No. 743,759. PATENTED NOV. 10, 1903.

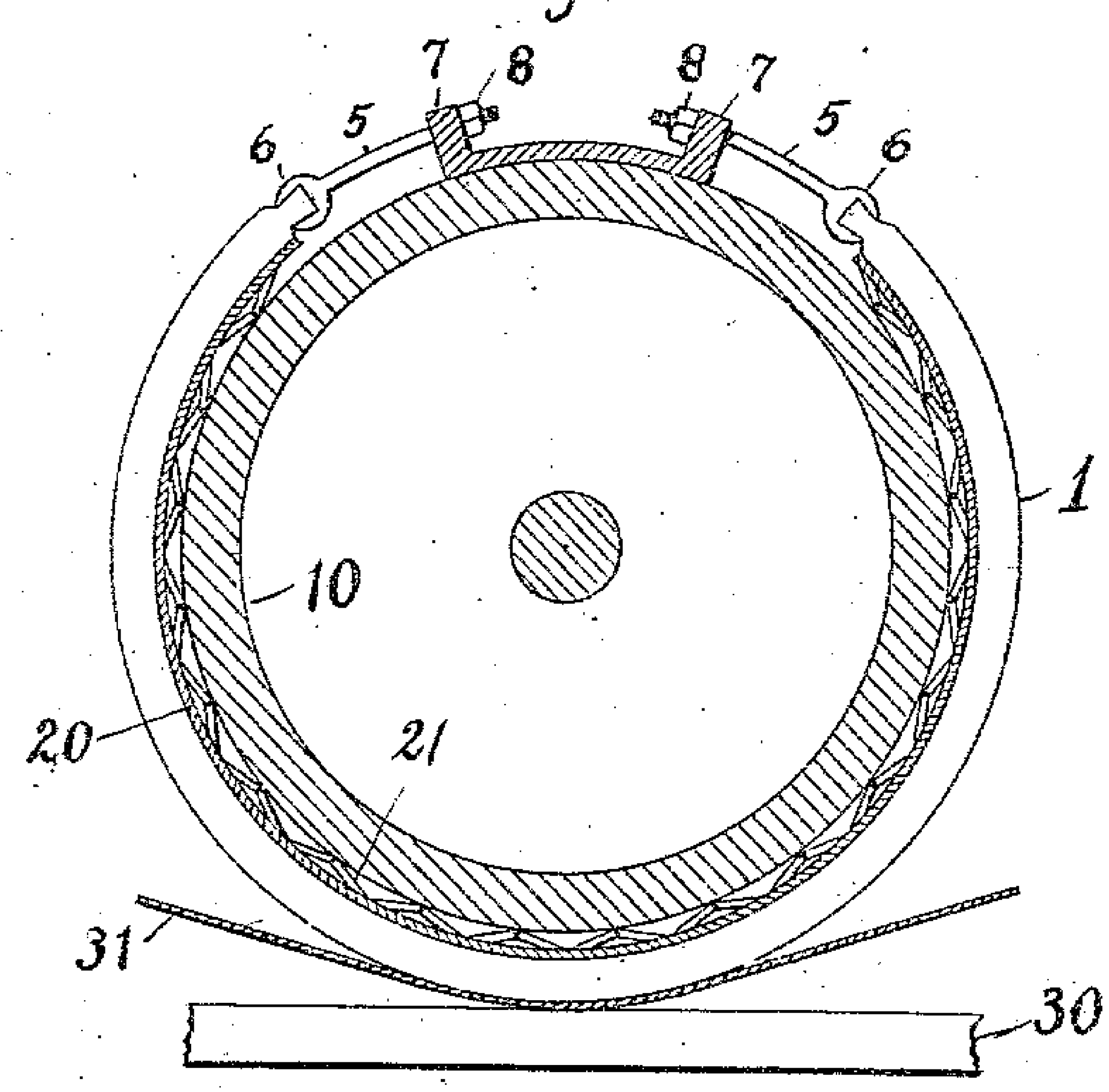
M. L. SEVERY.

PRINTING PRESS.

APPLICATION FILED APR. 30, 1900.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1



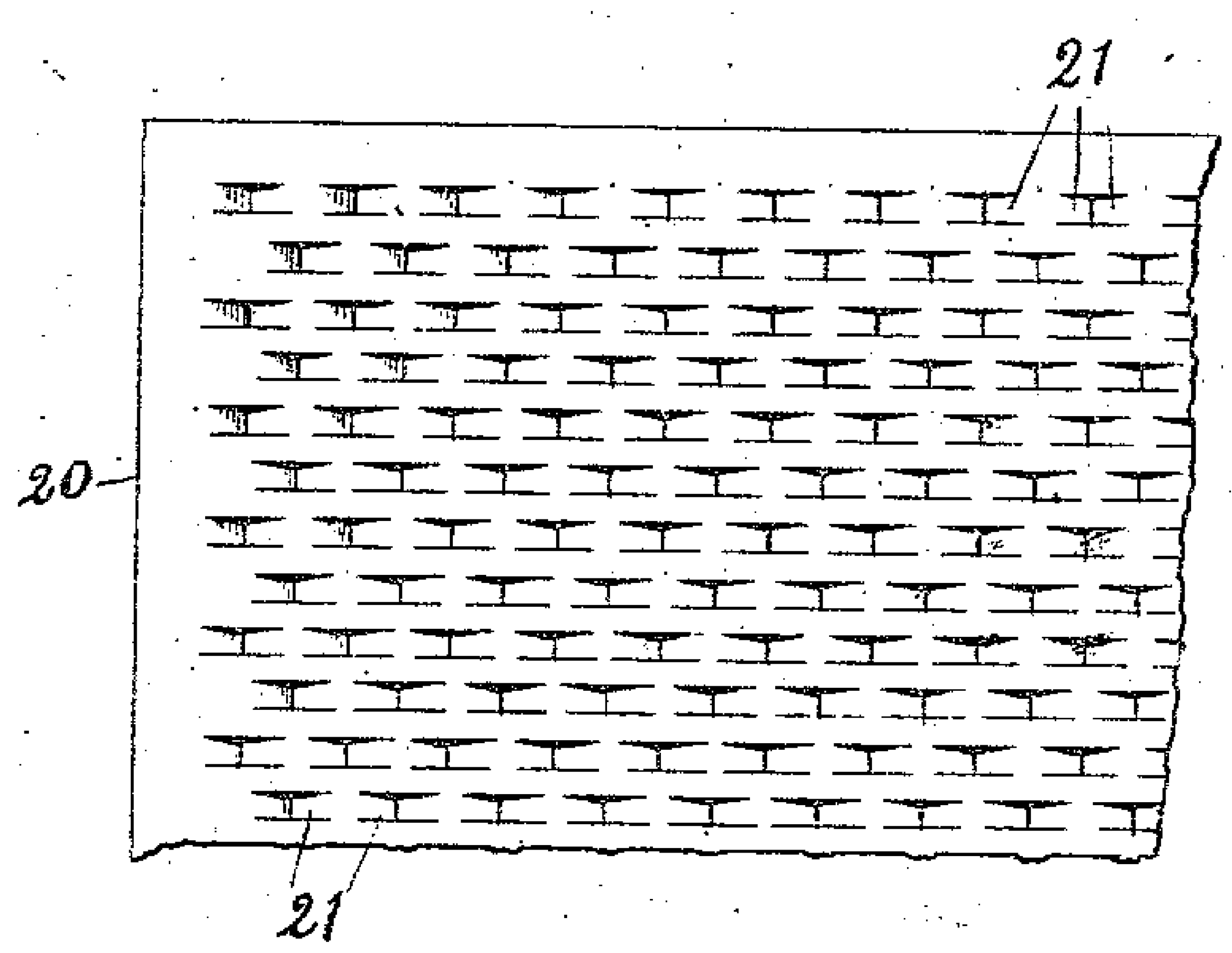


Fig. 2

Witnesses

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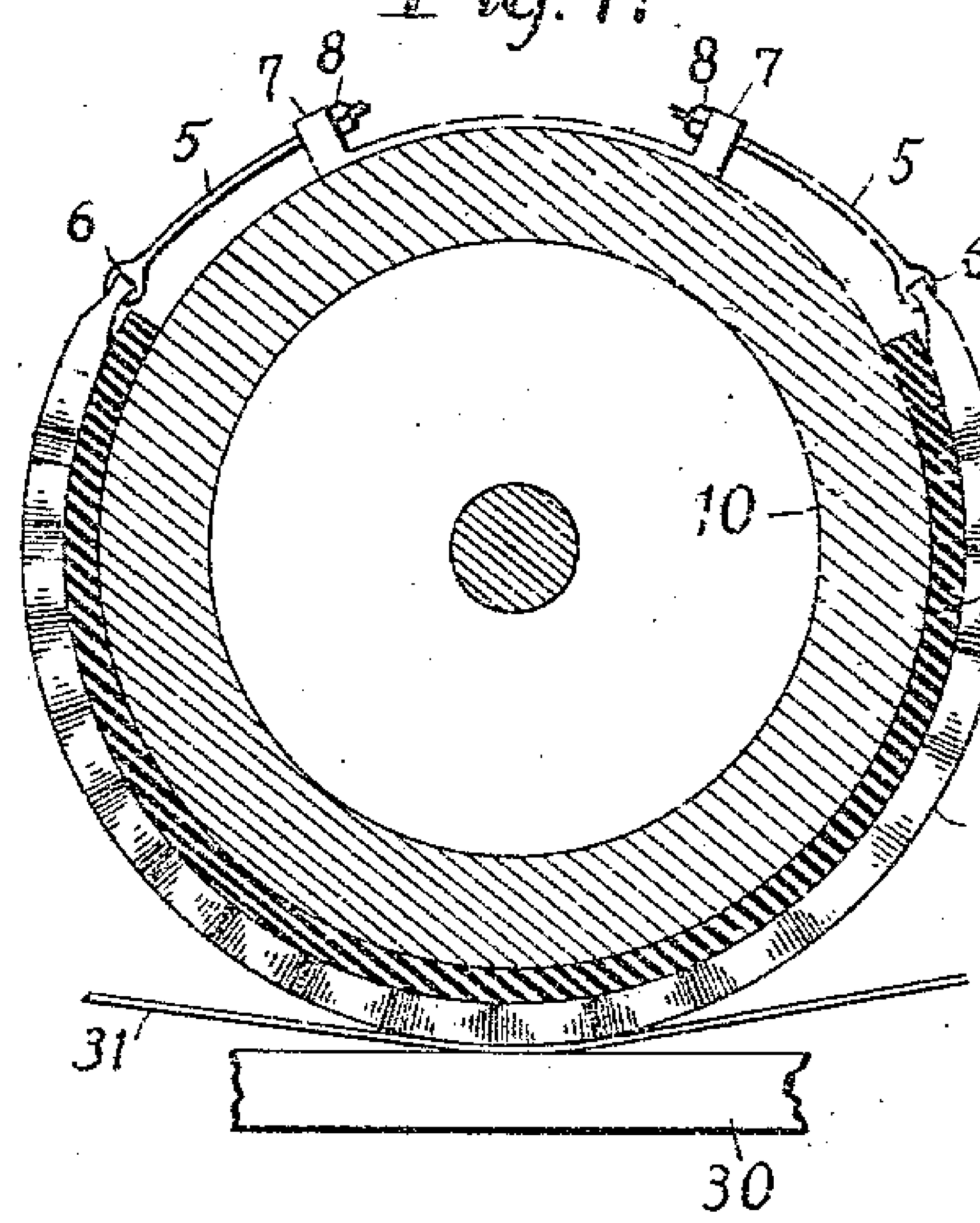
NO MODEL. 2 SHEETS—SHEET 2.

Fig. 11



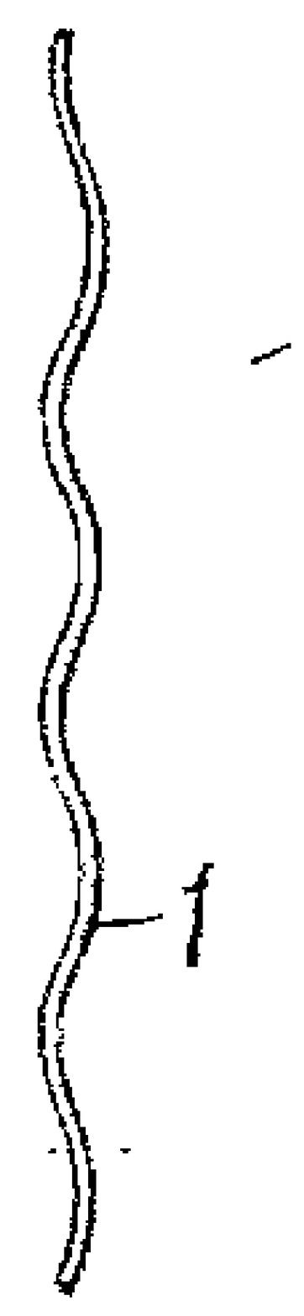


Fig. 7

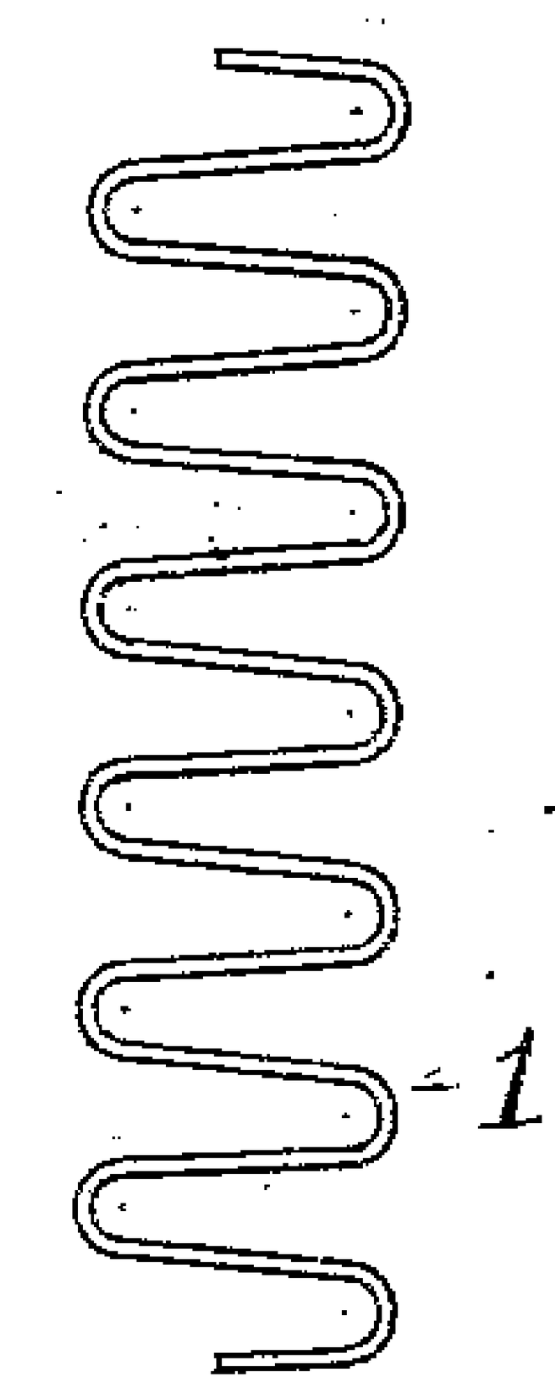


Fig. 6

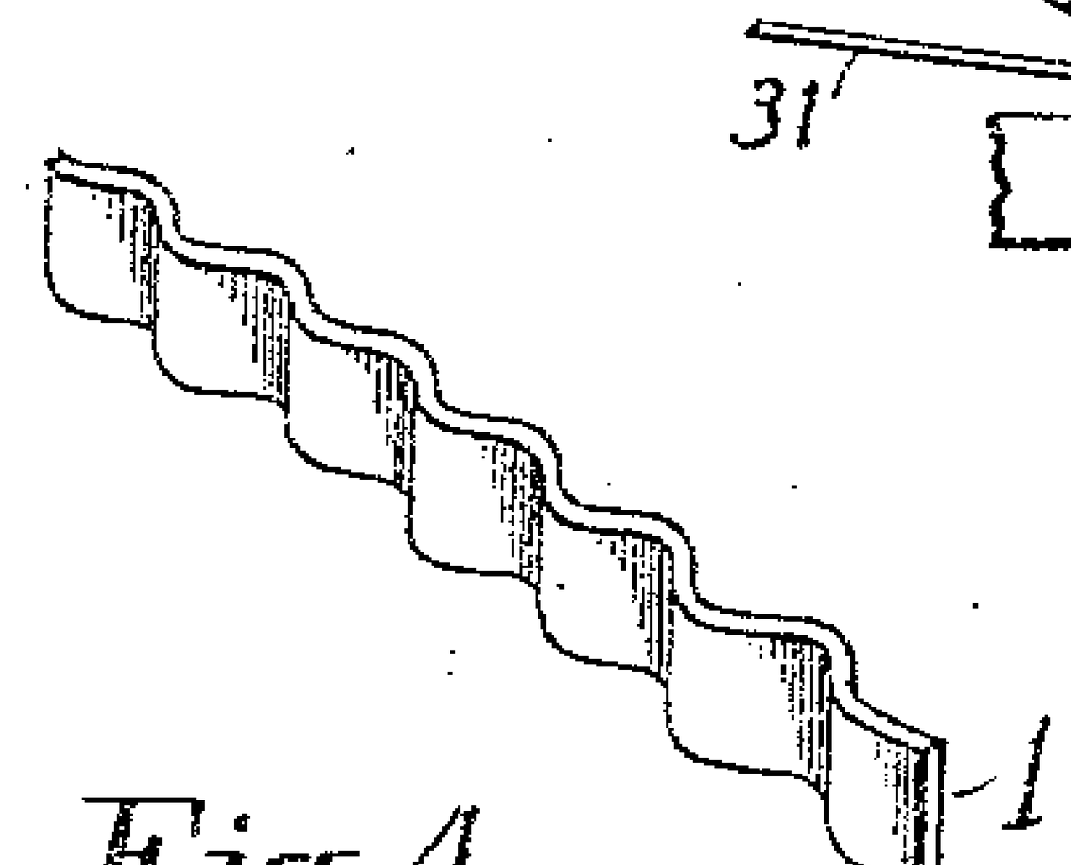


Fig. 4

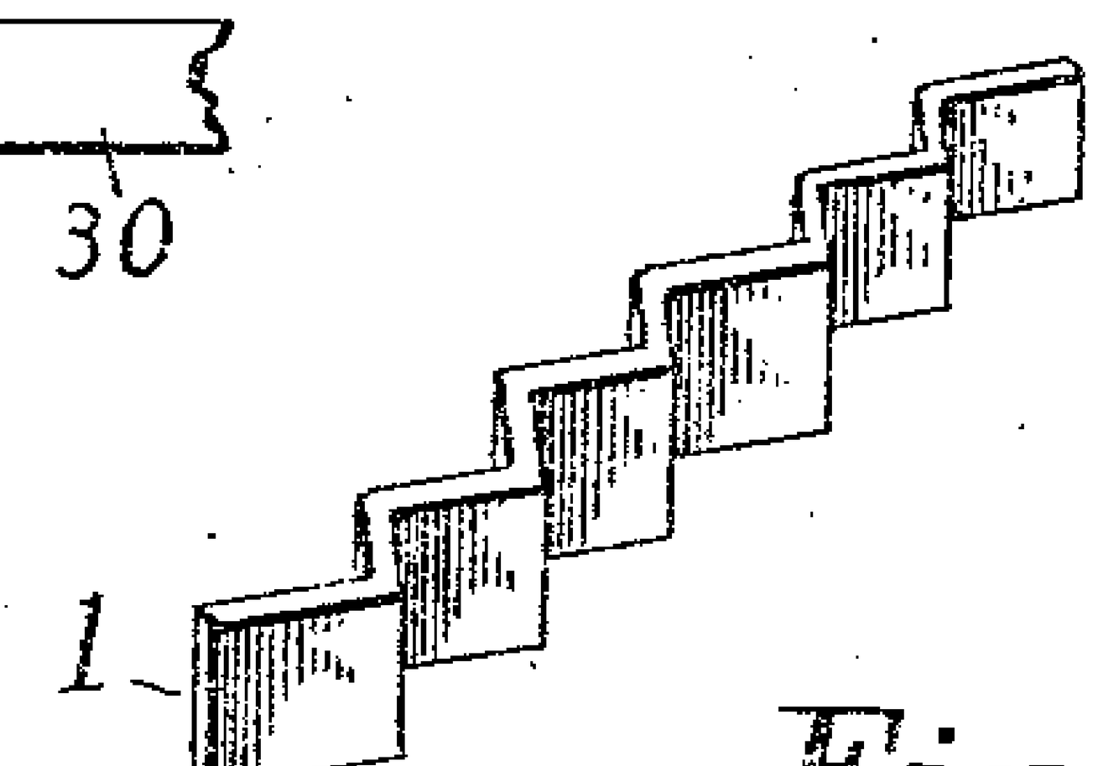


Fig. 5

Fig 10

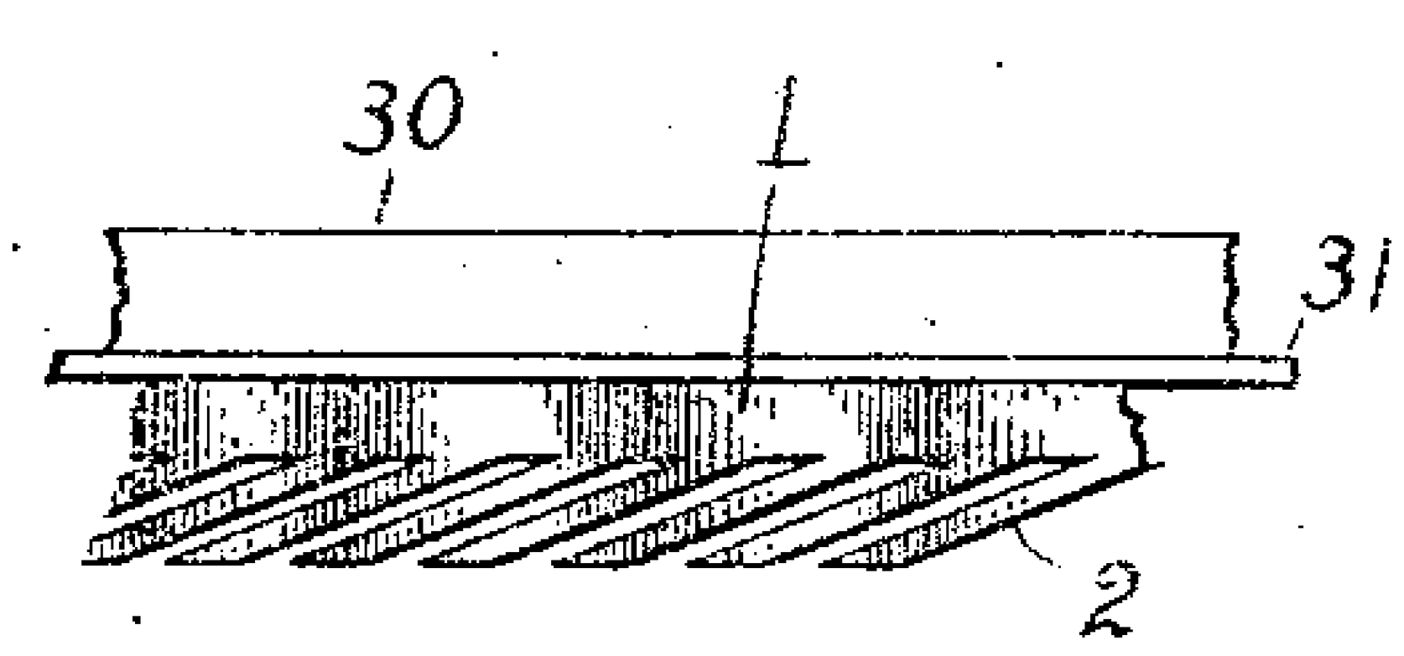


Fig. 8

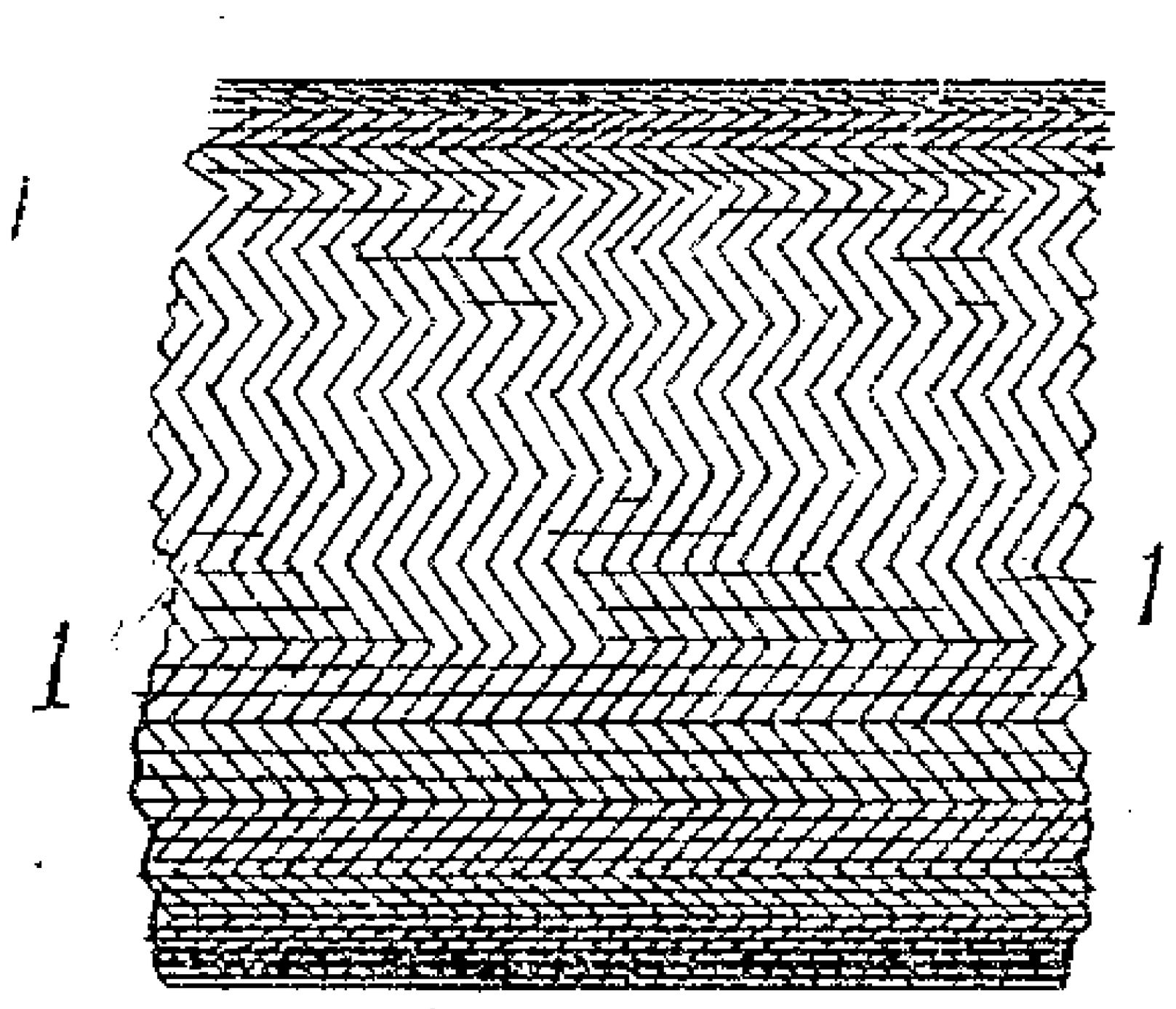


Fig. 3

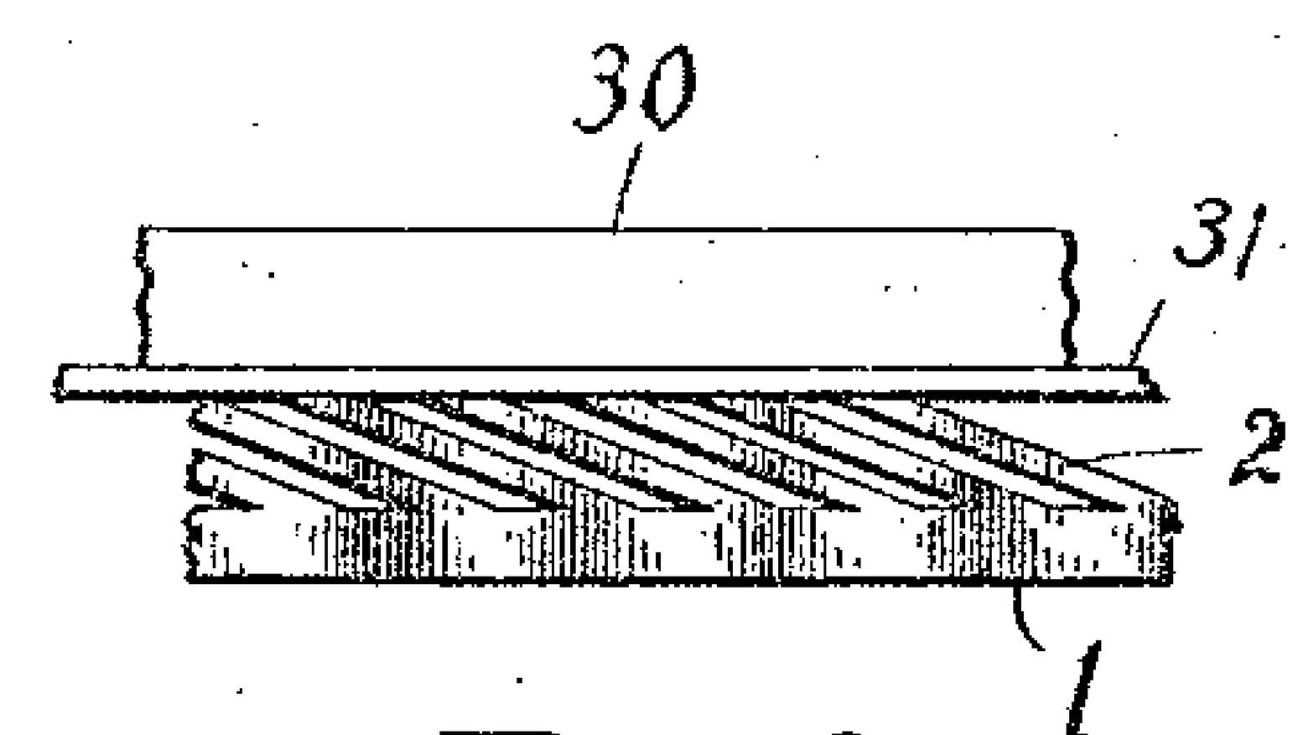


Fig. 9

Witnesses;

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A. B. Upham.

Kenyon & Kenyon

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No. 743,759. Patented November 10, 1903.

UNITED STATES PATENT OFFICE.

MELVIN L. SEVERY, OF ARLINGTON HEIGHTS, MASSACHUSETTS, ASSIGNOR TO AUTOMATIC TYMPAN COMPANY, A CORPORATION OF NEW YORK.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 743,759, dated November 10, 1903.

Application filed April 30, 1900. Serial No. 14,923. (No model.)

To all whom it may concern:

Be it known that I, MELVIN L. SEVERY, a citizen of the United States, residing at Arlington Heights, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Printing-Presses, of which the following is a full, clear, and exact description.

The object of this invention is the construction of an improved impression-surface or blanket for printing-presses and which while applicable to flat presses is especially adapted for cylindrical impression members.

The essential feature of my invention is the construction of such an impression-surface constituted by a multiplicity of sensibly-resilient elements presenting independently-yielding areas.

Referring to the drawings forming part of this specification, Figure 1 is a transverse section of a cylindrical impression member provided with my preferred form of the invention. Fig. 2 is a face view of the elastic cushion designed for the support of the lineal elements. Fig. 3 is a front elevation of a slightly-modified form of the invention. Fig. 4 is a perspective view of a part of one of my preferred forms of independent element. Fig. 5 is a perspective view of the same made sharply sinuous, the showing in Fig. 4 being but moderately so. Fig. 6 is a face view of such element made deeply sinuous. Fig. 7 shows the same but slightly sinuous. Fig. 8 is a part of one of the elements formed integrally cushioned. Fig. 9 is a side view of the same element vertically reversed. Fig. 10 is a face view of a part of one of my elements made straight throughout its length, except at its ends, where it is given sufficient sinuosity to make it tensionally resilient. Fig. 11 is a transverse section of a supporting-cylinder having my lineal elements cushioned thereon by a soft-rubber sheet.

Each of the elements which together constitute the impression-surface consists, preferably, of a comparatively thin band or strap of resilient metal 1, supported edgewise upon a suitable cushion 20. These elements are made thin enough to present united a surface constituted by a multiplicity of lineal areas each scarcely more than a mathematical line in width, and they are made deep enough to bend but very slightly under pressure, thereby distributing over a large number of points of the cushion the pressure given by the printing-surface at a single point of the element. It is this feature of exceedingly-slight flexure which differentiates this invention over the lineal areas of the companion application designated as "Case A."

Each element 1 is preferably given a laterally-sinuous form corresponding to the showing in Fig. 4, although it may vary therefrom to the extents indicated in Figs. 5, 6, and 7. The purpose of this sinuosity is, first, to enable the elements to be more easily bent about the cylinder, a function which is performed by such sinuosity; second, to give the elements a broad base sufficient to overcome any tendency to their leaning, and, third, to render their lines of separation one from the other incapable of coinciding with the prevailing printing-lines of the type matter.

One form of cushion consists of the rubber 20, and my means for securing the elements in place about the same consists of the screw-rods 5, having clamp-jaws 6 engaging the properly-prepared ends of the elements, said rods being adjustably held by the anchorages 7, and the means of adjustment comprising the nuts 8, turning on the threaded ends of said rods. Inasmuch as the nuts 8 are of much greater width or diameter than the elements 1, it is of course necessary to have each clamp-jaw 6 engage a sufficient number of adjacent elements to more than equal the space occupied by said nuts.

The type of impression-cylinder illustrated in Fig. 1 is adapted particularly for presses having a flat reciprocating form 30, the section of the cylinder unprovided with the impression-surface being that which rotates over the type-form when the latter is moving back to its initial position, or this cylinder can be adapted to rock over the type-form.

Although I prefer to support the elements 1 upon a cushion, it is possible to give each element an integral resilience of its own, as by slitting it obliquely, as shown in Fig. 8, and thereby provide it with a series of spring-fingers 2 for rendering it independently yielding. This construction is more clearly set

forth and claimed in my companion application designated as "Case C."

Fig. 9 illustrates the same construction as that just described, but turned upside down in order to present the extremities of the spring-fingers 2 to the form 30, a bridging-plate 31 being of course placed between.

The advantages of my arrangement are especially evident when used in connection with a press one member at least of which is cylindrical. Here the contact between the impression member and printing-surface is theoretically but a mathematical line. Practically, of course, such contact line or tread is of an appreciable width, and in the case of a comparatively soft cushion such width is considerable, according to the degree to which the cushion is compressed. To narrow down such tread to the nearest approximation to a mathematical line while still maintaining the independently-yielding characteristic of such line is the ideal for printing purposes. The reason for this is that the narrow line greatly limits the gross pressure required between the members of the press, and hence diminishes the strain upon the machine. The narrow yielding line more readily conforms itself to the printing-surface, and thus insures perfection of impression. A soft cushion not only causes the type matter to more or less embed itself therein, and therefore emboss the paper, but slurs the impression and ruins the type.

By means of my arrangement I almost perfectly retain the cylindrical contour of the impression-surface, and hence obtain all the desirable results above quoted. At the same time the cushion between the elements 1 and the inflexible supporting member permits each element to bodily yield, and thereby constitute the perfectly-conforming impression-line of narrowest possible width.

It is further evident that a comparatively soft elastic cushion is enabled to transmit a very heavy resistance to a single point of the impression-surface, since each point of an element is by the practical inflexibility of the latter resisted by a large number of points on the cushion. Hence when a rubber cushion is employed it is not so easily injured by overpressure, it is not disintegrated, its life is much greater, and the quality of the work produced is far superior to what can possibly be accomplished by means of a cushion alone.

My preferred form of cushion is that illustrated in Figs. 1 and 2, and consists, essentially, of the resilient sheet of metal 10, having its under surface formed with the acutely-oblique projections 11. Said projections or teeth are preferably made by stamping out from the sheet a multiplicity of small sections thereof, as shown. As indicated in Fig. 1, these teeth set but very slightly out from the body of the sheet 10, and so make a sharply-acute angle therewith. Hence when the sheet is pressed upon these teeth yield thereto, but when the pressure is removed the teeth recover their position. Further, should the sheet be so strongly pressed as to flatten any or all the teeth flush therewith the bend of the teeth is so slight as to be within the limit of "set" of the metal, and therefore there is no danger of the cushion becoming permanently flattened or deteriorated. The teeth are inclined in opposite directions, as shown, in order that in bending they shall not create a tendency on the part of the sheet to creep. The teeth in the respective rows are staggered, as shown in Fig. 2, in order to support the sheet 10 as uniformly as possible.

By having my slightly-resilient elements supported upon this cushion 10 the rigidity of said elements is sufficient to perfectly bridge over the spaces between the roots of the teeth 11 in the cushion, and said lineal elements 1 are thereby made to constitute an ideal impression-surface.

In an impression-surface constituted as is that above described by the sinuous ribbons or elements 1 there will unavoidably be slight crevices between the same, especially between the crests of one and the hollows of its neighbor, when said ribbons are made of uniform thickness. It is hence necessary to use a bridging-plate over the same, as illustrated in Figs. 1, 8, 9, and 11, particularly with the deeply-sinuous elements shown in Fig. 6.

What I claim as my invention, and for which I desire Letters Patent, is as follows, to wit:

1. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of narrow, sensibly-resilient elements extended bodily in the plane of said surface, and presenting independently-yielding areas, substantially as set forth.

2. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of narrow, closely-arranged, sensibly-resilient elements extended bodily in the plane of said surface, and presenting independently-yielding areas, substantially as described.

3. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of deep, narrow, closely-arranged, sensibly-resilient elements extended bodily in the plane of said surface, and presenting independently-yielding areas, substantially as described.

4. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of laterally-sinuous elements presenting independently-yielding areas, substantially as described.

5. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of narrow, closely-arranged, laterally-sinuous elements presenting independently-yielding areas, substantially as described.

6. The combination with a suitable printing-surface, of an impression-surface con-

stituted by a multiplicity of narrow, deep, closely-arranged laterally-sinuous elements presenting independently-yielding areas, substantially as described.

7. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of narrow laterally-sinuous elements presenting independently-yielding areas, and a yielding support for said elements, substantially as described.

8. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of narrow, laterally-sinuous, sensibly-resilient elements presenting independently-yielding areas, and a yielding support for said elements, substantially as described.

9. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of laterally-sinuous elements presenting independently-yielding areas, a yielding support for said elements, and means for straining said elements upon said support, substantially as described.

10. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of laterally-sinuous, deep, narrow, closely-disposed elements presenting independently-yielding areas, a yielding support for said elements, and means for straining said elements upon said support, substantially as described.

11. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of extensible, elongated elements extended bodily in the plane of said surface, and presenting independently-yielding areas, a yielding support for said elements, and means for straining said elements upon said support, substantially as described.

12. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of deep, narrow, sensibly-resilient, extensible, elongated elements extended bodily in the plane of said surface, and presenting independently-yielding areas, a yielding support for said elements, and means for straining said elements upon said support, substantially as described.

13. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of sensibly-resilient, narrow elements extended bodily in the plane of said surface, and presenting independently-yielding areas, a cushon underlying said elements, and a cylindrical support for said cushion, substantially as described.

14. The combination with a suitable printing-surface, of an impression-surface constituted by a multiplicity of narrow, sinuous elements presenting independently-yielding areas, a cushion underlying said elements, and a cylindrical support for said cushion, substantially as described.

15. In a printing-press, the combination with the cylinder, of the cushion thereon, the multiplicity of independent, elongated elements supported by said cushion, the clamps holding the ends of said elements, the threaded rods attached to said clamps, the anchorage, and the nuts adjustably securing said rods to said anchorage, substantially as set forth.

16. The combination with an impression-surface, of a cushion therefor constituted by a sheet of spring metal having the multiplicity of small, acutely-bent teeth, and an underlying support contacting with the extremities of said teeth, substantially as described.

17. The combination with an impression-surface, of a cushion therefor constituted by the sheet of spring metal having the multiplicity of small, acutely and oppositely bent, staggered teeth partially separated therefrom, substantially as described.

In testimony that I claim the foregoing invention I have hereunto set my hand this 24th day of April, 1900.

MELVIN L. SEVERY.

Witnesses:

LEON M. ABBOTT,

A. B. UPHAM.