(No Model.) 3 Sheets—Sheet 1.

G. A. ONCKEN.

MACHINE FOR CUTTING VENEERS.

No. 431,952. Patented July 8, 1890.

Fig. 1.

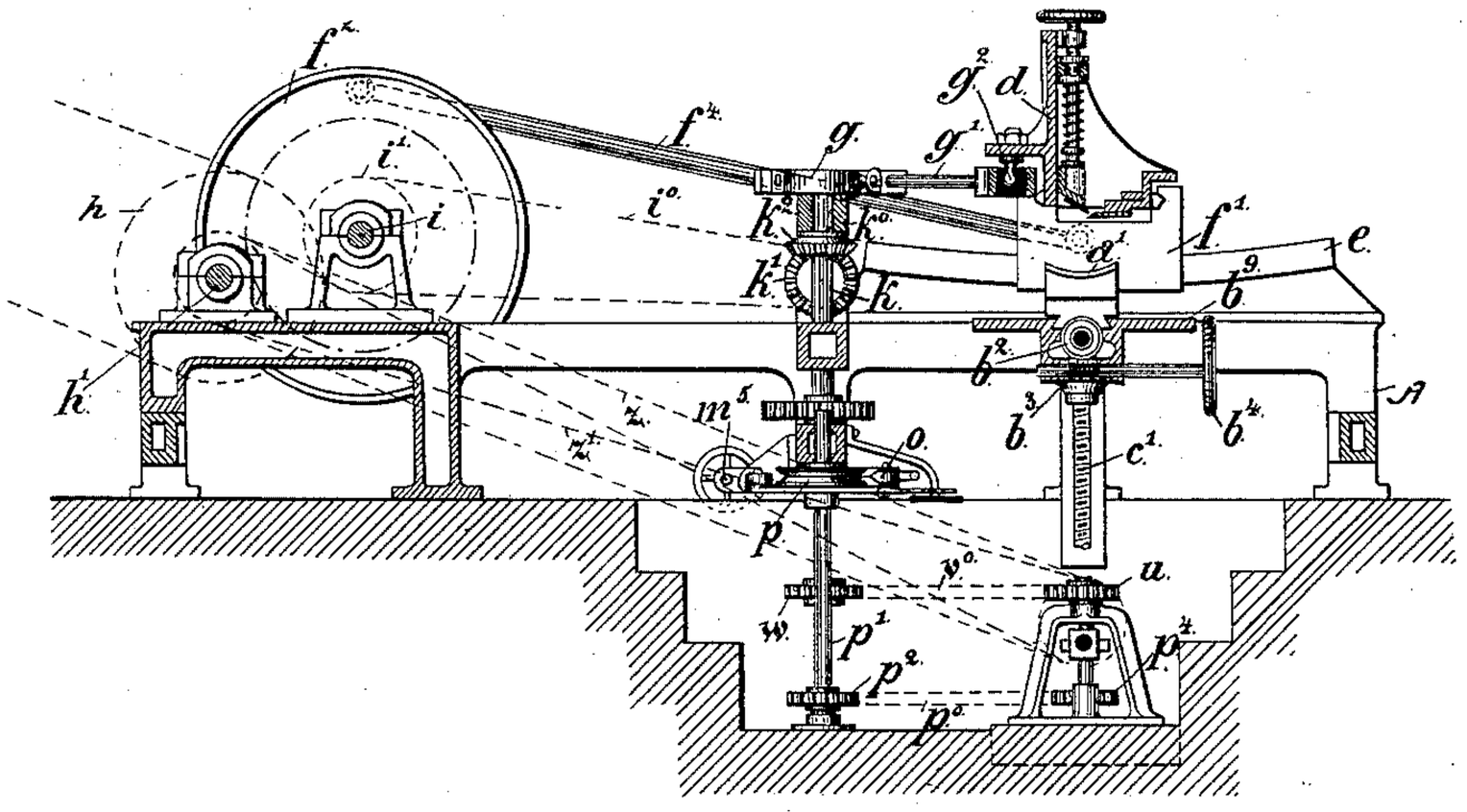
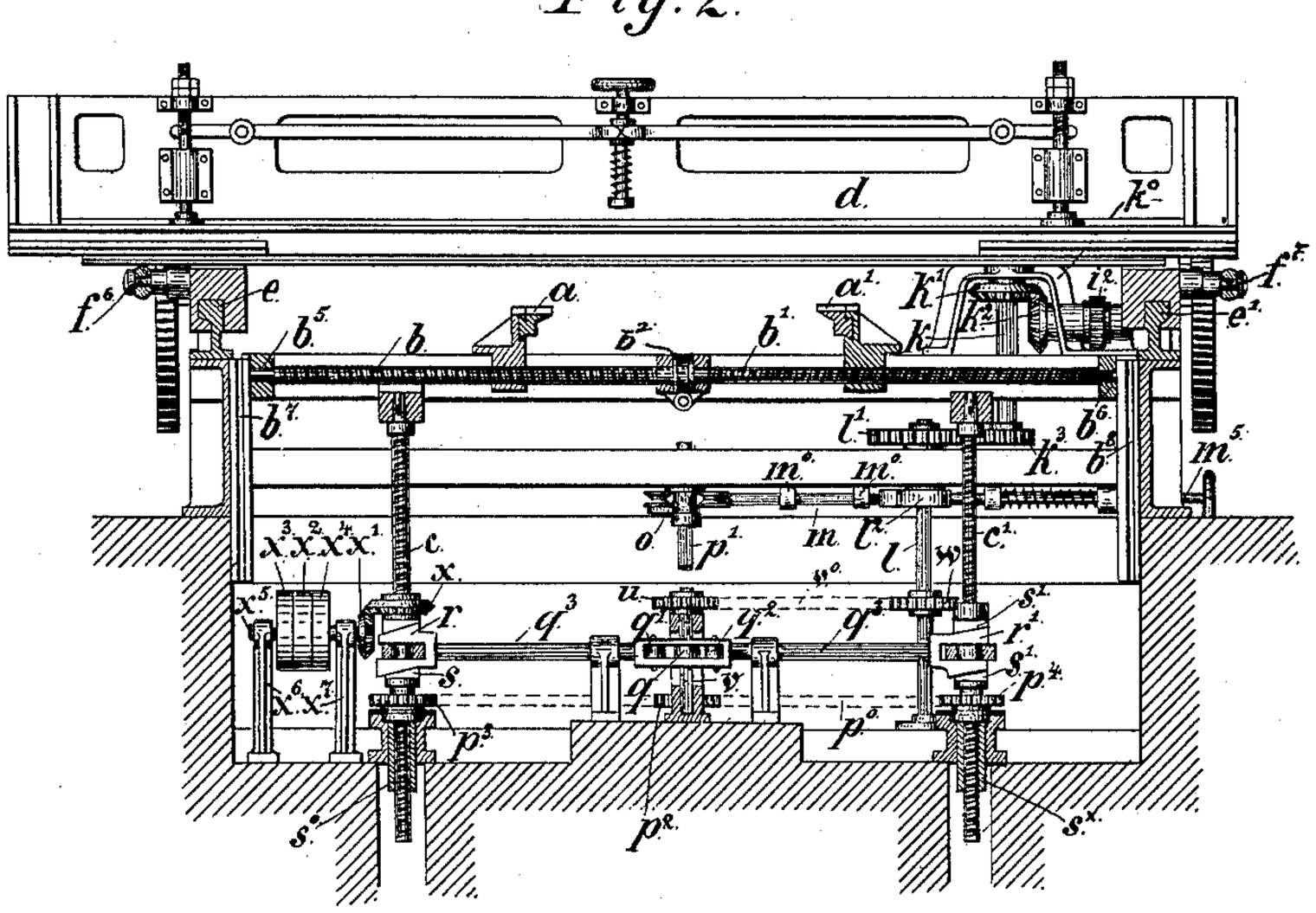


Fig. 2.



Witnesses.
John R. Petree
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(No Model.)

3 Sheets—Sheet 2.

G. A. ONCKEN.

MACHINE FOR CUTTING VENEERS.

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Fig. 3.

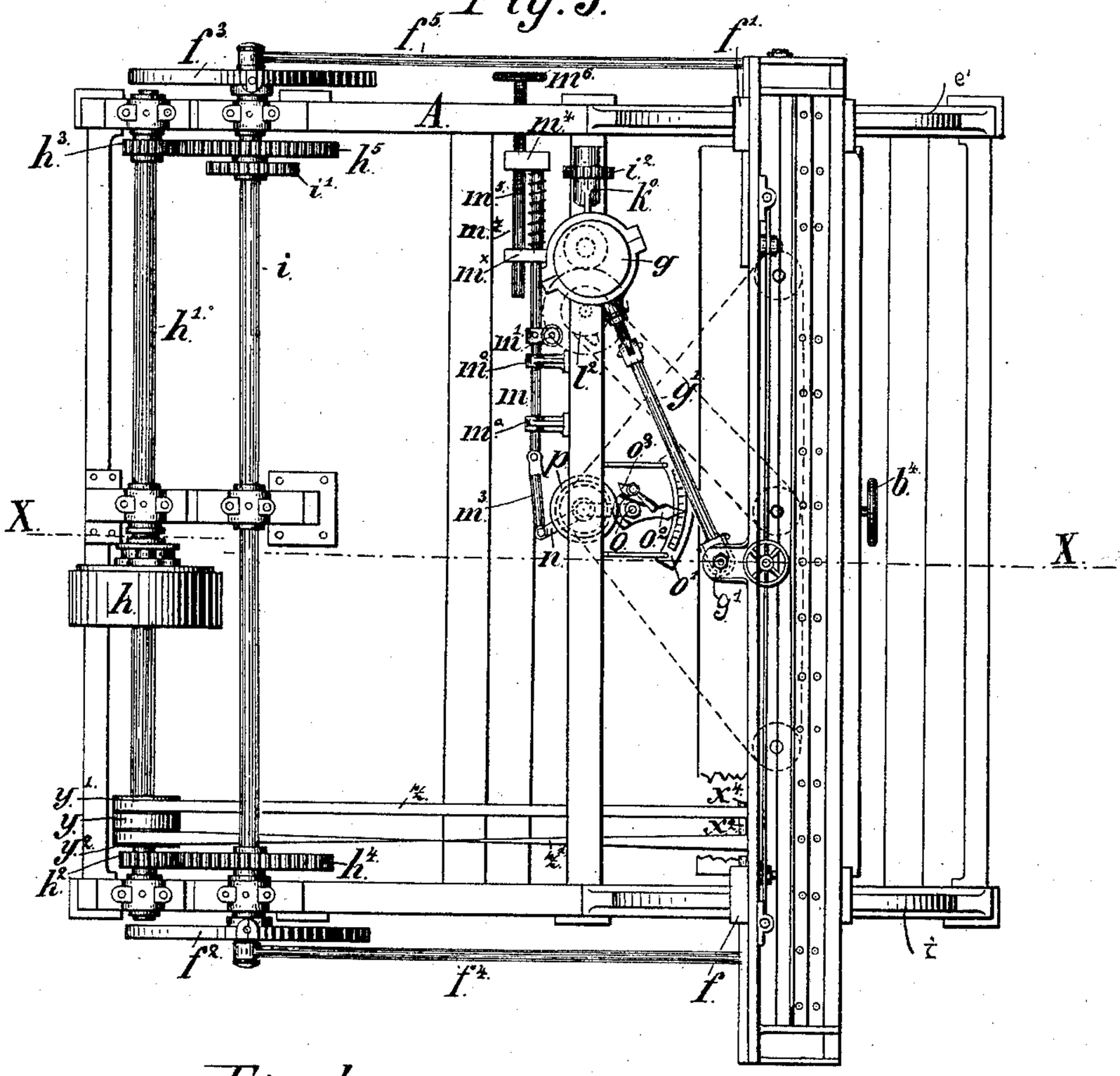


Fig. 4.

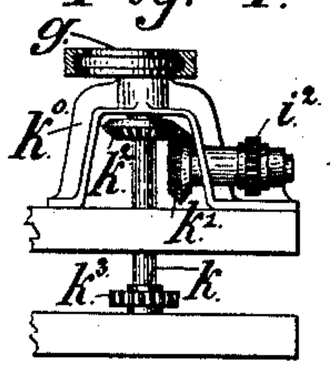


Fig. 5.

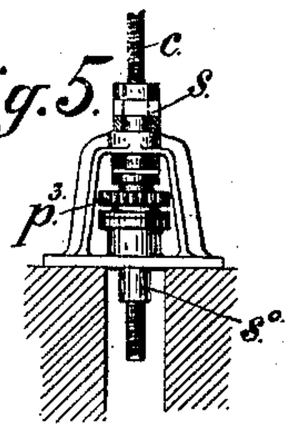
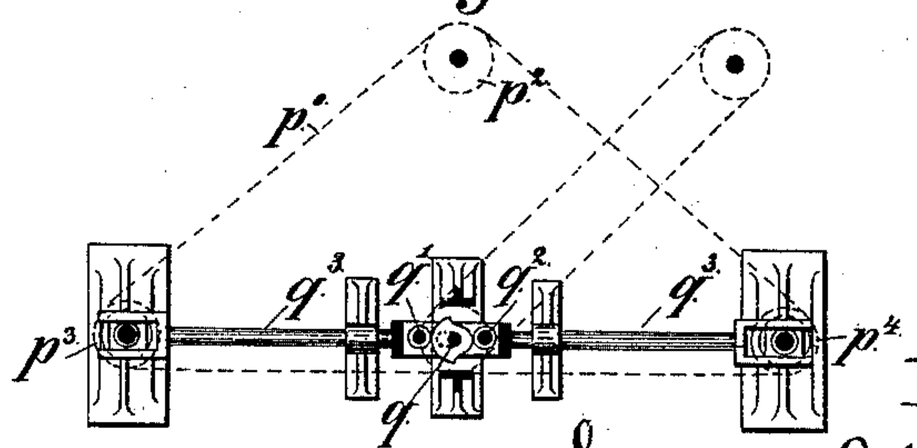


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

G. A. ONCKEN.

MACHINE FOR CUTTING VENEERS.

No. 431,952. Patented July 8, 1890.

Fig. 7.

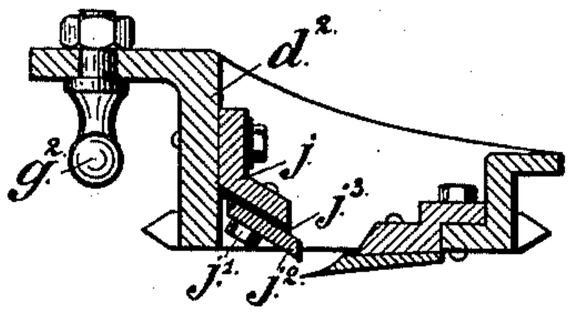


Fig. 8.

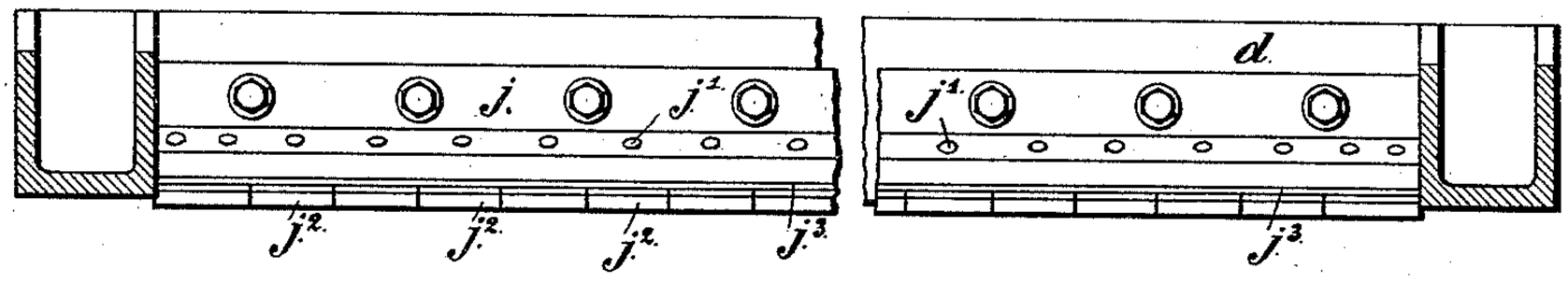


Fig. 9. *Fig. 10.* *Fig. 11.*

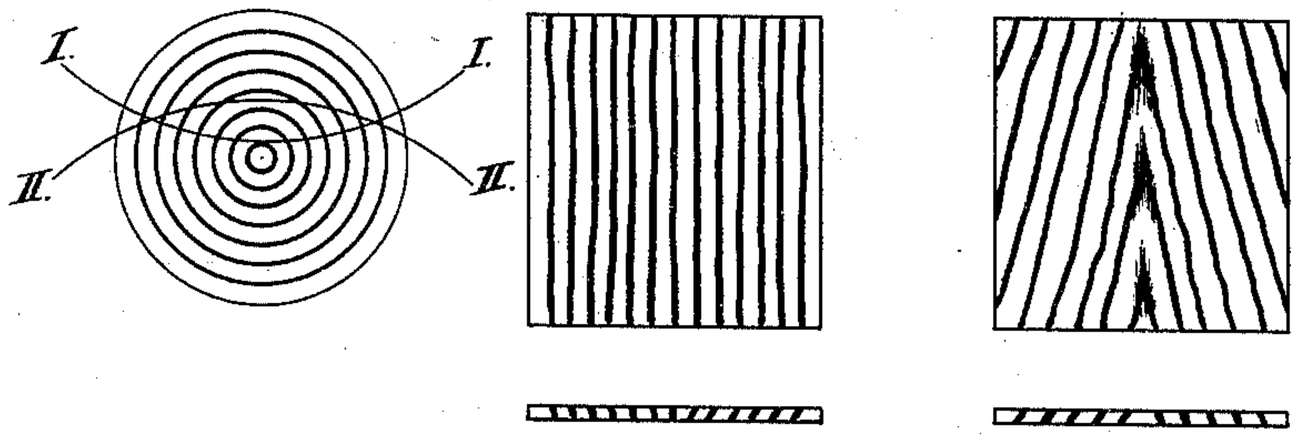
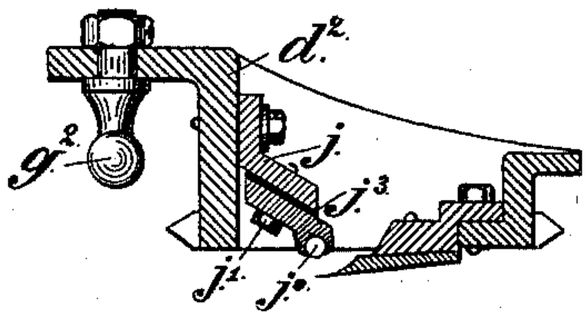


Fig. 7.ª



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UNITED STATES PATENT OFFICE.

GUSTAV ADOLPH ONCKEN, OF FRANKENTHAL, BAVARIA, GERMANY.

MACHINE FOR CUTTING VENEERS.

SPECIFICATION forming part of Letters Patent No. 431,952, dated July 8, 1890.

Application filed January 8, 1890. Serial No. 336,313. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV ADOLPH ONCKEN, a citizen of the United States, temporarily residing at Frankenthal, in the Kingdom of Bavaria and German Empire, have invented certain new and useful Improvements in Machines for Cutting Veneers, of which the following is a specification.

This invention relates to the cutting of veneers and other thin sheets of wood from a log or block and to apparatus connected therewith; and the object of the said invention is to obtain a uniform grain throughout on the dressed surface of the veneers from the same block or log of wood by cutting the latter lengthwise and concave through the annular rings. I attain the object (to perform instead of a plain cut a concave one) by means of the machinery illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of the entire machine on the line X X, Fig. 3; Fig. 2, a front view of the machine, partly in section; Fig. 3, a top view of the entire machine. Fig. 4 is an enlarged detail view of a portion of the mechanism for imparting a reciprocating horizontal motion to the knife-carriage. Fig. 5 is a similar view of the lower end of one of the block-support-adjusting rods and its bushings or bearings. Fig. 6 is a diagrammatical plan view of the means for operating said rods. Fig. 7, of which Fig. 7^a shows a modification, is a cross-section, and Fig. 8, a top view, partly in horizontal section, of the knife-frame and the flexible presser-bar. Fig. 9 represents the diagram of a cross-section of a log or block of wood as may be employed in my machine; and Figs. 10 and 11 are the respective views of the dressed surface of pieces of veneer cut, respectively, after the line I I and II II of Fig. 9.

Similar letters refer to similar parts throughout the several views.

In order to obtain from a log or block of wood veneers having almost equal grain throughout, the square or cylindrical log is cut into veneers by actuating a reciprocating knife in such a manner that a concave cutting-surface throughout the whole length of the log is obtained. The knife is to be adapted while cutting the veneers from the log to concave the same, as indicated by the line I I, Fig. 9, and the log is to be advanced against the knife previous to each cut a distance equal to the thickness of each slice to be cut and after the cut, is by a cam or wedge movement withdrawn sufficiently to clear the path of the returning knife. The block is cut from two opposite sides until close to its heart, so that the remaining portion will show a concavo-concave cross-section. This concavo-concave portion may also be divided into small pieces by cutting it at right angles to the former cutting-faces and in the same manner as aforesaid. The veneers cut according to this improved method from a cylindrical or square block are comparatively broader than those cut in the ordinary manner, and as each cut of the knife is performed equally through the annular rings of the tree the dressed surface of all the veneers cut from the same block will have a uniform grain.

In the machine serving to carry my invention into practice, and in which A is the main frame, the log resting upon a support b^9 is rigidly secured in the direction of its axis between suitable claws $a\,a'$. The latter are provided with right and left hand female screw-threads fitting upon the correspondingly-threaded spindle $b\,b'$. In the middle of the said spindle a worm-wheel b^2 is mounted, which engages with a worm b^3, journaled in the support b^9 and carrying upon its axis a hand-wheel b^4, by means of which the said claws a a' may be displaced. The two ends of the spindle $b\,b'$ are also journaled in the said support, and the latter slides at its two ends $b^5\,b^6$ in vertical guides $b^7\,b^8$ of the main frame A of the machine under the action of the vertically-arranged screw-spindles $c\,c'$. By the aid of the latter the screw or spindle $b\,b'$ is at regular intervals advanced toward the horizontally-actuated knife-frame d and withdrawn at each cut in order that the block may clear the path of the reciprocating knife on its return movement. This knife-frame d is supported by suitable carriages $f\,f'$, sliding upon horizontal concave guides $e\,e'$ of the main frame of the machine, and as the knife-frame is also adapted to slide horizontally on the carriages $f\,f'$ and at right angles to the path of the latter the veneer is cut from the

block under the joint movement of the knife parallel and at right angles to the axis of the block.

The machine is driven from a pulley h, mounted on a horizontal main shaft h', which is journaled in the main frame and actuates, by means of a pair of pinions h^2 h^3 and spur-wheels h^4 h^5, an intermediate horizontal shaft i, carrying on each of its extreme ends a pair of crank-disks f^2 f^3. The crank-pins of these disks are connected by pitmen f^4 f^5 to suitable pins f^6 f^7 of the carriages f f' in order to impart through the medium of the latter a to-and-fro motion to the said knife-frame, according to the path of the said concave guides e e', connected to the main frame.

The intermediate horizontal shaft i is adapted to drive a vertical intermediate shaft k by the aid of a chain i^0, chain-wheels i' i^2, and a pair of bevel-gears k' k^2. This vertical shaft k is journaled at its upper end in common with the aforesaid intermediate horizontal shaft i in the bracket k^0, Fig. 4, and it carries there an eccentric g, which is connected by a rod g' to a ball-pivot g^2, attached to the knife-frame d, and to the latter it imparts the hereinbefore-mentioned reciprocating horizontal motion upon the carriages f f' parallel to the axis of the block. Although this reciprocating motion of the knife-frame could be obtained in view of the to-and-fro motion of the carriages f f' when simply connecting the same by means of a pitman to a stationary pivot of the machine, I prefer to employ an agitated eccentric in order to overcome the dead-points otherwise appearing at the end of each stroke of the knife-frame. The said intermediate vertical shaft k is furthermore adapted to drive by means of a pinion k^3 and spur-wheel l' another vertical shaft l, carrying a cam l^2, in the path of which is placed a projection or roller m' of a horizontal rod m, actuating the mechanism for advancing the block against the knife and adjusting the cut. This adjusting-rod m is guided by a pair of stationary brackets m^0 m^0 of the main frame, as well as by a bracket $m^\times$ and the nut m^4 of an adjusting-screw m^5, and it is connected at its inner end, through the medium of a pitman m^3, Fig. 3, to a double-armed lever n, which is adapted to turn according to the to-and-fro movement of the said adjusting-rod m upon a third vertical shaft p', and to actuate by means of a friction-cam o, secured at its second arm, a friction-wheel p, mounted upon the said shaft p'.

The reciprocating movement of the adjusting-rod m is caused on one hand by a coiled spring m^7, situated between the said nut m^4 and the fixed bracket $m^\times$ of the adjusting-screw m^5, and on the other hand by the said cam l^2 of the revolving shaft l, for the purpose of periodically actuating the vertical shaft p'. As the stroke of the adjusting-rod m by displacement of the roller m' through the said adjusting-screw m^5, the oscillating motion of the friction-cam o, attached to the said double-armed lever n, and consequently the intermittent rotating motion of the shaft p', are to be proportionally varied, the thickness of the veneers cut by the knife can be regulated by simply turning the hand-wheel m^6 of the adjusting-screw correspondingly, whereas the motion of the shaft p' is transmitted upon the support b^9 of the log of wood, as will be hereinafter described. The length of the stroke of the adjusting-rod m, and consequently the thickness of the veneer at a certain cut depending upon the former, is duly indicated upon a dial o' by a hand o^2, connected to the said friction-cam on the double-armed lever n. This cam, however, may be entirely disengaged from the corresponding friction-wheel p by means of an eccentric or lever o^3 in case it should be intended to stop the advance of the block toward the knife. The transmission of the intermittent rotating motion of the said friction-wheel p and its shaft p' is performed simultaneously by means of a chain gearing p^0 p^2 p^3 p^4, of which the driven chain-wheels p^3 p^4 are fitted upon a pair of axially-movable bushings s^0 $s^\times$, Fig. 5, which are provided with female screw-threads corresponding to the thread of the before-mentioned vertical screw-spindles c c', carrying the block-support, and upon which they are rotated by the said chain-wheels p^3 p^4 to advance the support b^9 of the block. In consequence of the intermittent rotating motion of the said bushings s^0 $s^\times$ upon the said vertical support-spindles c c' the block to be cut is periodically advanced against the knife, and the latter thereby caused to cut the veneer of the desired thickness.

The progressive motion of the support b^9 and of the log is caused by the hereinbefore-described means during the backward motion of the knife-frame d. Therefore the block needs to be previously retracted a certain distance in order to clear the path of the returning knife and in due time to be set in position toward the knife that a regular cut may be performed. This periodical withdrawal of the block of wood is caused by the weight of the support b^9 and adjusted by the to-and-fro motion of two forks r r', the prongs of which, surrounding the said bushings s^0 $s^\times$ of the vertical support-spindles, are provided with horizontally-inclined faces, upon which the support b^9, through the medium of the vertical screw-spindles c c', the said rotating nuts or bushings s^0 $s^\times$, and suitable cheeks s s', rests. The latter are adapted to admit the axial and rotating movement of the said bushings and to fit to the inclined faces of the forks r r', which are caused to slide between the said cheeks s s', according to the movement of a rotating cam q, performing the to-and-fro motion of the said forks. As the inclined faces of the said forks are exactly parallel to each other, both are actuated simultaneously and in the same sense in such a manner that on each revolution of their actuating-cam q the support is once withdrawn from and once set

again into its normal position to the knife—that is to say, the one during which the knife performs its backward motion and the one during which the latter is actuated to cut a veneer from the block on the support b^9. The motion required to advance the block against the knife for a fresh cut is imparted to the support and the mechanism hereinbefore mentioned while the support is in the withdrawn position. The vertical shaft v, carrying said fork-operating cam q, is continually rotated by means of a chain v^0 and the chain-wheels $u\ w$ from that vertical shaft l^2 operating the above-mentioned adjusting-rod m.

In order to allow the log on the support b^9 to be easily adjusted, a quick motion in either direction may be transmitted to the latter directly from the main driving-shaft h' by connecting to one of said bushings or nuts s^0, Fig. 2, of the said vertical support-spindles a bevel-wheel x, gearing with a corresponding wheel x', which is mounted upon a short horizontal shaft x^5, being journaled in standards $x^6\ x^7$ beneath the main frame. The short shaft x^5 carries one tight pulley x^2 and two loose pulleys $x^3\ x^4$, which are connected by an open belt z and a crossed belt z' to corresponding loose and tight pulleys $y\ y'\ y^2$ upon the main horizontal shaft h'. By shifting the one or the other of these belts upon the tight middle pulleys $x^2\ y$ the said bevel-gears $x\ x'$ and chain-wheels $p^2\ p^3\ p^4$ are turned in one or the other direction, and therefore the support b^9, with the log raised or lowered accordingly.

While adjusting the block by the means set forth the feeding device may be disengaged by simply turning the lever o^3, Fig. 3, so as to turn the friction-cam o out of gear with the friction-pulley p. In this class of machines, in which the knife-frame has a reciprocal motion, the cutting-edge of the knife and the edge of the presser-bar must be in a plane in every point perpendicular to the movement of the knife-frame, so that the knife has only to sustain a pressure perpendicular to its cutting-edge, while the presser-bar takes up all the side pressure from the feeding device.

The yielding presser strip or bar having a uniform movement throughout its length, as used in machinery for cutting a continuous board from a log of wood and described in the specification of my pending application for Letters Patent, Serial No. 301,095, filed February 25, 1889, may also be used in combination with that class of machine in which the knife or log has a reciprocal movement. Instead of making the said presser-bar, together with the slide upon which it is fixed, yielding from one end to the other, the slide j, Figs. 7 and 8, may be stationary in relation to the knife-frame d, in which case I am accustomed to produce said presser-bar out of a certain number of small pieces j^2, each of which to be attached separately to the said slide j by means of bolts j', and a layer j^3 of elastic material—such as india-rubber—is placed between the single parts of the presser-bar j^2 and the said slide j, so that each part j^2 may yield independently from the others under the pressure of and according to the varying resistance which the wood may offer at any point during the forward motion of the log in the direction toward the presser-bar. Although this arrangement of the presser-bar will suit for ordinary cases, I sometimes provide each part j^2 of the presser-bar with a separate roller j^0, which will serve to bear against the block to be cut and to reduce the friction otherwise occurring if the presser-bar touches the wood directly, Fig. 7^a.

I do not herein claim the subject-matter of my pending application for patent, filed April 26, 1890, Serial No. 349,649, which relates to an improvement in the presser-bar.

Having particularly described and ascertained the nature of my said invention, what I desire to claim and secure by Letters Patent is—

1. In a machine for cutting from a log or block of wood boards or veneers, the knife-frame having a to-and-fro transverse and a reciprocal longitudinal movement over a concaved carriage or bearings, substantially as and for the purpose set forth.

2. In a machine for cutting from a log or block of wood boards and veneers, the combination of the reciprocating knife-frame and the log-supports guided upon separate agitated carriages with the concave guideways and the mechanisms for periodically advancing the log toward the knife, substantially as and for the purpose set forth.

3. In a machine for cutting from a log or block of wood boards or veneers, the combination of the reciprocating frame, the carriages traveling upon a concave guideway, the rotating eccentric g, the pivot g^2, and the eccentric-rod g', substantially as and for the purpose described.

4. In a machine for cutting from a log or block of wood boards or veneers by a reciprocating knife, the combination of the support carrying the block, the screw-spindles $c\ c'$, the bushings $s^0\ s^\times$, actuated by a chain gearing with the friction-wheel p, the oscillating lever n, and the friction-cam o, substantially as and for the purpose specified.

5. The combination, in a machine for cutting from a block or log of wood boards or veneers, of the block-support, the transporting-spindles, the bushings or nuts axially movable in the agitating-wheels $p^3\ p^4$, the fork-ended rod q^3, the prongs of which having inclined side faces, the cheeks $s\ s'$, and the rotating cam q, substantially as set forth.

6. The combination, in a machine for cutting from a block or log of wood boards or veneers, of the mechanism for advancing the

block-support toward the knife and the cut-adjusting mechanism consisting of the adjusting-screw m^5, nut m^4, rod m, projection m', coiled spring m^7, and the rotating cam l^2, substantially as and for the purpose specified.

7. In a machine for cutting from a log or block of wood boards or veneers, the knife-frame having a to-and-fro transverse and a reciprocal longitudinal movement over a concaved bearing and provided with a lower cutting-knife, and an upper presser-bar having a uniform yielding movement throughout its length, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 30th day of October, 1889.

GUSTAV ADOLPH ONCKEN.

Witnesses:
ALEXANDER SPECHT,
LUDWIG KÖNIG.