

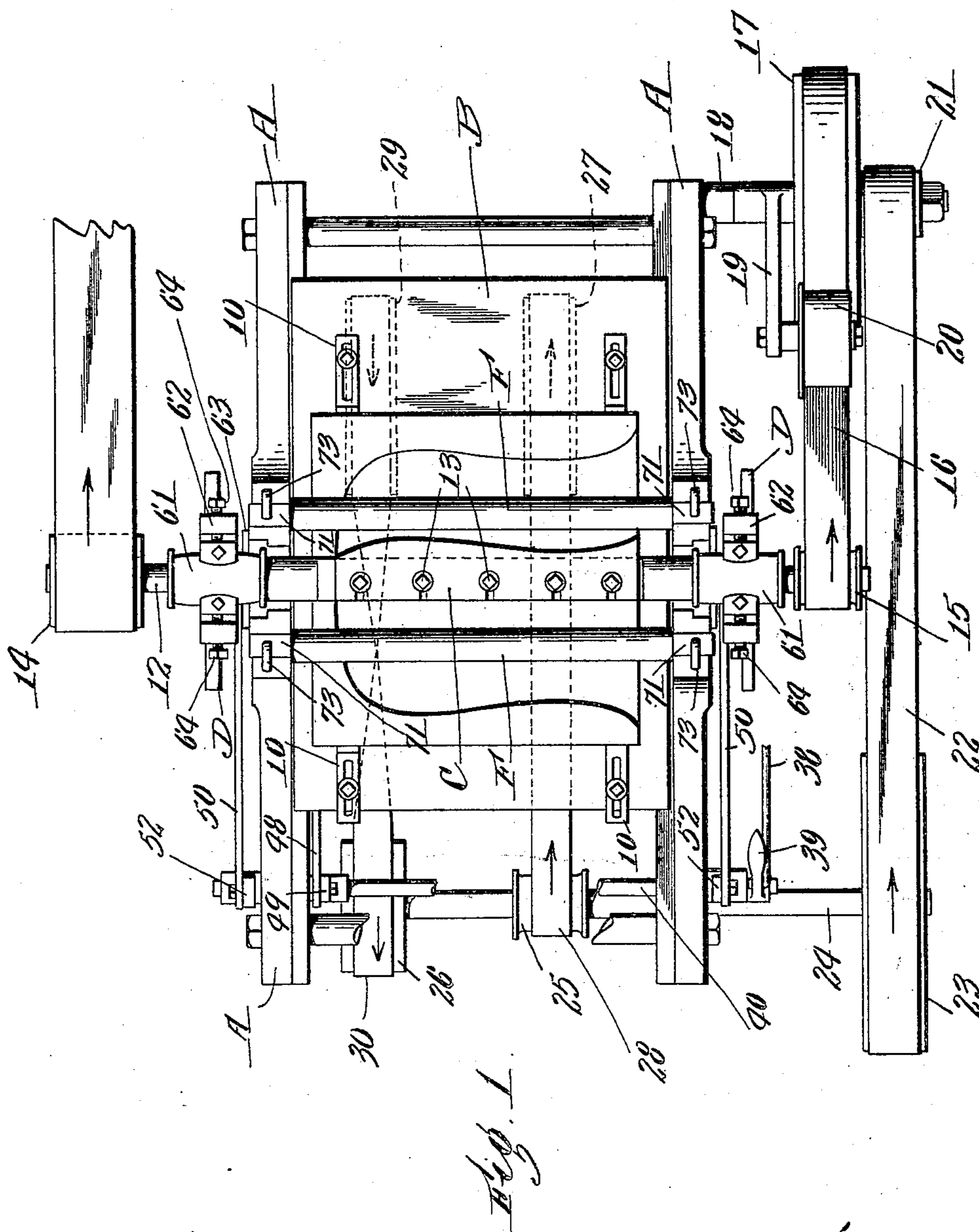
No. 886,721.

PATENTED MAY 5, 1908.

L. G. McKNIGHT.
MACHINE FOR MAKING CHAIR SEATS.

APPLICATION FILED SEPT. 30, 1906.

4 SHEETS—SHEET 1.



Witnesses:
G. F. Mason
E. M. Allen

Inventor:
L. G. McKnight
By Attorneys
Lutigate & Lutigate

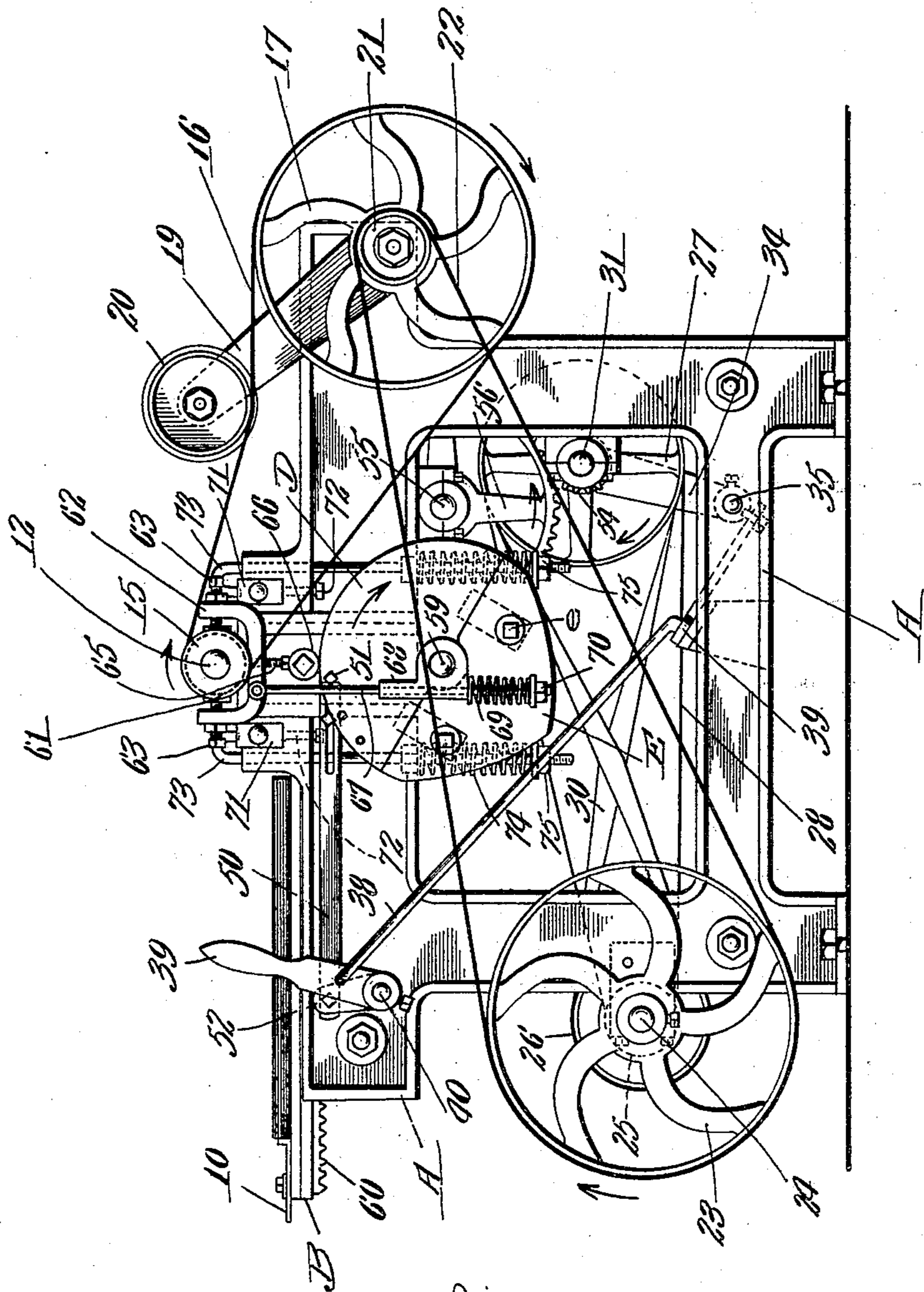
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Witnesses:
G. F. Wilson.
E. M. Allen.

Fig. 2.

Inventor:
L. G. McKnight.
By Attorneys,
Sutcliffe & Sutcliffe

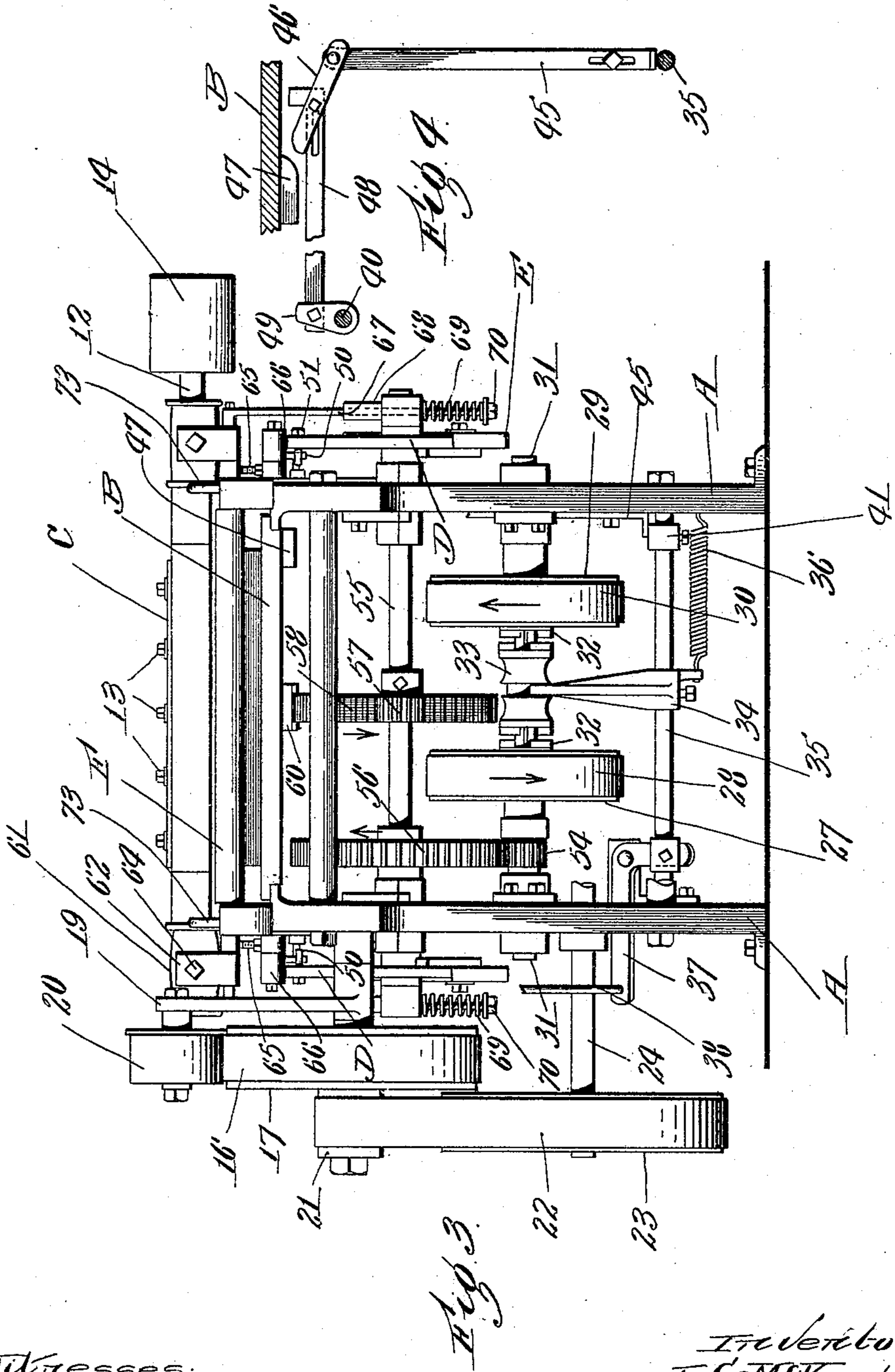
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Witnesses:
C. F. Mason.
E. M. Allen.

Inventor:
L. G. McKnight
By Attorneys.
Sutcliffe & Sutcliffe

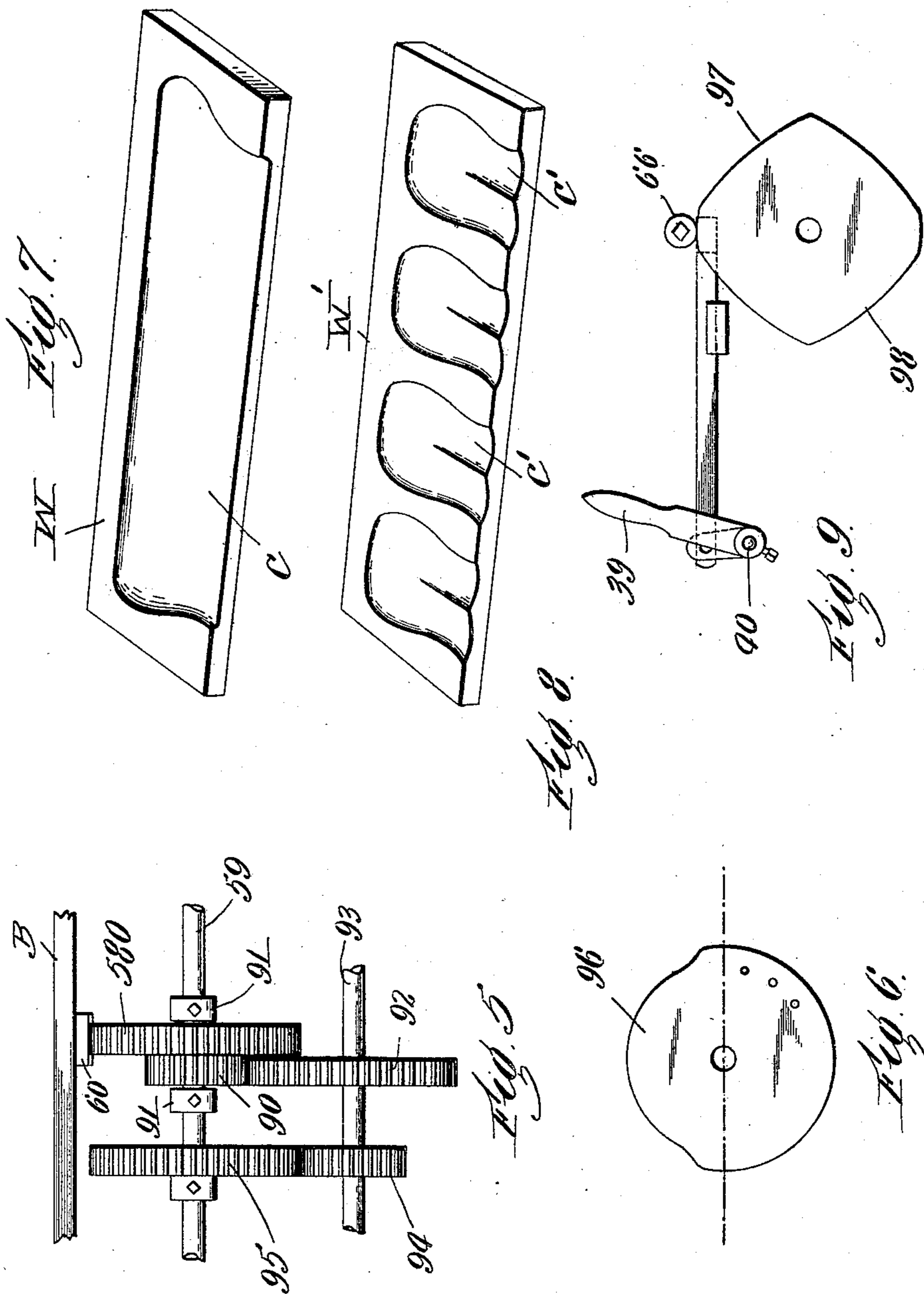
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4 SHEETS—SHEET 4.



Witnesses:

C. F. Mason.
M. E. Regan.

Inventor:
L. G. McKnight
By Attorneys
Southgate & Southgate

UNITED STATES PATENT OFFICE.

LEVI G. McKNIGHT, OF GARDNER, MASSACHUSETTS.

MACHINE FOR MAKING CHAIR-SEATS.

No. 886,721.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed September 30, 1905. Serial No. 280,756.

To all whom it may concern:

Be it known that I, LEVI G. McKNIGHT, a citizen of the United States, residing at Gardner, in the county of Worcester and State of Massachusetts, have invented a new and useful Machine for Making Chair-Seats, of which the following is a specification.

The object of this invention is to provide a new and improved machine for cutting out wooden chair or settee seats.

The particular aim of the invention is to provide a simple and efficient apparatus for this purpose by which work can be produced with great rapidity and by which the same is done under the full inspection and control of the operator.

A machine constituting one embodiment of this invention is illustrated in the accompanying four sheets or drawings, referring to which,

Figure 1 is a plan view of the machine. Fig. 2 is a side elevation thereof. Fig. 3 is a rear elevation thereof. Fig. 4 is a detail hereinafter referred to. Fig. 5 is a detail view showing a modified form of gearing to be used when the cam shaft is to be turned more slowly to make settee seats. Fig. 6 is a detail view showing the shape of cam for cutting a settee seat. Fig. 7 is a perspective view showing one form of settee seat which can be made. Fig. 8 is a perspective view showing a second form of settee seat which can be made, and Fig. 9 is a detail view showing the shape of cam used in cutting the form of settee seat shown in Fig. 8.

The invention will best be understood by describing the details and the operation of the machine illustrated.

In detail, A designates a suitable frame. Fitted so as to be capable of a reciprocating motion thereon is a table or work-holder B. This table has suitable clamps 10 by which the block or blank which is to be formed into a chair-seat can be clamped or laid in place thereon.

12 designates a cutter-shaft which has a cutter C removably secured thereto. This construction is adapted so that cutter blades of different shape may be employed, depending upon the contour or shape which is to be given to the particular chair-seat. The removable cutter blade C is held to said shaft by screws or bolts 13. A pulley 14 is arranged on the end of said shaft 12 and power

may be applied to the machine by a belt trained around said pulley. On the other end of the shaft 12 is arranged a pulley 15 which connects by a belt 16 to a pulley 17 journaled on a stud 18 projecting from the framing. Pivoted on said stud is an arm 19 which carries a belt tightener 20 which rests on the belt 16 so as to keep the same under constant tension. Turning with the pulley 17 is a small pulley 21 which connects by a belt 22 to a pulley 23 mounted on a counter-shaft 24. Arranged on this counter-shaft 24 is a small pulley 25 and a large pulley 26. A pulley 27 is driven from the pulley 25 by means of an open belt 28, and a pulley 29 is driven from pulley 26 by means of a cross-belt 30. By this arrangement the pulleys 27 and 29 will turn oppositely.

The pulleys 27 and 29 as shown in Fig. 3, are loosely arranged on a shaft 31, and have opposing clutch teeth 32. The shaft 31 has a key-way cut therein, and keyed and fitted to slide axially on said shaft is a double-clutch 33. This clutch normally can stand in position to clear the clutch teeth on the pulleys 27 and 29, but can be moved to engage the clutch teeth of either pulley. The double clutch 33 is controlled and operated by an operating arm 34 which is notched at its upper end and which engages a groove in said double clutch. The operating arm 34 is adjustably secured on a rod 35 which is fitted so as to be capable of an axial movement in the framing. The rod 35 is normally moved to the right, as shown in Fig. 3, by a spring 36 connected between the arm 34 and the framing. A bell-crank lever 37 is pivoted to a bracket extending in from the framing and to a block fitted on the rod 35. The outwardly projecting end of the bell-crank lever 37 is connected by a link 38 to an operating handle 39. The operating handle 39 is secured on a shaft 40 journaled in the framing.

A block 41 is adjustably secured on the rod 35. A catch-rod 45 as shown in Fig. 4 is arranged in suitable bearings and on a bolt secured in the framing, so as to be capable of a vertical motion. This catch-rod is arranged in motion to drop in behind the block 41 and hold the double-clutch 33 in its left-hand position. A link 46 is pivoted to the framing and connected to said catch-rod 45. A cam 47 is arranged on the under side

of the table to engage said pivoted link 46. A rod 48 is arranged to slide horizontally under the table and is connected to an arm 49 secured on the handle-shaft 40. Fitted
 5 to slide on bolts screwed into the framing are rods 50—50 which connect to arms 52—52 secured on the handle-shaft 40. A pin 51 is arranged in each of the cams D, hereinafter referred to, in position to engage the end of
 10 one of the rods 50. The rods 50 also serve to hold the cutter up out of operative position during the return of the work-carriage by engaging beneath the rollers 66 which are normally supported by the shaping cams
 15 hereinafter referred to. A pinion 54 is secured on the shaft 31. An intermediate shaft 55 is journaled in the framing and carries a gear 56 with which the pinion 54 meshes. Also arranged on the intermediate
 20 shaft 55 is a pinion 57 which meshes with a gear 58 secured on a shaft 59 which I term the cam-shaft. This gear 58 meshes with a rack 60 secured on the under side of the table B. By this construction, as hereinafter described, the table will be reciprocated back
 25 and forth.

The cutter-shaft 12 is journaled in boxes 61 pivoted in supports 62, which latter are fitted so as to be capable of vertical motion
 30 in the framing and which are held in place by gibs. The boxes 61 are held in said supports laterally by screws 63, whereby the position of the boxes can be adjusted. Threaded into the bottom of each support is a screw
 35 65. Each of these screws rests on a projection adjustable vertically in each support, and extending out therefrom. A roller 66 is arranged in line with each of said projections, and these rollers bear on cams D—D ar-
 40 ranged on the ends of the cam shaft 59 during the operating or cutting part of the stroke, and are supported on the rods 50 during the idle or return part of the stroke. Each cam D has a removable face E which
 45 forms an operative section thereof, the remaining section of the cams being circular. These removable faces E are held in place by bolts or screws *e*. By this arrangement, different faces can be used on the cams to
 50 give different shapes to various kinds of work. A rod 67 is connected to each support and each rod extends down through a guide 68 pivoted on the cam-shaft 59. A spring 69 is arranged upon each rod and the
 55 tension of these springs can be adjusted by nuts 70. By this arrangement, the rollers 66 will be held to the cams D by a spring tension. Rollers F—F are arranged one at each side of the cutter C. These rollers F—F are
 60 journaled in boxes 71 which are fitted so as to be capable of vertical motion in the framing. The lowest position of these boxes is controlled by screws 72. Rods 73 are fitted so as to slide vertically in the framing
 65 and the end of each of these rods is bent

around in the form of a hook to engage the top of its box 71. A spring 74 is arranged on each of these rods and the tension of these springs can be adjusted by nuts 75 arranged on the lower ends of the rods 73.
 70 In this way the rollers are held down with a spring tension.

The operation of the mechanism is as follows: The cutter C and cam faces E—E, which are adapted for the particular work
 75 desired, are placed in the machine. The operator usually stands at the left-hand of the machine, as shown in Fig. 2. The table is stopped in its extreme left-hand position. The work or blank is placed in the clamps
 80 10. The operator then pulls the handle 39 towards him. This moves the double-clutch 33 to the left, as shown in Fig. 3, and causes the double-clutch to engage the clutch teeth of the pulley 27. This, by means of
 85 the gearing before described, will cause the table to move forward or to the right, as shown in Fig. 2. This movement will pass the work under the cutter C which is revolving at a high rate of speed. As this move-
 90 ment takes place, the cutter-shaft will be raised and lowered by the cams D so that the work will be given the proper shape, the shape of the cutter blades and the contour of the cams being designed to cut a chair seat
 95 of any desired pattern. When the double-clutch 33 is moved to the left, to cause the table to move forward, the sliding catch-rod 45 drops in behind the adjustable block 41 and holds the clutch in engagement and
 100 when the work is passed under the cutter and the table reaches its right-hand extreme, the cam 47 on the table will engage the pivoted link 46 which will raise the catch-rod 45 clear of the block. The spring 36 will now throw
 105 the rod 35 and hence the double-clutch 33 to the right and this action will be helped by the cam engaging the rod 48. This movement of the double-clutch 33 to the right will cause the same to engage the clutch teeth on the
 110 pulley 29. When this engagement takes place the motion of the table will be reversed as the pulley 29 is turning oppositely relatively to the pulley 27 and the table will be returned, which return movement will be
 115 quicker than the forward or feed movement, as the pulley 26 is larger than the pulley 25. Although the motion of the cam-shaft is reversed during the idle or return stroke of the bed, the cutter will be held up out of contact
 120 with the work by the engagement of the cam-rolls 66 with the rods 50. As the table reaches the end of its return movement, the pins 51 on the cams D will push on the end of the rods 50 and will move the double-clutch
 125 to its middle or inoperative position, as shown in Fig. 3. This movement will leave the operating handle 39 in position to be pulled to the left, as shown in Fig. 2, for the next operation. The operator then removes
 130

the finished chair-seat and puts in a new block and proceeds as before. The spring-pressed rolls F—F tend to keep the work rigidly down on the table while it is acted upon by the revolving cutter C. By this arrangement it will be seen that all the operator has to do after putting the work in place, is to pull the handle, when the work will be fed forward and returned and automatically stopped in position to be removed.

In addition to cutting single chair-seats a machine constructed according to this invention is also well adapted for cutting or molding settee seats of various forms. This may be done by using a long work-carriage and either turning the shaping cams at a slower speed relatively to the feed of the carriage, as shown in Figs. 5 and 6, or by using a double-cam, as shown in Fig. 9.

Referring to Fig. 5, a driving pinion 580 corresponding to the driving pinion 58 instead of being fastened to the cam-shaft 59 is made integral with a smaller gear 90, and is secured longitudinally in place on the cam-shaft 59 by collars 91, said double-gear formed by parts 580 and 90 being free on the shaft 59. Meshing with the gear 90 is a larger gear 92 on a counter-shaft 93. Also fastened on the countershaft 93 is a gear 94 meshing with a larger gear 95 on the cam-shaft 59. In the particular construction illustrated, the gear 90 is one-half the size of gear 92, and gear 94 is one-half the size of gear 95, so that the cam-shaft 59 is turned at one-quarter the speed of the table operating gear 580. When this arrangement of gearing is employed, a cam 96, shown in Fig. 6, may be employed for cutting the form of settee seat W shown in Fig. 7, which seat W has a molded-out portion C of uniform depth. With this modified form of gearing the same automatic reversing mechanism may be employed, it being noted merely that the cams are turned at one-quarter the speed that is used when single saddle seats are molded.

In order to employ a machine constructed according to this invention to cut a settee seat, such as W', shown in Fig. 8, with a series of separate molded-out seats C', it is simply necessary to use the form of cam illustrated in Fig. 9, which has two similar operating faces 97 and 98. When this form of cam is used the pinion for operating the automatic reversing devices is omitted, and the reversing handle will be operated by hand to reverse the feed whenever the cam-rollers are on the high points of the cam, two revolutions of the cam-shaft being permitted when a four division settee-seat is to be molded, as shown in Fig. 8, and a corresponding increase of revolutions being permitted according to the length of the seat which it is desired to shape. Thus a simple and efficient apparatus for the purposes mentioned is provided which has a great range of adjustment.

The details and arrangements herein shown and described may be greatly varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a wood-working machine, the combination of a work table, means for reciprocating the table, a reversing clutch, a sliding rod for operating the reversing clutch, a block adjustably secured on said rod, a catch rod adapted to move into position to engage said block so as to prevent the motion of said sliding rod for reversing the clutch, said catch rod being reciprocable at an angle to the direction of motion of said rod, a link pivoted to said catch rod, a sliding rod with which said link is also pivotally connected, and a cam on the table for engaging said link to move the catch rod at a certain position on the table, whereby the first mentioned sliding rod may be left free to move.

2. In a wood-working machine, the combination of a moving table, a reversing clutch therefor, means for operating said reversing clutch, a catch rod slidably mounted and adapted to move into position to prevent the reversing of the clutch, a link pivoted to said catch rod, a shaft, a sliding rod connected with said shaft to be operated thereby, said rod having a slot, said link being pivotally connected with said rod through said slot, a handle on said shaft for operating it, and a cam on the work table for engaging said link and moving the catch rod out of operative position.

3. In a wood-working machine, the combination of a frame, a set of vertically movable supports thereon, boxes pivotally mounted in said supports, cutter shafts journaled in said boxes, a work table, a cam for vertically moving said supports, a shaft on which said cam is located, a rod connected with said supports, a guide for said rod supported by said shaft, and a spring located between said guide and the end of said rod for drawing the support onto the cam.

4. In a wood-working machine, the combination of a frame, a set of movable supports thereon, a cutter shaft supported by said supports, a work table movable under said cutter shaft, a cam shaft, a cam thereon, a guide on the cam shaft, a rod passing through said guide and connected with said supports, and a spring on said rod for forcing the supports toward the cam.

5. In a wood-working machine, the combination of a bodily movable cutter, a work table movable thereunder, means for raising the cutter, a pin moving with said means, a rod adapted to support the cutter when the cutter is not supported by said means for raising it and located in a position to be en-

gaged by said pin, and means adapted to be operated by said rod for stopping the machine.

6. In a machine for making seats, the combination of a cutter, a reciprocating work-table, a cam for moving the cutter while the work-table is on its forward stroke, and means for supporting the cutter out of connection with the cam during the return stroke.

7. In a machine for making seats, the combination of a cutter, a reciprocating work-table, a cam, a projection or roller engaged by the cam to move the cutter while the work is being presented thereto, and means for supporting the cutter to hold the projection or cam-roller out of engagement with its cam during the return stroke of the table.

8. In a machine for making seats, the combination of a cutter, a reciprocating work-table, cams, projections or cam-rolls supported by said cams for moving the cutter while the work is being presented thereto, a reversing handle, and connections operated therefrom for reversing the travel of the carriage, and supporting rods engaging the projections or cam-rolls and holding the same out of engagement with their cams during the return movement of the bed.

9. In a machine for making seats, the combination of a cutter, a reciprocating work-table, cams turning in one direction while the table is on its forward stroke, and in the other direction while the table is on the return stroke, said cams serving to move the

cutter while the work is being presented thereto, and means for supporting the cutter out of connection with the cams while the work is on its return travel.

10. In a wood working machine, the combination of a bodily movable cutter, a work table, means for moving the work table under the cutter, means for raising and lowering the cutter during the operation of the work table, a reversing clutch, a rock shaft, means for connecting the rock shaft with the reversing clutch, a rod connected with the rock shaft and adapted to hold the cutter elevated during part of the stroke of the work table, and means connected with the cutter raising and lowering device for moving the said rod to rock the shaft and stop the motion.

11. In a wood working machine, the combination of a bodily movable cutter, a work table movable thereunder, a cam, means operable by said cam for raising the cutter, a pin on the cam, a sliding rod adapted to support the cutter when the cutter is not supported by the cam and located in a position to be engaged by said pin, and means operable by said rod for stopping the motion.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

LEVI G. McKNIGHT.

Witnesses:

PHILIP W. SOUTHGATE,
E. M. ALLEN.