

(No Model.)

3 Sheets—Sheet 1

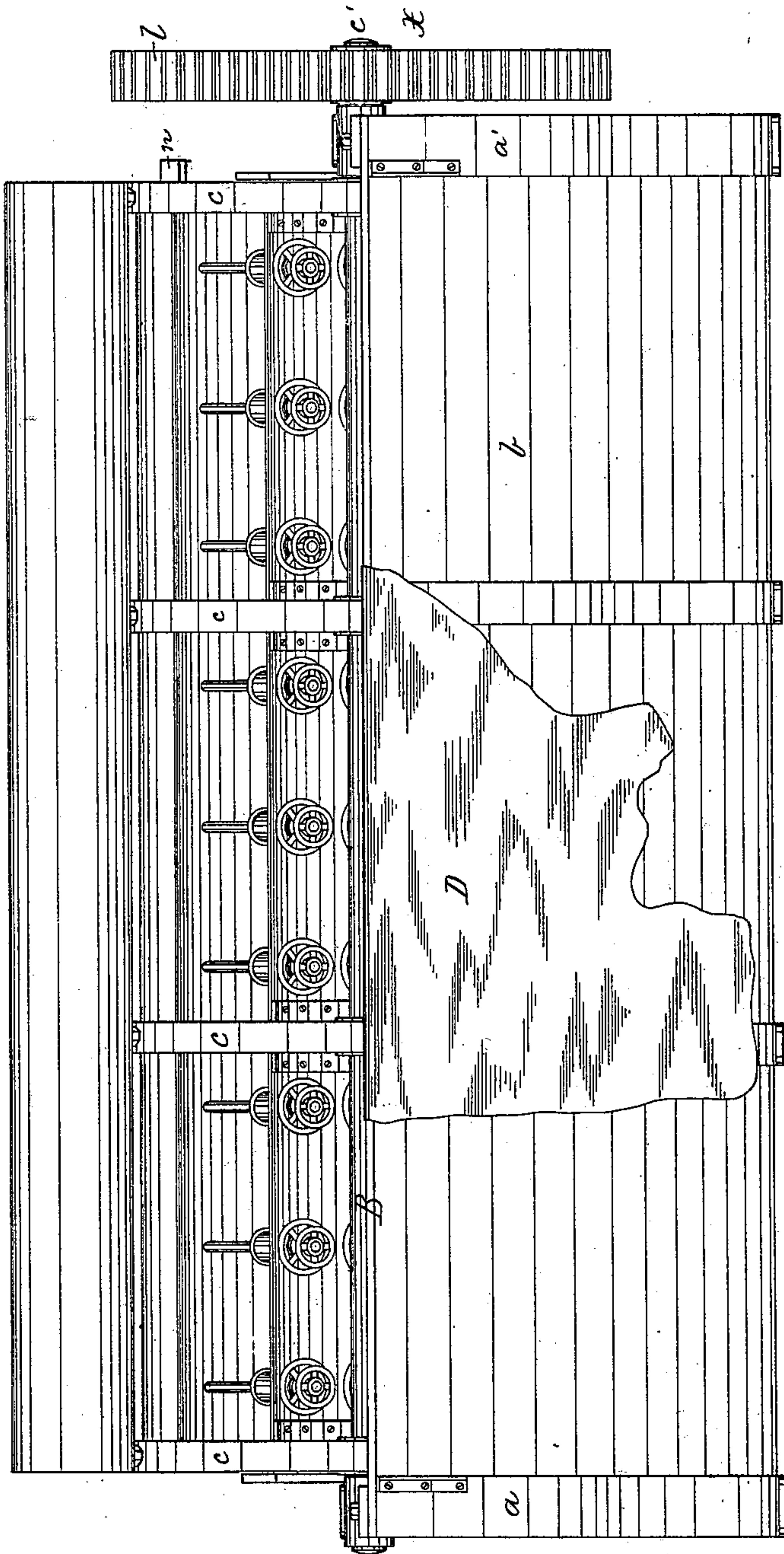
J. H. HOVEY.

LEATHER BOARDING AND GRAINING MACHINE.

No. 253,533.

Patented Feb. 14, 1882.

Fig. 1.



Witnesses.

Sarah M. Goodrich

Henry Chadbourne.

Inventor.

John H. Hovey

by Allan Audren
his atty.

(No Model.)

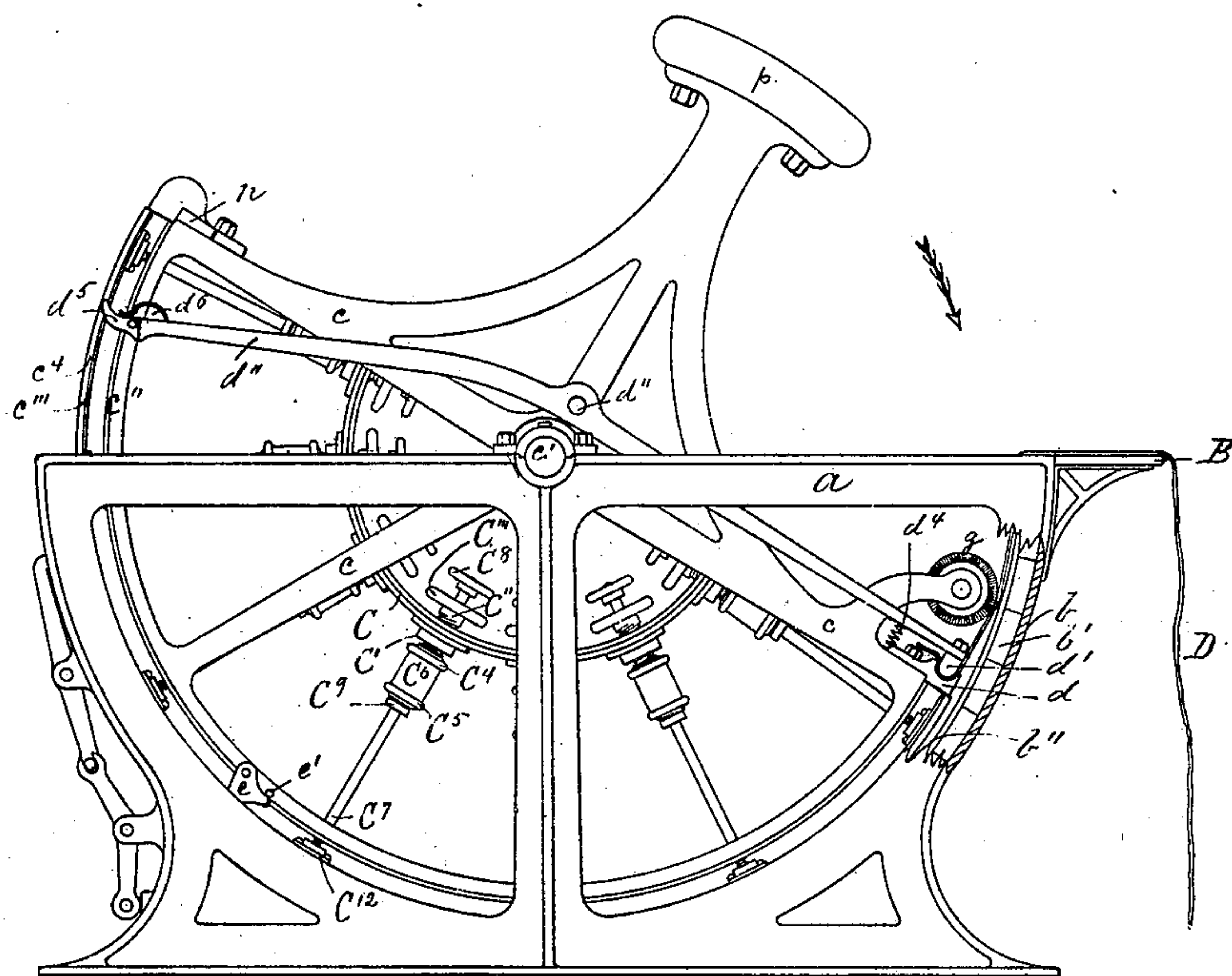
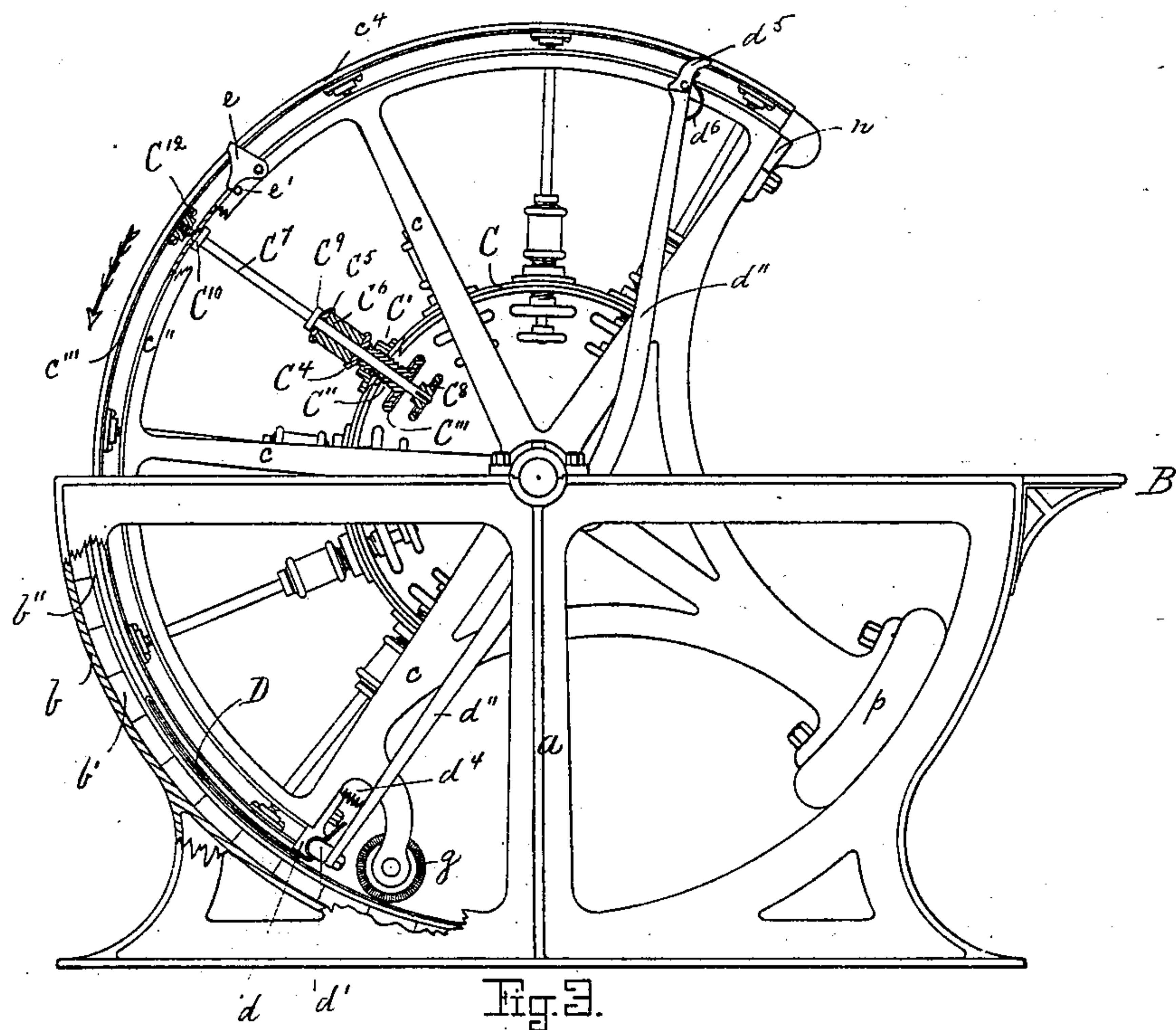
3 Sheets—Sheet 2.

J. H. HOVEY.

LEATHER BOARDING AND GRAINING MACHINE.

No. 253,533.

Patented Feb. 14, 1882.



Witnesses.

Sarah M Goodrich
Henry Chadbourne.

Fig. 2.

Inventor.

John H. Hovey
by Abraham Andren
his atty.

(No Model.)

3 Sheets—Sheet 3.

J. H. HOVEY.

LEATHER BOARDING AND GRAINING MACHINE.

No. 253,533.

Patented Feb. 14, 1882.

Fig. 5.

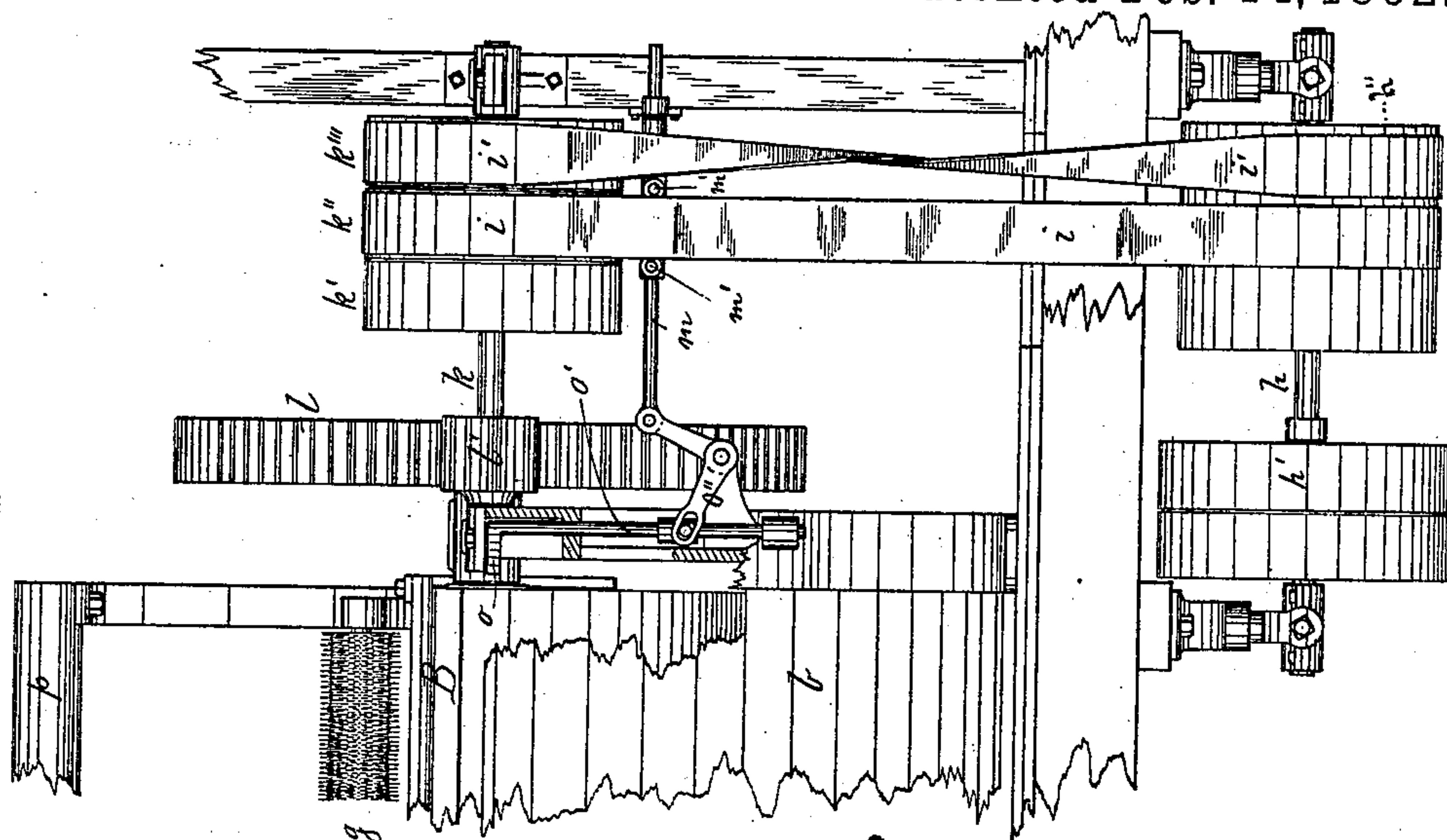
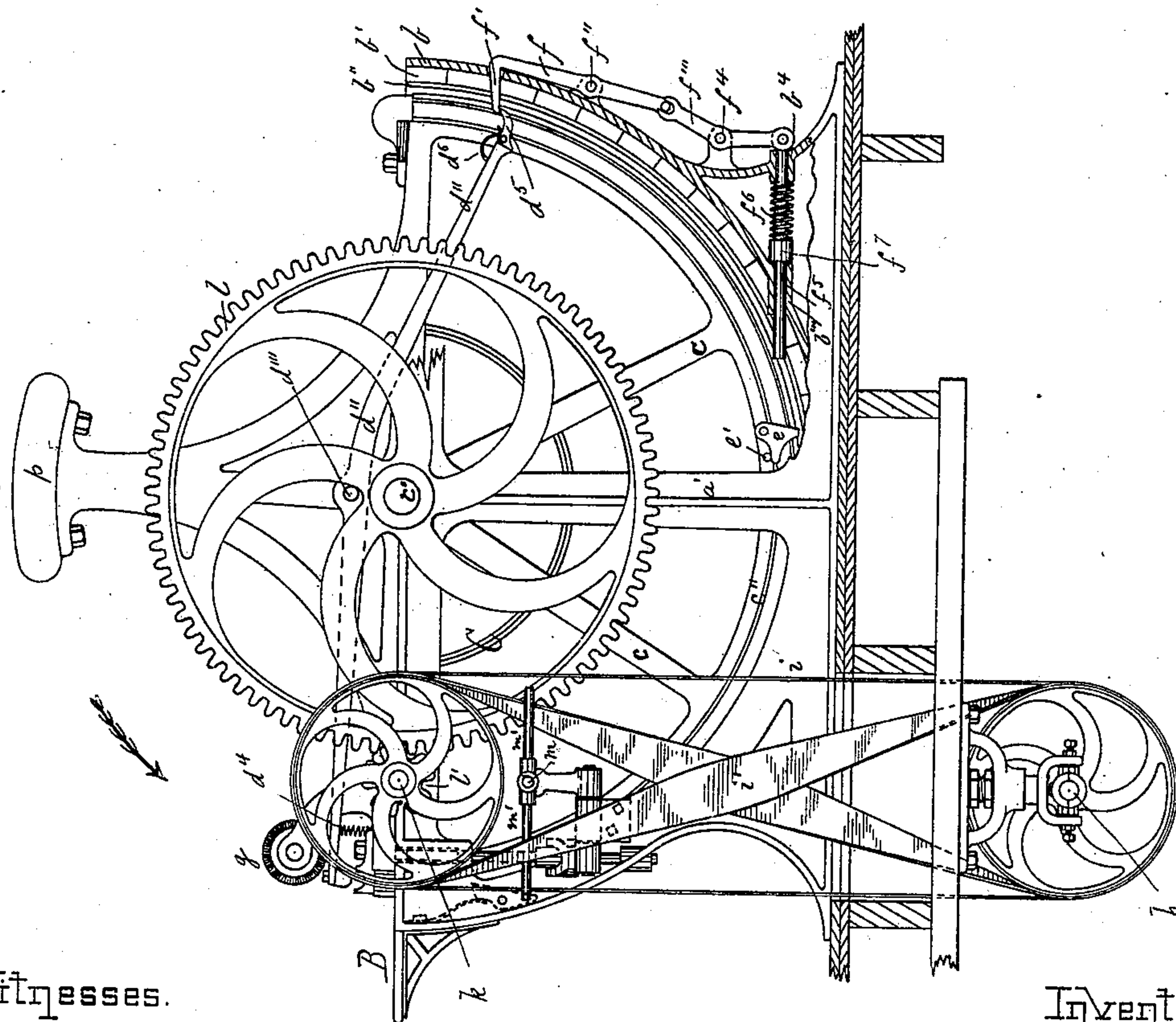


Fig. 4.



Witnesses.

Sarah M. Goodrich
Henry Chadbourn.

Inventor.

John H. Hovey
by *Wm. H. Hovey*
his atty.

UNITED STATES PATENT OFFICE.

JOHN H. HOVEY, OF WOBURN, MASSACHUSETTS.

LEATHER BOARDING AND GRAINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 253,533, dated February 14, 1882.

Application filed December 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. HOVEY, a citizen of the United States, residing at Woburn, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Leather Boarding and Graining Machines; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

This invention relates to improvements in leather boarding and graining machines; and it consists essentially of a stationary concave bed having an elastic or yielding surface on its inside and a reciprocating worker movable on an axis, and provided with a yielding convex surface adapted to work within the aforesaid concave bed, and provided with a holding device for attaching and holding one end of the leather that is to be boarded or grained; also, in the combination with the stationary concave bed and reciprocating worker, of a revolving brush-roll located in bearings attached to the reciprocating worker, a little in advance of its holding device, for the purpose of properly laying and keeping the leather smooth, and to prevent it from wrinkling during the processes of boarding or graining it, as will be further described.

The invention further consists of an automatic holding and locking device for locking and holding the leather attached to the forward end of the worker until the boarding or graining is accomplished. I also use an automatic reversing device for automatically reversing the motion of the reciprocating worker during the operation of the machine. The reciprocating worker is provided with an adjustable pressure-regulating device, by means of which the surface of the said worker may be adjusted more or less in or out, as may be required, for regulating the pressure on the leather between the reciprocating worker and the concave bed, according to the thickness of the leather that is operated upon. The concave bed and its reciprocating worker are of a sufficient size to take in a whole side of leather at one time, so that the soft and thin parts of the side may receive the same relative pressure as the thick parts thereof, to be able to grain the side equally all over.

My improved machine is designed to take the

place of the ordinary hand-tools now used for graining or boarding leather, which is previously printed or pebbled in the usual manner.

On the accompanying drawings, Figure 1 represents a front elevation of my improved machine. Fig. 2 represents an end elevation of the same, showing the worker in the act of drawing the leather into and laying it inside of the concave yielding bed. Fig. 3 represents an end view of the machine, showing the motion of the worker, as reversed, in the act of boarding or graining the leather. Fig. 4 represents an end view, seen from X in Fig. 1; and Fig. 5 represents a front elevation of the automatic reversing device for the reciprocating worker.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In the drawings, *a* and *a'* represent the ends or frames of the machine, between which is secured the concave bed, composed of an outer concave metallic frame, *b*, wood lining *b'*, and yielding elastic surface *b''*, made of cork, india-rubber, or similar elastic material. The said concave bed is made semicircular, and in bearings in the frames *a* and *a'* is located the shaft *c'* for the reciprocating worker, hereinafter to be more fully described. Said shaft *c'* is arranged centrally to the concavity of the arch of the concave bed *b b' b''*, as shown.

B is the table in front of the machine, upon which the side of leather *D* is laid and guided to the machine during the operation of boarding or graining the leather.

The reciprocating worker is composed of a pair of rigid metallic skeleton-frames, *c c*, secured to the shaft *c'*, and having secured to its outer semicircular surface a semicircular wooden or metal plate, *c''*, outside of which is arranged concentrically to it the adjustable semicircular metal plate *c'''*, with its exterior elastic or yielding covering, *c⁴*, made of india-rubber, cork, or similar elastic or yielding material.

The pressure from the center toward the exterior of the yielding semicircular plate *c'''*, to regulate the pressure on the leather when operated for the purpose set forth between the yielding surfaces *c⁴* and *b''* of the worker and concave bed, respectively, is regulated and adjusted by the following means, viz: Between the frames *c c* of the reciprocating worker is

secured, about midway between the shaft c' and the semicircular plate c'' , a semicircular rigid plate, C , to which is secured at intervals a number of screw-threaded nuts, C' C' C' , each of which is provided with a hollow pressure-screw, C'' , adjustable in each of said nuts C' , and having a hand-wheel, C''' , by which it can easily be manipulated. The outer end of each hollow pressure-screw C'' rests against a hollow metallic washer, C^4 , between which and a similar metallic washer, C^5 , is interposed an india-rubber spring, C^6 . (Shown in Fig. 3.) A spindle or shaft, C^7 , passes through the parts C' , C'' , C''' , C^4 , C^5 , and C^6 , and it is provided in its inner end with a suitable hand-wheel, C^8 , by means of which it may be turned. The spindle C^7 is provided with a collar, C^9 , resting against the outside of the washer C^5 , as shown in Fig. 3. The outer end of the spindle C^7 is provided with a collar or nut, C^{10} , resting against the inside of the semicircular metal plate c'' . The extreme outer end of the spindle C^7 passes loosely through the semicircular plate c'' , and its screw-threaded end is made to work in a corresponding nut, C^{12} , secured to the inside of the adjustable semicircular plate c''' . By this arrangement any desired portion of the semicircular plate c''' may be adjusted to or from the center of the shaft c' by turning any one of the desired hand-wheels C^8 C^8 , and the outward pressure from the center to any desired portion of the semicircular plate c''' may be regulated by turning any one of the desired hand-screws C''' , and thereby increasing or decreasing the pressure on the india-rubber spring C^6 , the outer washer, C^5 , collar C^9 , spindle C^7 , and outer movable case, c''' , as may be desired, according to the thickness of the leather which is operated upon and the pressure desired to be exerted on it.

Between the forward ends of the rigid frames $c c$ of the reciprocating worker is secured a grooved bar, d , which extends the whole length of the machine, and it serves, in combination with the movable bar d' , as a holding device for securing thereto the edge of the leather D to be grained or boarded.

To each end of the movable bar d' is secured an arm, d'' , which is hinged at d''' on the reciprocating frame c , as shown in Fig. 3, and ordinarily the side D of leather is automatically confined in its forward end between the grooved bar d and nipper-bar d' by the influence of the coiled springs d^4 d^4 , secured to the arms d'' and frames c , as shown in Figs. 2 and 3. Each rear end of the arms or levers d'' is provided with a hinged foot, d^5 , held in position on the end of such lever by means of the small spring d^6 . (Shown in Figs. 2, 3, and 4.) e is a tooth or dog, hinged one on each side of the rim of the frames $c c$, and e' is a stop-pin for each of the teeth $e e$, to prevent their swinging too far around their hinge-pins.

f is a lever, provided with an inwardly-projecting hook, f' , and hung at f'' to the outer concave shell, b , the lower end of such lever

being jointed in a suitable manner to the upper end of the lever f''' , hung at f^4 on the outer concave shell, b , as shown in Figs. 2 and 4. The lever f''' is hinged in its lower end to the horizontal sliding rod f^5 , located in bearings b''' and b^4 on the concave shell b , as shown, and having its inner end projecting beyond the inner bearing, b''' , so that when the tooth e strikes it it shall be forced back against the influence of the coiled spring f^6 , located on the rod f^5 , between its rear bearing, b^4 , and a collar, f^7 , on said spindle, as shown in Fig. 4.

The operation of this unlocking device is as follows: During the motion of the reciprocating worker in the direction of the arrow shown in Fig. 4 the hinged foot d^5 comes in contact with the inwardly-projecting hook f' of the lever f , and in so doing turns the arm d'' on its fulcrum and disconnects the bars d and d' , so that the end of the side of leather D may be inserted between said bars when the latter are in the vicinity of the work-table B . The bars d and d' are held apart until the tooth e comes in contact with the inner end of the yielding spindle f^5 , when by the latter's connection to the upper lever, f , its hook f' is released from the hinged foot d^5 at the same time as the bars d and d' are automatically brought together to nip the edge of the leather D by the influence of the coiled springs d^4 d^4 , as heretofore described. One tooth, e , is used in each end of the reciprocating worker, combined with a connecting mechanism consisting of a yielding spindle and jointed levers, as hereinabove set forth and described. g is the rotary brush, located in bearings on the frames $c c$ in advance of the holding-bars $d d'$, as and for the purpose set forth.

The reversing mechanism for alternately setting the worker in a reciprocating motion is fully represented in Figs. 4 and 5, in which h represents a shaft which is set in rotary motion by means of belt-power applied to a fast pulley, h' , thereon, as usual. On said shaft h is keyed a drum, h'' , carrying a straight belt, i , and twisted belt i' to the pulleys $k' k'' k'''$ on the shaft k , which is supported so as to rotate in suitable bearings, as usual.

k' and k''' are fast pulleys, and k'' is a loose pulley on the said shaft k .

l is a small pinion on the shaft k , which is geared into the teeth of the spur-wheel l , that is fast on one end of the worker-shaft c' .

m is a shipper-bar, as usual provided with the prongs $m' m'$.

On the frame c , about diametrically opposite to the holding device $d d'$, is a projection, n , which, as it approaches that end of the concave bed where the work-table B is located, comes in contact with an ear or projection, o , at the top of a vertically-movable rod, o' , located in suitable bearings, and thereby actuates a knee-lever, one end, o'' , of which is jointed to the rod o' , and its other arm, o''' , being jointed to the shipper-bar m , by which arrangement the belts i and i' are automatically reversed.

from fast to loose and from loose to fast pulleys, and thus causing the worker to reverse its rotary motion until, after nearly one complete revolution, its ear *n* is again brought in contact with the projection *o* on the vertically-adjustable shipper-rod *o'*, by which an automatic reversal of the worker is accomplished continually until the machine is stopped.

p is a balance or counter weight secured to extensions on the arms *c c* for the purpose of balancing the reciprocating worker.

In using the machine one end of the leather to be grained or boarded is inserted between the bars *d* and *d'*, which are made automatically to close upon each other and to hold the leather firmly between them, and the reciprocating worker then proceeds in the direction shown by the arrow in Fig. 4. The reciprocating worker continues in the same direction to draw and lay the leather *D* within the concave bed in a manner as shown in Fig. 2, and continues in the direction shown by arrows in said Fig. 2 until its projection *n* hits the projection *o* on the belt-shipper, when the motion of the worker is reversed, as shown by arrow in Fig. 3, and causing the leather *D* to be grained or boarded by being doubled upon itself, and, as it were, rolled between the elastic concave bed *b''* and the elastic covering *c⁴* in a manner closely resembling the manner of graining or boarding by hand tools. The worker continues to move in the direction shown by arrow in Fig. 3 until the reciprocating worker has completed nearly a revolution around its axis, and until the projection *n* again comes in contact with the reversing-projection *o*, when its motion is reversed to that shown by the arrow in Figs. 2 and 4, and during this motion of the worker the hinged foot *d⁵* on the end of the arm or lever *d''* is brought in contact with the inward projection *f'*, causing the holding device *d d'* to open to enable the finished leather to be taken away and a new side inserted, which is automatically clamped and held firmly between the parts *d d'* as soon as the dog or tooth *e* comes in contact with the sliding rod *f⁵*, as heretofore has been described. The hinged

foot *d⁵* will pass freely by the lever-projection *f'* when the worker is moved in the direction of the arrow shown in Fig. 3, and when the worker is in such motion the dog or tooth *e* will also pass freely by the inner end of the sliding rod *f⁵*.

What I wish to secure by Letters Patent and claim is—

1. In a boarding or graining machine, the stationary concave bed *b*, having an elastic or yielding inner surface, *b''*, and the reciprocating worker composed of frame *c c c'' c'''*, with outer yielding surface, *c⁴*, and a holding device, *d d'*, for securing the leather to one end of the worker, as and for the purpose set forth.

2. In combination with the stationary concave bed *b*, its yielding surface *b''*, and reciprocating worker *c c'' c''' c⁴*, and holding device *d d'*, the rotary brush or roll *g*, arranged on the frame *c c* in advance of the holding device, as and for the purpose set forth.

3. In a graining or boarding machine, as described, the holding device consisting of the grooved bar *d*, movable bar *d'*, attached to levers *d'' d'''*, movable on fulcrum *d'''*, and provided in their outer ends each with a hinged foot, *d⁵*, and spring *d⁶*, in combination with the dog *e* and the locking and releasing lever *f*, and connecting mechanism to the sliding rod *f⁵*, as and for the purpose described.

4. In a graining or boarding machine, a reciprocating worker, *c c''*, having adjustable outer surface *c''' c⁴*, and a positive pressure device for regulating the pressure on the leather that is operated upon, as set forth.

5. A graining and boarding machine consisting of a stationary concave bed, *b b' b''*, reciprocating worker *c c'' c''' c⁴*, a holding device for securing one end of the side of leather, and an automatic reversing device, as and for the purpose set forth.

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

JOHN H. HOVEY.

Witnesses:

MARCELLUS LITTLEFIELD,
MONTRESSOR T. ALLEN.