No. 880,512. PATENTED MAR. 3, 1908.

W. F. FINCH.

MACHINERY FOR STRETCHING AND SETTING LEATHER.

APPLICATION FILED OCT. 30, 1905.

2 SHEETS—SHEET 1.

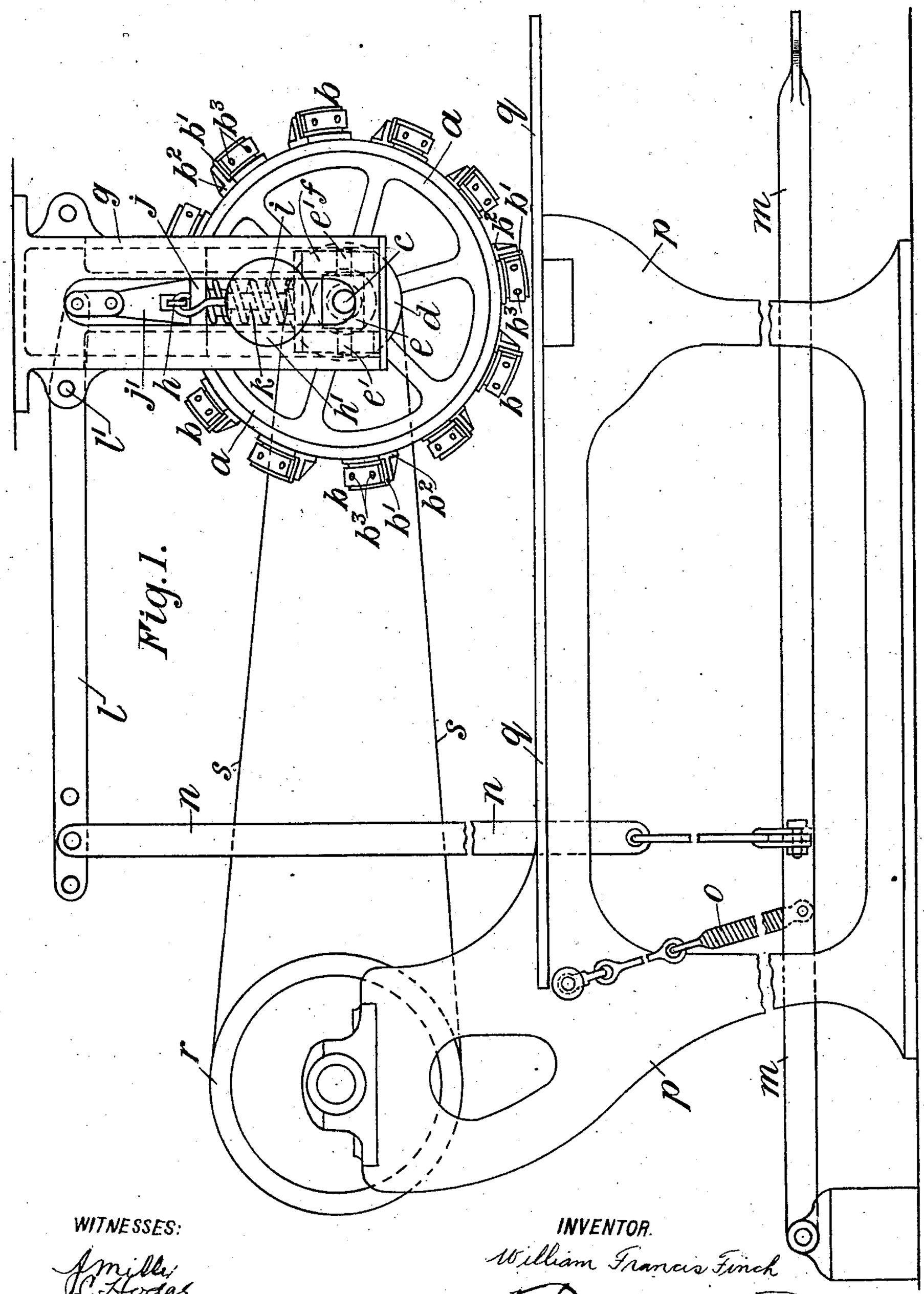

Fig. 1.

WITNESSES:

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J. C. Hodge

INVENTOR.

William Francis Finch

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2 SHEETS—SHEET 2.

Fig. 3.

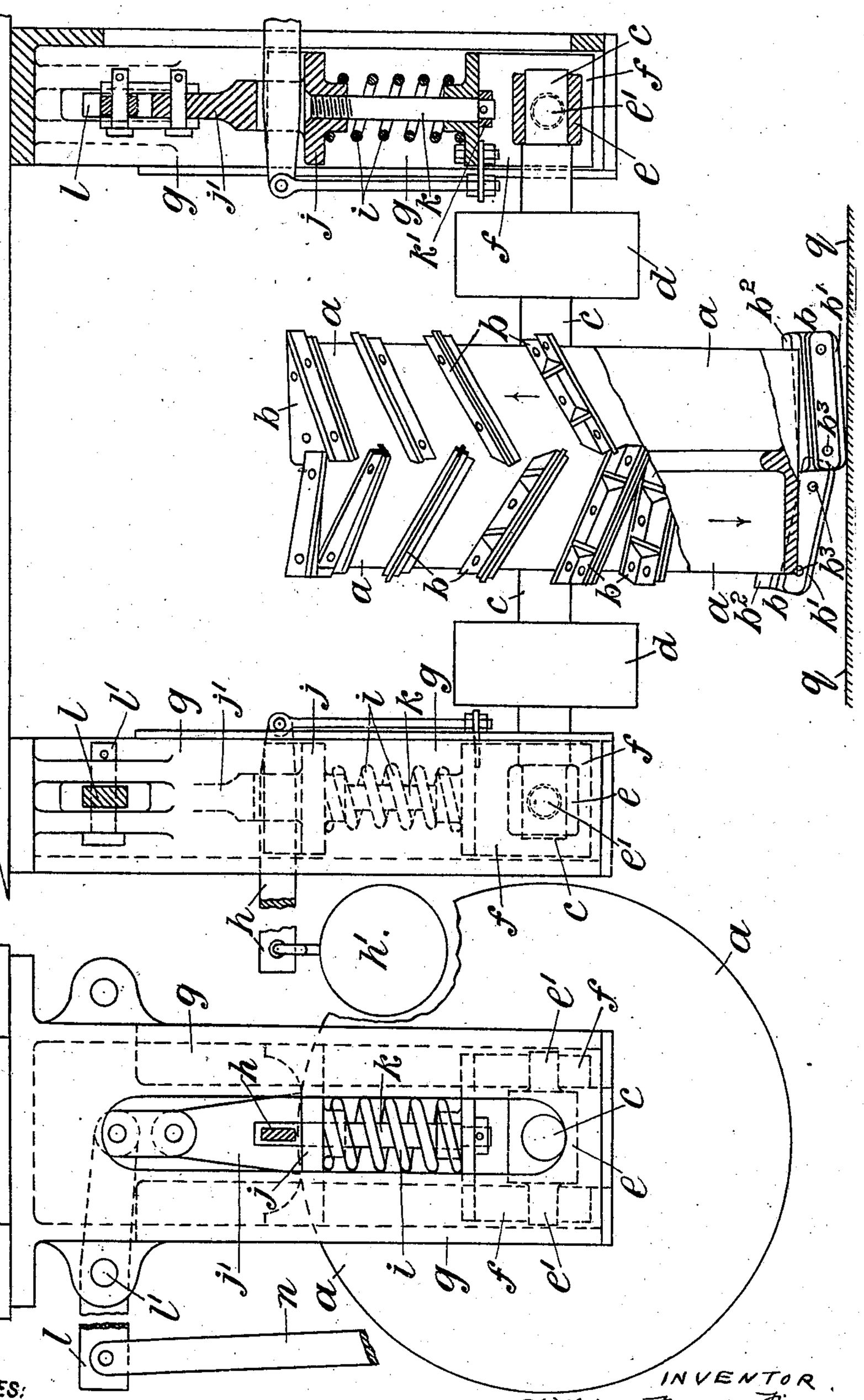

Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM F. FINCH, OF LITHERLAND, NEAR LIVERPOOL, ENGLAND.

MACHINERY FOR STRETCHING AND SETTING LEATHER.

No. 880,512. Specification of Letters Patent. Patented March 3, 1908.

Application filed October 30, 1905. Serial No. 285,168.

To all whom it may concern:

Be it known that I, WILLIAM FRANCIS FINCH, a subject of the King of England, residing at Litherland, near Liverpool, in the county of Lancaster, England, have invented new and useful Improvements in Machinery for Stretching and Setting Leather, of which the following is a specification.

This invention has reference to machinery for operating upon leather in the process of its manufacture, for "stretching" or "setting out" the leather; that is to say, for operating upon it, for consolidating and compacting it, and laying the grain in the desired manner; and it has primarily for its object, among others, to provide improved machinery for effecting these purposes, which can be advantageously employed in the manufacture of butts and bends, and operating upon them in the coarse or rough state, and treating rough shoulders, strap bends, and offal.

According to this invention, the leather to be "stretched" or "set out", is operated upon by a rotary device, such as a wheel or barrel, having upon its periphery, blade tools, arranged on different sides, alternately, and at suitable distances apart, and inclined from the center backwards. The axis of the wheel or rotary barrel is also capable of moving, that is, being rocked in the vertical plane, so that the periphery of the wheel can become inclined to the horizontal—which is the normal position. By this, in the first place, the tools act and press upon the leather right and left, at different moments, as the rotary tool or wheel revolves, and stretches and sets out the leather and grain right and left; and in the second place, as the thickness and upper surface or level of the leather varies, the tools adjust themselves to the varying contour of the leather, and so act upon every part of it, with a more or less uniform degree.

The invention will be described with reference to the accompanying drawings, which illustrate a machine constructed and adapted to operate according to it.

In these drawings, Figure 1 is a side elevation of the machine; Fig. 2 is a side elevation; and Fig. 3 an elevation from the back illustrating the details of the tool wheel self-adjusting arrangement.

Referring now to the drawings, *a* designates the tool wheel or barrel; and *b* the tools on the periphery of same, *c* is the shaft carrying the wheel *a;* and *d* are two belt wheels thereon, by which the shaft and wheel are rotated. The shaft *c* is mounted at each end by a bush bearing *e*, with trunnions e^1 at each side, disposed in the horizontal transverse plane, these trunnions being mounted by the main bearing carriers *f*, which are adapted to move up and down in the bracket slides or guides *g*. The bearing carriers *f* are normally pressed down by weighted levers *h*, having weights or springs h^1 on their ends, through a spring *i* between these bearings *f* and a crosshead *j*, which the levers *h* press and lie upon. Thus while there is a constant load on the springs *i* and the bearings *f*, due to the weights of the levers *h*, self-adjustment is given to the whole arrangement connected with the tool wheel, to compensate for varying and even great differences of thickness of parts of the hide or leather being operated upon, and small and local adjustment is also afforded by the springs *i*.

The limit of the distance apart of the crosshead or plate *j*, and the top of the bearing carriers *f* is maintained by means of the head or nut k^1 on the end of the rod *k*, connecting these two parts together; while on the other hand, the bearing carriers *f* are free to slide up the rod *k*, compressing the springs *i*, without necessarily moving the levers *h*, thus providing for small and local vibrations or adjustments, and keeping a constant and fairly uniform pressure on the leather being worked. This whole adjusting mechanism, including wheels, bearings and levers, is adapted to be raised and lowered when desired, by levers *l*, fulcrumed at l^1 to the stationary brackets *g* (which are suitably suspended from the roof or ceiling), and connected to an extension j^1 of the crosshead *j* at the short end, and to a foot lever *m* at the long end, by the connecting rods and chains *n*. By pressing on the treadle or foot lever *m*, the whole of the parts carried in the frames or guides *g* and the wheel *a* can be raised. A spring *o* connected to the foot lever *m* and the frame *p* of the machine, takes the weight of this lever off the tool wheel *a* and parts connected with it, so that it does not interfere with or act against the other weight levers *h*, and renders the use of heavy weights on the bearings *f* and shaft unnecessary.

The leather is operated upon on a table *q* under the tool wheel *a*, and this table also carries two driving pulleys *r*, from which the

two wheel pulleys *d* are driven by belts *s*. By driving the tool wheel shaft by two sets of belts and pulleys as described from a countershaft, an even and balanced action of the wheel is accomplished, and a practical mode of enabling the rise and fall of the tool, to meet the uneven thicknesses and substance of the leather or hides operated upon, is attained. By the manner of mounting this tool wheel *a*, it will be plain that several adjustments or movements are provided for; namely, the ends of the shaft *c* can move up and down, so that the wheel can rock about the plane in which it ordinarily lies and works, and can compensate or adjust itself to the abnormal thicknesses or differences of thickness in the leather or hide being operated upon, and can also rise bodily vertically, when it comes upon abnormally hard or thick parts.

The tools *b* on the wheel *a* are in two sets, one on each side, those on the one side being disposed at the center of the wheel, at about the mid-position between the ends of those on the other side; and they are inclined from each side of the center backwards, so that in action, the inner edge of each blade or tool first comes in contact with the leather, when in the lowest position, and then gradually the other portions of the edge come into action as they pass the vertical. The tools being thus arranged on the opposite sides of the wheel *a*, and alternating with the others, each tool does its own work separately, striking the leather with the leading corner or point of the tool, and pressing it out in the manner of a screw; and the successive tools being arranged a considerable distance apart, a large air capacity is furnished, and little risk of overheating the leather surface during the operation exists. This characteristic is advantageous, as it obviates burning of the leather, and besides which, the arrangement enables less power to drive the tools than it otherwise would do, very little pressure being necessary. While at the same time, in this machine, comparatively light weights are necessary to cause the tools to accomplish the work.

In the arrangement shown, the tools consist of a blade proper b^1 (the working edge of which is preferably rounded or blunt) fixed on angle-shaped carriers b^2, fixed on the periphery of the wheel *a;* the blades being fixed on the carriers by bolts or screws b^3, so that they can be adjusted and attached or detached as required.

This machine will bring down the grain and unevenness of the coarsest hides with ease; this being accomplished to a large extent by the tools being self-adjusting, rising and falling to their work instantly, no matter how uneven the substance of the hides may be; while at the same time, it requires very little pressure, and overheating the leather, or injuring it at all by heat, is obviated.

This invention enables heavy shoulders, bend fore-ends, and any kind of very growthy hides to be operated upon and stretched, and set out, so as to produce from such kind of material, and in fact from various kinds of inferior portions of hides and offal, a leather commanding a very good price, that is, a leather equal to what is considered a high grade leather; so that all parts of a hide practically are enabled to be operated upon, and converted into good high-class leather. While the invention has the advantages referred to, it is also suitable for operating upon light leather, as by the means of the sensitiveness of the tool wheel in its rising and falling, and its automatic adjustment to inequalities, any unequal substances can be operated upon; and as the pressure on the tool and the leather is governed by the weights acting in the bearings of the wheel shaft (that is, due to the short weigh-levers at each side of them), the machine and pressure of the tool is easily adjusted to suit all classes of work, by moving the balance weights. And the tool wheel being weighted to a comparatively light extent, the stretching and setting out actions are not accomplished so much by dead weight, as by the actual mode of action and uniform pressure on the setting out tools, as they operate upon the surface with uniform pressure. The leather is thereby not damaged or strained, but on the contrary is wrought upon in the manner and with the effect most desirable, and air, which can and will freely circulate between the tools and over the leather, keeps it cool.

What I claim is:—

1. A machine for stretching and operating upon leather, comprising a rotary tool wheel *a* with a plurality of radially disposed blades *b*, set obliquely on the periphery of the wheel *a* to the axis thereof, having its axis at each end supported in a bearing, capable of rising and falling automatically at all times vertically, independently, and separately weighted to normally press the tools down onto the leather being operated upon, substantially as set forth.

2. A machine for stretching and operating upon leather, comprising a rotary tool with a plurality of blades upon its periphery, having its axis at each end supported in a bearing, capable of rising and falling automatically at all times vertically, independently, and separately weighted by a weight to normally press the tool down onto the leather being operated upon and a spring interposed between said weights and the bearings, substantially as set forth.

3. A leather stretching and operating machine consisting of a rotary tool wheel with blades on its periphery, set in oppositely in-

clined directions, having its axis supported at opposite ends in downwardly weighted independent bearings free to rise and fall independently, and such weight being adapted to constitute the sole pressure coming upon the leather through the tools, substantially as set forth.

4. A machine for stretching and setting out, and operating upon leather, comprising a tool wheel *a*, with blade tools *b* thereon, a shaft *c* carrying said wheel, bearings adapted to slide up and down carrying the ends of said shaft, vertical guides on which said bearings slide up and down, a weighted lever adapted to press the said bearings of the said shaft downwards, and a spring between the part pressed by said levers, and the bearing parts carrying the shaft; substantially as set forth.

5. In a machine for stretching and setting out, and operating upon leather, a wheel with blade tools on its periphery, a shaft supporting said wheel, bearings in which the two ends of the shaft are mounted and vertically adjustable at either end automatically, guides on which said bearings slide vertically, means for normally pressing down said bearings, and a lifting foot lever connected with the said bearings; as herein set forth.

6. A machine for stretching and operating upon leather, comprising a rotary tool *a*, with a plurality of blades b^1, upon its periphery, having its axis at each end supported in a bearing, vertically movable independently, a weight at each bearing, and adapted to press each bearing down independently, and a spring interposed between said weight and the bearing, through which the weight is transmitted to the bearing, and the small vertical vibrations of the bearings are received and taken by the springs, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM F. FINCH.

Witnesses:
S. GOODALL,
W. HARRISON.