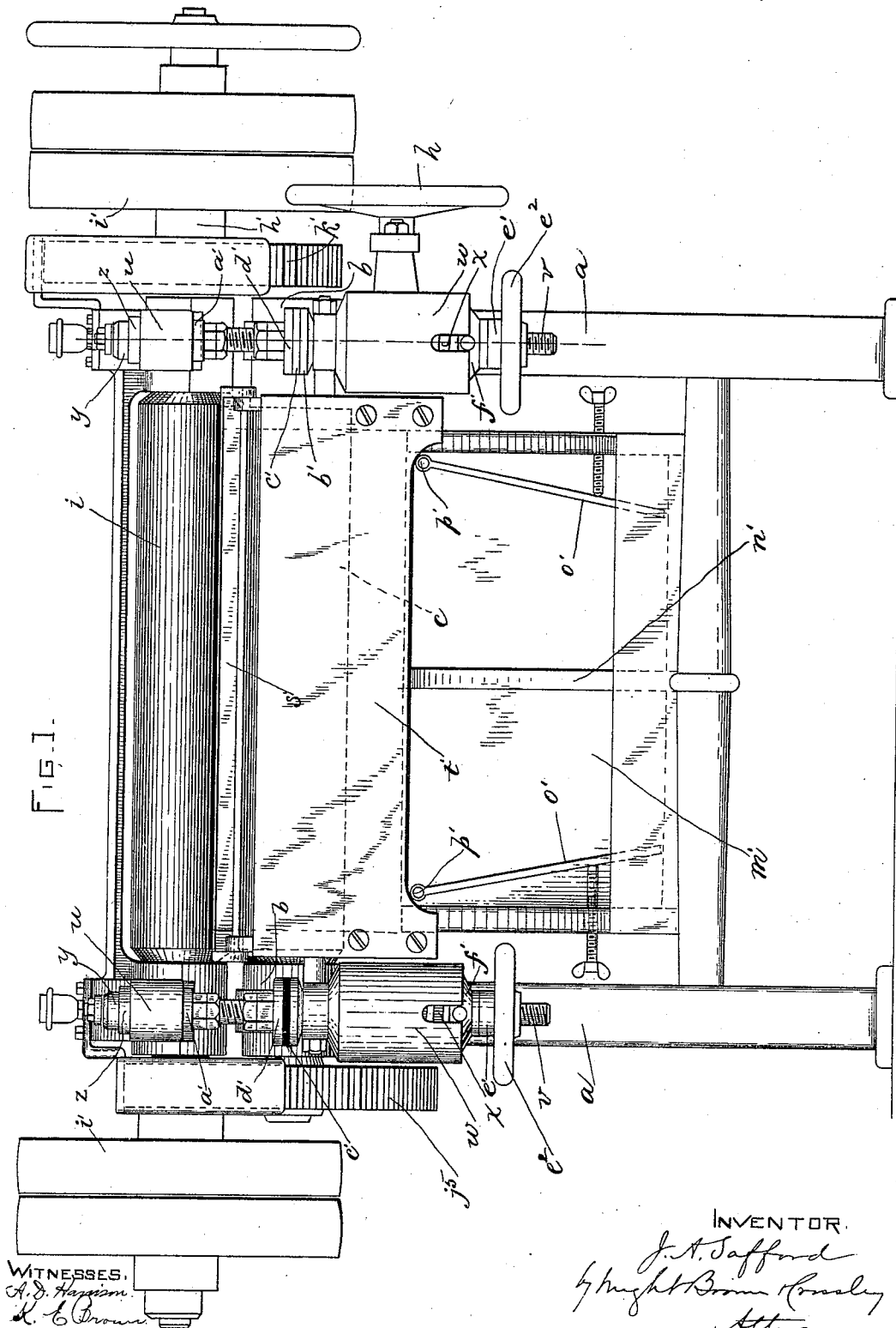


6 Sheets—Sheet 1.

No. 466,083.

Patented Dec. 29, 1891.



INVENTOR

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4 Knight Brown Conalty
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

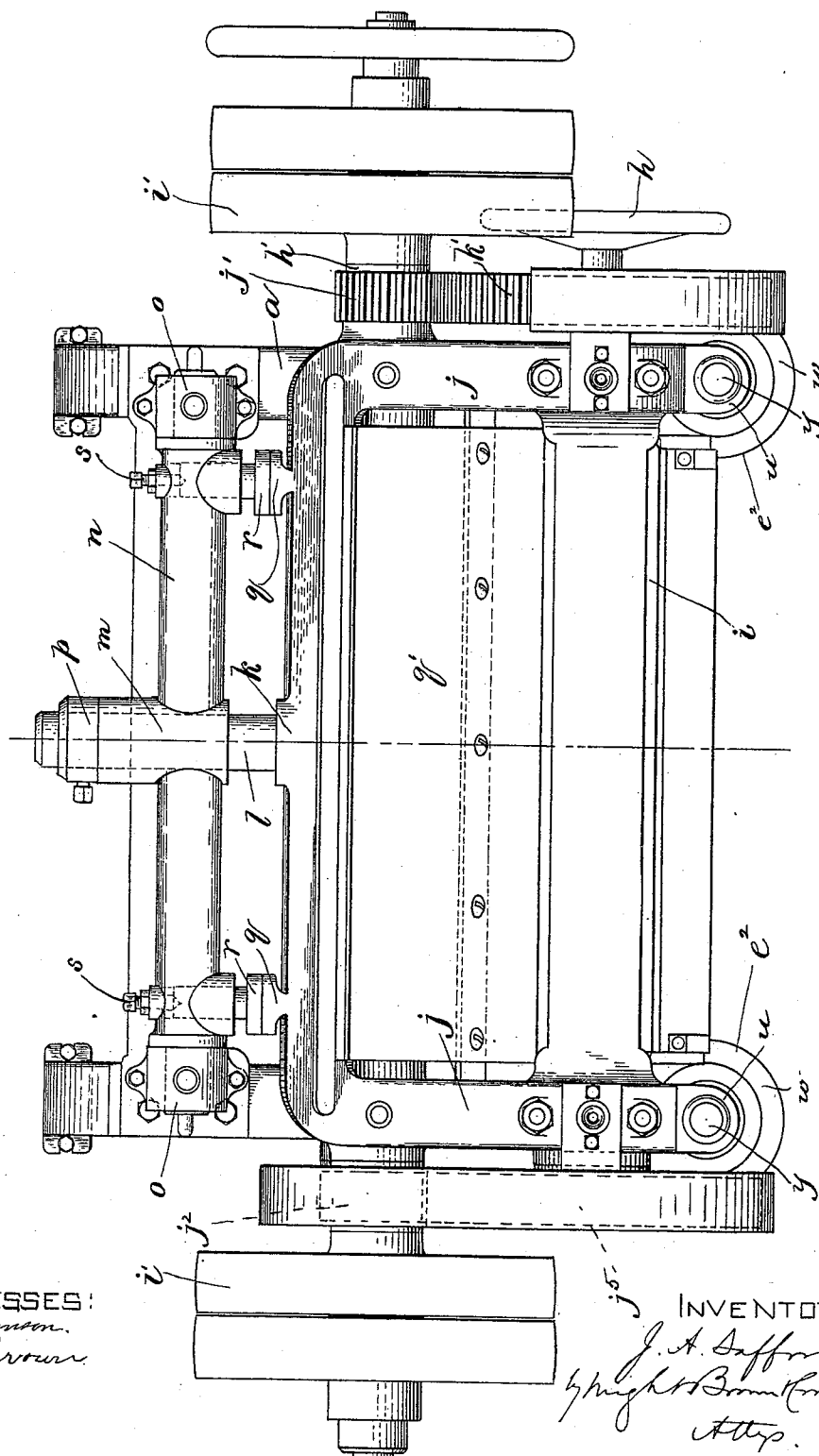
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J. A. SAFFORD.
LEATHER ROLLING MACHINE.

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FIG. 2.



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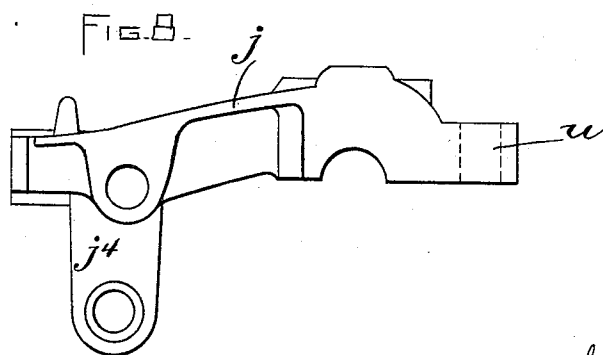
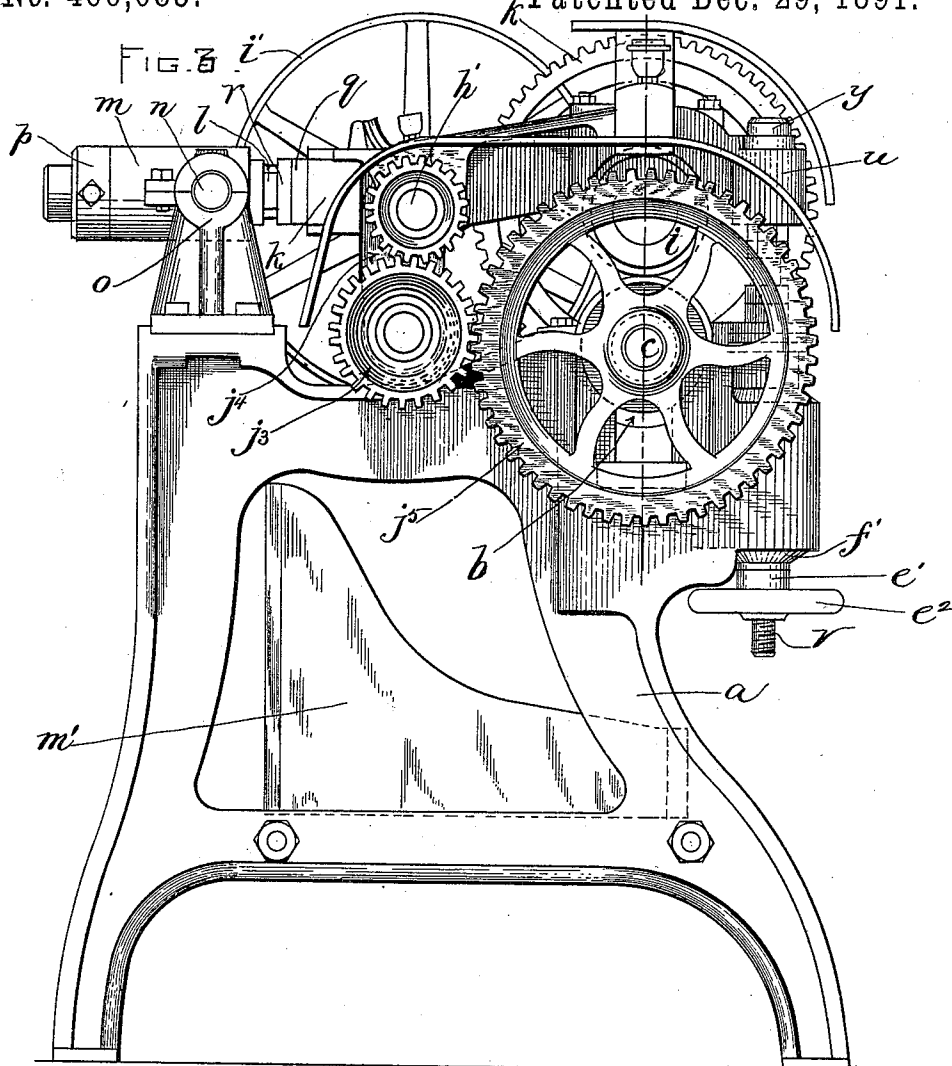
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J. A. SAFFORD.
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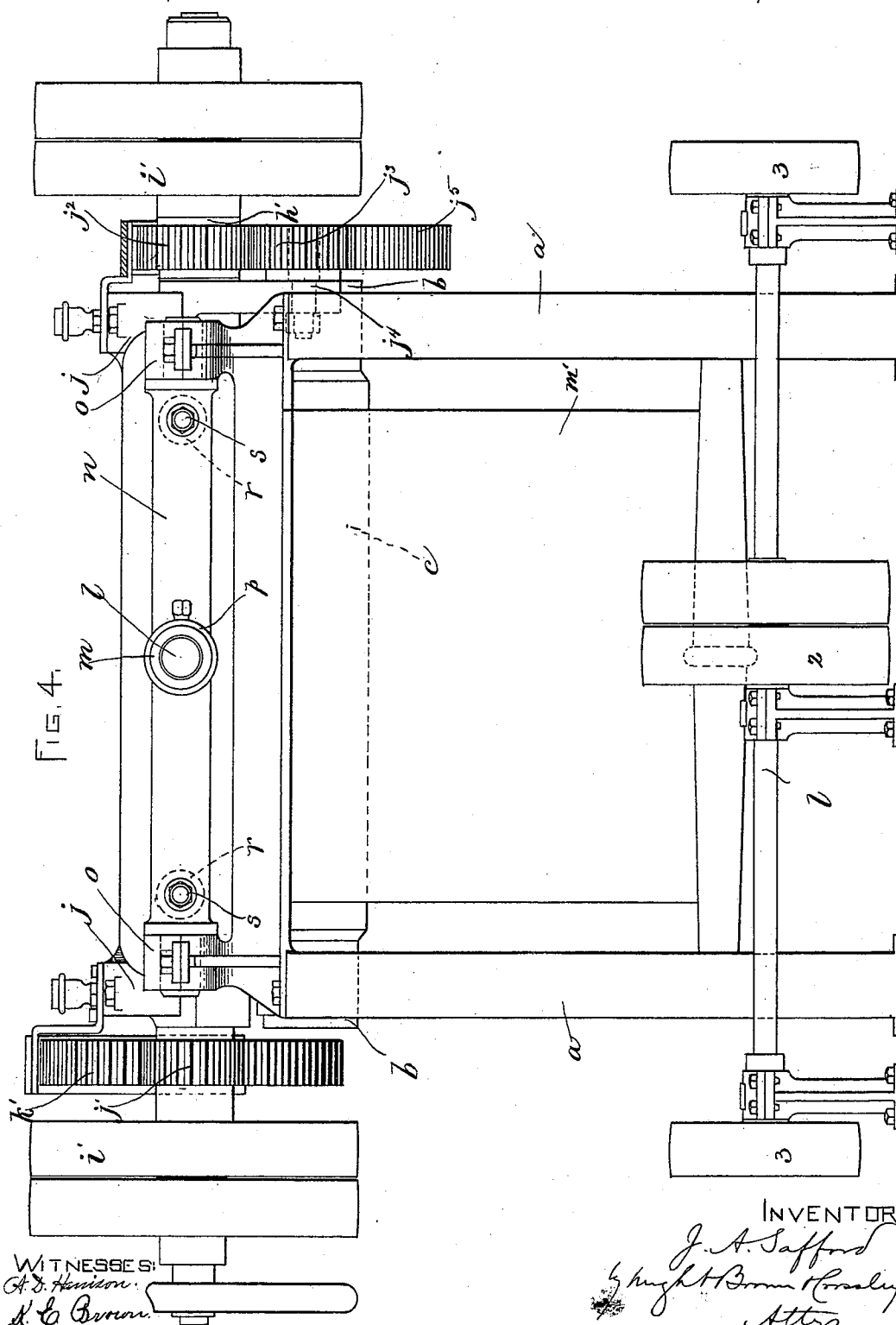
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6 Sheets—Sheet 4.

No. 466,083.

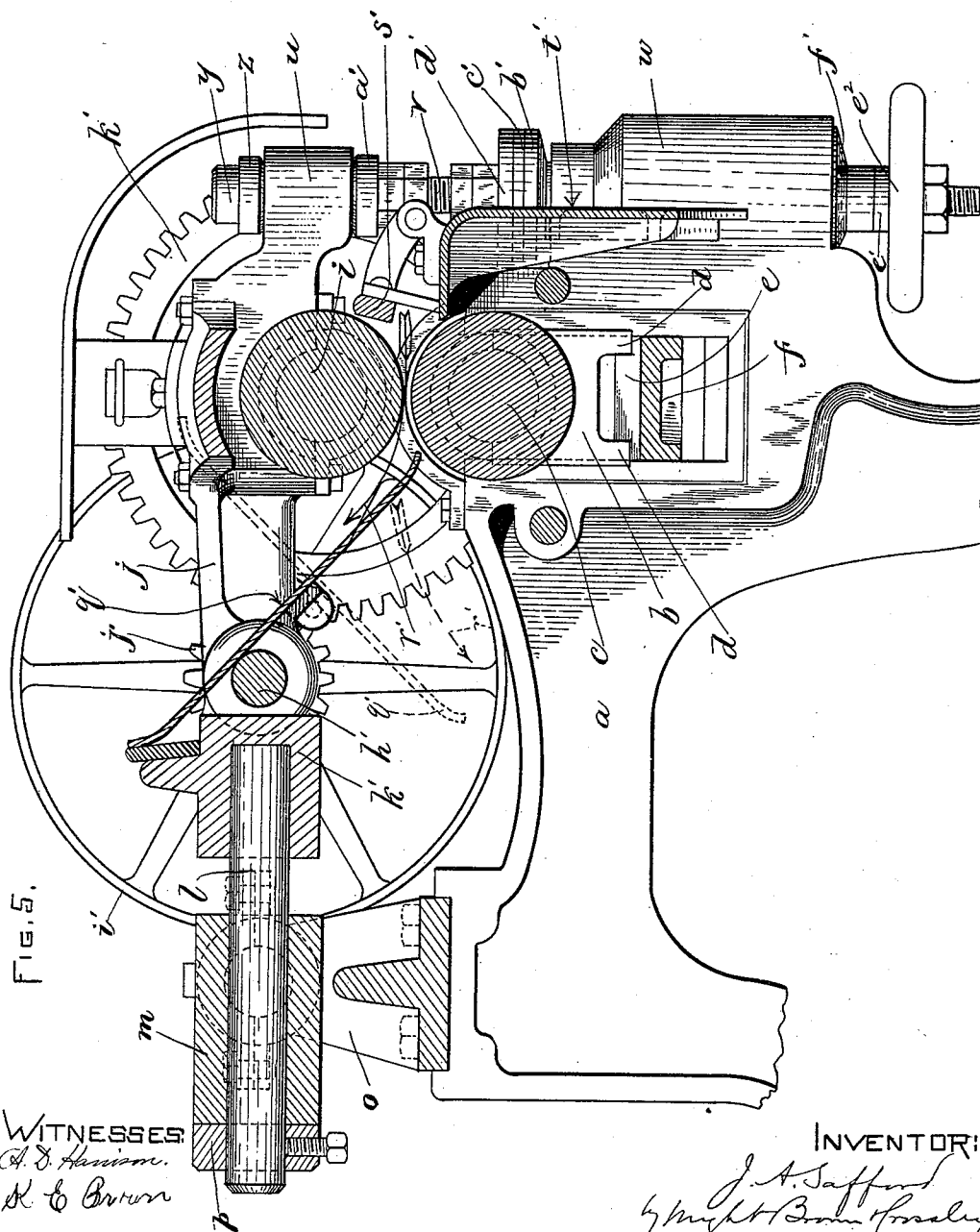
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6 Sheets—Sheet 5.

No. 466,083.

Patented Dec. 29, 1891.



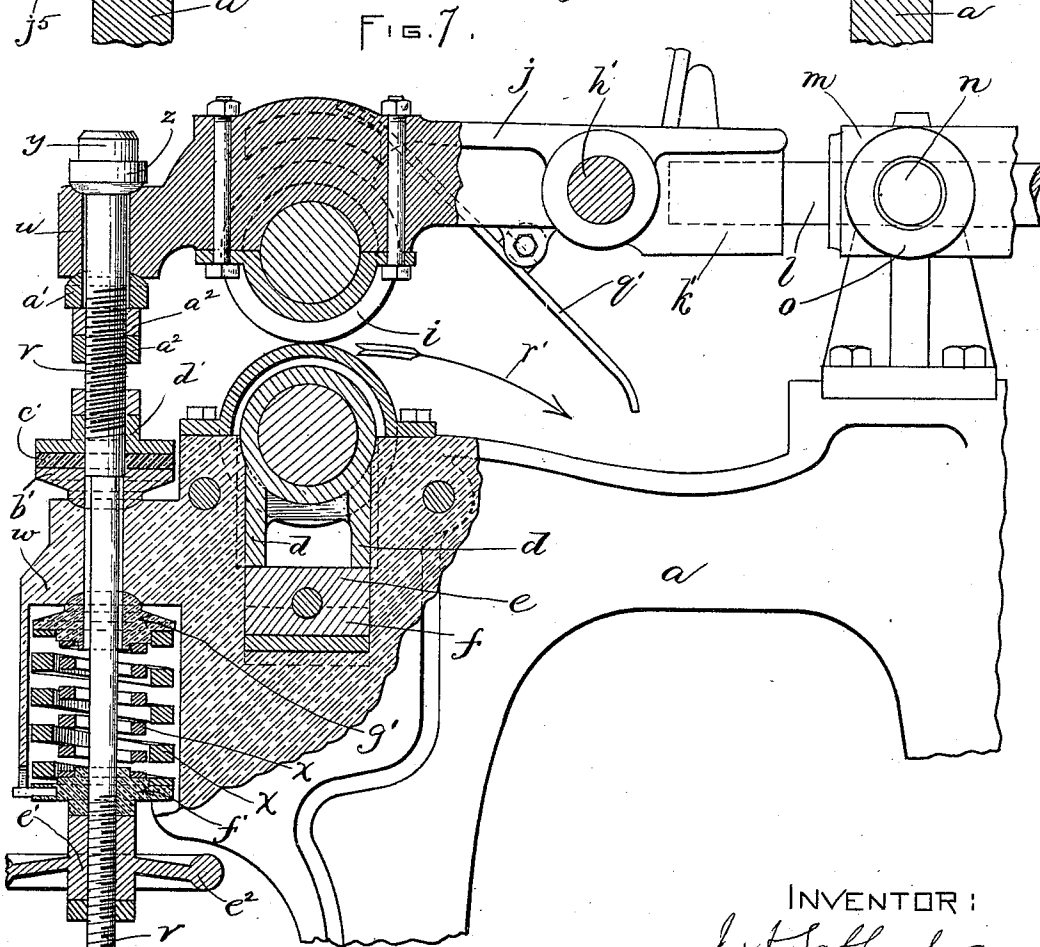
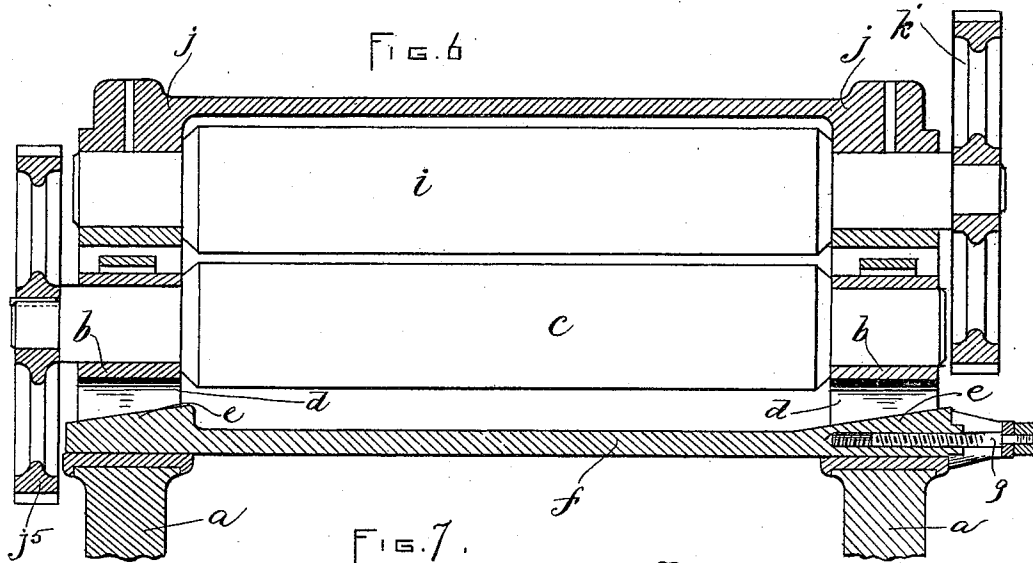
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LEATHER ROLLING MACHINE.

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WITNESSES:
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UNITED STATES PATENT OFFICE.

JOSEPH A. SAFFORD, OF MALDEN, MASSACHUSETTS.

LEATHER-ROLLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 466,083, dated December 29, 1891.

Application filed May 8, 1891. Serial No. 392,013. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. SAFFORD, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Leather-Rolling Machines, of which the following is a specification.

This invention relates to machines for rolling sole-leather and other like material, so that the same may be given an even surface and be rendered more compact and firm and be given a uniform thickness; and it has for its object to provide a machine which, while it is adapted to communicate a powerful pressure to the material operated upon, shall at the same time yield sufficiently to variations in the thickness of said material to obviate undue strain on the machine.

To this end the machine consists in the improvements which I will now proceed to describe.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a leather-rolling machine embodying my improvements. Fig. 2 represents a top plan view of the same. Fig. 3 represents an end view with the driving-pulleys removed in order to better show the arrangement of gears for operating the rolls. Fig. 4 represents a rear view of the machine. Fig. 5 represents a section on line 2 2, Fig. 2. Fig. 6 represents a section on line 3 3, Fig. 3. Fig. 7 represents a section on line 1 1, Fig. 1. Fig. 8 represents an end view of the frame to which the upper roll is secured, the arrangement and construction of the same forming an important feature of my improvements.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings, *a* represents a supporting-frame provided with suitable openings to receive the bearings *bb* of the journals of a roll *c*. Said bearings are provided with projections *d d* on their under sides, adapted to engage or rest upon wedge-shaped projections *e e*, formed upon a bar *f*, interposed between said journal-boxes and the supporting-frame *a*, and adapted to be moved in either direction in the direction of the length of said roll by the rotation of a screw *g* in one end of said bar, said screw being provided with a hand-wheel *h*, whereby it may be rotated. The end-

wise movement of the bar *f* raises or lowers the roll *c*, as the case may be, to adjust the roll to the thickness of the material. (See Figs. 5, 6, and 7.) The top roll *i* is journaled in bearings formed on the under side of a yoke-shaped frame *j j*, Figs. 2 and 7, located above the main supporting-frame *a*, and provided at its rear central portion with a socket *k*, into which is rigidly secured a trunnion *l*, Figs. 2, 5, and 7. Said trunnion is fitted to turn in a bearing *m* on a rock-shaft *n*, the latter being journaled in bearings *o o* on the frame *a*. To the outer end of the trunnion *l* is affixed a collar *p*, which secures the frame *j* in position and at the same time permits the trunnion to rock in the bearing *m*, so that the frame *j* can rock or tip in the direction required to raise either end of the roll *i* and depress the other when material of varying thickness is passing between the rolls *i* and *c*. The frame *j* is prevented from swinging or moving laterally and exerting lateral or bending strain on the trunnion *l* by projections *q q*, formed on the rear portion of the frame *j*, having frictional contact with like projections *r r*, secured in the rock-shaft *n*. Said projections *r r* are provided with shanks or studs which enter sockets formed in said rock-shaft and are stepped against screws *s s* in said shaft, as shown in dotted lines in Fig. 2.

The construction and arrangement of the frame just described are such that the roll *i* is enabled to rise and fall bodily by the turning of the rock-shaft *n* in its bearings, and to rise at either end and fall at the other end by the rocking motion of the trunnion *l* in its bearing. Hence the top roll *i* adapts itself readily to variations in the thickness of the leather passing under it and is prevented from unduly compressing the thicker parts of the leather. This freedom of the top roll to adjust itself also prevents undue strain on the rolls and their bearings when the leather is of uneven thickness.

The frame *j* is provided with lugs *u u*, extending in front of the upper roll and on a line with the journals of the same, and provided with openings to receive rods *v v*, which extend longitudinally through housings *w w*, formed on the frame *a* and containing spring *x x*. Said rods are provided with heads or flanges *y y* on their upper ends and bear upon

collars $z z$, encircling the rods, and bearing upon the upper sides of the lugs u on the frame j . The undersides of said collars z are rounded or convexed sufficiently to fit cup-shaped or concave depressions or sockets formed in the lugs u around the openings through which the rods v pass.

$a' a'$ represent collars of the same construction as collars $z z$. Said collars a' also encircle the rods $v v$, and their upper sides are rounded or convexed to fit the concave undersides of the lugs $u u$. Said collars $a' a'$ are held in position by nuts $a^2 a^2$ upon the screw-threaded portions of the rods $v v$.

$b' b'$ represent collars having convex projections on their under sides bearing upon concave depressions in the upper surfaces of the housings w' . The collars b' support thick washers $c' c'$ of yielding material interposed between said collars and flanged nuts $d' d'$ upon the upper screw-threaded portion of the rod v ; for a purpose to be hereinafter explained. The lower ends of rods $v v$ are screw-threaded to engage nuts $e' e'$, which are provided with hand-wheels $e^2 e^2$, the said nuts and hand-wheels being adapted to adjust the tension of the springs $x x$, interposed between collars $f' f'$, resting upon the nuts and collars g' , Fig. 7, bearing against the upper interior portion of the housings $w w$.

The construction and arrangement of the rods, collars, and springs just described is such that I am enabled to provide a support for the frame j and its attached roll i , and at the same time provide means for applying the required pressure upon the material operated upon and prevent undue strain upon the machine caused by variations in thickness of said material, as I will now proceed to explain.

By reference to Figs. 6 and 7, it will be seen that the frame j and its attached roll i is supported in the position shown by the rods $v v$ and the attached collars—viz., the collars $a' a'$, bearing against the under side of the projecting lugs of said frame, suitably secured in position on said rods by nuts, and the flanged nuts $d' d'$, attached to the rods by screw-threaded connection and bearing upon the flanged collars $b' b'$ (resting upon the housings $w w$, formed as before described) upon the frame a , the arrangement being such that the top roll is prevented from coming in contact with the bottom roll after the material has passed between them, which would be objectionable on account of injury to said rolls and would prevent the insertion of material therebetween. The pressure of the rolls upon the material is provided by the tension of the springs $x x$, attached, as described, to the lower portion of the rods $v v$, as will be understood by reference to Fig. 7. The openings in the lugs u and spring-housings $w w$ are of larger diameter than the rods $v v$ extending there-through, so that the latter may be free to exert vertical strain on said frame through their springs under varying positions of the upper

roll when in operation and prevent said rods from binding laterally at the points where they pass through said housings and lugs.

It will be seen from the foregoing that both rolls are provided with convenient adjusting devices to operate on material of any thickness. This feature, together with the universally-pivoted frame, forms an important feature of my invention.

h' represents the driving-shaft of the machine provided with pulleys $i' i'$, one at each end. Said shaft is journaled in bearings on the frame j , and is provided with gears $j' j^2$, the gear j' meshing with a gear k' on the upper roll, as shown in Figs. 2 and 4, and the gear j^2 meshing with an idle-gear j^3 , supported by an arm j^4 , formed on the frame j , (see Figs. 3 and 8,) said gear j^3 meshing with the gear j^5 on the bottom roll, as shown in Fig. 3, the arrangement being such that all of the gears, with the exception of gear j^5 , are supported by the frame j , and when the upper roll is raised or lowered, its supporting frame moving therewith, the transmitting or idle gear j^3 is moved in the arc of a circle of a radius substantially that of the pitch-line of the gear j^5 on the lower roll, the center of said arc being the bearings $o o$ of said frame, so that the gears $j^3 j^5$ will mesh and operate without binding when the roll i rises or falls.

The described arrangement of gearing has been shown and described in Letters Patent of the United States No. 413,093, granted to me October 15, 1889, to which reference may be had. I prefer to use a pulley on each end of the shaft c , for the reason that I thus afford more ample power for operating the rolls and obtain a steadier or more uniform motion. I may, if preferred, provide a counter-shaft 1, having pulleys 2 attached thereto at its center, and a pulley 3 at each end on a line with the pulleys $i' i'$ on shaft h' , so that the latter may be operated from said counter-shaft by suitable belting. (See Fig. 4.)

The material operated upon by my machine is of various sizes, from a piece the size of a boot or shoe sole to a side of leather, and when operating upon small work I have provided a receptacle m' to receive the same, consisting of a box having a partition n' in its center and resting on suitable supports inside the frame a under the rolls, as shown in Figs. 1 and 3. Said receptacle is provided with swinging partitions $o' o'$ at each end, which are pivoted at $p' p'$ to the rear side of said receptacles, so that the bottom portion of said partitions can be adjusted toward or from the center of the receptacle to regulate the space therein according to the size of the work passing between the rolls, and falling into said receptacle, so that it may be more conveniently disposed of or handled.

q' represents a deflector constructed of suitable material, preferably of sheet metal, extending lengthwise of the machine in the rear of the rolls and pivotally secured at each end to the frame j , the arrangement being

such that when the machine is operating on work too large to be deposited in the receptacle therefor said work may pass over the deflector in the direction of the arrow r' in Fig. 5, and when the machine is operating on small work the deflector may be readily moved on its pivoted connections with the frame to the dotted-line position shown in the above-mentioned figure and in full lines in Fig. 7, which permits the work to pass from the rolls into the receptacle.

s' represents a guard or safety rail located in front of and in close proximity to the roll i and extending lengthwise of said roll and pivotally secured at each end to a plate or shield t' , located in front of the lower roll and extending across the front of said roll and secured at each end to the frame a , so that the liability of accident to the operator may be obviated and the frame braced laterally. (Shown in Figs. 1 and 5.)

I claim—

1. In a leather-rolling machine, the combination of the supporting-frame, a lower roll supported in adjustable bearings thereon, a yoke or frame connected by a double or universal joint to the supporting-frame, a top roll journaled in bearings in said yoke or frame, and means for imparting a yielding pressure to said yoke and top roll, as set forth.

2. In a leather-rolling machine, the combination of the supporting-frame, a lower roll supported in adjustable bearings therein, a rock-shaft mounted in bearings on said frame, a yoke or frame pivotally connected with said rock-shaft, a top roll journaled in bearings in said yoke or frame, and means for exerting a downward yielding pressure on the yoke or frame and top roll, as set forth.

3. In a leather-rolling machine, the combination of the supporting-frame, a lower roll supported in adjustable bearings therein, a

rock-shaft mounted in bearings on said frame, a yoke or frame having a trunnion journaled in a bearing on said rock-shaft, a top roll journaled in bearings on said yoke or frame, and projections or bearings formed, respectively, on said yoke or frame and rock-shaft and arranged in pairs which are located at opposite sides of said trunnion, whereby the yoke or frame is supported at opposite sides of the trunnion, as set forth.

4. In a leather-rolling machine, the combination of a supporting-frame, a lower roll journaled in bearings thereon, a swinging yoke or frame having a universal-joint connection with the supporting-frame, the rods $v v$, passing through enlarged orifices in the ends of said yoke and having convex projections or collars bearing on concave sockets or depressions in said yoke, and adjustable nuts or collars bearing on fixed portions of the supporting-frame, and springs arranged to exert a downward pressure on said rods and through the latter on the yoke and top roll, as set forth.

5. In a leather-rolling machine, the combination of the supporting-frame, the lower roll journaled in bearings on said frame, the yoke or frame having a universal-joint connection with said frame, said frame having an arm j^1 , supporting an idle-gear meshing with a gear on the lower roll, and a driving-shaft having at one end a gear meshing with the said idle-gear and at its other end a gear meshing with a gear on the upper roll, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 29th day of April, A. D. 1891.

JOSEPH A. SAFFORD.

Witnesses:

C. F. BROWN,
A. D. HARRISON.