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PATENTED NOV. 27, 1906.

J. W. McINDOE.

METHOD OF FORMING PRINTING CYLINDERS.

APPLICATION FILED DEC. 12, 1905.

3 SHEETS—SHEET 1.

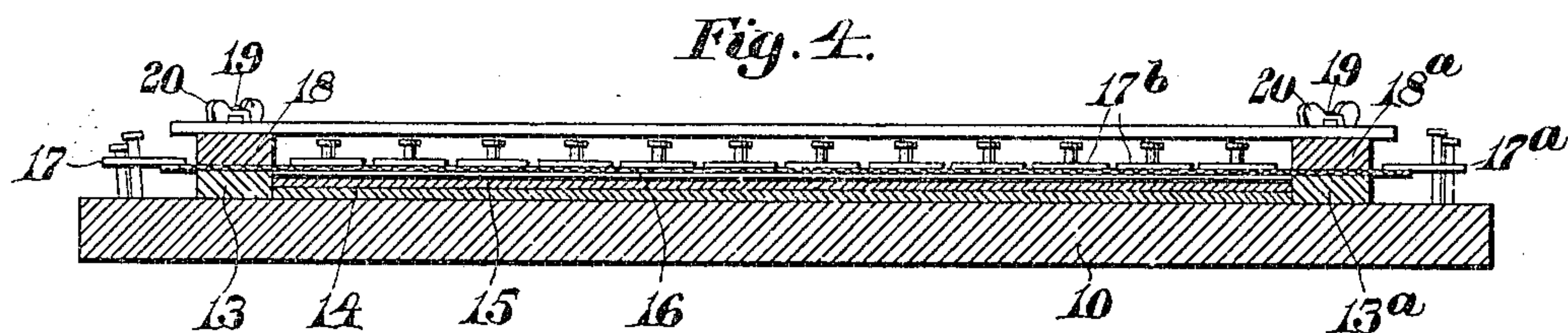
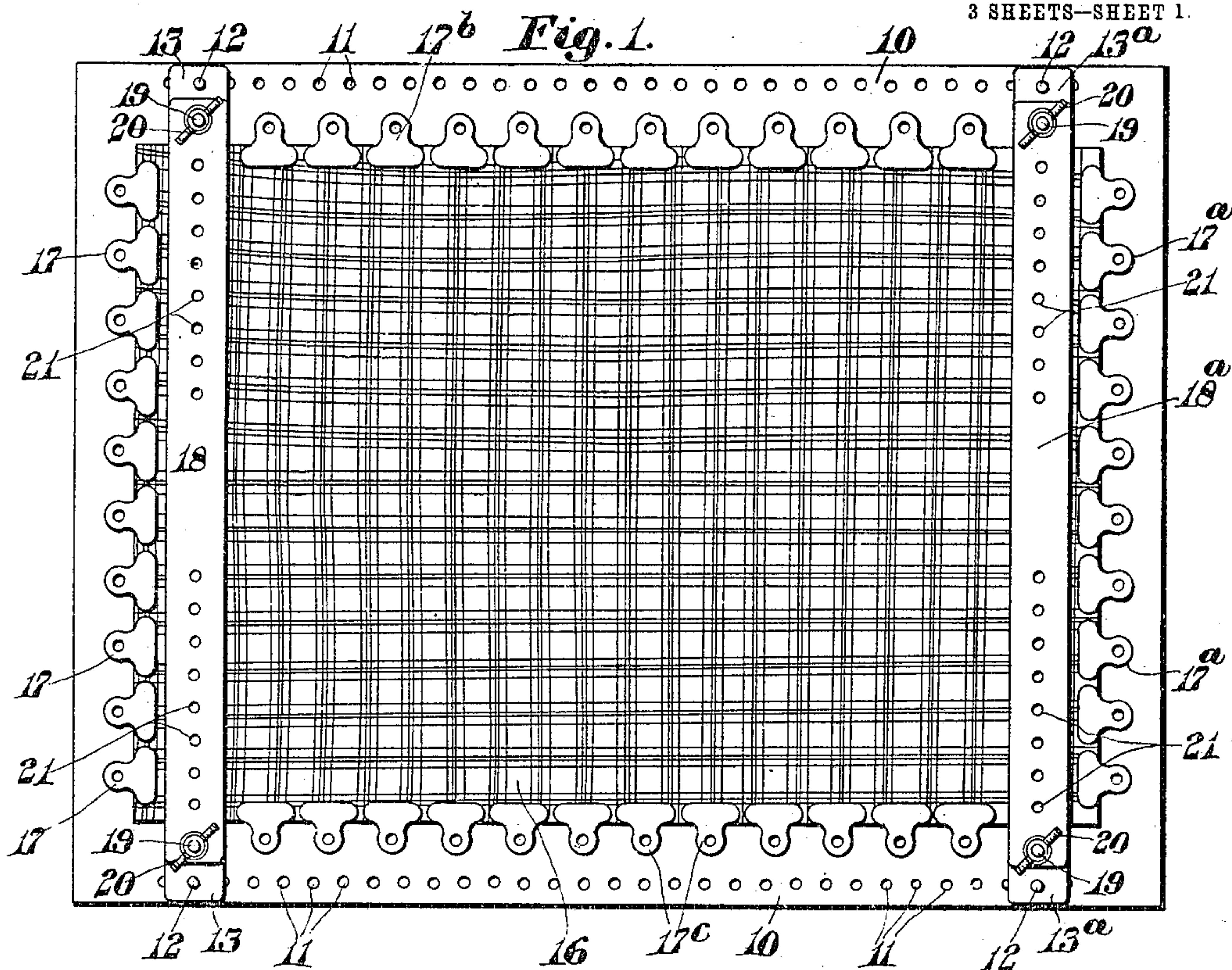
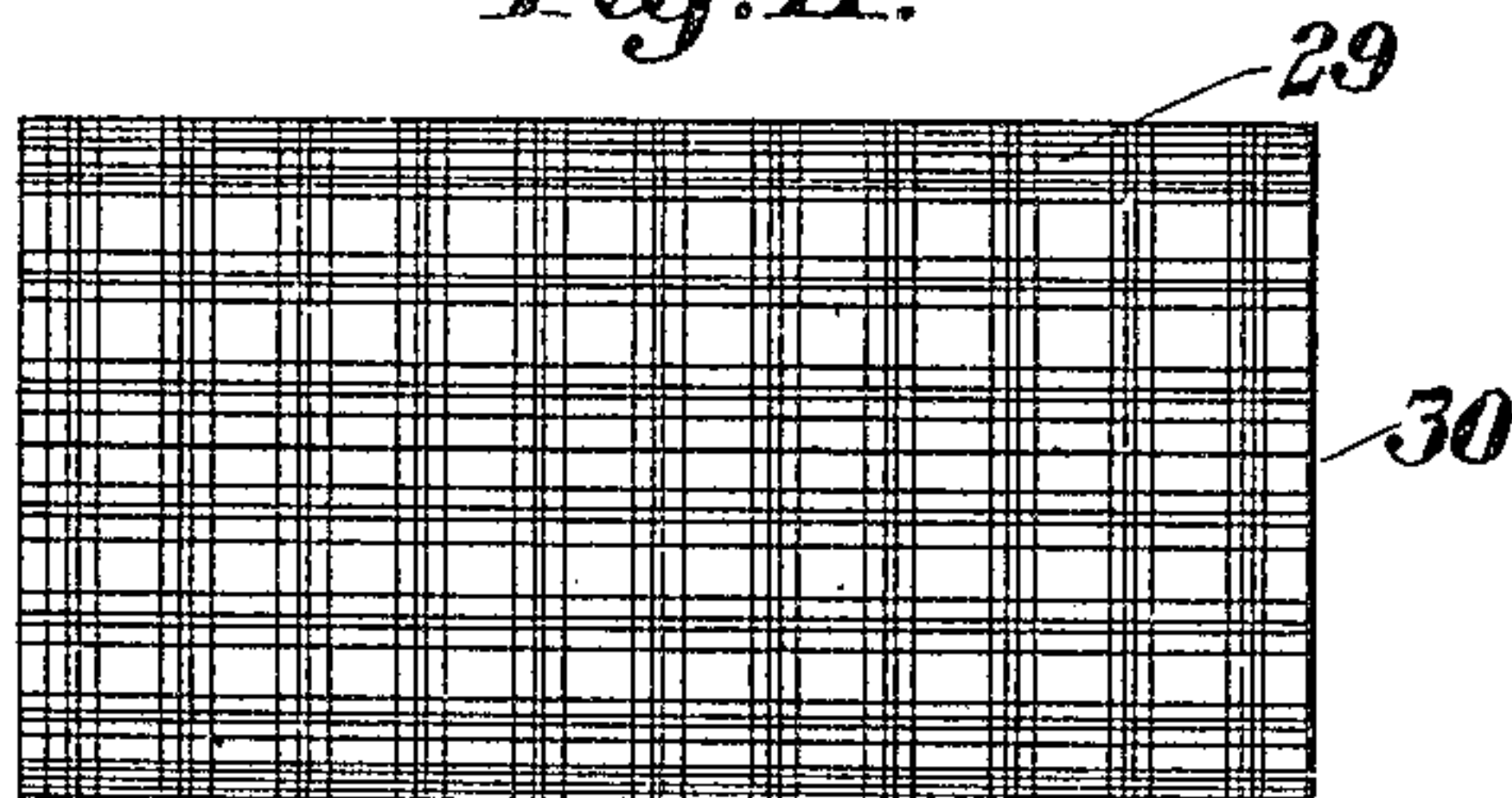


Fig. 11.



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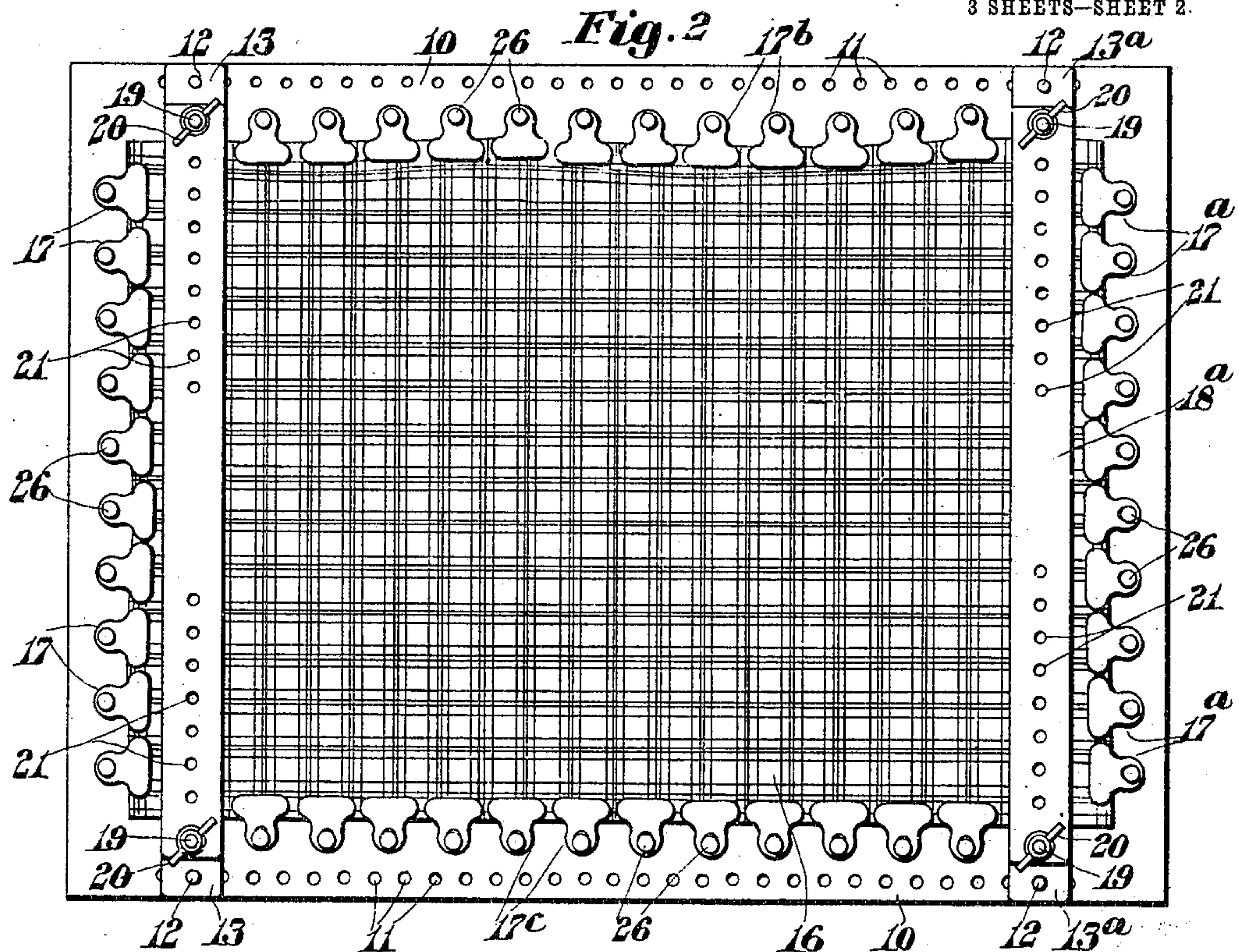


Fig. 5.

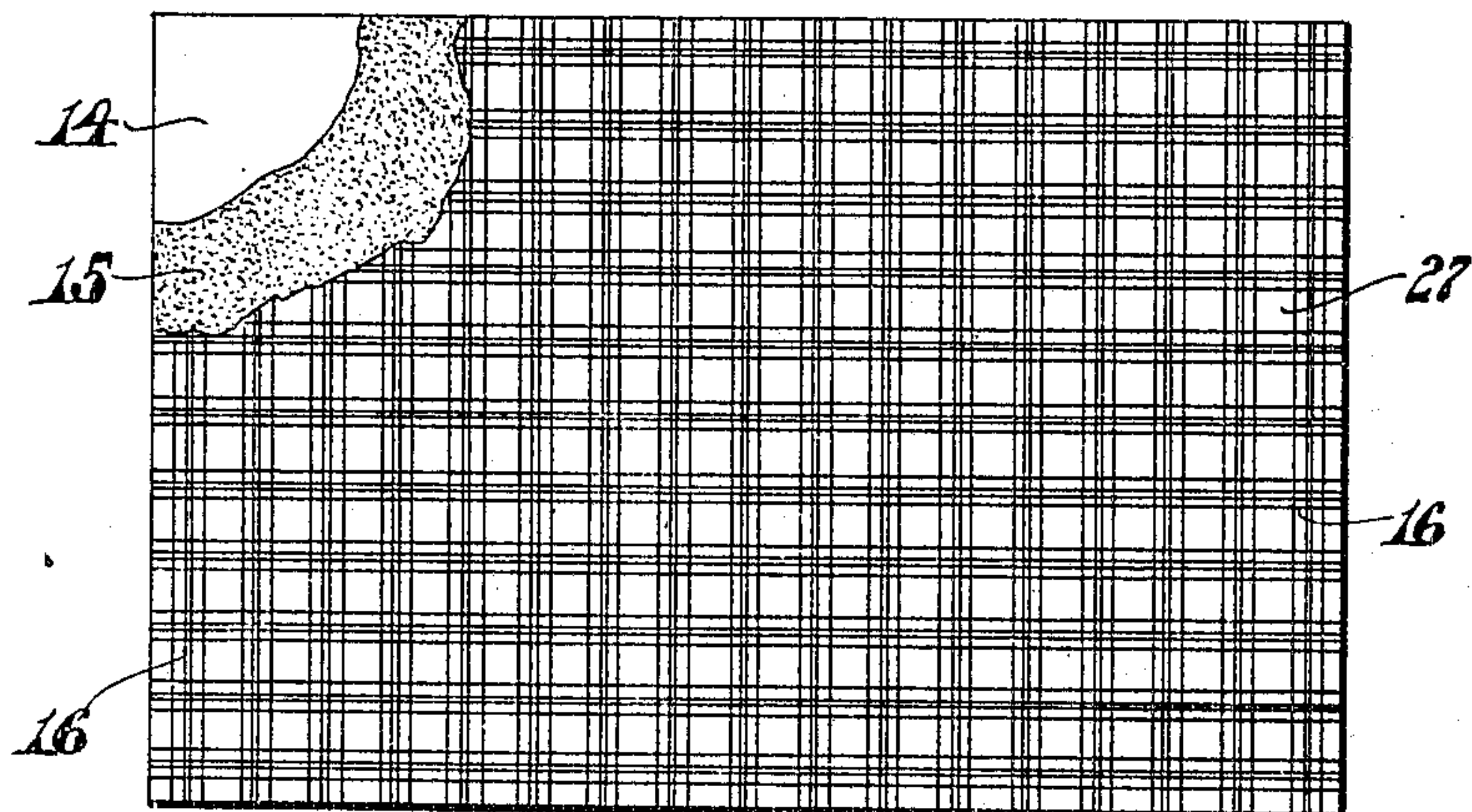


Fig. 6.



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3 SHEETS—SHEET 3

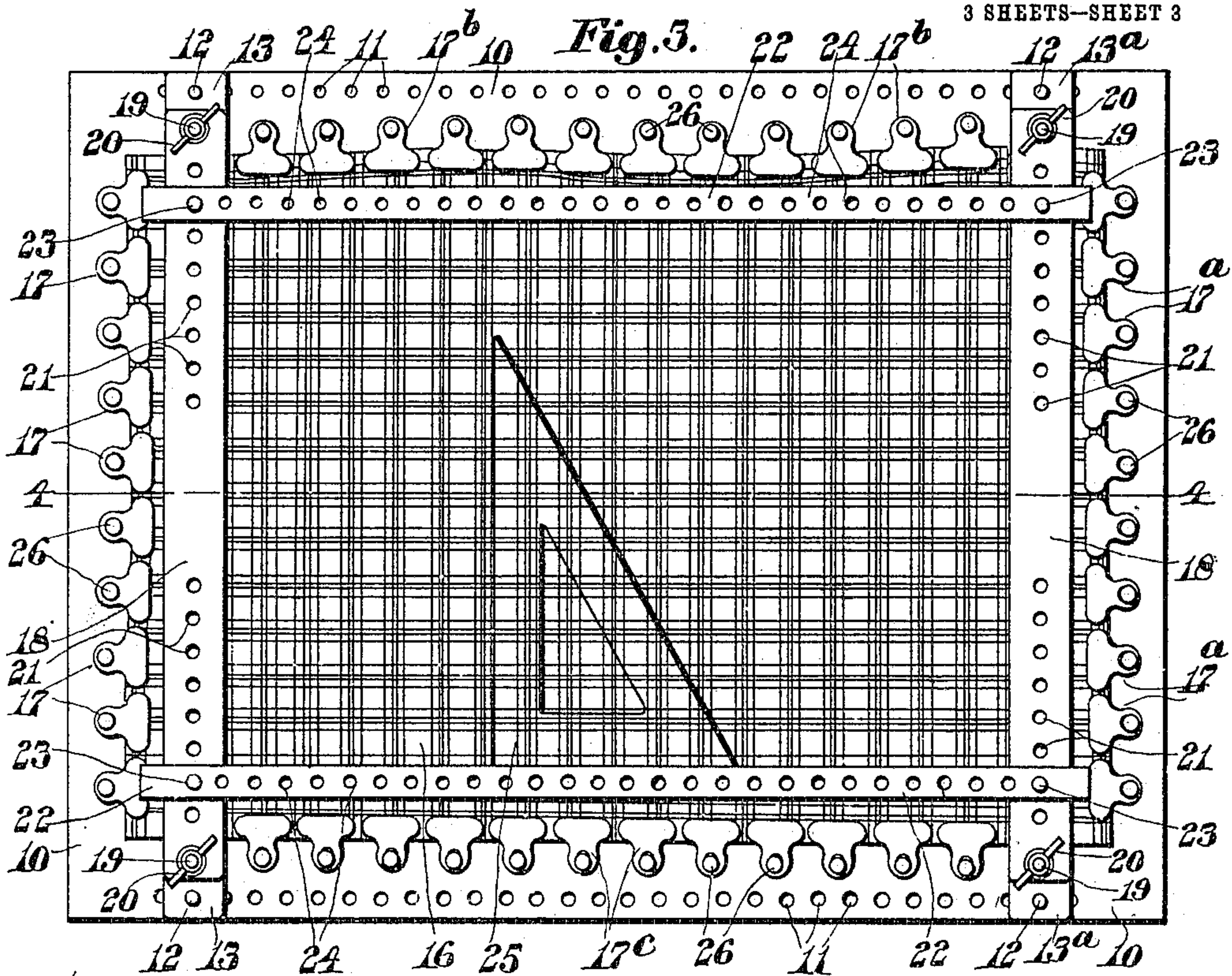
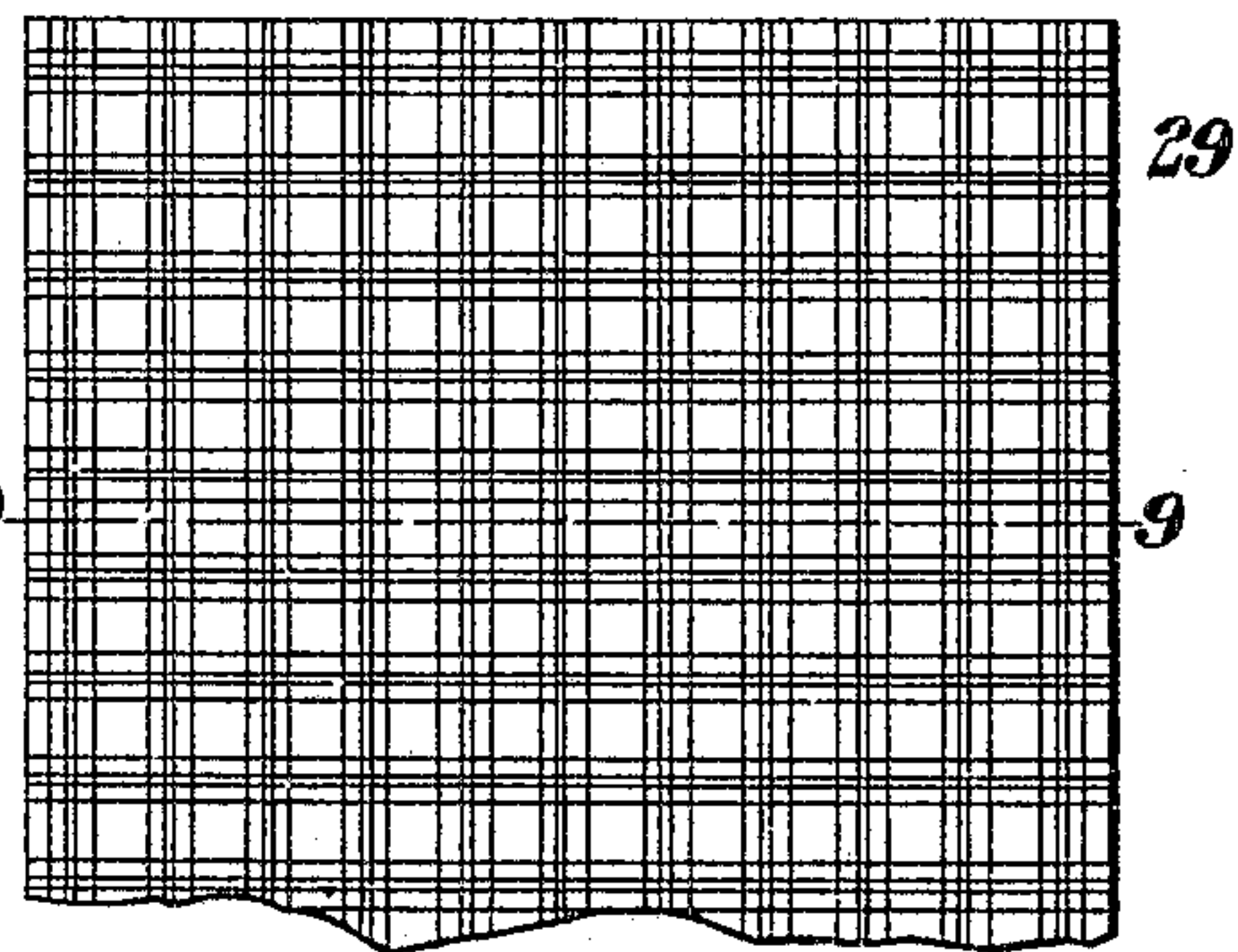
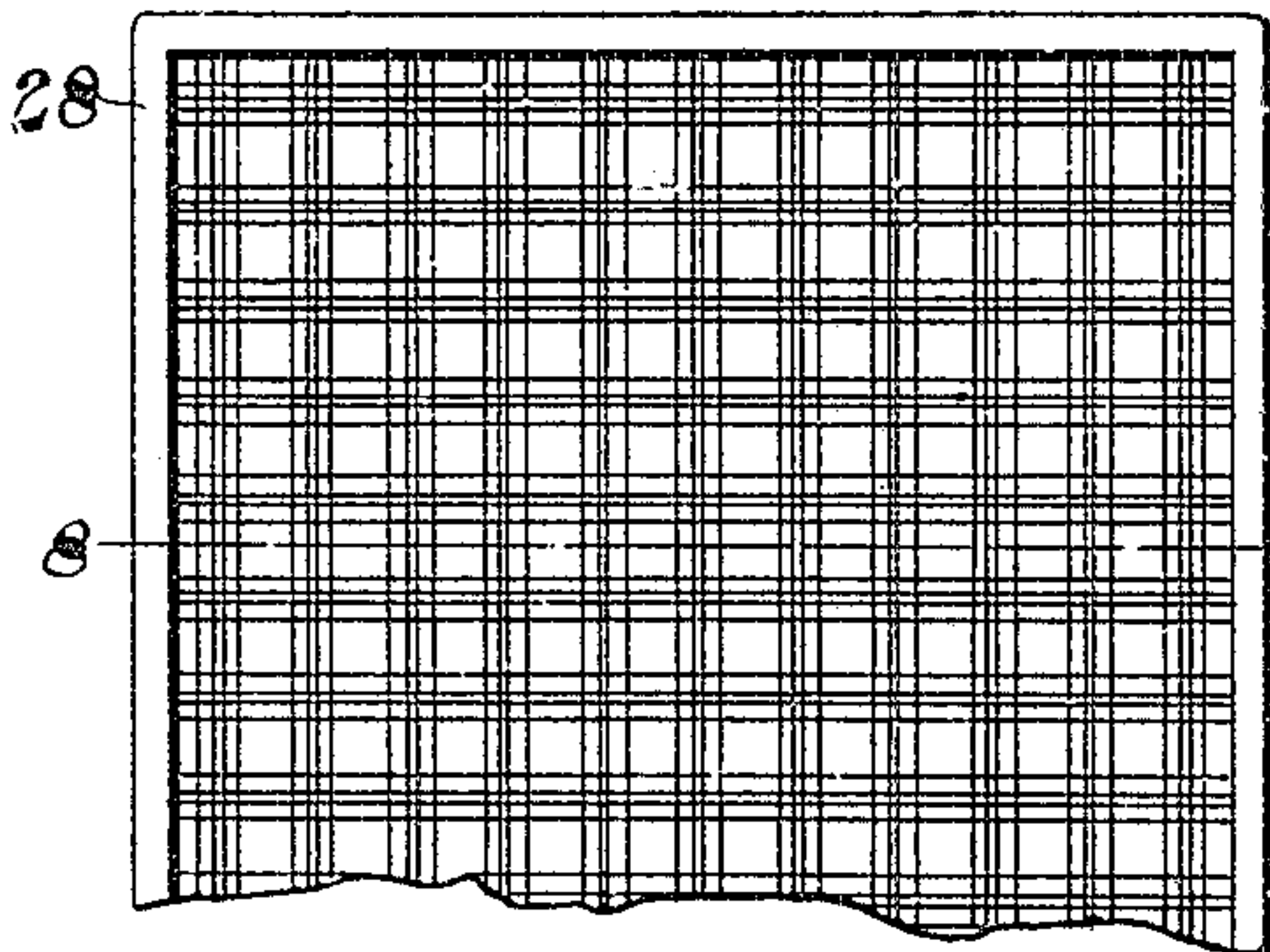


Fig. 7.

Fig. 9.



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UNITED STATES PATENT OFFICE.

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ONE-HALF TO ARTHUR E. WHITNEY, OF WINCHESTER, MASSACHU-
SETTS.

METHOD OF FORMING PRINTING-CYLINDERS.

No. 837,102.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed December 12, 1905. Serial No. 291,395.

To all whom it may concern:

Be it known that I, JAMES W. McINDOE, a citizen of the United States of America, and a resident of Dorchester, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Methods of Forming Printing-Cylinders, of which the following is a specification.

This invention relates to a process of and apparatus for preparing printing-surfaces, and has for its object the production of a printing-surface at a slight expense of fabrics or other materials, having ornamentations or configurations upon the surface thereof.

The particular object of the invention is to supply a means of stretching the fabric to cause the configurations thereon to assume parallel positions and also a means for varying the parallelism of said configurations when the fabric has been stretched.

It has for a further object the provision of means for securing the fabric when stretched to a suitable backing to hold the fabric in its stretched position, so that an electroplate of the fabric thus stretched may be made the configurations on which will be parallel, so that if desired the electroplate may be formed in a cylinder, and the two opposite meeting ends will match and form a continuous ornamentation upon the surface of said cylinder.

In order to carry out the process which constitutes a feature of this invention, certain apparatus is essential, said apparatus embodying certain novel features of construction and arrangement of parts, which will be readily understood by reference to the description of the drawings and to the claims to be hereinafter given.

Of the drawings, Figure 1 represents a plan of a device embodying the features of this invention, showing a piece of fabric applied thereto, said fabric being distorted and having a warped appearance. Fig. 2 represents a similar view after the fabric has been stretched, causing the configurations thereon to assume parallel positions. Fig. 3 represents a similar view showing means for verifying the parallelism of the configurations on said fabric. Fig. 4 represents a vertical section on line 4 4 on Fig. 3. Fig. 5 represents a rectangular piece cut from said fabric after the fabric has been stretched and showing said fabric secured to a suitable backing to

maintain it in stretched position. Fig. 6 represents an enlarged section of a portion of said backed fabric. Fig. 7 represents a plan of a portion of a matrix formed from the backed fabric. Fig. 8 represents a section of the same on line 8 8 on Fig. 7. Fig. 9 represents an electroplate formed from said matrix. Fig. 10 represents a section of the same on line 9 9 on Fig. 9; and Fig. 11 represents an elevation of the electroplate formed into a cylinder with two opposite ends meeting, with the configurations thereon matching to form a continuous ornamentation on the perimeter of said cylinder.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents a suitable support of wood or other suitable material provided on two opposite sides thereof with a plurality of holes 11 at equal distances from each other and from the edge of said support 10. By means of pins 12, inserted in the holes 11, strips 13 are secured to said support in positions parallel to each other. Between the strips 13 is interposed a suitable backing of cardboard or any other suitable material lying flat upon the upper face of said support. On the upper face of the backing 14 is placed a sheet 15 of suitable adhesive material. Above the sheet 15 and upon the strips 13 is laid a fabric 16, which is provided with a plurality of configurations thereon which it is desired to reproduce as a continuous ornamentation upon a long sheet of paper or other suitable material, as shown in Figs. 1 to 3.

In order to secure a continuous ornamentation from a woven fabric, it is essential that said fabric should be stretched to cause the configurations thereon to assume parallel positions and when stretched so that the configurations thereon are in parallel positions to secure the fabric thus stretched to a suitable backing by which the fabric will be held in its stretched form. Usually fabrics are more or less distorted and the configurations thereon out of parallelism, so that it is almost impossible to cut from the fabric a piece and join two opposite ends together and have the configurations meet to form a continuous ornamentation upon the cylinder thus formed. In order to obviate this and bring the configurations upon the fabric into

parallelism, a plurality of gummed clips 17 of any well-known construction are secured by the gummed portions thereof to the edges of said fabric 16 resting upon the strips 13, the gummed portions of said clips being first moistened before being applied to said edges. It is obvious that when the gummed portions of said clips dry in contact with the fabric they will adhere thereto. A clamping member 18 is then placed above the fabric upon the strips 13, these members being held in position by the threaded bolts 19, extending through openings in either end of the clamping member 18 and being provided upon their outer ends with nuts 20, by which said members 18 may be clamped securely to the strips 13.

When the clamping members 18 are in position by means of the clips 17, the end of the fabric is stretched so as to bring the warp-threads thereof in perfect alinement with the edge of the strip 13, and the clamping member 18 is then by means of nuts 20 clamped upon that end of the fabric. The operation is then repeated at the other end of the support 10 by means of the clips 17^a to bring the warp-threads at the other end of the fabric in line with the strip 13^a at that end of the support, which having been accomplished that end of the fabric is also clamped by means of the member 18^a. When this has been accomplished by means of the clips 17^b and 17^c on the edges of the fabric 16 at right angles to the strips 13 13^a, the fabric is then stretched to bring the center warp-threads into parallelism with the strips 13 13^a and to cause the weft-threads to become parallel to each other and at perfect right angles with the warp-threads.

The clamping members 18 18^a are each provided at either end with a plurality of holes 21 at equal distances apart and from the ends of said members 18 18^a. Two cross members or strips 22 are secured to the members 18 18^a by means of pins 23 in said members 22 and entering the holes 21 in the members 18 18^a. The strips 22 are each provided with holes 24 therethrough, equal in number and in corresponding positions relative to each other as the holes 11 in the support 10.

The holes 21 in the members 18 18^a are so positioned that when a pin 23 is passed through a hole 24 in either end of the strip 22 and is inserted in corresponding holes in the members 18 18^a the inner edge of said strip 22 will be at right angles to the inner edge of the members 18 18^a, thereby providing suitable edges with which a triangle 25 may cooperate to verify the parallelism of the warp and weft threads of the fabric or the ornamentations thereon. When the fabric has been suitably stretched to secure parallelism of the configurations thereon and verified in the manner described by means of suitable triangles, the clips 17 are secured to the sup-

port 10 by brads 26. The position of the clips relative to the support 10 may be adjusted by removing the brads 26, changing the clips to a new position, and then drawing the brads into the support 10 in such adjusted position. When the fabric by means of the clips 17 and brads 26 is secured in stretched position upon the support 10, pressure and heat—as, for instance, a heated iron—are applied to the upper surface of the fabric 16 to bring the same into contact with the sheet of adhesive material 15, the heat from the iron causing the material to soften and adhere to the rear surface of the fabric and also to adhere to the upper surface of the cardboard backing 14. The heated material 15 is then allowed to cool and harden, firmly holding the fabric in position upon the backing 14. Should at any time it be discovered that the configurations upon the fabric are out of true and not perfectly parallel, heat may be applied again, softening the adhesive material, thereby loosening the fabric, so that it may be slightly stretched again to bring it into parallelism, and it is then again allowed to harden and secure the fabric in its new adjusted position. When the fabric has been secured to the backing 14 in this manner, a rectangular portion of the fabric, with its backing—as, for instance, that portion within the inner edges of the strips 13 13^a and cross members 22—is cut from the stretched fabric, thus leaving a rectangular piece of cardboard 14, to which is secured by the sheet 15 the stretched fabric 16 with the ornamentations thereon in perfect parallelism, all as shown in Fig. 5. This piece 27 may then have applied to its upper face a suitable sizing to harden it and in this form may, if desired, be used as a printing-surface, printing directly upon the fabric itself. Preferably, however, the piece 27, suitably sized, is used to form therefrom a matrix 28, as shown in Figs. 7 and 8, said matrix being made of wax or any other well-known suitable material. This matrix is then used in the usual manner to produce an electroplate 29, as shown in Figs. 9 and 10. The electroplate thus formed may be provided with a suitable backing and used as a printing-surface in flat form, as shown in Figs. 9 and 10, or it may be formed into a cylinder, as shown in Fig. 11, the two opposite ends of said electroplate being trimmed to meet at 30 with the ornamentations thereon matching perfectly, so that a continuous ornamentation is provided upon the outer face of said cylinder from which a continuous impression may be given to a strip of paper or other material of any desired length.

Heretofore attempts have been made to produce cylindrical surfaces from fabrics from which to print a continuous strip; but as far as is known all of these attempts have been unsuccessful, as there was found to be

extreme difficulty to make the ends of the threads of the fabric match and make a perfect joint which would not be discovered when the impression was made from the cylindrical printing-surface. By means of the present apparatus and process printing cylindrical surfaces may be made at slight expense which will give a perfect continuous ornamentation from which a continuous impression may be made upon a strip of any desired length.

It is obvious that the fabric may be inserted between the strips 13 and clamping member 18 before said strips are secured to the support 10 without altering the principles of this invention. When this is done, the fabric is placed upon the strip 13 and clamping member 18 placed thereon, and then the fabric is pulled by means of the gummed clips 17 to cause the weft-threads to aline themselves of the fabric have been operated upon in this with the edge of said strips. When both ends manner and the threads are alined with the strips, the strips may then be secured to the support parallel with each other. The result obtained is precisely the same. It is quite evident that other modifications in the process may be made without altering the principles of this invention.

It is believed that from the foregoing the invention will be thoroughly understood without any further description.

I claim—

1. The process of forming printing-surfaces which consists in taking a fabric, stretching the same at various points along either edge to cause the configurations thereon to assume parallel positions, holding said fabric while in such adjusted positions on a suitable support, securing said fabric to a suitable backing, and sizing the same.

2. The process of forming printing-surfaces which consists in taking a fabric, stretching the same at various points along either edge to cause the configurations thereon to assume parallel positions, holding the fabric in such adjusted positions on a suitable support, securing said fabric to a suitable backing, sizing the same, forming a matrix therefrom, and forming an electroplate from said matrix.

3. The process of forming printing-surfaces which consists in taking a fabric, stretching the same at various points along either edge to cause the configurations thereon to assume parallel positions, holding the fabric on a suitable support, clamping the edges of said fabric to retain it in stretched position, securing the fabric to a suitable backing, and sizing the same.

4. The process of forming printing-surfaces which consists in taking a fabric, stretching the same at various points along either edge to cause the configurations thereon to assume parallel positions, holding the fabric

thus stretched on a suitable support, clamping the edges of said fabric to retain it in stretched position, securing the fabric to a suitable backing, sizing the same, forming a matrix therefrom, and forming an electroplate from said matrix.

5. The process of forming printing-surfaces which consists in taking a fabric, clamping two ends thereof, stretching the fabric at various points along its edges to cause the configurations thereon to assume parallel positions, securing the same to a suitable backing, sizing the same, forming a matrix therefrom, and forming an electroplate from said matrix.

6. The process of forming printing-surfaces which consists in taking a fabric, stretching the same at various points along either edge to cause the configurations thereon to assume parallel positions, holding the fabric in adjusted positions on a suitable support, clamping two edges of said fabric in parallel devices, securing to said devices parallel members at right angles thereto, verifying the parallelism of said configurations by means of angles against the edges of said parallel devices, securing the fabric to a suitable backing, and sizing the same.

7. The process of forming printing-surfaces which consists in taking a fabric, stretching the same at various points along its edges to cause the configurations thereon to assume parallel positions, holding the same in such stretched position on a suitable support, inserting beneath said fabric a suitable backing upon said support, interposing between said backing and said fabric a sheet of securing material, applying pressure to said fabric and securing it by means of said material to said backing, and sizing the same.

8. The process of forming printing-surfaces which consists in taking a fabric, stretching the same to cause the configurations thereon to assume parallel positions, inserting beneath said fabric a suitable backing, interposing between said backing and said fabric suitable securing material, applying heat to said fabric, and securing it by means of said material to said backing, and sizing the same.

9. The process of forming printing-surfaces which consists in taking a fabric, stretching the same to cause the configurations thereon to assume parallel positions, inserting beneath said fabric a suitable backing, interposing between said backing and said fabric a sheet of securing material, applying pressure and heat to said fabric to secure it by means of said material to said backing, and sizing the same.

10. The process of forming printing-surfaces which consists in taking a fabric, stretching the same to cause the configurations thereon to assume parallel positions, in-

serting beneath the same a suitable backing, interposing between said backing and fabric a sheet of adhesive material, applying pressure and heat to said fabric to cause it to adhere to said backing, cutting therefrom a piece having upon its face a pattern, and trimming the opposite edges of said piece so that when formed into a cylinder the edges will meet and the pattern thereon coincide.

10 11. The process of forming printing-surfaces which consists in taking a fabric, stretching the same to cause the configurations thereon to assume parallel positions, inserting beneath the same a suitable backing, sizing the same, interposing between
15 said backing and fabric a sheet of adhesive material, applying pressure and heat to said fabric to cause it to adhere to said backing, and cutting therefrom a piece two opposite
20 edges of which are adapted when trimmed to meet and form a cylinder having upon its periphery a continuous pattern.

12. The process of forming cylindrical printing-surfaces which consists in taking a fabric, stretching the same to cause the configurations thereon to assume parallel positions, inserting beneath the same a suitable backing, interposing between said backing and fabric a sheet of adhesive material, applying pressure and heat to said fabric to cause it to adhere to said backing, cutting therefrom a piece two opposite edges of which are adapted when trimmed to meet and form a cylinder having upon its periphery a continuous pattern, sizing the same, forming
35 a matrix therefrom, and forming an electroplate from said matrix.

Signed by me at Boston, Massachusetts, this 9th day of December, 1905.

JAMES W. McINDOE.

Witnesses:

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EDNA C. CLEVELAND.