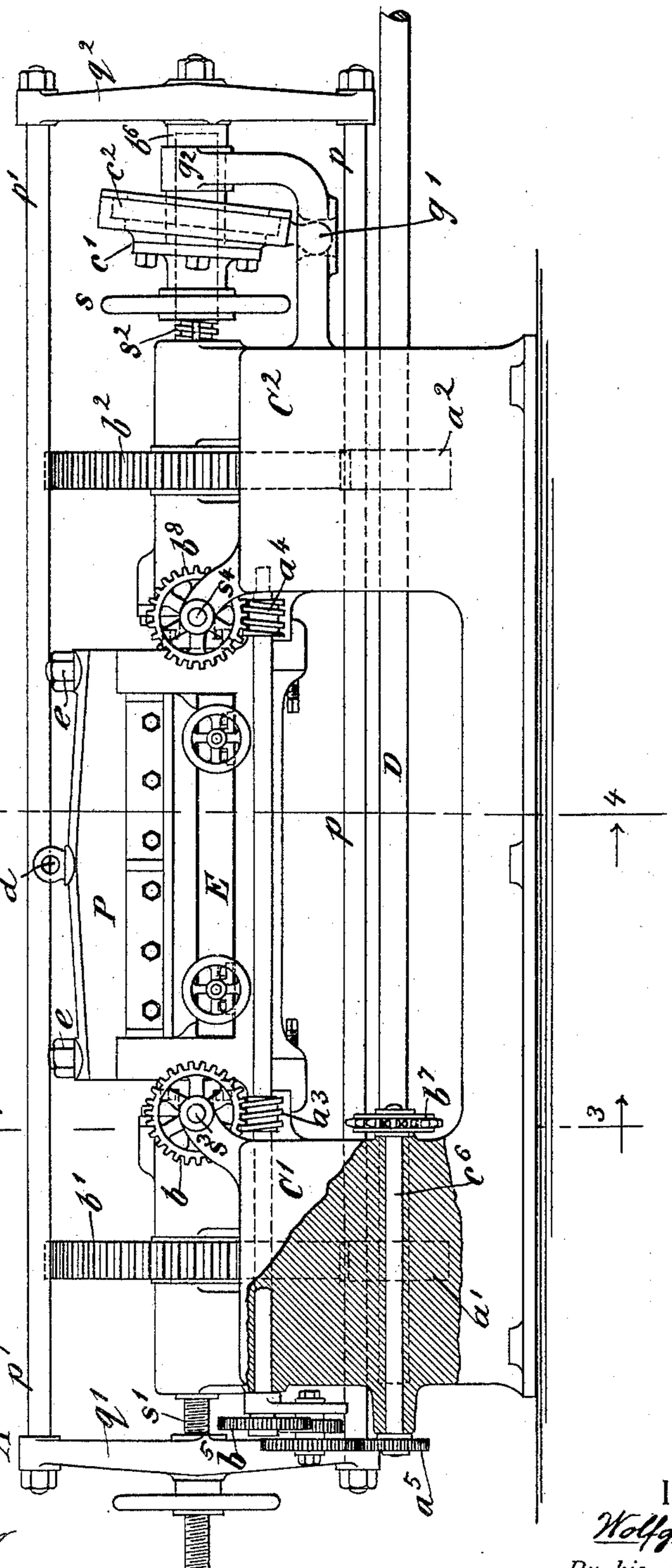
(No Model.) 4 Sheets—Sheet 1.

W. SCHRADER.

VENEER CUTTING MACHINE.

No. 468,307. Patented Feb. 2, 1892.



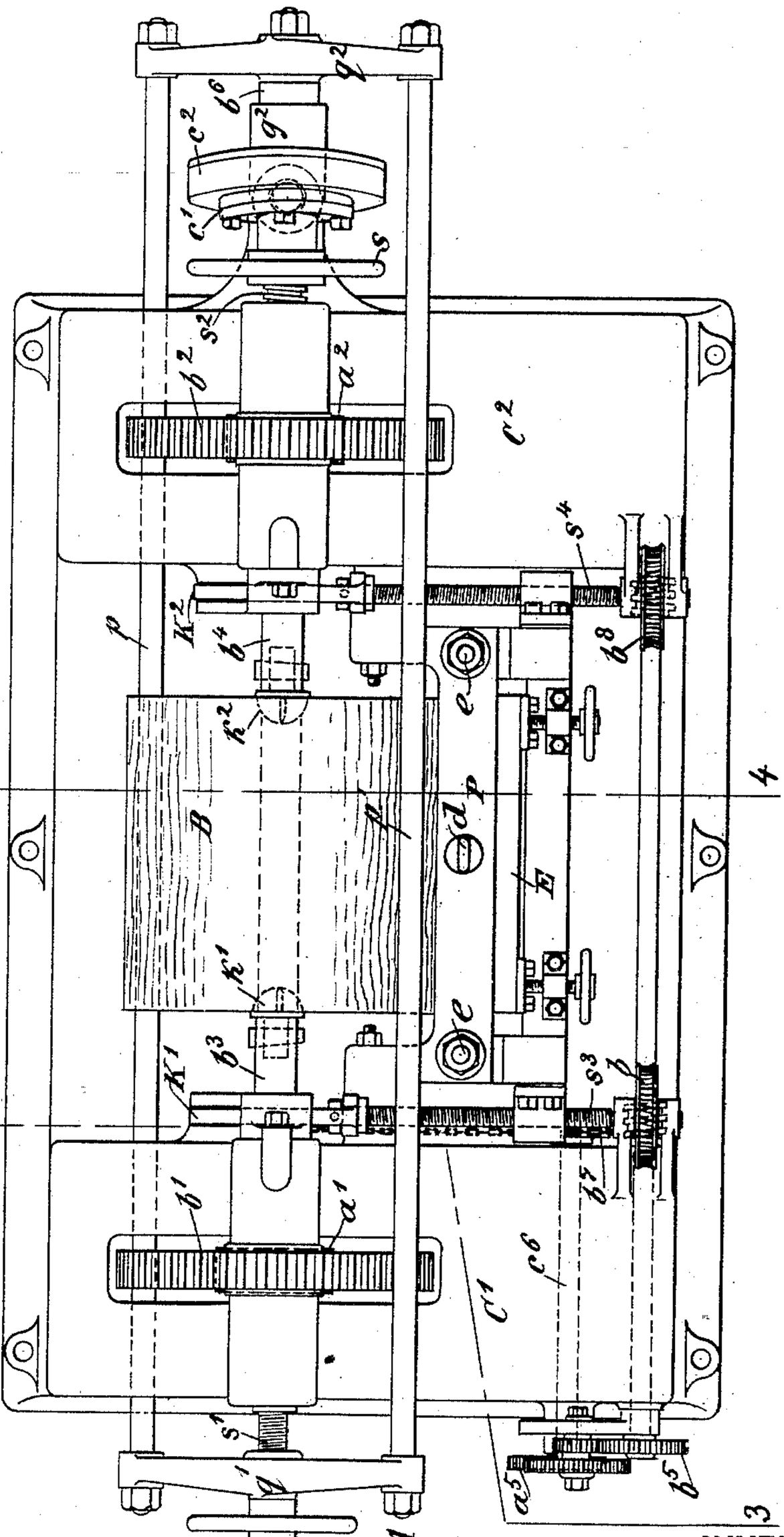
(No Model.) 4 Sheets—Sheet 2.

W. SCHRADER.

VENEER CUTTING MACHINE.

No. 468,307. Patented Feb. 2, 1892.

FIG. 2.



WITNESSES:
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INVENTOR:
Wolfgang Schrader,
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(No Model.) 4 Sheets—Sheet 3.

W. SCHRADER.

VENEER CUTTING MACHINE.

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FIG. 4.

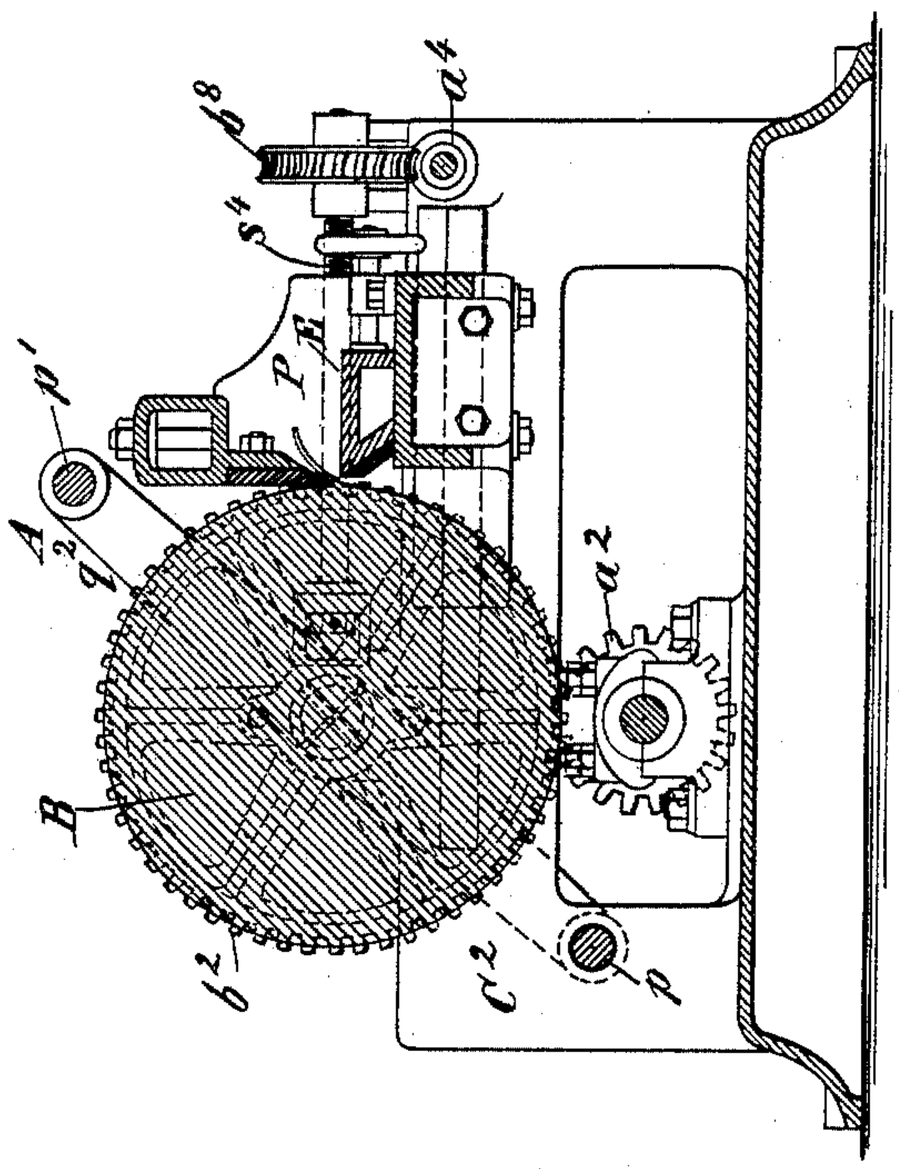


FIG. 3.

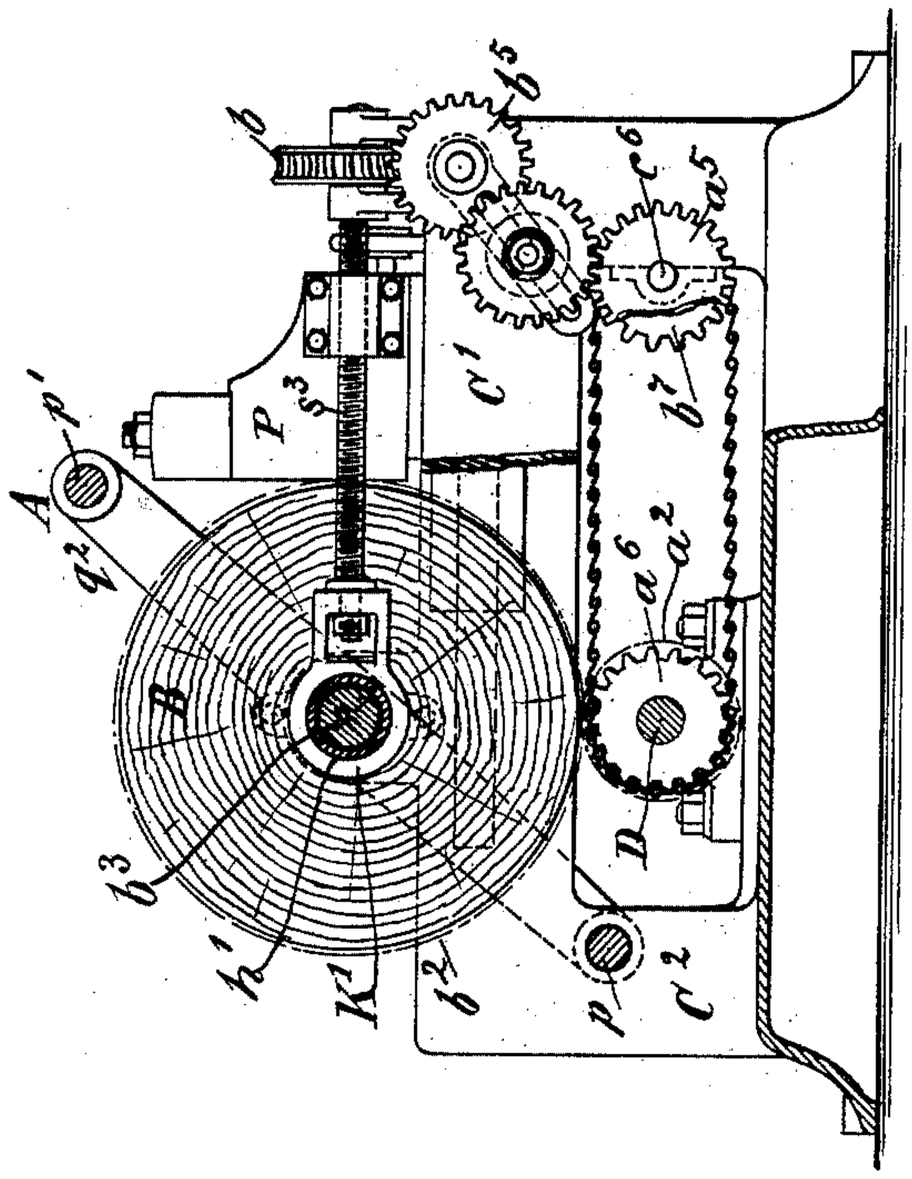
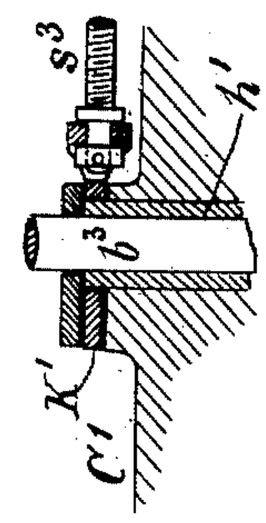


FIG. 7.



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(No Model.) 4 Sheets—Sheet 4.

W. SCHRADER.

VENEER CUTTING MACHINE.

No. 468,307. Patented Feb. 2, 1892.

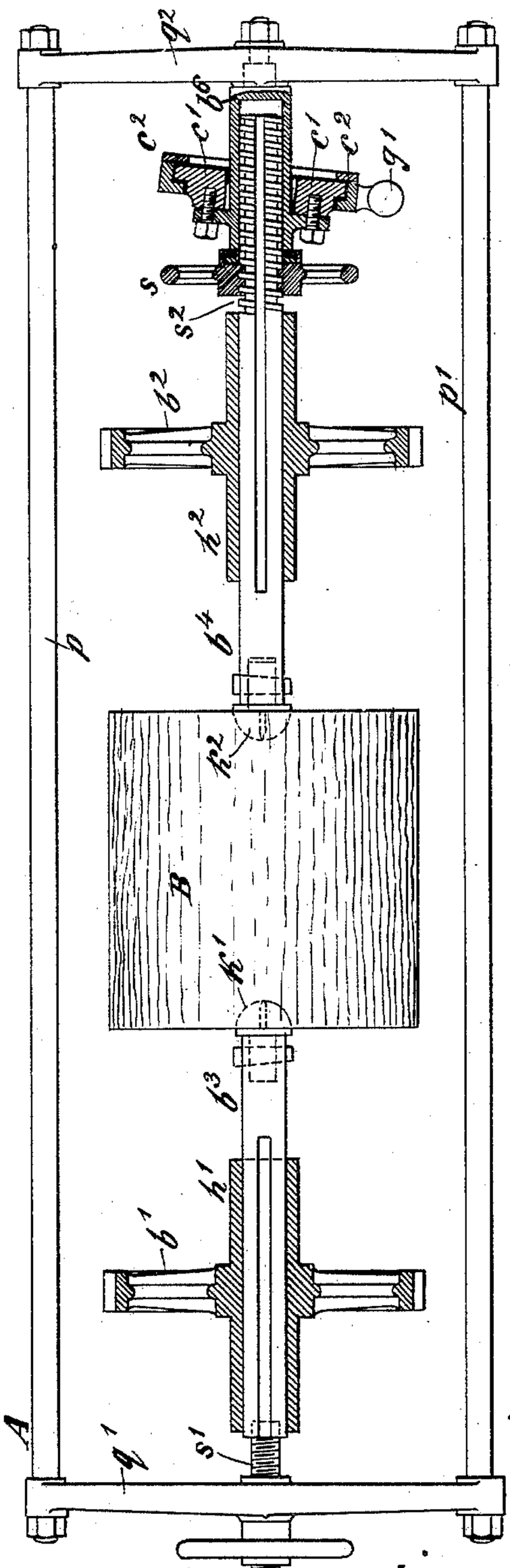

FIG. 5.

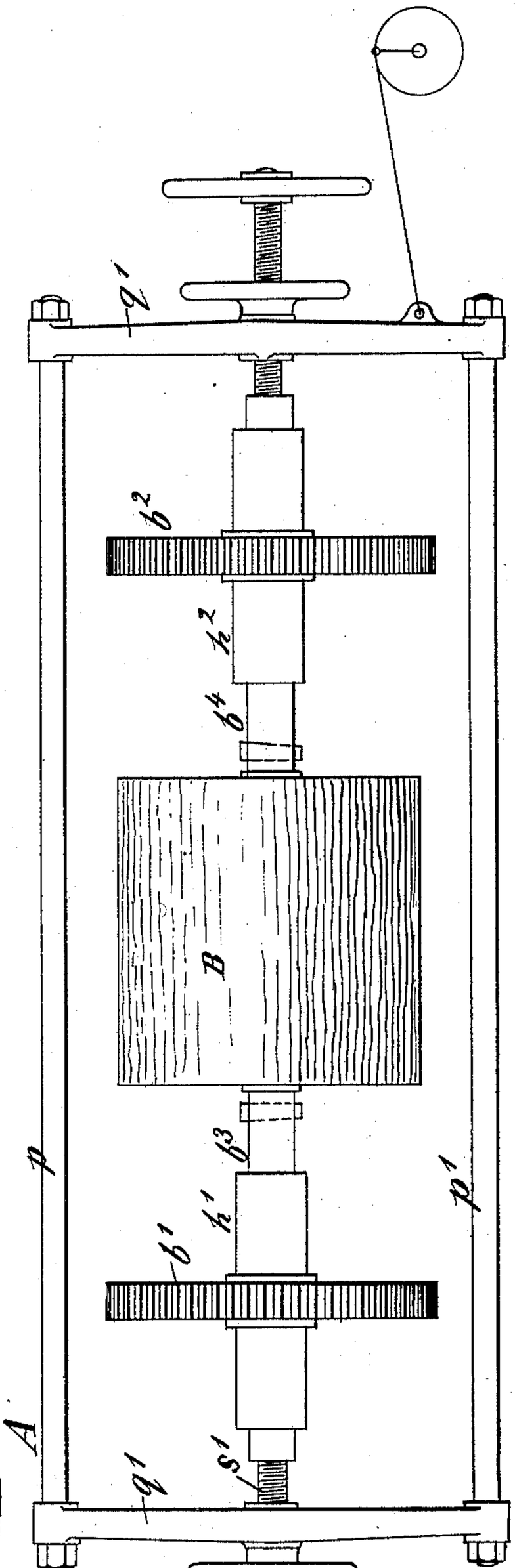

FIG. 6.

WITNESSES:
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UNITED STATES PATENT OFFICE.

WOLFGANG SCHRADER, OF BERLIN, GERMANY, ASSIGNOR TO C. L. P. FLECK & SÖHNE, OF SAME PLACE.

VENEER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 468,307, dated February 2, 1892.

Application filed November 8, 1890. Serial No. 370,828. (No model.) Patented in England May 20, 1889, No. 8,369; in Norway May 27, 1889, No. 1,761, and in Austria-Hungary January 3, 1890, No. 39,063 and No. 63,740.

To all whom it may concern:

Be it known that I, WOLFGANG SCHRADER, a subject of the King of Prussia and Emperor of Germany, residing at Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Rotary Veneer-Cutting or Wood-Paring Machines, (which have been patented in England, No. 8,369, dated May 20, 1889; in Austria-Hungary, No. 39,063 and No. 63,740, dated January 3, 1890, and in Norway, No. 1,761, dated May 27, 1889,) of which the following is a specification.

The process of cutting or paring a continuous sheet of wood, as a veneer or board, from a cylindrical block by a straight knife has been accomplished in several different ways.

The present invention is based upon that process in which the wood block rotates around its axis against the edge of the knife, the block preferably moving to and fro at the same time in a plane parallel to the knife-edge, and in which process the knife moves automatically straight forward toward the axis of the block; and the invention consists in a machine carrying out this process in a new and improved manner.

In the accompanying drawings, representing the preferred form of this new machine, Figure 1 is a front elevation, partly in section. Fig. 2 is a plan. Fig. 3 is an end elevation, partly in vertical cross-section, cut on the lines 3 3 in Figs. 1 and 2. Fig. 4 is a vertical cross-section on lines 4 4 in Figs. 1 and 2. Fig. 5 shows an elevation of the block-frame removed, looking vertically to the cross-beams, certain of the parts being in axial section. Fig. 6 is a view similar to Fig. 5, showing the block-frame and its parts removed and showing a modification of the device for oscillating the frame; and Fig. 7 is a fragmentary horizontal section of the ring-head K′ and the adjacent parts.

Referring to the drawings, let A represent the block-carrying frame; B, the cylindrical block of wood to be pared; C′ C², the head-stocks of the base of the machine; b^3 b^4, the axial spindles for the block, which are mounted in the head-stocks, and D the driving-shaft of the machine.

The block B is clamped between two axial spindles b^3 b^4 by means of claws k' k^2, fastened to the inner ends of the said spindles, which latter have their bearings in the head-stocks C′ and C². The spindles b^3 b^4, together with the block B, are rotated by the toothed gears a' b' and a^2 b^2, of which the pinions a' a^2 are mounted upon the driving-shaft D of the machine and the gears b' b^2 upon the spindles b^3 b^4.

The block B receives an oscillating or to-and-fro motion parallel to the edge of the cutting-knife by a mechanical contrivance of peculiar construction, and which may be used advantageously, with suitable variations, in other veneer-cutting or wood-paring machines. I consider this contrivance a very valuable part of my invention and claim it as such.

The spindles b^3 b^4 do not turn directly in the head-stocks C′ C², but indirectly with the sleeve-hubs h' h^2 of the wheels b' b^2, which hubs surround the spindles like a sleeve. The spindles may slide in axial direction inside the hubs h' h^2 of the wheels b' b^2, but are caused by feather and groove or any other suitable device to turn with the rotating wheels. When the claws k' k^2 are pressed tightly into the block B, they form, together with the spindles b^3 b^4, a rigid shaft or spindle or a kind of solid thrust-shaft. The spindle b^3 rests at its outer end with a central thrust-plug against the end of the screw s', the cross-beam q' of the frame A serving as a nut for this screw. From the ends of the cross-beam q' two rods p and p' extend to the ends of a second cross-beam q^2, so that the two cross-beams q' q^2, with the two rods p p', form a rigid frame A. The right-hand portion of the spindle b^4 is screw-threaded at its outer end at s^2, and a hand-wheel s works as a nut on this screw-threaded portion. This nut is coupled to a sleeve or tube b^6, closed at its outer end, at which it rests with a thrust-plug against the cross-beam q^2. The sleeve can slide along the screw-threaded end of the spindle b^4 when the hand-wheel s is turned in

either direction; but it is prevented from rotating relatively to the spindle by a feather and groove or any other suitable device.

It will readily be seen that when the block B is clamped between the spindles b^3 b^4 and within the frame A a structure in which all the forces employed are self-contained is formed, and consequently no other parts of the machine are strained by the clamping of the block B. Another advantage of this construction is that the thrust-plugs can be made of small diameter, and that they therefore cause a minimum of friction.

The rods p p' of the frame A are parallel with the axes of the spindles b^3 b^4, and one of these rods, preferably p, is connected by a sliding connection with the two head-stocks C′ C², preferably by entering bearing-holes therein, as shown in Fig. 3, so that the whole frame A can therefore be moved axially by reason of this connection and of the sliding connections of the spindles b^3 b^4, while any other movement of the frame is prevented. On the other hand, the spindles, being mounted inside the frame, as described, can rotate, together with their wheels, sleeves, and the wood block, in the locked state. The construction is such that one element consisting of the spindles and block is capable of rotary motion independently of the oscillatory or to-and-fro motion of the frame.

It is clear that the frame may be moved by any suitable mechanical construction capable of producing an oscillatory or to-and-fro motion. In the present case the following arrangement is employed: Upon the sleeve b^6 is fastened the cylindrical disk c', the geometrical axis of which is inclined to that of the spindle b^4 and in such manner that the angle of inclination can be altered from zero to any desired angle. This oblique disk is surrounded by a cylindrical ring c^2, having a ball g' loosely engaging a socket g^2 in the frame-work of the machine in such manner that the ball can be adjusted in vertical direction, but is immovable in horizontal direction. By this kind of connection the desired motion is obtained by reason of the inclination of the disk c', which in rotating within the ring c^2 with the spindles causes the frame A and everything carried thereby to move to and fro parallel with the knife; but I do not confine myself to the use of this contrivance, as any other suitable apparatus may, as above mentioned, be substituted therefor—such, for instance, as that shown in Fig. 6, which consists of a crank and pitman connected to the frame for oscillating it. To bring the knife during the cutting gradually nearer to the wood block, the knife is mounted upon a slide-rest P, which is mounted on guides carried by the head-stock C′ C² of the machine and can be shifted toward the main axis of the machine. To the slide-rest P are fixed the nuts of two screws s^3 s^4, which have their bearings in the body of the machine and are rotated by two sets of worm-wheels and worms or screws a^4 b^8 and a^3 b. These screws a^3 a^4 are driven by chain-wheel gear a^6 b^7 c^6, of which a^6 is mounted upon the driving-shaft D of the machine by means of a train of toothed gearing a^5 b^5. (See Figs. 1, 2, and 3.)

It is clear that the arrangement of gearing may be altered, and also that one or other of them may be replaced by any other kinematically equivalent thereto. For instance, instead of chain-wheels, toothed wheels may be employed; instead of toothed gearing, friction or other gear may be used.

The screws s^3 s^4 turn in bearings carried by the body of the machine, which are arranged in such manner that the strain caused by the pressure against the wood block is transferred as much as possible directly from the knife to the screws. This is accomplished by constructing the screws to transfer the strain not to the body of the machine, but to two ring-heads K′ K², engaging the above-mentioned elongated hubs h' h^2, to which ring-heads the screws are fastened at one end. The pulling force exerted by the screws s^3 s^4 is thus transferred through the hubs h' h^2, surrounding the spindles b^3 b^4, to the latter, and from them by the claws k' k^2 to the wood block. The slide-rest, the screws s^3 s^4, the spindles b^3 b^4, with their sleeves h' h^2, and the wood block B form, therefore, a closed system of kinematic links or connections in which the forces nearly compensate each other without straining materially the body of the machine.

A further peculiarity of the present machine consists in the knife-carrier being so attached to the slide-rest that it can be removed from it after loosening its two binding-screws e e, instead of, as in other similar machines, being made in one piece with the slide-rest. For removing it the knife-support is provided with a loop d, into which the hook of a tackle can be hitched. This arrangement is of great advantage, as the knife can be put in position without danger, notwithstanding the great weight of such knives. In machines as hitherto built the changing of the knives is always tedious and for the workmen a dangerous operation.

The adjusting of the thickness of the veneer or board is effected at the slide-rest by an adjustable pressure-bar E, the construction of which is so well known as to render a description unnecessary, and which is not claimed herein.

Having now particularly described and ascertained the nature of my said invention, I declare that what I claim are the following defined novel features and combinations, substantially as hereinbefore set forth, namely:

1. In a rotary veneer-cutting or wood-paring machine in which the wood block has a rotating motion around its axis, the body of the machine and the knife carried thereby constructed to have a rectilinear motion toward the axis of the block and to be fixed against longitudinal movement, in combination with a substantially rectangular clamping-frame

having spindles carrying the block, said frame constructed with a portion movably connected to said body to slide therein longitudinally parallel with the axis of said spindles and block, gearing for rotating the latter, and means for reciprocating said frame on its said connection, whereby when the block is rotated it and said frame are moved to and fro in a direction parallel to the knife-edge.

2. In a veneer-cutting or wood-paring machine in which the wood block has both an axial movement and a rotating motion around its axis, the combination, with the machine-body and the knife carried thereby, of the clamping-frame movably connected with the body of the machine longitudinally by a sliding connection and carrying the spindles and the wood block as a thrust-shaft, whereby the forces created by the clamping of the block are compensated in the frame and the frame may be shifted or not during the working without affecting the machine.

3. In a rotary veneer-cutting or wood-paring machine in which the wood block has a rotating motion around its axis, the combination, with the machine-body and the knife, of a clamping-frame for the wood block, constructed with cross-beams q' q^2, rods p p', connecting the latter together, spindles b^3 b^4, carried by said cross-beams for carrying the block, screws constructed to press the spindles against the wood block, said spindles and one of said rods being connected to said body to move longitudinally thereto and said spindles constructed to rotate independently of such longitudinal movement, driving mechanism for said spindles, and means for reciprocating said frame, whereby the pressure of the spindles against the block is transmitted through the screws to the cross-beams and resisted by the rods, thereby avoiding distortion of the machine when the block is clamped.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WOLFGANG SCHRADER.

Witnesses:
CARL T. BUROHARDT,
CHAPMAN COLEMAN.