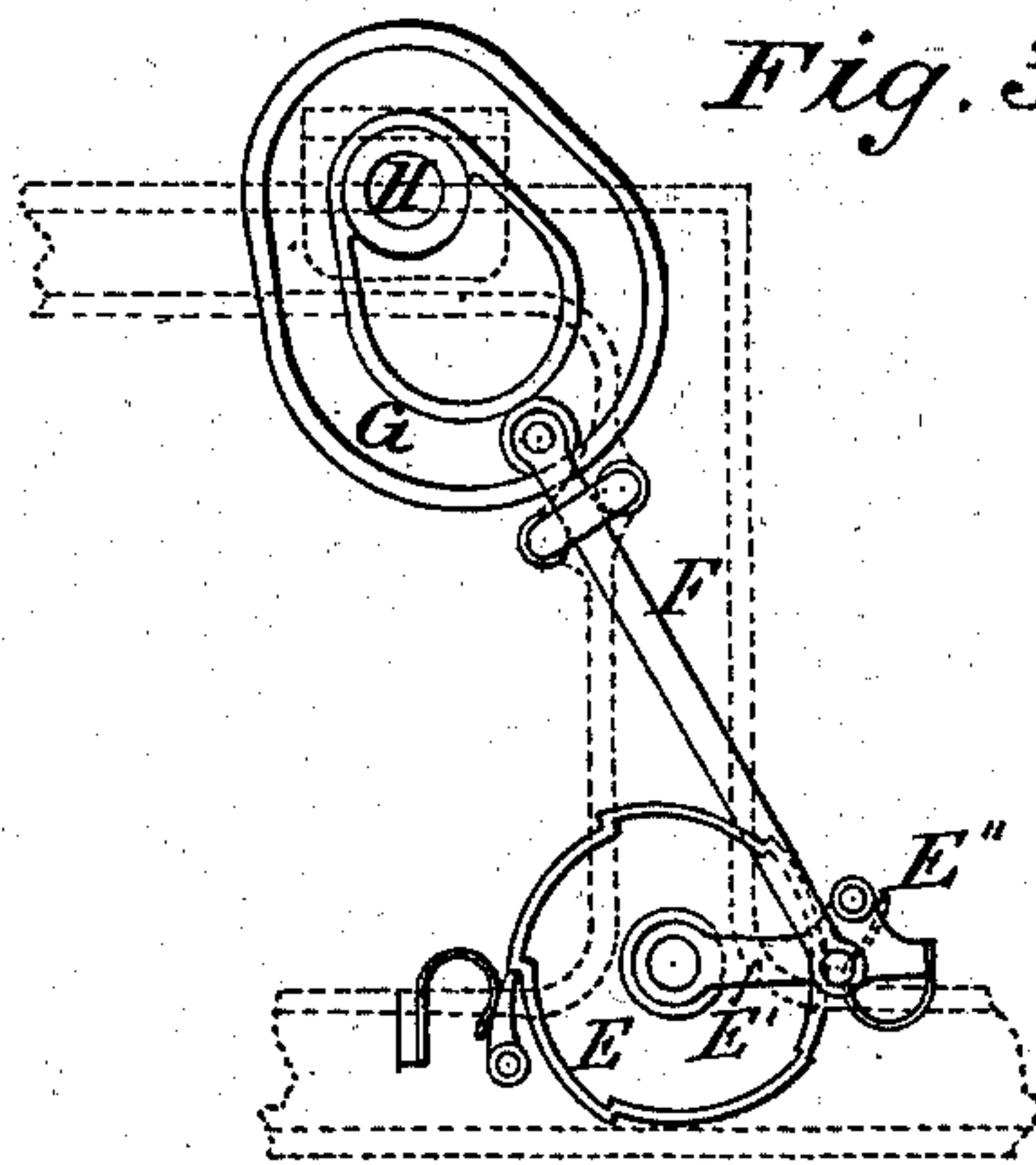
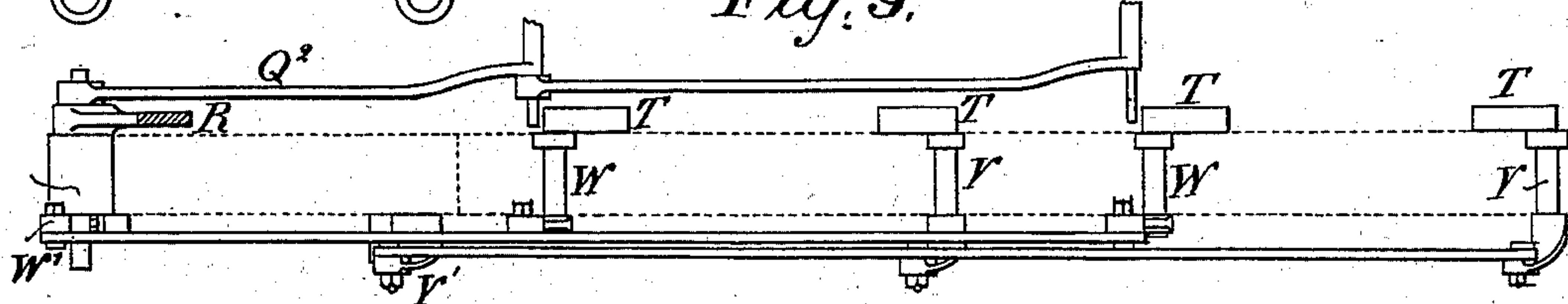
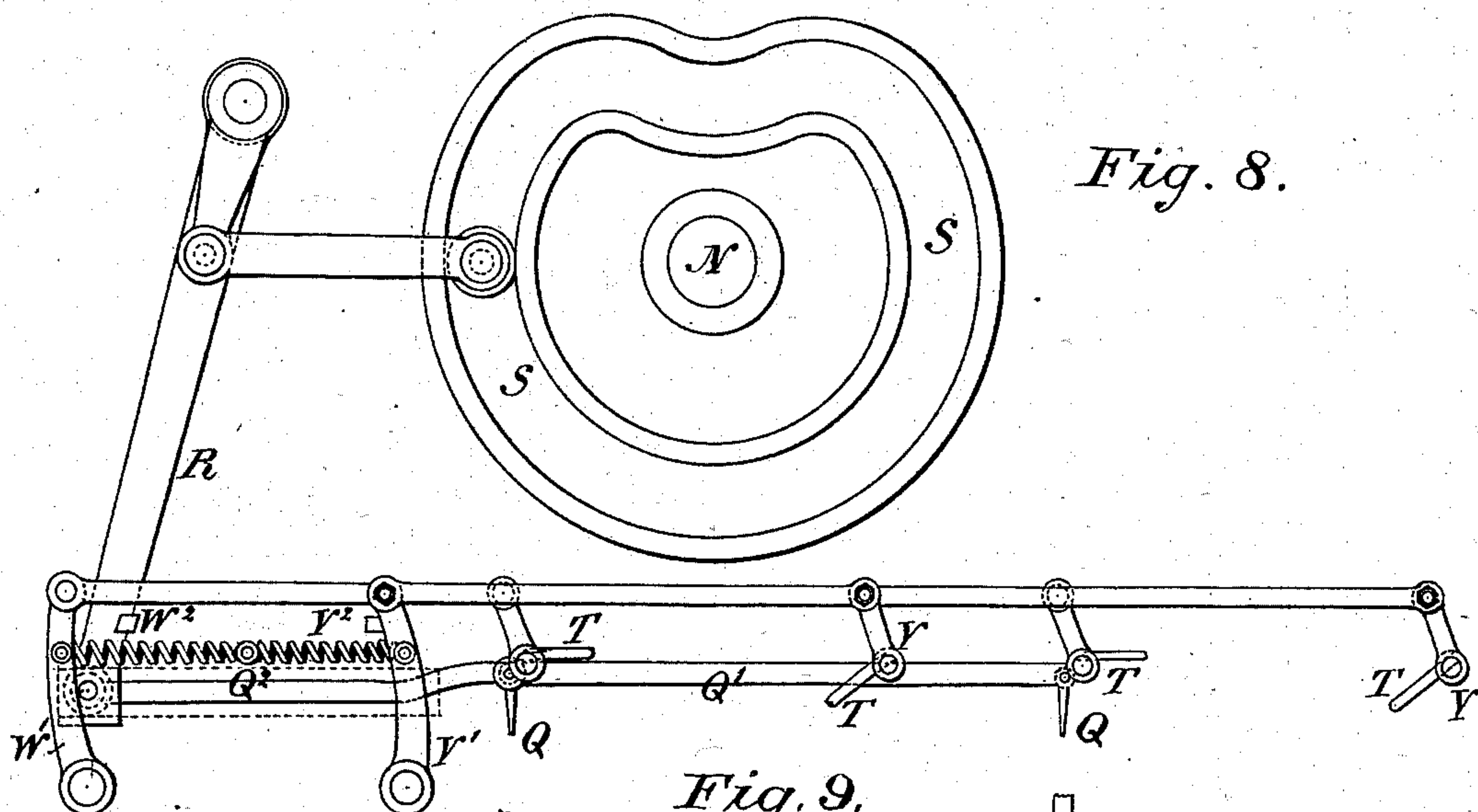


Fig. 6.

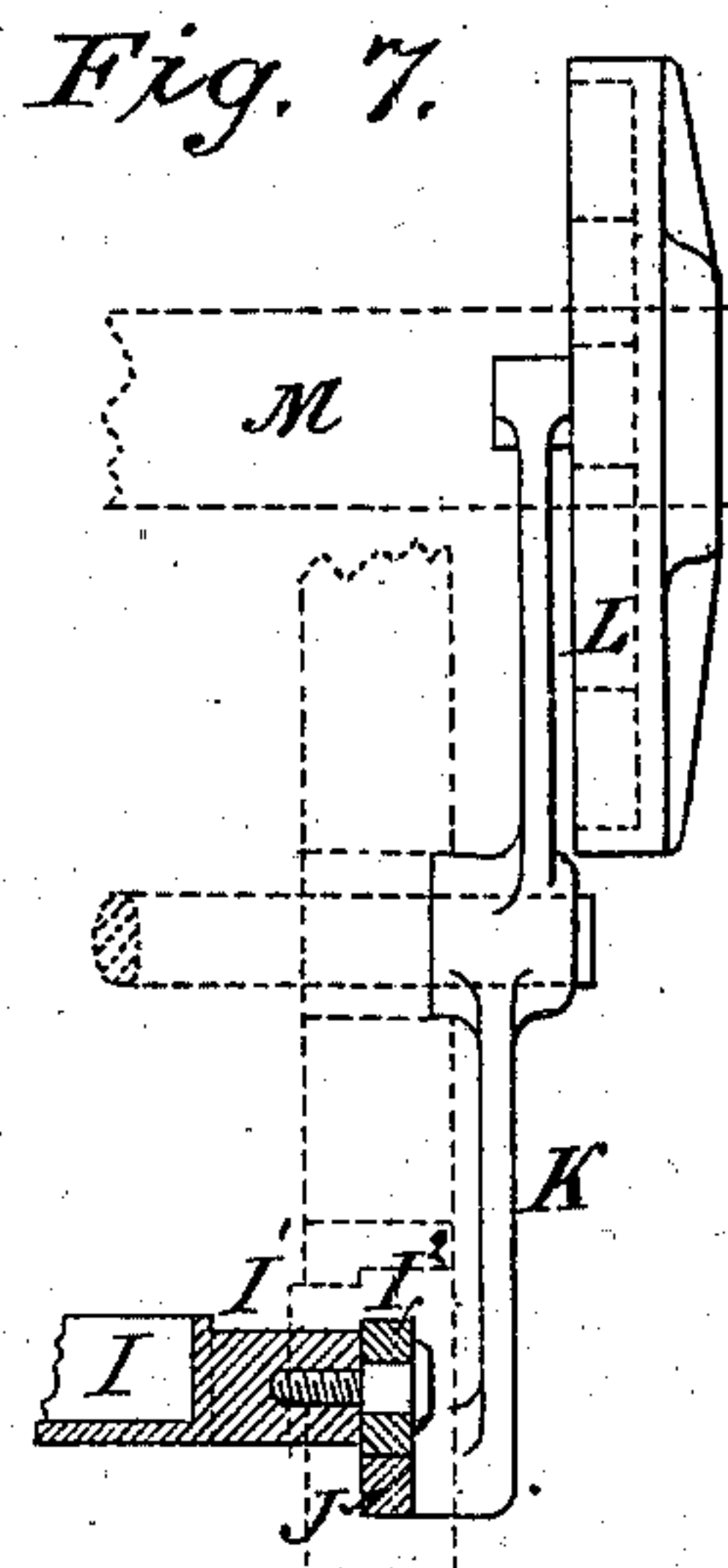
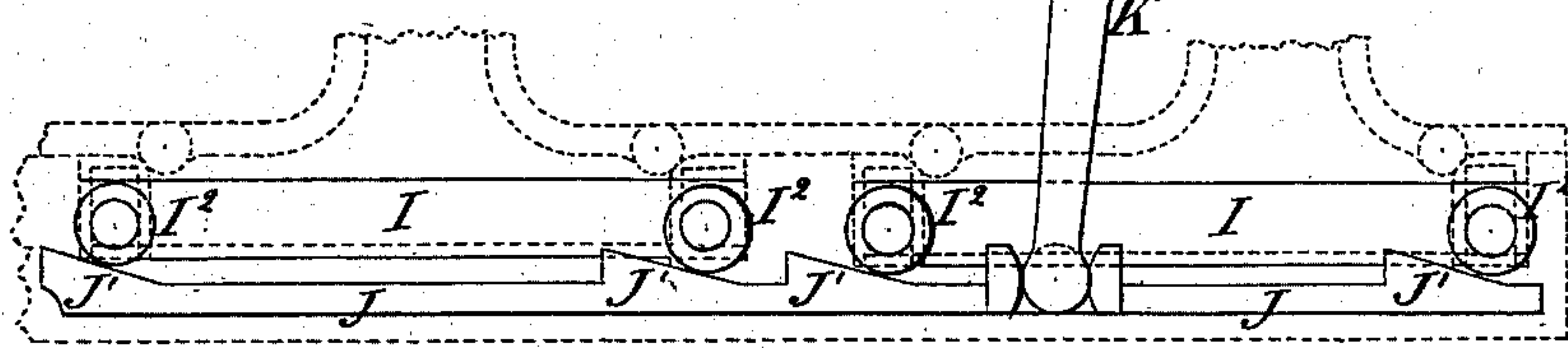


Fig. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES F. LEAKE, OF HALE STREET, STAINES, COUNTY OF MIDDLESEX,
ENGLAND.

MANUFACTURE OF FLOOR-CLOTH.

SPECIFICATION forming part of Letters Patent No. 255,798, dated April 4, 1882.

Application filed January 13, 1881. (No model.) Patented in England June 8, 1880, and in France December 7, 1880.

To all whom it may concern:

Be it known that I, CHARLES FREDERICK LEAKE, a subject of the Queen of Great Britain, residing at Hale Street, Staines, in the county of Middlesex, England, have invented certain new and useful Improvements in the Manufacture of Floor-Cloth, (for which I have received Letters Patent in England No. 2,307, dated 8th June, 1880, and in France No. 140,019, December 7, 1880,) of which the following is a specification.

This invention has mainly for its object the manufacture of an improved linoleum floor-cloth of similar composition to that used in ordinary linoleum, and also from the composition in a granulated state similar to that used in the manufacture of what is known as "granite linoleum;" but instead of the manufactured article being of one color throughout, as in ordinary linoleum, or of a mixed granular pattern throughout, similar to granite cloth, I propose to make the patterns in the form of tiles or other suitable shapes with the colors of each tile or shape quite through to the canvas base, and of any number of separate colored tiles or shapes to each pattern found to be requisite to make up an agreeable design; or the colored shapes may be made sufficiently deep to withstand the constant wear which floor-cloth is subjected to without going entirely through the base fabric. For this purpose I use a canvas base of any suitable kind, upon which I prefer to roll or spread a coat of linoleum compound for the purpose of rendering the fabric firm and of sufficient rigidity to enable me to steer or guide it with accuracy and certainty, after which I pass the coated cloth over a bed or table, and apply onto the surface of the cloth granulated linoleum composition of various colors, the several colors being kept separate and apart from one another, as hereinafter described, so as to form the desired pattern; and subsequently I press the granular coating, while in a more or less heated state, onto the base-cloth, so as to render the coating smooth and solid and cause it to adhere to the base.

Various means may be adopted for applying the colored granulated compositions, either ordinary linoleum composition or other compo-

sition of oxidized oil mixed with other materials in the required patterns or forms, onto the base. It may be effected by means of a machine such as is illustrated by the drawings annexed.

Figure 1 is a side elevation of the machine; and Fig. 2, a cross-section taken on the line x y , and looking in the direction of the arrow z . Fig. 3 is a detail view, showing a side elevation of pawl-and-ratchet mechanism for intermittently actuating the band-supporting wheels. Fig. 4 is a sectional view, on an enlarged scale, of one of the molding-trays and the scraper therefor; and Fig. 5, a similar view, showing a portion of the tray on a still larger scale and one of its plungers. Fig. 6 is a view in elevation showing mechanism for moving the trays up and down; and Fig. 7 is a view of the same mechanism, looking at a right angle to Fig. 6, with parts in section. Fig. 8 is an elevation, and Fig. 9 a plan view with parts omitted, of the mechanism for actuating the scrapers. Fig. 10 is a view representing a section of coated cloth prepared for pressing. Fig. 11 is a view representing a modification.

In this machine, A (see Fig. 2) is a flat bed or table. B (see Fig. 1) is the coated base-cloth which is to be passed over such table, and which is to have colored granulated composition applied in patterns to its surface.

C is an endless chain or band with spikes standing out from it. This endless band is supported by wheels D. The band, during part of its travel, is level with the surface of the table A, as shown. There are two such bands, one on each side edge of the table. The base-cloth is slightly wider than the table, and its side edges overlap the bands, and where it enters the machine it is pressed down by grooved rollers D' onto the spikes of the bands, so as to be held by them. The cloth is moved with a step-by-step movement over the face of the bed by giving an intermittent rotating movement to the axle of one of the pairs of wheels D. In the machine shown in the drawings the axle has for this purpose a ratchet-wheel, E, Fig. 3, fixed upon it. On the end of the axle is mounted an arm, E', which can turn on the axle, and which carries a pawl, E'', which is held up to the ratchet-

wheel by a spring. The arm is jointed to one end of a rod, F. The opposite end of this rod works freely to and fro through a fixed guide and carries a roller. The roller is acted on by
 5 a grooved cam, G, which is fixed on the driving-shaft H of the machine, as shown at Fig. 1, and also at Fig. 3, which shows these parts separately. Thus for every revolution of the driving-shaft the cloth is moved one step forward.
 10 Above the bed or table A are trays I, one of which is shown in cross-section on a larger scale at Fig. 4, and a portion on a still larger scale at Fig. 5. In the bottom of the tray are perforations. Each perforation is
 15 surrounded on the under side by a steel or metal knife-edge, which projects downward from it.

Each tray can be moved upward or downward a short distance in guides in the frame
 20 of the machine, so as either to allow the descending knife-edges of the mold to rest upon the base-cloth or lift the mold upward away from the cloth. This upward and downward movement is given to the trays I in the following manner, (shown separately at Figs. 6
 25 and 7:)

Each tray has projecting from it four pins, I', two from the front and two from the back. These pins pass through vertical slots in the
 30 frame, which serve as guides for the tray in its upward and downward movements. On the ends of the pins I' are rollers I². The rollers at the front, and also those at the back, rest upon a bar, J. On this bar are inclines J'.
 35 Each bar can be moved endwise by a lever, K, acted on by a cam, L, on the shaft M, which is driven from the driving-shaft H, so as to revolve at the same speed with it. When the bars are moved from left to right the inclines
 40 J' are brought under the rollers I² and lift the trays I, and when moved in the opposite direction the inclines move away from below the rollers and the trays descend.

The machine shown in the drawings has
 45 two trays, I, so that it will produce a pattern in two different colors; but the machines might be formed with any desired number of trays, according to the number of colors in the pattern to be produced, a separate tray being re-
 50 quired for each color used in forming the pattern.

O' are plungers adapted to enter and fit within the perforations in the trays I. The plungers are carried on the under side of a
 55 ram or frame, O, which can be moved upward or downward in guides O² in the frame of the machine in any suitable manner. In the way shown in the drawings it is effected by means of grooved cams P. Two of these cams, which
 60 are for acting upon one ram O, are carried by the shaft M, and two other cams, for acting on the other ram, O, are upon a shaft, N, which is geared with the shaft M, so as to revolve with it at the same speed. The cams on
 65 the shaft M are shown at Fig. 2.

Q are scrapers, one for each tray. The scrap-

ers have a to-and-fro motion given to them to cause them to pass to and fro over the surface of the trays, and at both ends of this move-
 70 ment the scrapers are caused to rise up and then again descend. The way in which these motions are given to the scrapers is shown at Figs. 8 and 9. The scrapers Q are linked together
 75 by rods Q', and coupled to the lower end of pendent arms R by rods Q². The arms R are swung to and fro by a short arm on their axes, being coupled by a link to a roller that is acted
 80 upon by a cam, S, on the axis N.

In this way the scrapers are moved to and fro over the trays. In order to lift the scrapers
 80 just before they arrive at one or other end of their movement, the scrapers are furnished with pins projecting from their ends. These pins strike against and rise up inclines T, so lifting
 85 the scrapers. Afterward the pins pass beyond the upper end of the inclines, and the scrapers then drop down again onto the trays. There are four such inclines for each scraper, two to
 90 lift the scraper at one end of its course, and the others to lift the scraper at the opposite end of its course. The inclines which lift the scrapers at the end of their forward stroke are carried
 95 by axes V and the other set of inclines by axes W.

The arms on the axes V are coupled by links
 95 to one another and to a pendent arm, V', while arms on the axes W are coupled by links to one another and to a pendent arm, W'. The arms V' on either side of the machine are drawn
 100 by springs up to stops V², and other springs draw the arms W' up to stops W². As the scrapers are moved backward and forward by
 105 the arm R a pin at the end of this arm comes against the pendent arms V' and W' at the two ends of its stroke. In this way, just when the pins at the ends of the scraper have come
 110 against either the inclines fixed to the axes V or the inclines fixed to the axes W, the axes V or the axes W are caused to turn and lift the inclines into a horizontal position, and so lift the
 115 scrapers more quickly than they would be if the inclines were stationary. When the scrapers have arrived at either end of their course and the pins at their ends have passed beyond the inclines the scrapers drop down, as
 120 above explained, and when the scrapers are moved in the opposite direction the pins pass under the inclines and the scrapers remain resting upon the tray I until they again arrive
 125 nearly at the end of their stroke. The object of this is that each scraper may push before it a quantity of granulated material, and that when the scraper has pushed the material from one extremity of the tray to the other the
 130 scraper may rise up clear of the material and afterward descend close to the end of the tray, so that in its return movement it may again rake or push the granulated material back again over the surface of the tray, and so fill the perforation.

X is a hydraulic ram, by which the coated cloth can be pressed up to and against the

under side of a fixed plate, Y. The head of the ram and the fixed plate Y are kept heated by steam. The ram is caused to rise at the times required by the opening of a valve to admit water under pressure to the hydraulic cylinder from a loaded accumulator. When the ram is to descend this valve is closed and an outlet-valve opened to allow water to escape from the cylinder.

The opening and closing of the valves may be controlled by hand or by cams on the cam-shaft; or, in place of using a hydraulic cylinder, either the upper plate, Y, or the lower plate, X', might have motion given to them by cams or by other mechanical means. The plates, being heated, soften the granulated material at the same time that they compress it. This has the effect of swelling or expanding the several slabs of material until the small spaces between them are closed and the slabs fit each other and unite together at their edges. After the cloth and material upon it have thus been compressed the cloth may be led downward over a roller kept cool by a stream of cold water passed through it, or otherwise, and be so cooled and set.

In place of using flat heated plates to compress the granulated material onto the cloth, the compression of the material onto the cloth might be effected by rollers. The coated cloth might also be led for some distance around one of the pressing-rollers, which is heated, before being nipped between it and the other pressing-roller, so that the material may be thoroughly warmed before being pressed.

The action of the machine is as follows: The trays I are first lowered, so that the molds carried by them rest upon the cloth. The scrapers are then moved backward and forward over the surface of the trays, so first pushing a heap of granulated material over the trays and then raking it back again. The molds carried by the trays are thereby filled with material. Afterward the plungers O' are caused to descend into the perforations of the molds and to compress the material in them and make it to adhere to the cloth. The trays are then raised and the plungers also. The cloth is now caused to travel forward a distance, and a portion of it, which, as shown at Fig. 10, has been completely coated with granulated material, is brought between the upper and lower plates of the press. The plates then close against the cloth and compress it, while at the same time the trays again descend onto the cloth, and the same operations are repeated, the press being caused to release the cloth just before the cloth has to be again moved forward a distance.

As before stated, there are as many perforated trays as there are colors in the colored pattern to be formed on the cloth. Slabs of the requisite form of one color are molded onto the cloth by the first tray. Afterward, when the cloth has been moved onward and brought under the second tray, slabs of another color

are molded in proper position onto the cloth, and so on until the whole series of colors has been applied and the surface of the cloth completely covered. The covered cloth then comes to the pressing apparatus, where it is compressed and consolidated.

In place of slabs of one color being first compressed onto the cloth, the cloth then shifted, and slabs of another color compressed onto it, and so on until the whole surface of the cloth is covered, as above described, the whole surface of a short length of fabric might be covered with colored granulated material arranged in pattern before the cloth is moved onward for the succeeding length of the cloth to be similarly covered. This may be effected in the manner illustrated at Fig. 11. The cloth B is moved step by step over a bed-plate, A, as in the former arrangement. A mold, D², is laid onto the surface of the cloth. The mold is divided up into numerous cells or compartments, some requiring to be filled with one color and others with other colors.

To allow of the compartments which have to be filled with any one color being filled with that color, a perforated templet, C, may be placed over the top of the mold. The perforations are only made in the templet above the cells or compartments which have to be filled with the particular color. Granulated material of the required color is scraped to and fro over the top of the templet, and the perforations of the mold which are to be filled with that color are so filled. Afterward this templet is removed and another templet put in its place onto the top of the mold. The second templet is perforated to correspond with the perforations of the mold, which are to be filled with another of the colors, and so by using a succession of templets, one for each color, all the colors may be filled into their proper compartments of the mold. A properly-shaped plunger might then be made to descend and compress the material in the several compartments sufficiently to make it adhere to the cloth; or this plunger may be dispensed with. The mold is then lifted and the cloth moved forward and submitted to pressure between heated plates, as in the arrangement first described. Another modification of this arrangement is to cover the bed A by a sheet of thin paper or other suitable material, and to place onto the paper or such other suitable material a mold, D², such as above described with respect to Fig. 11. The perforations in the mold may then be filled with granulated material. Afterward, when the mold has been removed, the spaces left by the removal of the mold may be filled in with finely-granulated linoleum material of any color desired. A sheet of coarse canvas or other suitable fabric may now be laid onto the top of the granulated material, and the whole drawn by means of the paper between the upper and lower plates of a hydraulic or other press, which has been previously heated by steam or otherwise. Pressure may now be applied and

kept on while the next portion of the pattern is being got ready. The operation is so carried on continuously, and a continuous sheet may be so formed of any desired length and width.

5 Having thus described the nature of my invention and the manner of performing the same, I would have it understood that I am aware that it has before been proposed to take
10 sheets of linoleum composition of various colors and to cut or punch out pieces from them, and with such pieces to build up any desired pattern upon a sheet of coarse canvas, and finally to consolidate the whole by pressure.

15 By the above means only patterns in two colors can be produced; but by the means hereinbefore described patterns of any number of colors may be produced.

What I claim is—

The manufacture of floor-cloth with colored patterns produced from compounds composed of oxidized oil with other materials and colored to varied colors, in the manner hereinbefore described—that is to say, by the colored compounds being first reduced to a granulated form, then built up separate the one from the other into colored patterns or devices by the means substantially as hereinbefore described, and afterward consolidated together and to a base-cloth by the application of heat and pressure.

London, 21st day of December, 1880.

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