No. 629,687. Patented July 25, 1899.

M. A. HOLMES & F. A. BRADFORD.

LEATHER SCOURING AND SETTING MACHINE.

(Application filed Feb. 18, 1899.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1

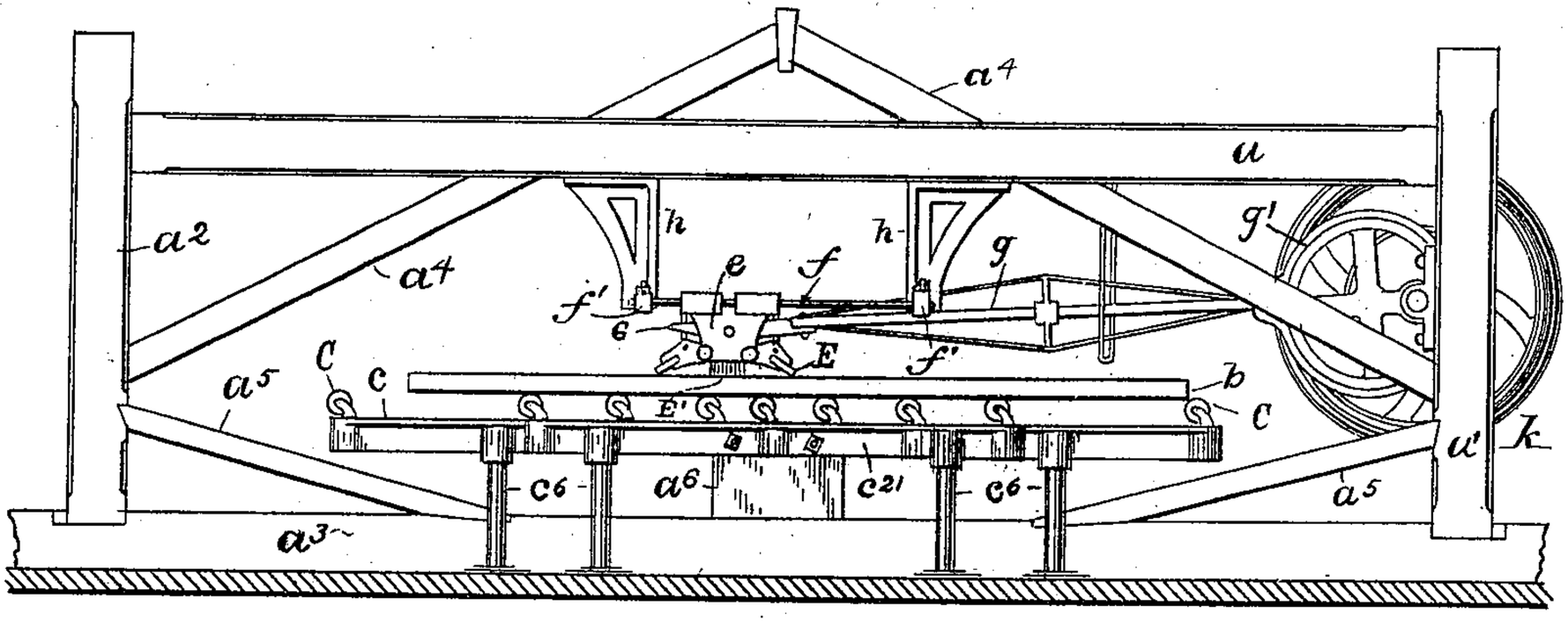
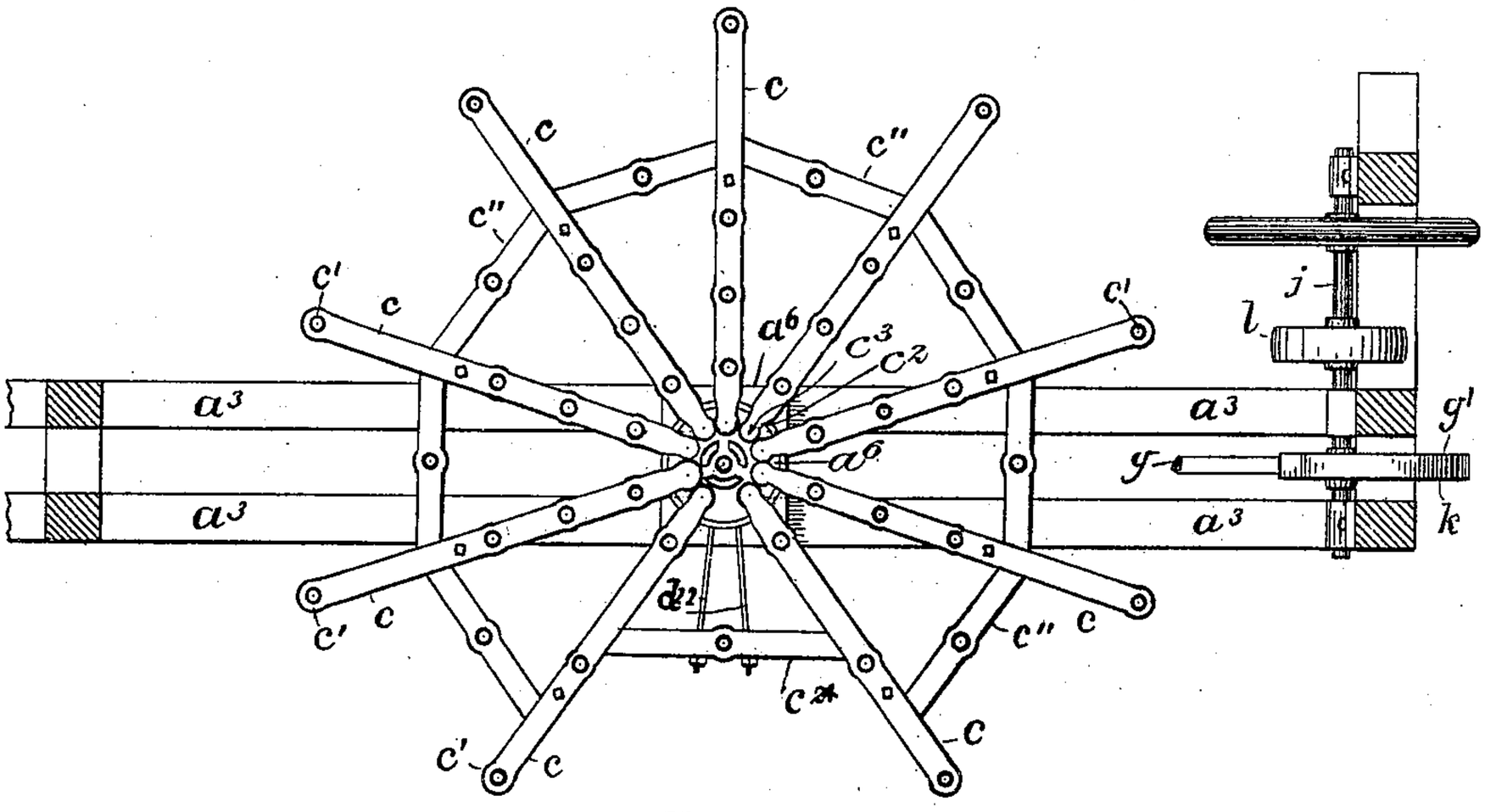


Fig. 2



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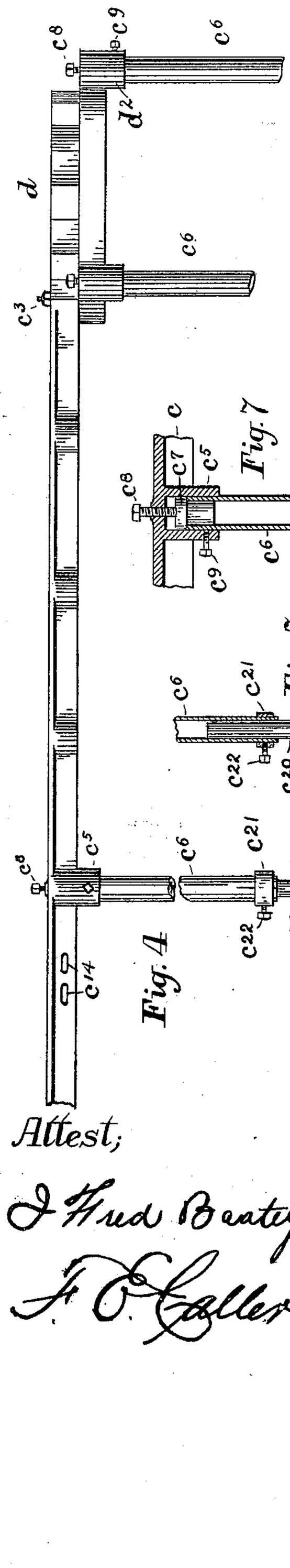

Fig. 4

Fig. 7

Fig. 7a

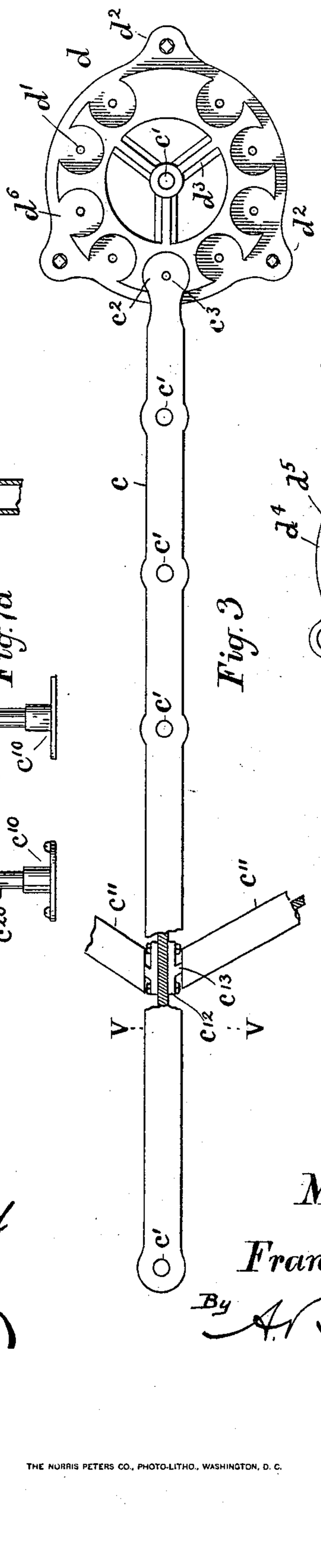

Fig. 3

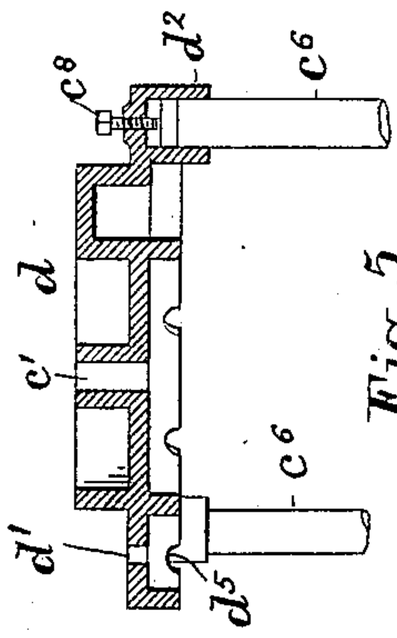

Fig. 5

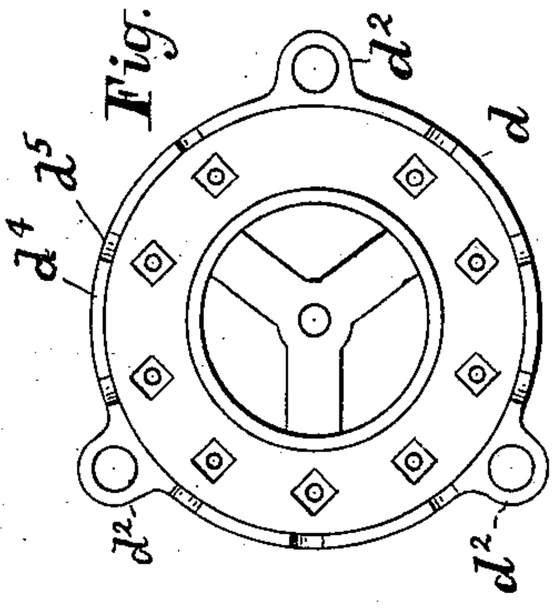

Fig. 6

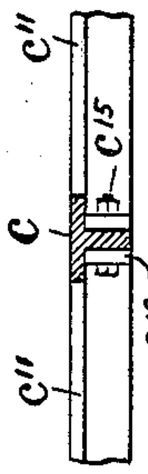

Fig. 3a

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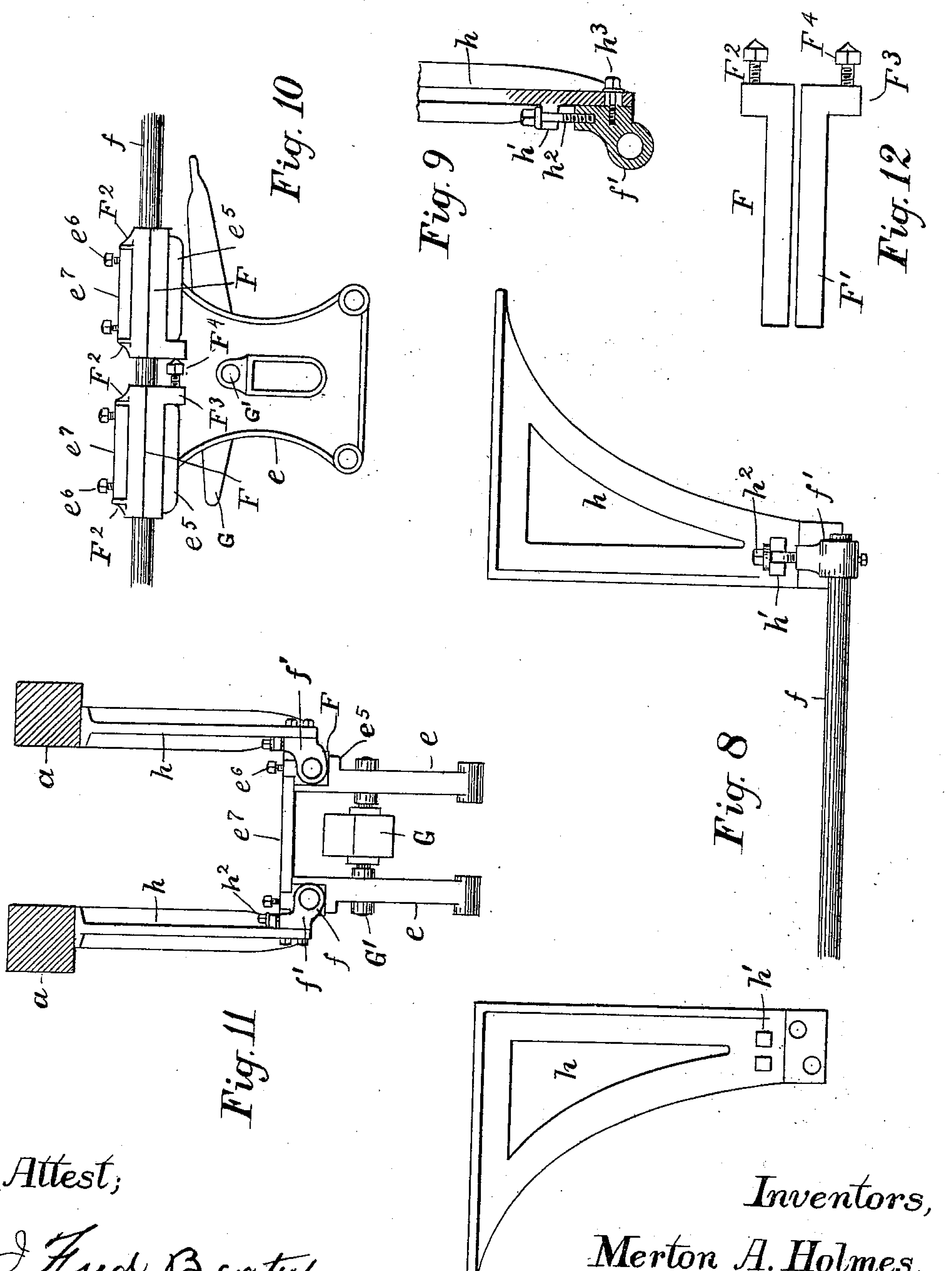
4 Sheets—Sheet 3.



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LEATHER SCOURING AND SETTING MACHINE.

(Application filed Feb. 18, 1899.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 14

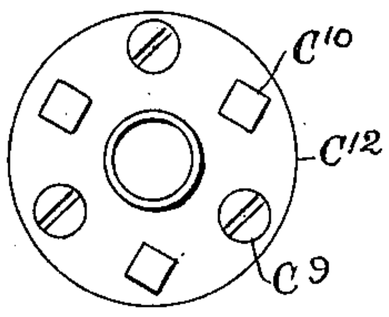
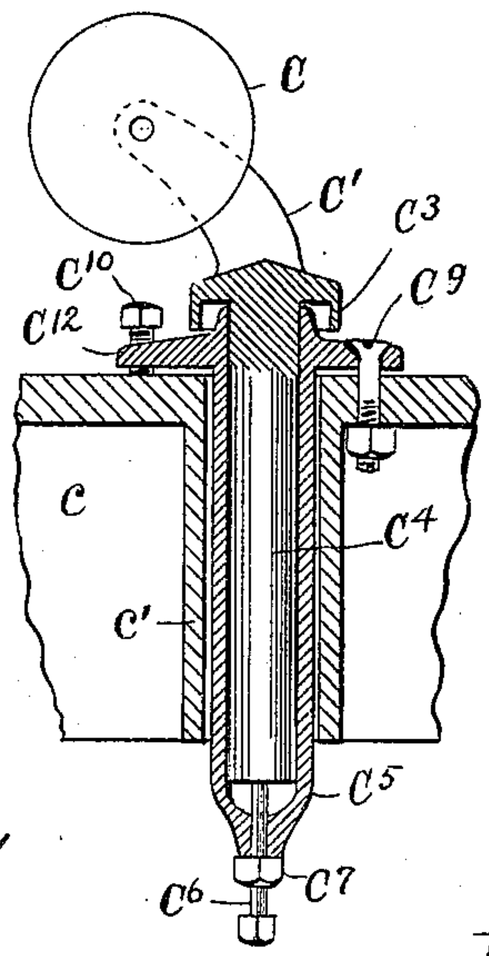


Fig. 13



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UNITED STATES PATENT OFFICE.

MERTON A. HOLMES, OF NEWTON, AND FRANK A. BRADFORD, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO HARRIET E. HOLMES, MANAGER OF ESTATE OF CHARLES HOLMES, TRUSTEE.

LEATHER SCOURING AND SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 629,687, dated July 25, 1899.

Application filed February 18, 1899. Serial No. 705,960. (No model.)

To all whom it may concern:

Be it known that we, MERTON A. HOLMES, residing at Newton Highlands, in the county of Middlesex, and FRANK A. BRADFORD, residing at Boston, in the county of Suffolk, State of Massachusetts, citizens of the United States, have invented a new and useful Leather Scouring and Setting Machine, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in machines for stretching or "setting out" leather and for brushing and scouring the same, as hereinafter set forth.

In the drawings forming part of this specification, Figure 1 is a side elevation of the complete machine. Fig. 2 is a plan view of the spider and base of the machine. Fig. 3 is a detail plan view, upon a larger scale, of one of the spider-arms and the center casting. Fig. 3^a is a cross-section at V V in Fig. 3. Fig. 4 is a side elevation of the spider-arm and center casting. Fig. 5 is a central sectional elevation of said casting. Fig. 6 is an under view of the said casting. Fig. 7 is a detail sectional view of one of the leveling-posts which support the spider. Fig. 7^a is a sectional elevation of the lower portion of said post. Fig. 8 is a side view of the ways and supporting-brackets of the carriage. Fig. 9 is a detail view of the means for attaching said ways to said brackets. Fig. 10 is a side view of the carriage-casting. Fig. 11 is an end view of the carriage-supporting ways, showing the brackets and the said carriage-castings. Fig. 12 is a detail view of one of the brass boxes sliding on said ways and holding said carriage. Fig. 13 is a sectional detail view of the caster spindle and socket, and Fig. 14 is a plan view of said socket.

As shown in Fig. 1, the framework is strongly built up from wooden timbers *a a' a^2 a^3*, &c., designed for the support of the operating parts of the machine. The freely-movable table *b*, upon which the hides are laid to be worked, is supported by the easily turning and swiveling casters C, carried by the spider *c*. Above said table is a carriage *e*, adapted to be reciprocated upon the ways *f* by means of the eccentric *k*, mounted upon the power-shaft *j* and connected thereto by the rod *g*. The purpose of this carriage is to actuate the hide-working tools E and the brush E' and through their means to operate upon the hides. In thus operating upon the hides the table *b*, supporting the same, is moved by the attendant in various directions, front and back and from right to left, until every part of the hide has received the required action of the tools E, whose path of action is comparatively limited, and it is hence necessary that the table shall be capable of the easiest motion possible. It is further equally requisite that the table shall be positively supported at every point in order that it may not be rocked or otherwise imperfectly moved. To this end the casters C must be capable of perfect adjustment both vertically and angularly in order to both bring them to the proper height and to make their swiveling spindles absolutely vertical, for when their spindles are out of true even slightly a caster will be higher at one point than it will when swung around to another, and it will not swivel so easily in one direction as the other. Our means for thus truing up the casters is shown in detail in Figs. 13 and 14. As here shown, the spider-socket *c'*, in which the caster-shell C^5 is held, exceeds the latter in diameter, and said shell is formed with a flange C^{12}, having the three set-screws C^{10} and the three binding-screws C^9, arranged as shown. By suitably tightening certain of said screws and loosening others the caster-shell C^5, and hence the caster-spindle C^4, can be made absolutely vertical. These screws also serve as a means of elevating and depressing the caster bodily; but the pivot-screw C^6 is the main reliance for this purpose. The object of the cap C^3, formed as a part of the caster-spindle, is to prevent the admission of water within the shell C^5 while the hides are being treated.

As shown in Fig. 2, the spider consists of nine radial arms *c* and an equal number of brace-bars c^{11}, all having sockets *c'* for holding the casters C. Previous to this invention said spider-arms were formed of wood,

and hence rapidly deteriorated and rotted from the effect of the liquids employed in treating the hides. Our spider-arms are of cast-iron, made T-shaped in cross-section and with enlargements for the sockets c'. The central casting d is mainly an annulus having bolt-holes d' cored therein for the reception of the bolts c^3, by which the spider-arms are secured thereto. These bolt-holes are provided with square recesses at the under side of the annulus for preventing the bolts from turning when the nuts are being applied at their upper ends. At the center of the annulus is a boss having the socket c' for the reception of the caster C to be located at such point. Said boss is joined to the annulus d by the radial arms d^3.

The outer portions of the spider-arms c are bound together by the brace-bars c^{11}, secured in the following manner: At each end of a brace-bar c^{11} is a head c^{12}, joined thereto by a neck or web c^{13}, as shown in Figs. 3 and 3^a. The heads c^{12} are secured to the arms c by the bolts c^{15}, passing through the slots c^{14}, cored in said arms. Said holes c^{14} are slotted, as shown in Fig. 4, in order that the brace-bars c^{11} can be forced toward the center of the spider-arms and so tighten the entire structure.

As shown in Fig. 2, at the inner end of each arm c is a cylindrical boss c^2, with its axis vertical and fitted in a corresponding seat d^6, and it is secured in place by the bolt c^3, the object of such form of boss and seat being to permit of a limited angular adjustment of each arm c. The necessity for such angular adjustment arises from inequalities of the brace-bars c^{11} and of the arms c themselves, both as to length and straightness. A further necessity is that of a perfect vertical adjustment for the spider-arms. To effect this, the said arms are supported upon the adjusting-posts c^6, which are secured to the floor by the socket-castings c^{10}. These posts are preferably simple lengths of gas-piping and are made capable of considerable longitudinal adjustment at their lower ends and a finer degree of adjustment at their upper ends. The adjustment at their lower ends is accomplished by forming the socket castings or feet c^{10} with the cylindrical stubs c^{20}, fitting within the tubular posts c^6 and held at any desired point therein by means of the clamp-collar c^{21} and the set-screw c^{22}, the end of said post being split to permit of its being thus clamped through the agency of said collar and set-screw. The object of this adjustment of the posts c^6 is to enable the spider, and hence the table b, to be set at any desired height, some operators wishing the table higher and some lower, according to their height or habits of work.

To permit of the finer degrees of adjustment above referred to, each spider-arm is formed with the cylindrical boss c^5, drilled or cored to snugly fit the upper end of the post c^6. The shouldered plug c^7 being inserted into the open end of the post c^6, both are inserted into said boss until stopped by the set-screw c^8, at which point the binding-screw c^9 serves to fasten said post in place. As will be evident upon inspection of Fig. 7, the shouldered plug c^7 serves two purposes: first, as a means of engagement for the adjusting-screw c^8, and, second, as a means for preventing the binding-screw c^9 from crushing the tubular post c^6. In use the binding-screw c^9 is first unloosened and then the adjusting-screw c^8 turned up or down until the required height is reached for that part of the spider. The screw c^9 is then re-set and the spider made secure.

The central casting d is supported upon three similar posts held in the bosses d^2, if desired, or said casting may be bolted upon a block a^6, as shown in Figs. 1 and 2. When thus mounted upon a solid block, the flange d^4 of said casting is formed with a notch d^5 beside each bolt-hole d', through which the person setting up the spider may insert his finger and support the bolt until its nut can be applied thereto.

Referring to Fig. 1, the brackets $h\,h$ are secured to the timbers a and support the ways f, upon which slides the carriage e. Said ways are two parallel lengths of cylindrical shafting held by the adjusting-boxes f'. These boxes are made capable of both vertical and angular adjustment upon the brackets h in order that the ways f may be made exactly parallel both with each other and the table b, and such adjustment is accomplished in the following manner: Each box f' is bolted to its bracket h by bolts h^3, passing through bolt-holes in such bracket of considerably larger diameter than said bolts. This permits the box to be moved somewhat, both up or down or angularly. The required vertical adjustment of each box is performed by the screw h^2, tapped into said box and having a shoulder supported upon the two lugs h', projecting from the bracket. (See Figs. 8 and 9.) Said boxes being thus adjustable and the ways f being cylindrical, the latter can be brought to the exact position required no matter how the brackets h may vary. In case the supporting-brackets of a single way-shaft f are so warped as not to be in the same vertical plane coincident with said shaft the latter being cylindrical fits equally well and is not subjected to the slightest torsional strain.

The carriage e does not itself contact with the ways, but is provided with removable boxes for sliding thereon and taking the wear. There are two of such boxes F for each way-shaft, and each is formed in two parts. As shown in Figs. 10 and 12, the under portion F′ of each box, and often, also, the upper half of each box, as shown in Fig. 12, is formed with a lug F^3, into one of which is tapped the bolt F^4 and against the other of which the head of said bolt is adapted to abut when suitably turned. This serves to keep said lower portions F′ immovable upon the seats

e^5 of the carriage. The upper half of each box is formed with the two projections or ears F^2, between which fit the overhanging ends of the top plates e^7. Through said overhanging ends are tapped the set-screws e^6, by means of which the upper halves of the boxes are adjusted toward the lower halves and all wear taken up which is caused by the friction between such boxes and the ways. The ears F^2 serve to prevent end play of said upper halves.

Our means for taking up wear in the eccentric-strap and eccentric from which power is communicated to the carriage is as follows: Said strap g' is formed in two parts, each having the elbow or flange g^3 at each extremity. In the inner faces of said flanges are the recesses g^6, adapted to receive the spiral springs g^5, which serve to elastically expand the said flanges one away from the other and against the hold of the bolt g^4. When any wear occurs between the eccentric and strap, all that is needed is to tighten up on the bolts g^4, the springs yielding to the same. The object of these springs is to hold the eccentric halves free from vibration and rattle and yet permit the taking up of wear, as above stated.

To further improve the eccentric, we form the latter with the deep annular flanges g^{20} and set into the same the two semi-annular wearing-blocks m, preferably of brass or composition metal. These are prevented from revolving about the eccentric by having the lugs m' projecting into depressions or slots g^{21}. These wearing-blocks are thinner than the depth of the flanges g^{20}, and the eccentric-strap g' is adapted to rest upon said wearing-blocks and set in between said flanges. In this way the eccentric and strap can be each made from cast-iron; but the strap is provided with a dissimilar metal to wear against.

As previously described, each spider-brace c^{11} is permitted a limited degree of adjustment along the spider-arms at each end thereof, such means of adjustment comprising the slots c^{14}, (shown in Fig. 4,) through which pass the binding-bolts c^{15}. It is necessary, however, to provide a greater amount of adjustment than this in order to insure an absolutely sufficient and rigid adjusting of the spider no matter how much the arms and braces may shrink or warp in casting. This we accomplish by means of the bolts d^{22}, extending from the brace c^{24} in the forward part of the spider back to the central casting d. By tightening up on said tie-bolts d^{22} said brace is forced inward and by its wedging action swings all the spider-arms backward into firm engagement with the braces.

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

1. In a leather scouring and setting machine, the spider comprising the central casting, the radial arms pivotally held thereby, and the brace-bars extending from arm to arm, each brace-bar being slidably adjustable along the arms to which it is secured substantially as and for the purpose set forth.

2. In a leather scouring and setting machine, the combination of the central casting having the peripheral sockets, the cast-metal arms having the cylindrical bosses held in said sockets, the brace-bars extending from arm to arm, and means for adjustably securing them in place, such means comprising the tie-bolts uniting the central casting and one of said braces.

3. In a leather scouring and setting machine, the combination of the spider-arms formed from metal and cast T-shaped in cross-section, a central casting to which said arms are all secured, the brace-bars similar in cross-section and having the heads joined to the vertical web alone, and the bolts for fastening said heads to the vertical webs of said arms, substantially as and for the purpose set forth.

4. In a leather scouring and setting machine, the combination of the central casting in the shape of an annulus having the peripheral sockets, the radial arms having the cylindrical bosses fitting in said sockets, the bolts passing vertically through said bosses and central casting, and the brace-bars for binding the outer portions of said arms rigidly together, said central casting having the notched flange beneath its outer edge, substantially as and for the purpose set forth.

5. In a leather scouring and setting machine, the combination of the spider and means for truing up the same, such means comprising the tubular posts loosely fitting in sockets in said spider, the shouldered plugs located in the upper ends of said posts, the binding-screws for fastening said posts at the desired points of adjustment, and the adjusting-screws tapped in said spider and resting upon said shouldered plugs, said plugs being long enough to reach below said binding-screws, substantially as and for the purpose set forth.

6. In a leather scouring and setting machine, the combination of the spider having the sockets, a caster-shell loosely fitting in each socket and formed with the flange at its upper end, binding-screws passing through said flanges and engaging the spider, and set-screws tapped through said flanges and pressing against the spider, substantially as and for the purpose set forth.

7. In a leather scouring and setting machine, the combination of the central casting having the caster-socket and the laterally-open peripheral sockets, said sockets having each a bolt-hole through the bottom thereof and the square recess, the cast-metal spider-arms having ends fitting in said sockets and formed with the caster-sockets, bolts passing through said arm ends and recessed holes, brace-bars uniting said arms, casters held in said caster-sockets, and adjustable supports for said spider, substantially as and for the purpose set forth.

8. In a leather scouring and setting ma-

chine, the combination with the spider, of the tubular posts held at their upper ends by said spider and adapted for a slight degree of adjustment thereat, the casting having the cylindrical post rising therefrom and fitting in each of said tubular posts, the lower ends of the latter being split, and the collars and set-screws for clamping said split ends tightly about said cylindrical posts, as set forth.

9. The combination with the carriage having the ledges or seats, e^5, and the top plates, e^6, of the split boxes, F, having the ears, F^2, and lugs, F^3, held between said seats and plates, the bolt, F^4, tapped into one of said lugs, F^3, and pressing against the other, and the set-screws, e^7, tapped through said plates and setting against said boxes, substantially as and for the purpose set forth.

10. In a leather scouring and setting machine, the combination of the four brackets each having the pair of lugs, h', and the enlarged bolt-holes, the boxes secured to said brackets by the bolts passing through said enlarged holes, the adjusting-screws supported by said lugs and tapped into said boxes, the cylindrical way-shafts terminally held in said boxes, and the carriage reciprocative upon said way-shafts, such form of the said way-shafts and the adjusting arrangements of the boxes permittting perfect adjustment of said way-shafts, substantially as set forth.

In testimony that we claim the foregoing invention we have hereunto set our hands this 11th day of February, 1899.

MERTON A. HOLMES.
FRANK A. BRADFORD.

Witnesses:
A. B. UPHAM,
EDWARD C. BATES.