

No. 835,305.

PATENTED NOV. 6, 1906.

G. A. LAWRENCE.  
LEATHER WORKING MACHINE.

APPLICATION FILED APR. 13, 1905.

3 SHEETS—SHEET 1.

FIG. 1.

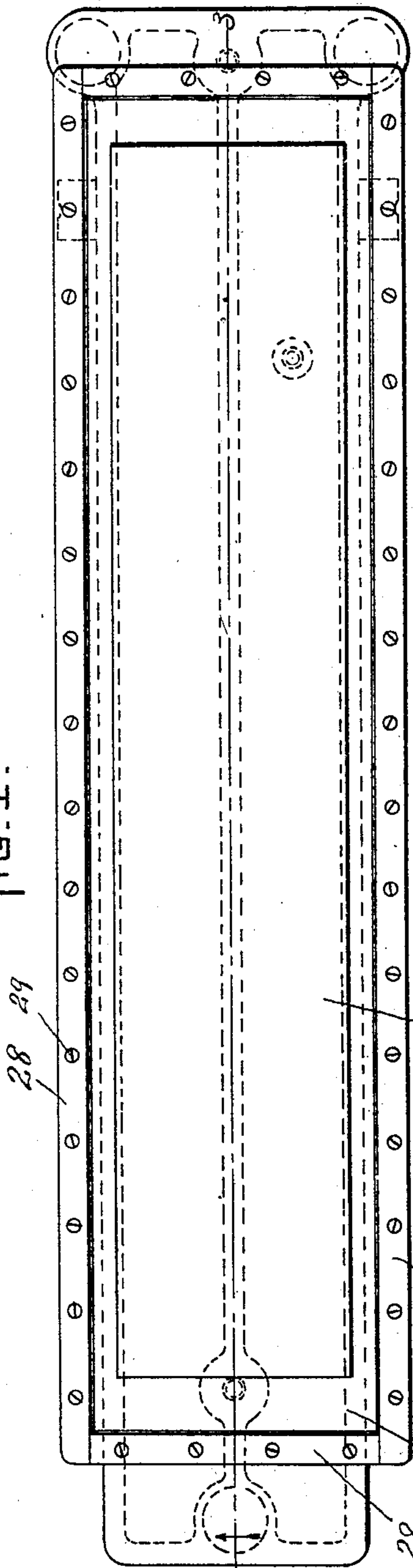


FIG. 2.

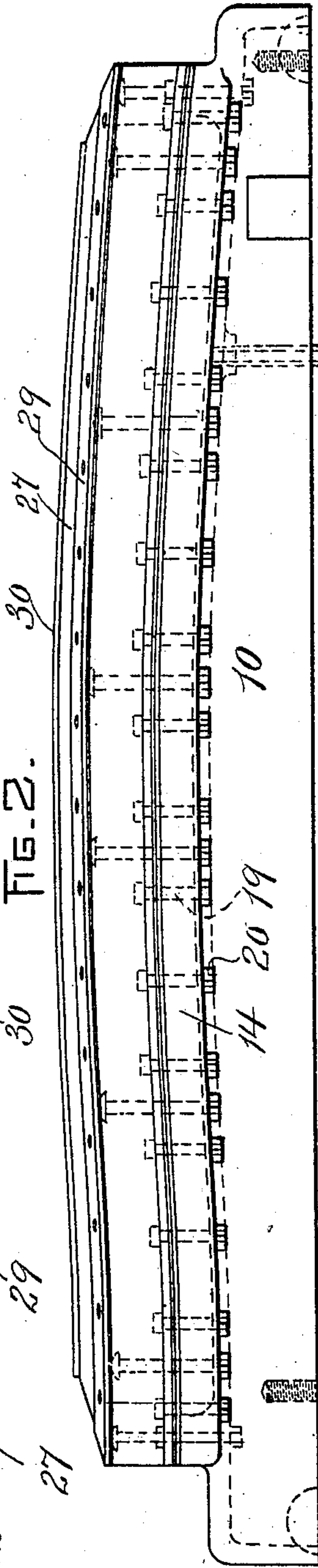
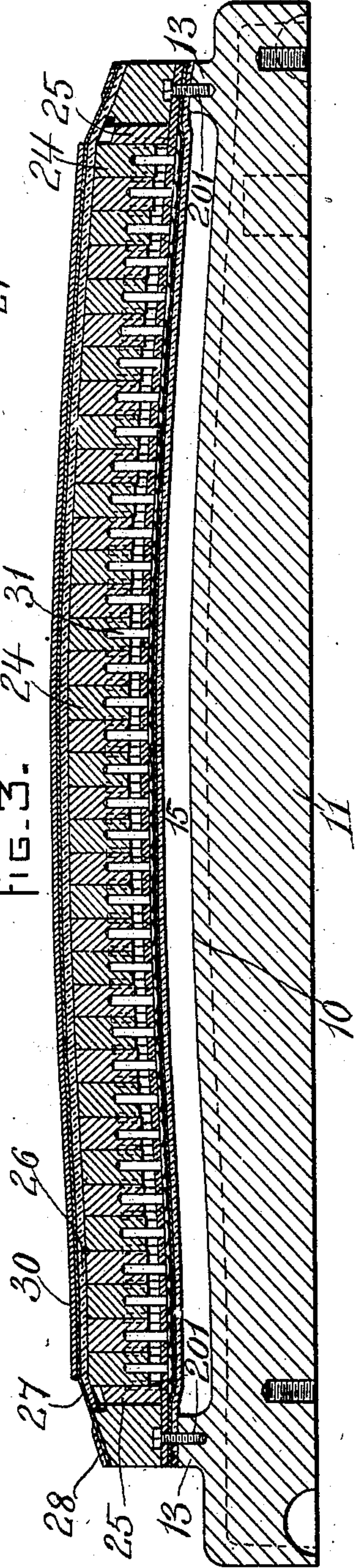


FIG. 3.



WITNESSES:

Walter P. Albee.  
C. C. Stecher.

INVENTOR:

G. A. Lawrence  
by Wright Brown - Inverby  
his atty





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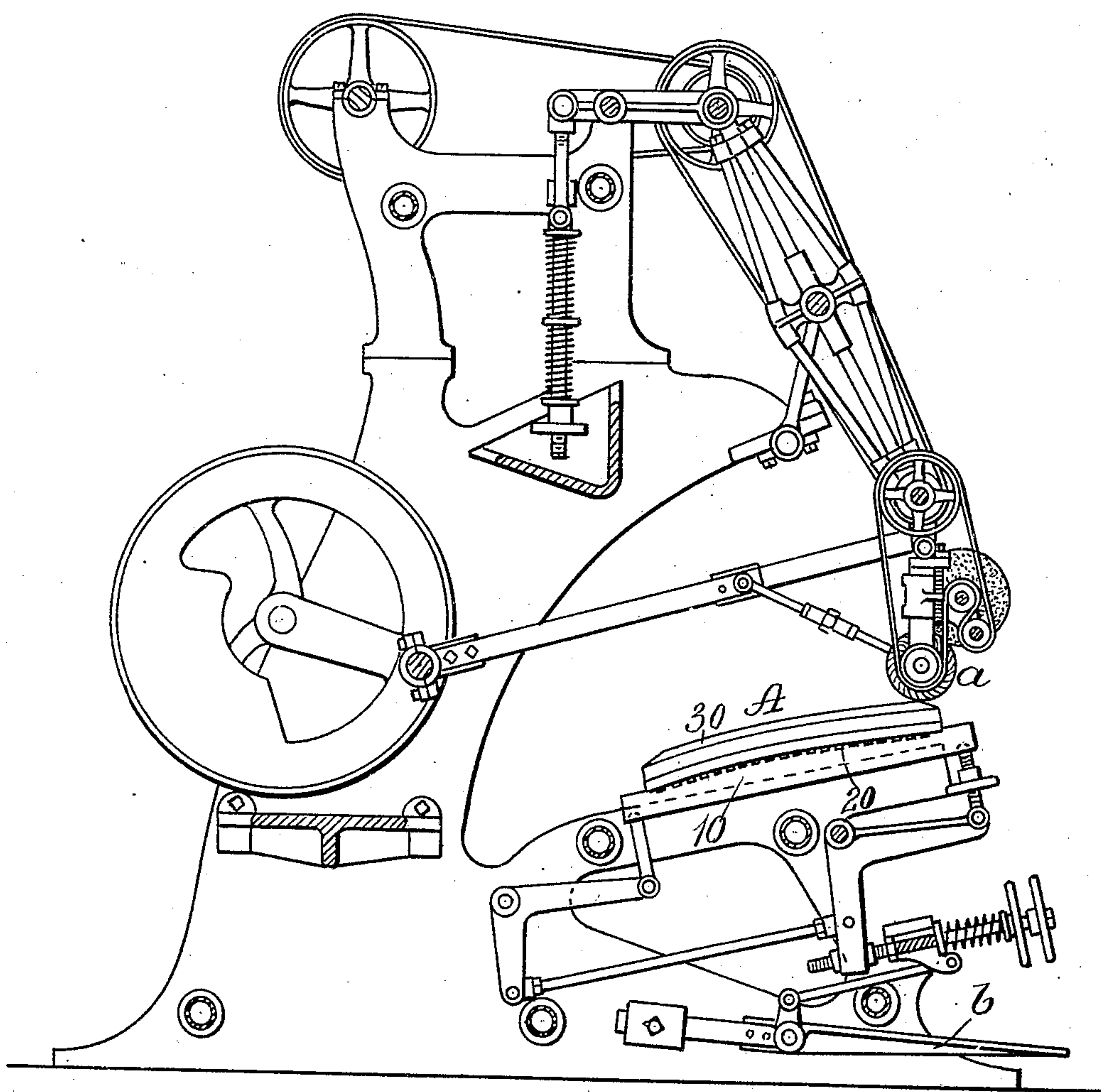
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3 SHEETS—SHEET 3.

FIG. 6.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

GEORGE A. LAWRENCE, OF WOBURN, MASSACHUSETTS, ASSIGNOR TO  
THE TURNER TANNING MACHINERY COMPANY, OF BOSTON, MAS-  
SACHUSETTS, A CORPORATION OF MAINE.

## LEATHER-WORKING MACHINE.

No. 835,305.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed April 13, 1905. Serial No. 255,439.

*To all whom it may concern:*

Be it known that I, GEORGE A. LAWRENCE, of Woburn, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Leather-Working Machines, of which the following is a specification.

This invention has relation to leather-working machinery, and more particularly to the work-supports thereof.

In machines for buffing, whitening, glazing, rolling, and stoning leather a bed is utilized to support the skin, hide, or leather while the operative members of the machine are performing their work upon it; and from the following description it will be seen that my invention may be applied to machines for accomplishing these various operations, and thereby greatly enhance the efficiency of such machines and enable them to produce more satisfactory results than have ever been heretofore attained.

In machines for accomplishing the operations to which reference has been made it is desirable to support the skin upon a bed that is adapted to yield to compensate for inequalities in the thickness of the skin or caused by the adherence of small particles of flesh, and it has long been recognized that a pneumatic bed would be highly advantageous to secure the desired result. Up to the present time, however, so far as my knowledge extends, a practical pneumatic bed has never been produced, for the reason that in such beds the surface upon which the work was placed could not be made sufficiently flat when air was introduced into the bed, so that a tool could properly operate upon the work.

The object of my invention is primarily to produce a pneumatic bed for leather-working machines in which the operative surface of the bed can be maintained at all times either flat or slightly convex or slightly concave without danger of distortion or without danger of bulging when one portion of the surface is subjected to undue pressure. I accomplish this object in the present embodiment of the invention by the provision of an air-chamber having a flexible or elastic wall and a layer of material which forms the upper surface of the bed upon which the skin or hide is laid, which layer is supported by the flexible wall, so that it may yield under pres-

sure and provisions in consequence of which the elastic wall of the air-chamber under the greatest pressure cannot cause the layer to bulge or assume any abnormal position.

It is quite evident that the invention may be embodied in a variety of forms; but on the drawings I have illustrated one form that experience has shown to be eminently satisfactory.

Of the drawings, Figure 1 represents a plan view of said form of bed embodying the invention. Fig. 2 represents a side elevation of the same. Fig. 3 represents a section on the line 3 3 of Fig. 1. Fig. 4 represents a plan view of the bed with the bolsters or upper layers removed. Fig. 5 represents an enlarged section on the line 5 5 of Fig. 4. Fig. 6 represents a whitening or buffing machine in which the bed may be used.

Referring to Fig. 6, the machine therein shown, with the exception of the bed, is fully expressed and described in Letters Patent to Coombs, No. 631,359, dated August 22, 1899. It will be understood that I lay no claim to this machine, but have simply illustrated it as showing how my bed may be used, since my invention relates solely to the bed. In that machine *a* is the bladed whitening or buffing roll, which is driven by the mechanism illustrated and described in said patent. This roll while rotating is reciprocated longitudinally of the bed, which is indicated as a whole at *A*. This bed is yieldingly supported by spring-tensioned lever mechanism and is under the control of a lever *b*, whereby it may be raised and lowered into and out of operative relation to the tool or roll *a*.

Referring now to Figs. 1 to 5, it will be observed that the bed is formed of a base 10, which has strengthening-flanges 11 and 12. The said base has upstanding end and side walls 13 13 and 14 14, which form a chamber 15. In side elevation the upper surface of the walls 14 14 is illustrated as slightly convex, although this is not necessary, and it may be either flat or slightly concave, as desired. Stretched across the chamber is an elastic wall or diaphragm 16, which is preferably formed of sheet rubber. Upon this diaphragm is superposed a layer 17 of canvas to protect it from wear or abrasion. This canvas is preferably somewhat loose, so that it may yield freely.



Above the layer 17 is placed a plate 18. This plate and the edges of the two layers 16 17 are tightly clamped to the walls 13 14 by headed bolts 19 and nuts 20 or screws 201.

5 The plate 18 is drawn down so tightly upon the upper surfaces or walls 13 and 14 that an air-tight connection is made between the rubber and the upper surface of said walls, so that the chamber is practically air-tight.

10 Communicating with the chamber, however, is a conduit, which is shown in Fig. 2 at 21. This forms an inlet which in actual practice is provided with a valve or stop-cock, so that by means of an air-pump the air in the cham-

15 ber may be compressed to the desired extent. Secured above the walls 13 14 there is a rectangular frame consisting of the side walls 22 22 and the end walls 23. This frame forms a box, as it were, for the reception of a

20 plurality of independently-movable members upon which rests a bolster. The independently-movable members may be formed in any desired way; but, as illustrated, they consist of a series of oblong wooden blocks

25 24, arranged in rows longitudinally of the bed with their upper surfaces flush and with the blocks in one row breaking joint with the blocks in the adjacent rows. As illustrated, there are seven rows of these blocks or mem-

30 bers, and the second, fourth, and sixth rows have at their ends small spacers 25, as shown in Figs. 3 and 4.

The upper ends of the blocks or members form a continuous surface, upon which is laid

35 a layer 26 of rubber or felt or even leather. This is held in place by a layer 27 of leather which projects at its sides and ends, so as to overlap the upper surface of the walls 22 23 of the frame or box which incloses the inde-

40 pendently-movable members. The upper surfaces of these walls are beveled, as shown, and the edges of the leather layer 27 are secured in place by strips 28 and screws 29. In the present instance the frame is formed of

45 wood; but I may form it of metal, if desired. On the top of the leather layer 27 there is placed another layer 30 of rawhide, leather, rubber, or any other suitable material, this layer being cemented to the layer 27 and be-

50 ing substantially of the same dimensions in length and breadth as the layer 26. These three layers constitute a bolster which is more or less flexible and which rests upon and is supported by the flush surfaces on the

55 ends of the members 24. The members 24 are themselves finally supported by the diaphragm or elastic wall of the chamber 15, and this is accomplished by passing upwardly through properly-spaced apertures in the

60 plate 18 a series of pins 31, all of the same length and all extending into sockets formed in the lower ends of the members 24. These pins are independently movable through the plate 18, and each is formed with a head the

65 upper surface of which is flat and the under

surface of which is concave and rest upon the elastic diaphragm. The pressure of air against the diaphragm serves to normally hold all of the pins raised, so that their heads are flat against the under surface of the plate 70 18, and consequently the upper surfaces of the members 24 will remain flush even though there be an excessive air-pressure in the chamber 15.

From the foregoing description it will be 75 seen that in the chamber 15 there may be maintained any suitable or desired pressure without any portion of the surface of the bed projecting abnormally above any other portion. Thus the upper surface of the blocks 80 forms a straight line transversely of the bed, as shown in Fig. 4, so that all portions of the tool may operate with the greatest efficiency upon the work. At the same time each portion of the bolster is depressible to compen- 85 sate for inequalities in the skin.

By practical experience I have demonstrated that a bed constructed as hereinbefore set forth possesses the greatest efficiency and effects a marked saving in the leather. 90

I have referred to the bed as a "pneumatic bed" and to the chamber 15 as an "air-chamber;" but of course it will be understood that those terms are in no sense limiting, since any other fluid may be employed with practically 95 the same results. In some cases it may be desired to fill the chamber with water or in another case some gas may be used to advantage.

I have contemplated forming the pneu- 100 matic bed or "fluid-cushion," as I may term it, in other ways, although the one which I have illustrated is convenient and simple in construction, and I may provide other means for limiting the upward or downward move- 105 ment of the blocks and may form the blocks themselves in many shapes.

Having thus explained the nature of the invention and described a way of constructing and using the same, although without 110 attempting to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

1. A work-support for leather-working machines comprising a fluid-cushion, a work- 115 ing surface yieldingly supported by said cushion, and means located between the ends of said surface for limiting the outward or upward movement of all parts of said surface. 120

2. A work-support for leather-working machines comprising a fluid-cushion, and a series of independently-movable members supported by said cushion, whose exposed surfaces form a support. 125

3. A work-support for leather-working machines comprising a fluid-cushion, a series of independently-movable members supported by said cushion, whose exposed surfaces form a support, and means for limiting the 130



upward or outward movement under pressure of each of said members.

4. A work-support for leather-working machines comprising a fluid-cushion, a series of independently-movable members supported by said cushion, whose exposed surfaces form a support, and a flexible bolster covering said surface.

5. A work-support for leather-working machines comprising a fluid-cushion, a series of independently-movable members supported by said cushion, whose exposed surfaces form a support, a flexible covering for said surface, and means for limiting the outward or upward movement, under pressure, of said independent members.

6. A work-support for leather-working machines comprising a fluid-containing chamber having a flexible wall or diaphragm, a plurality of independently-movable members whose upper or outer exposed surfaces are flush to form a support, said members resting upon said wall and means for limiting the outward or upward movement of each of said members.

7. A work-support for leather-working machines comprising a plurality of independent members extending from side to side and from end to end of said bed to form a support, and a hollow fluid-containing chamber having an elastic wall which yieldingly supports said members.

8. A work-support for leather-working machines comprising a base having a fluid-containing chamber with a yielding wall, a plurality of independently-movable members yieldingly supported by said wall and having their upper or outer portions flush, and means on said base for limiting the upward

or outward movement of each of said members.

9. A work-support for leather-working machines comprising a base having a fluid-containing chamber with a yielding wall, a plurality of independently-movable members yieldingly supported by said wall and having their upper or outer portions flush, means on said base for limiting the upward or outward movement of each of said members, and a continuous layer of flexible material covering the exposed surfaces of said members.

10. A work-support for leather-working machines comprising a fluid-containing chamber having a diaphragm, a non-flexible plate superimposed upon said diaphragm, a plurality of blocks above said plate having their upper ends flush, and pins extending through apertures in said plate to support the blocks and to rest upon the diaphragm, and means on said pins for engaging the under face of said plate to limit the upward movement thereof.

11. A work-support for leather-working machines comprising a frame, a bolster stretched across said frame, a plurality of independently-movable members whose upper surfaces form a support for the bolster, a fluid-cushion for yieldingly supporting said members, and means for limiting the movement of said members under pressure to normally maintain their surfaces flush.

In testimony whereof I have affixed my signature in presence of two witnesses.

GEORGE A. LAWRENCE.

Witnesses:

M. B. MAY,

GERTRUDE J. MAY.