

No. 688,512.

Patented Dec. 10, 1901.

A. M. HALL & C. C. STUART.

SANDPAPERING MACHINE.

(Application filed Mar. 15, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

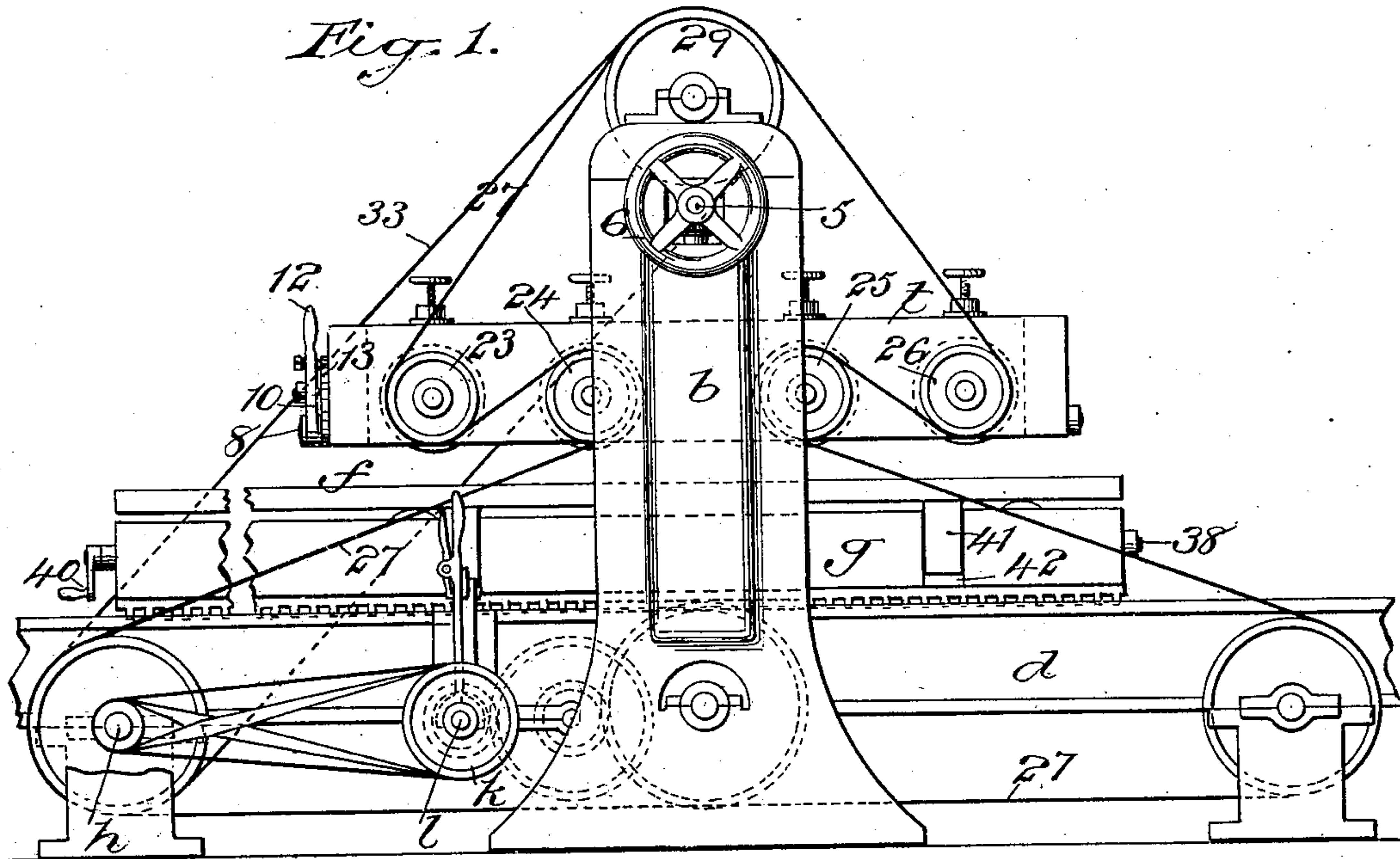
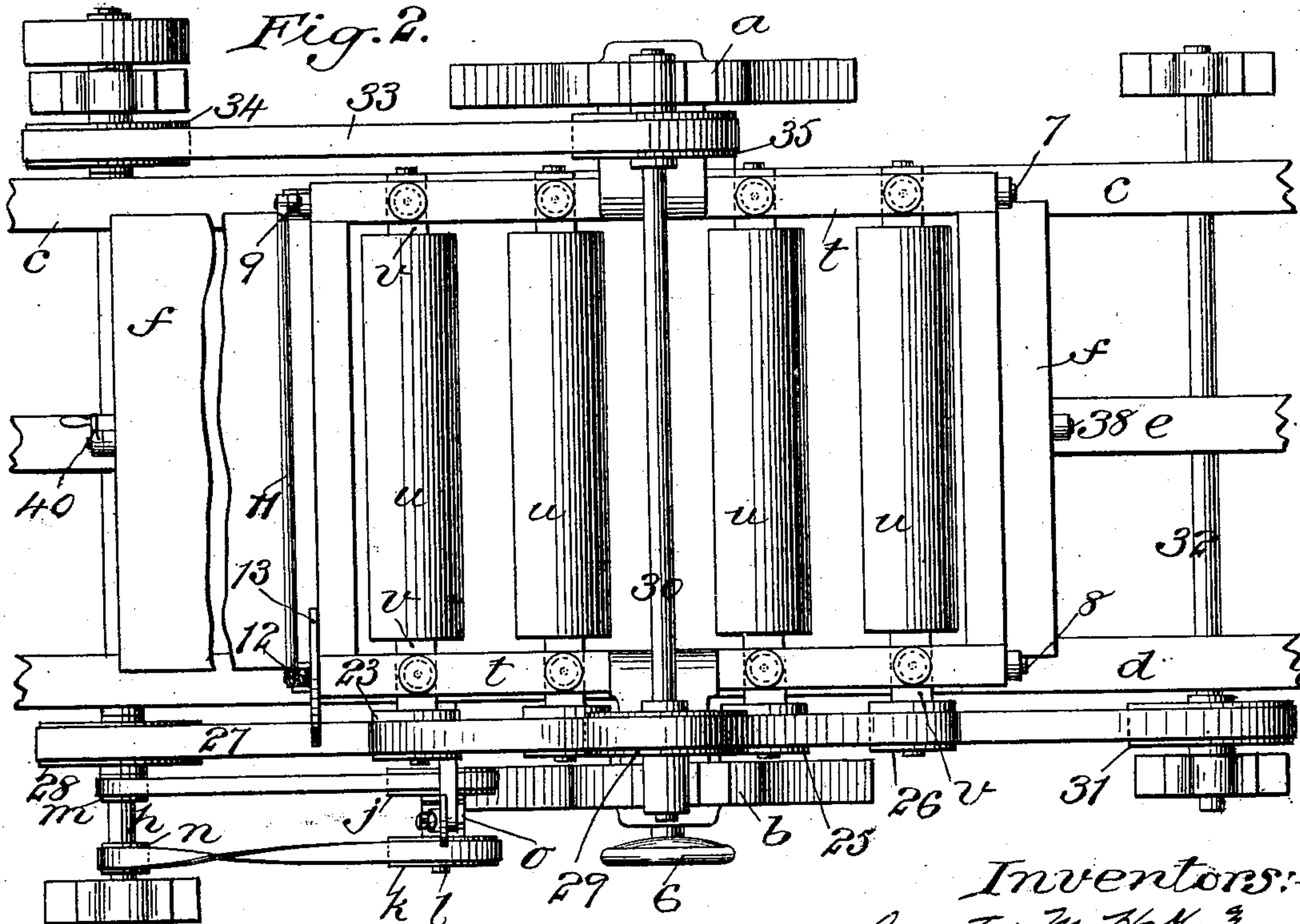


Fig. 2.



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3 Sheets—Sheet 2.

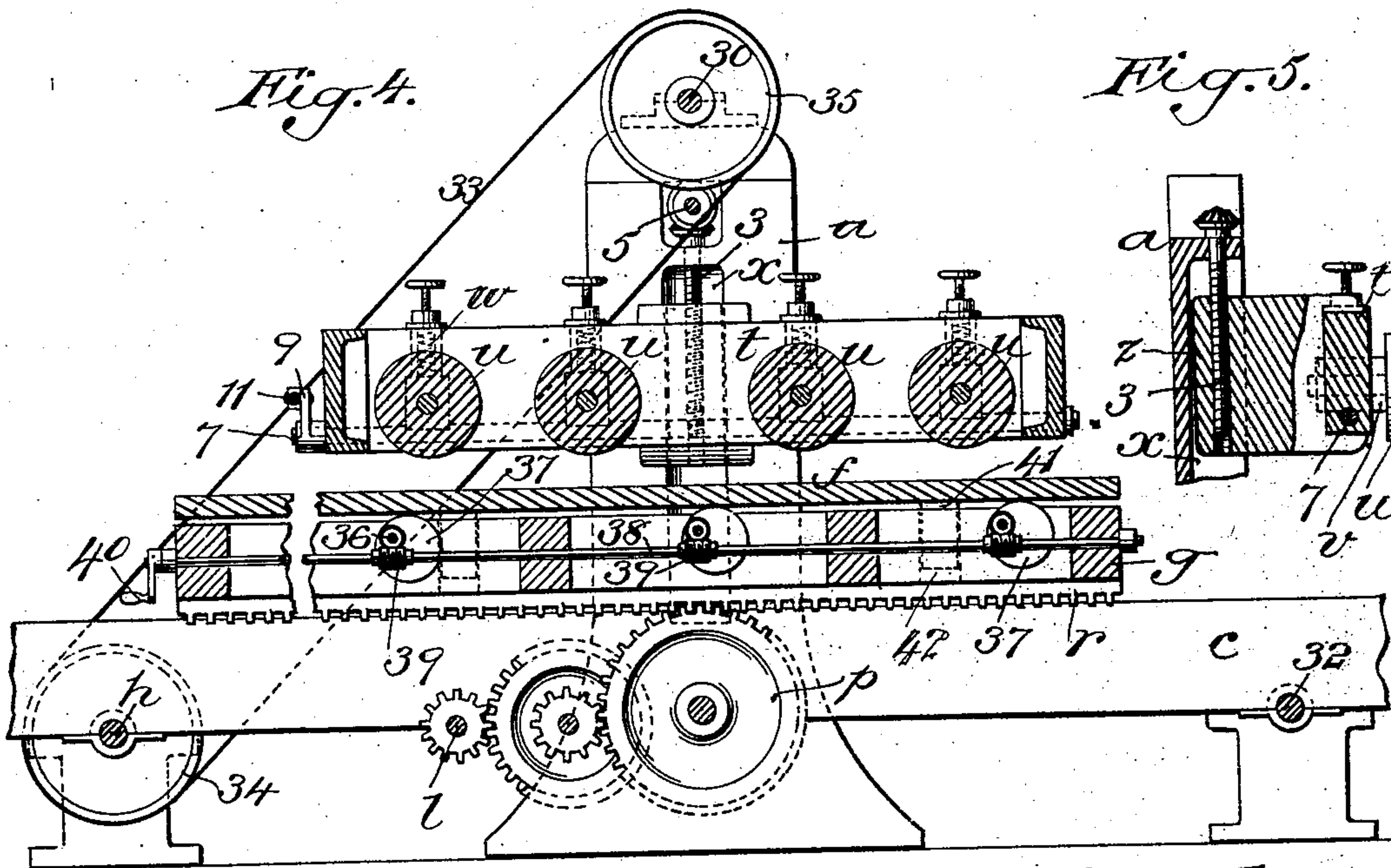
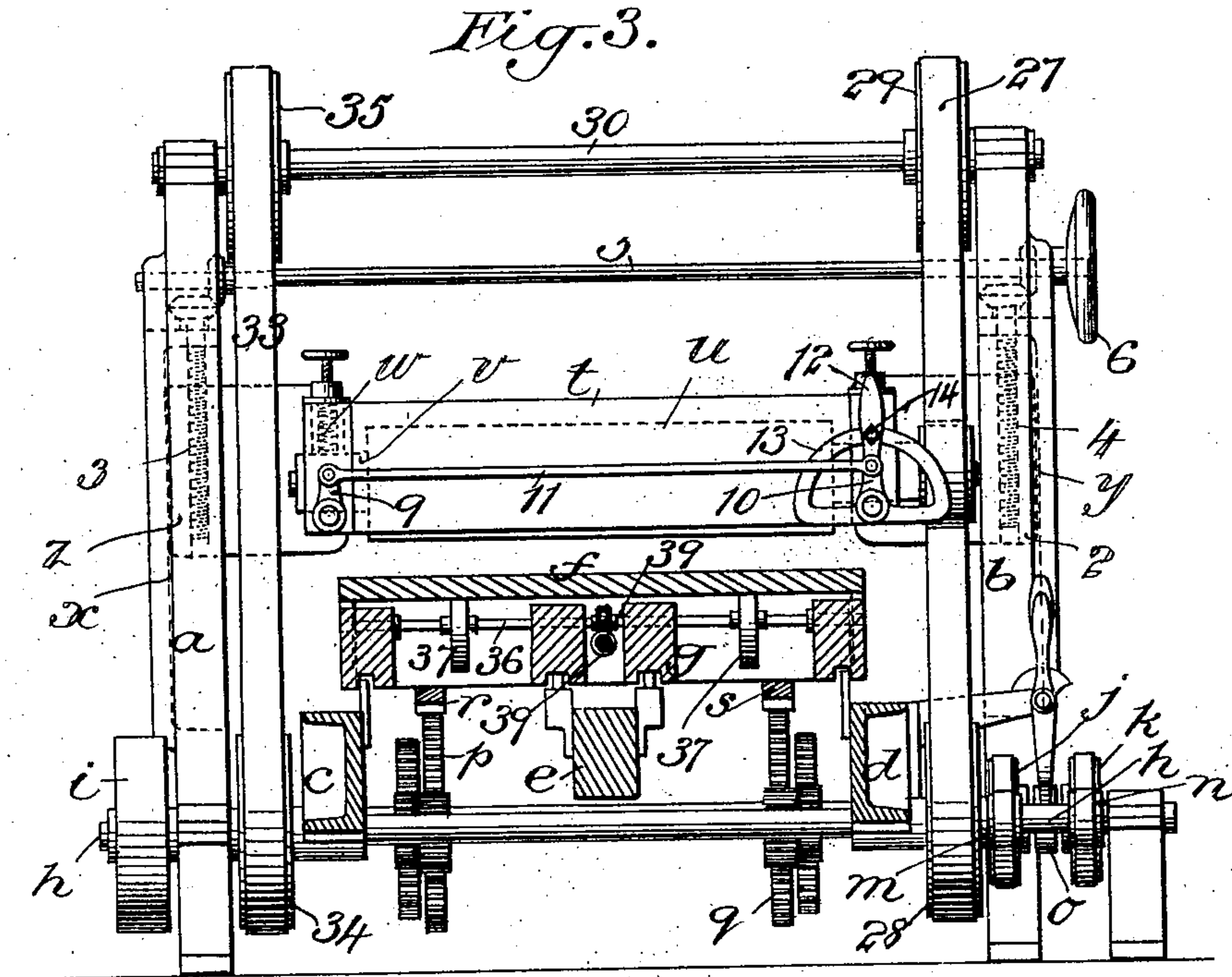
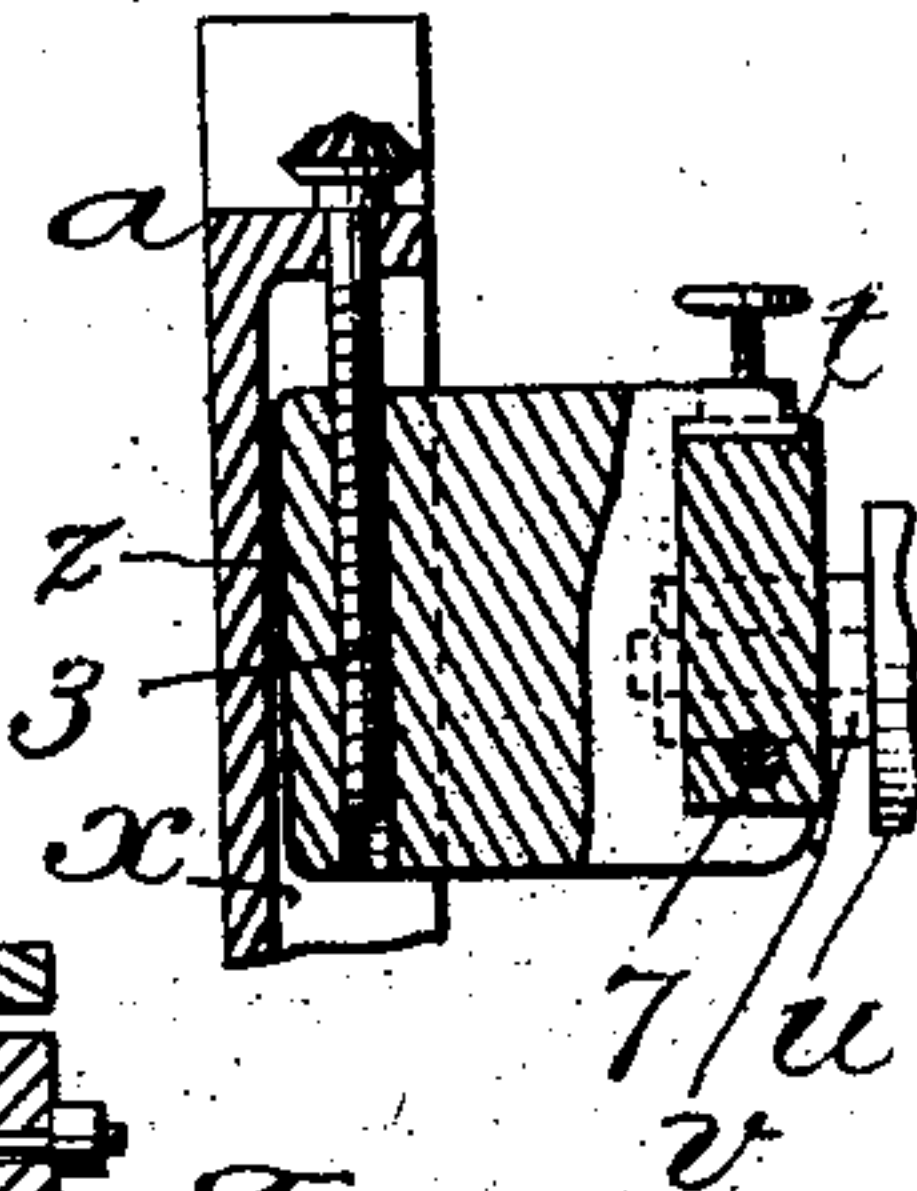


Fig. 5.



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(No Model.)

3 Sheets—Sheet 3.

Fig. 6.

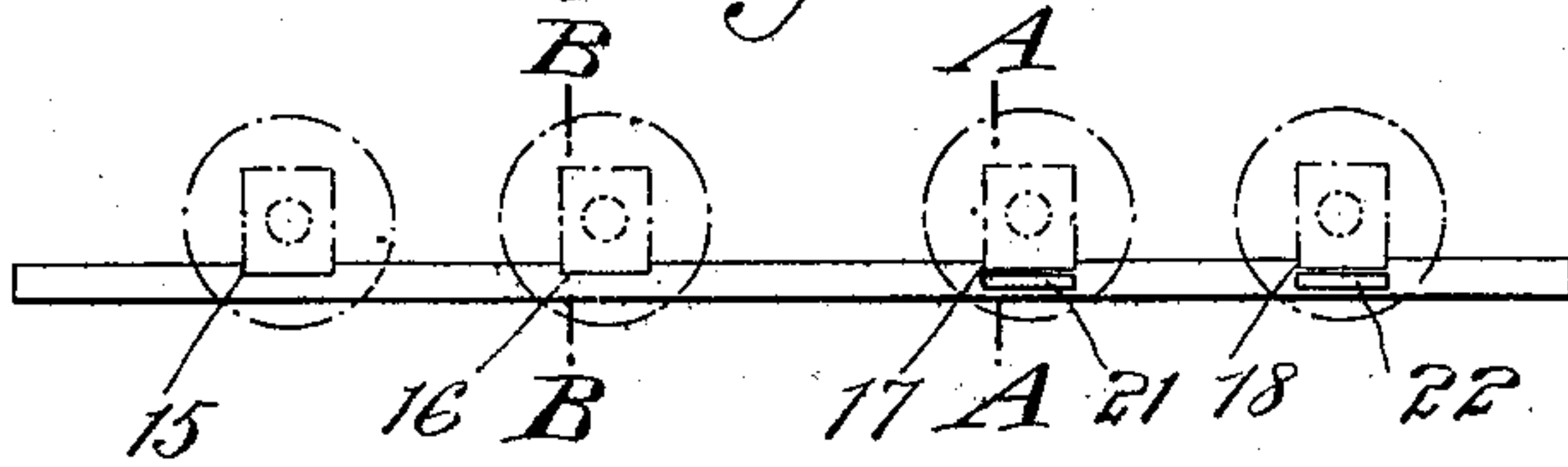


Fig. 7.

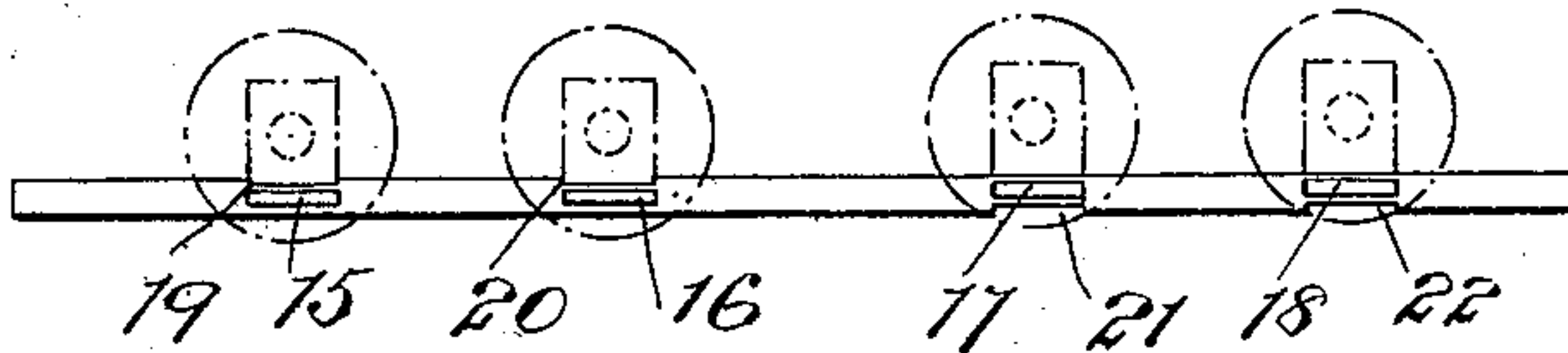


Fig. 8.

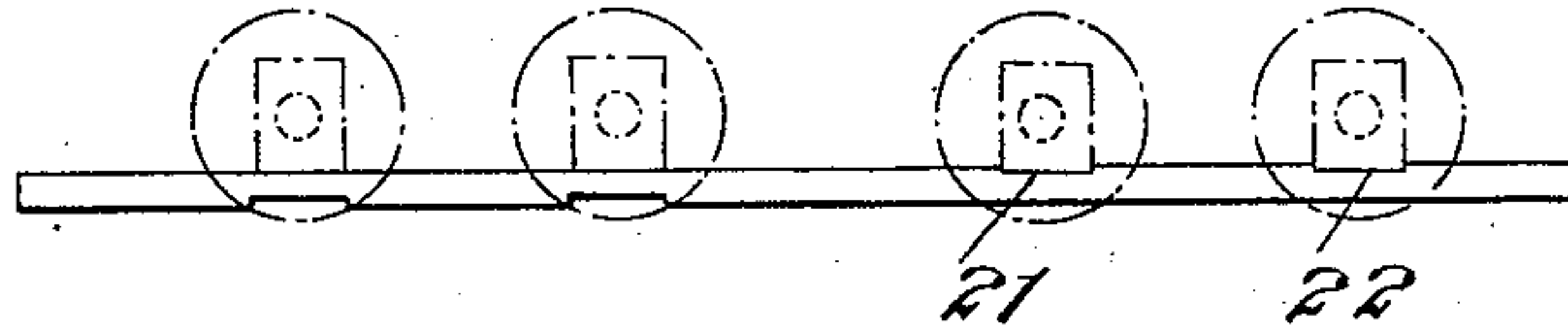


Fig. 9.

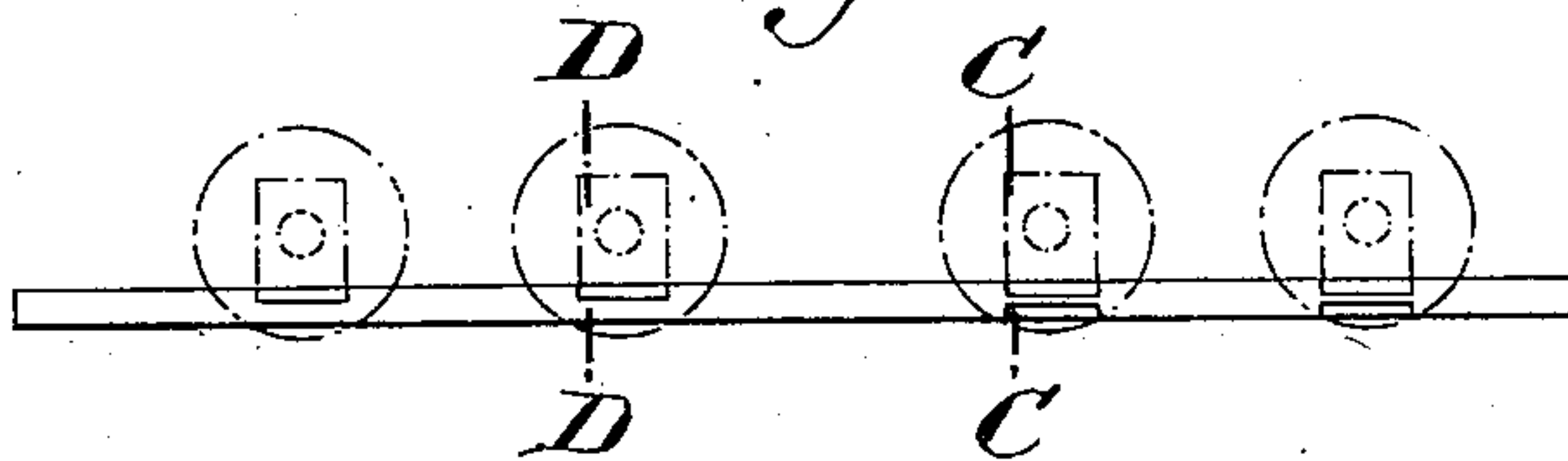


Fig. 10.

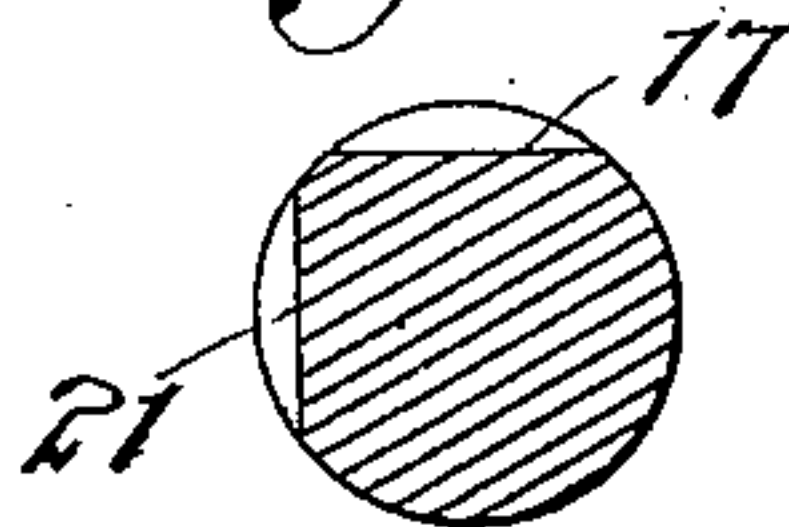


Fig. 11.

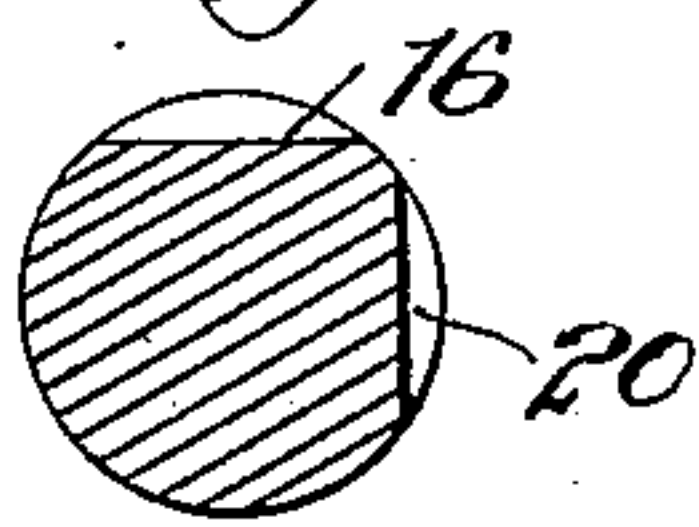


Fig. 12.

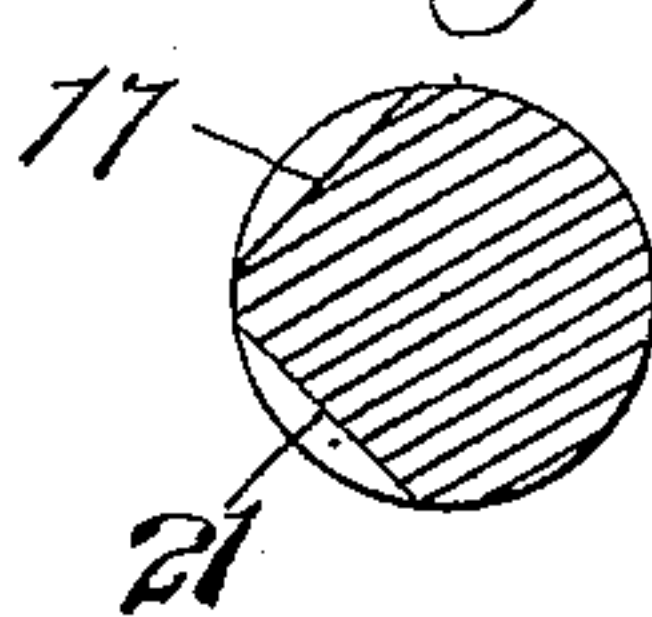


Fig. 13.

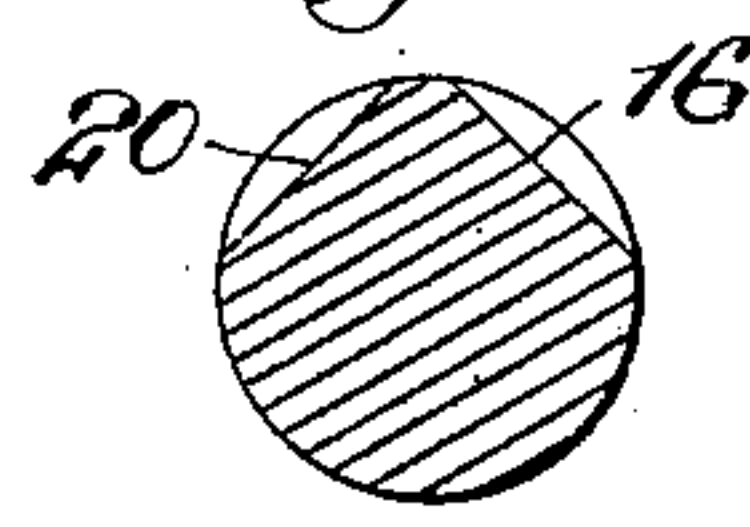


Fig. 14.

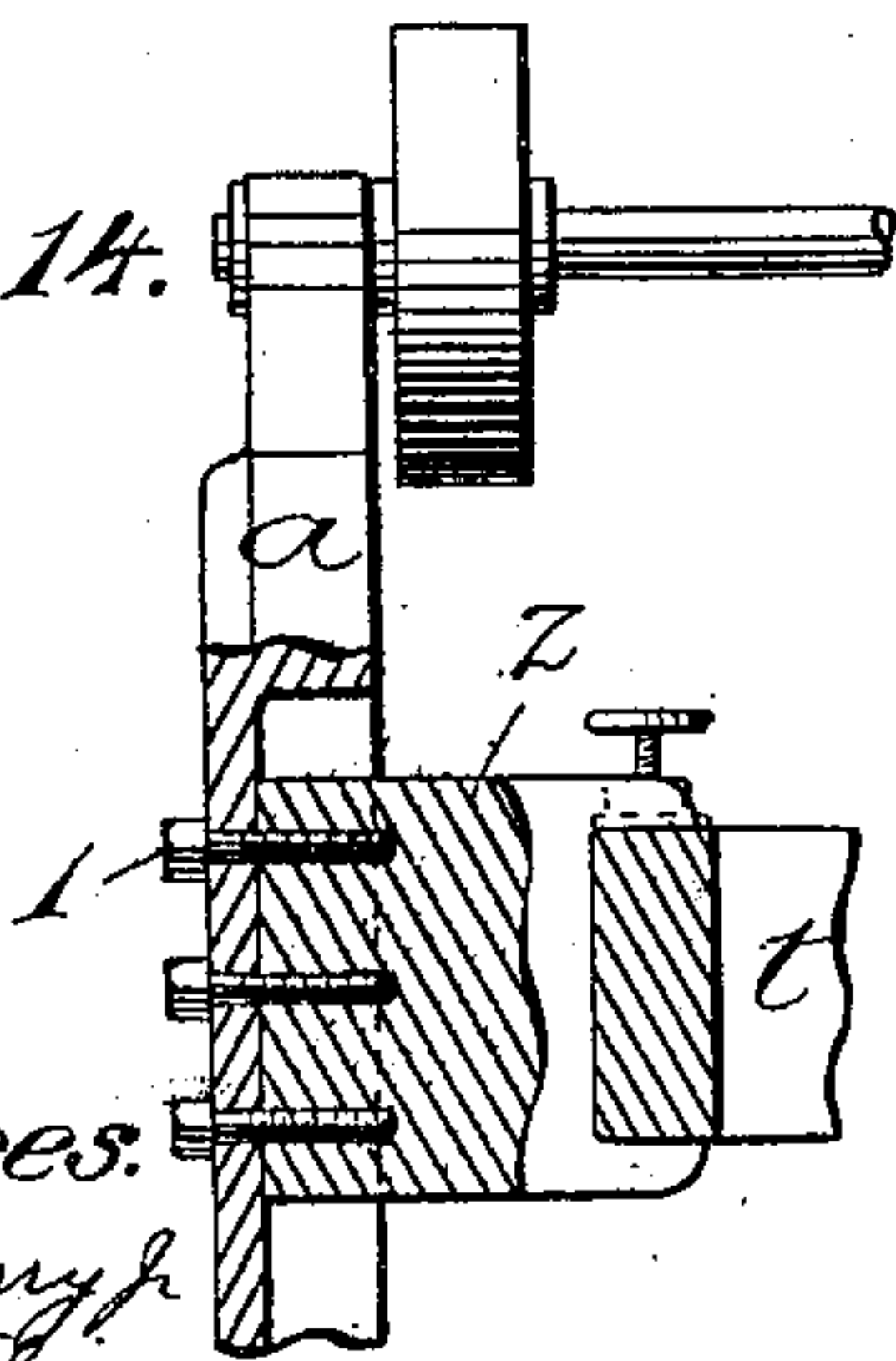
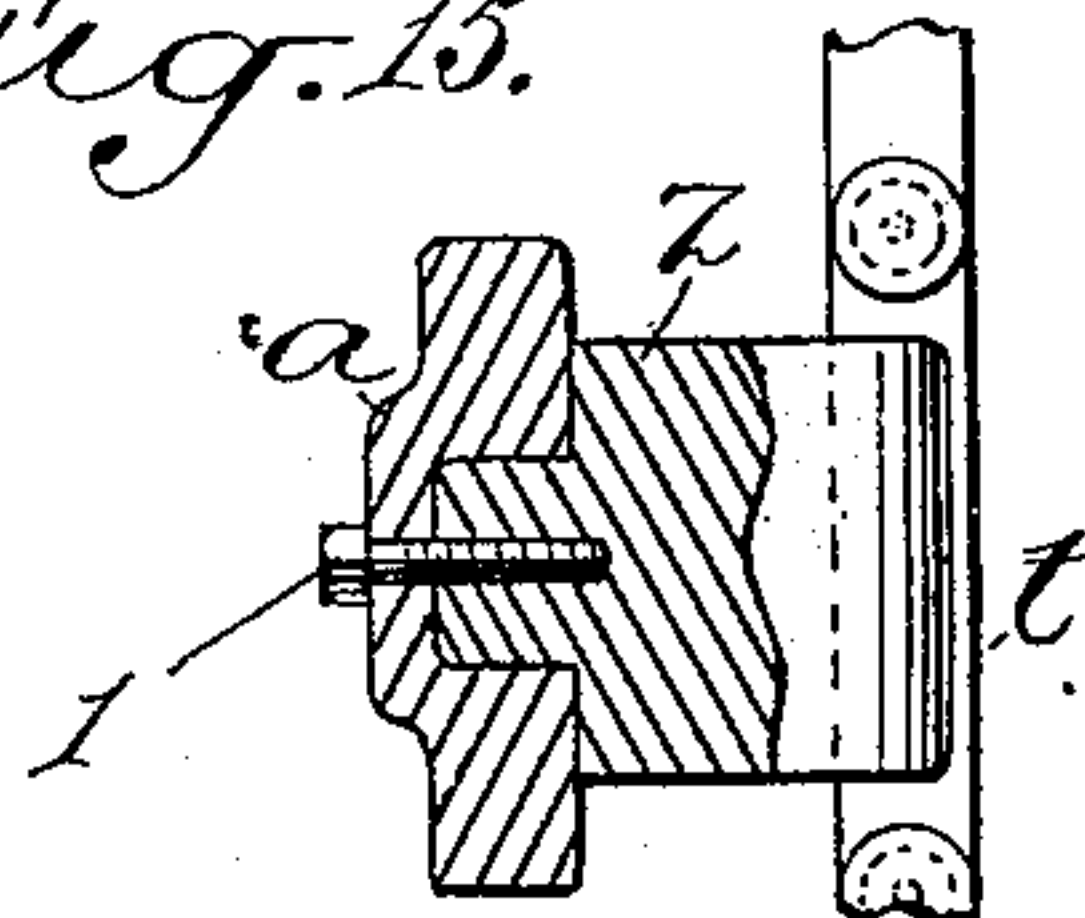


Fig. 15.



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UNITED STATES PATENT OFFICE.

AUGUSTUS M. HALL AND CHARLES C. STUART, OF CAMPVILLE,
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SANDPAPERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 688,512, dated December 10, 1901.

Application filed March 15, 1901. Serial No. 51,239. (No model.)

To all whom it may concern:

Be it known that we, AUGUSTUS M. HALL and CHARLES C. STUART, citizens of the United States, and residents of Campville, in the county of Litchfield and State of Connecticut, have invented a new and useful Sandpapering-Machine, of which the following is a specification.

Our invention relates to sandpapering-machines, and has for its object to provide a machine of the above character in which the platen for supporting the material to be operated upon and the sandpapering-rolls may be moved the one toward and away from the other, whereby the said parts may be accurately adjusted with respect to the material to be operated upon.

A further object is to provide a reciprocating material-supporting platen, which platen may be adjusted toward and away from the sandpapering-rolls, either in connection with means for adjusting the sandpapering-rolls bodily toward and away from the platen or means for simultaneously moving a roll into and another roll out of engagement with the material supported by the platen.

A further object is to provide certain new and improved features in the construction, form, and arrangement of the several parts of the machine, whereby the material to be operated upon may be brought to the required degree of smoothness in a rapid and efficient manner.

A practical embodiment of our invention is represented in the accompanying drawings, in which—

Figure 1 represents a view in side elevation of a machine embodying our invention, the ends of the machine being broken away. Fig. 2 is a top plan view of the same. Fig. 3 is a transverse vertical section through the machine. Fig. 4 is a longitudinal vertical section through the machine. Fig. 5 is a detail sectional view showing the means for moving the roll-supporting frame bodily toward and away from the material-supporting platen. Fig. 6 is a diagrammatic view of one of the cam-bars and two sets of sandpapering-rolls, both sets being in their lowered position with respect to the bar. Fig. 7 is a similar view in which the bar has been rotated in

one direction a quarter-turn to lift one set of rolls upwardly, while the other set is permitted to rest in its lowered position with respect to the bar. Fig. 8 is a similar view in which the bar has been rotated a quarter-turn in the opposite direction from the position shown in Fig. 6, showing the reverse positions of the set of rolls to that presented in Fig. 7. Fig. 9 is a similar view showing the bar turned to an intermediate position, where both sets of rolls are held at the limit of their upward movement with respect to the bar. Fig. 10 is an enlarged cross-section through the bar, taken in the plane of the line A A of Fig. 6. Fig. 11 is an enlarged cross-section through the bar, taken in the plane of the line B B of Fig. 6. Fig. 12 is an enlarged cross-section through the bar, taken in the plane of the line C C of Fig. 9. Fig. 13 is an enlarged cross-section through the bar, taken in the plane of the line D D of Fig. 9. Fig. 14 is an enlarged detail sectional view showing means for securing the roll-supporting frame against movement with respect to the main frame of the machine, and Fig. 15 is another sectional view of the same.

The frame which we have shown for supporting the several parts of the machine consists of a pair of uprights *a b*, a pair of horizontal longitudinally-extended side beams *c d*, and a centrally-arranged longitudinally-extended beam *e*.

The table or platen for supporting the material to be operated upon is denoted by *f*, and it is mounted upon a platen-supporting frame *g*, which frame is reciprocated by the following means: A main drive-shaft *h* is mounted to rotate in the main frame of the machine and extends transversely across the same. This drive-shaft is provided with a fixed pulley *i*, whereby the shaft may be driven from a source of power not shown herein. A pair of loose pulleys *j k* are mounted on a cross-shaft *l*, which pulleys have, respectively, a straight and cross belt connection with a pair of fast pulleys *m n* on the drive-shaft *h*. A suitable clutch mechanism *o* is mounted on the cross-shaft *l* in position to connect the one or the other of the oppositely-rotating pulleys *j k* to the shaft *l* for rotating the shaft in either of two directions. This shaft *l* is provided with

two trains of gears for rotating a pair of pinions $p\ q$, which mesh with a pair of rack-bars $r\ s$, located along the under side of the platen-supporting frame g . This geared connection 5 between the pinions and the clutch-shaft l is preferably so arranged as to reduce the speed to a considerable degree to permit a slow movement of the platen.

The platen-supporting frame g may be suitably supported and guided in the usual manner upon the central beam e and the two side beams $c\ d$ of the frame.

The sandpapering-roll-supporting frame t is shown herein as of oblong rectangular form 15 for supporting therein a plurality of sandpapering-rolls u . The opposite ends of each of the roll-shafts are mounted in sliding boxes v in the opposite side bars of the frame t , which boxes are held yieldingly at the limits 20 of their outward movements by heavy springs w . This spring tension will permit the rolls to yield when any undue strain is brought to bear therein that would tend to break or disarrange the same.

In the form shown in Figs. 1 to 5, inclusive, the supporting-frame t is made adjustable toward and away from the platen f in the following manner: The inner faces of the uprights $a\ b$ of the main frame are provided with 30 vertical elongated grooves x and y , within which are located the free ends of the guide-blocks z and 2 , projecting outwardly from the sides of the roll-supporting frame. These guide-blocks z and 2 are provided with vertical screw-threaded holes therethrough, arranged to receive the adjusting-screws 3 and 35 4 , which are mounted in the uprights a and b . These screws are simultaneously rotated either in a direction to raise the roll-supporting frame or lower the same by providing a 40 bevel-gear connection between the upper ends of the said screws and a cross-shaft 5 , mounted in the uprights a and b and provided with a suitable operating hand-wheel 6 at one side 45 of the machine.

In the form shown in Figs. 14 and 15 the roll-supporting frame t is shown as being held stationary with respect to the main frame by means of screw-bolts 1 , which secure the up- 50 rights to the blocks which project outwardly from the sides of the roll-supporting frame.

In the present instance we have shown the manner of securing the block z to its corresponding upright a , and it is to be understood that the other block 2 is secured to the 55 upright b in a similar manner.

The means which we employ for simultaneously moving the sandpapering-rolls into and out of operative position and also for simultaneously moving a roll into and another roll out 60 of operative position is as follows: A pair of longitudinally-extended connected cam-bars 7 and 8 are mounted in the side bars of the roll-supporting frame t in contact with the 65 journal-boxes v at the opposite ends of the sandpapering-roll shafts. These cam-bars are connected so that they will be rotated to-

gether in the same direction by providing short arms 9 and 10 at their front ends, the said arms being connected by a cross-bar 11 70 at points equal distances from the axes of the said cam-bars. One of these arms, in the present instance the arm 10 , is extended upwardly to form an operating-handle 12 . A sector 13 is provided concentric with the axis of the 75 cam-bar 8 , and the handle 12 is provided with a clamp-nut 14 , arranged to engage the sector 13 for clamping the cam-bars in any of their rotary adjustments. As each one of the cam-bars is constructed in the same manner, we 80 will describe one only of the said bars. The cam-bar is provided at points where it engages the bearing-boxes of the several rolls with a series of depressions or flattened portions $15\ 16\ 17\ 18$ in alinement with each other 85 along the bar, so that when this portion of the bar is in engagement with the bearing-boxes of the several rolls all of the rolls will be at the limits of their downward movements toward the platen. At points one-quarter way 90 around the periphery of the bar from the depressed portions above referred to upon each side thereof we provide flattened or depressed portions, so arranged that when the flattened portions upon one side are in engagement 95 with the bearing-boxes of the rolls those rolls will be at the limits of their downward movements and the remaining rolls will be held at the limits of their upward movements away from the platen, and vice versa. In the pres- 100 ent instance we have shown the rolls arranged in two sets of two each and the cam-bar provided on one side of the full series of depressions with a pair of depressions $19\ 20$ for operating one set of the rolls, and upon the other 105 side of the full series of depressions with a pair of depressions $21\ 22$, arranged to operate the other set of rolls. It will thus be seen that by turning the cam-bars the rolls may be moved simultaneously toward and away from 110 the platen and also that one set of rolls may be moved into operative position as the other set of rolls is moved away from its operative position.

The shafts of the several sandpapering- 115 rolls are provided with driving-pulleys $23\ 24\ 25\ 26$, which are engaged by a single belt 27 . This belt passes around a fast pulley 28 on the drive-shaft h , around a fast pulley 29 on a shaft 30 , mounted on the tops of the uprights 120 a and b , and also around an idler-pulley 31 , mounted on a shaft 32 in a position corresponding to the shaft h upon the other side of the uprights $a\ b$. The several pulleys around which this belt travels are so related to each 125 other that when the roll-supporting frame t is made adjustable it may be raised and lowered without interfering with the movement of the belt. This belt is passed around the several pulleys of the rolls in such a direction as to rotate the two rolls of each set in 130 opposite directions. To reinforce the drive of the main belt to prevent its slipping, we provide an auxiliary belt 33 at the other side

of the machine, which passes around a fast pulley 34 on the drive-shaft *h* and around a fast pulley 35 on the shaft 30, which carries the fast pulley 29, over which the main belt 5 passes.

The means which we have shown for adjusting the material-supporting platen *f* toward and away from the sandpapering-rolls comprises the following parts: Cross-shafts 10 36 are mounted at intervals in the frame *g*, which shafts are provided with cams 37, arranged to bear against the under face of the platen *f*, so that as the shafts 36 are rotated in one direction the cams will lift the platen 15 *f* away from the frame *g*, and when the shafts are turned in the opposite direction the cams will permit the platen *f* to return to its position upon the frame. A longitudinally-extended shaft 38 is mounted in the supporting- 20 frame *g* and has a worm-gear connection 39 with each of the shafts 36, whereby all of the cams 37 may be operated simultaneously. This longitudinal shaft 38 may be provided with a suitable crank-handle 40 at a point exterior to the end of the platen-supporting 25 frame for use in adjusting the platen. The platen *f* may be guided in its movements toward and away from the sandpapering-rolls by a plurality of guides 41, fitted to slide in 30 vertical slots 42 in the sides of the frame *g*.

It will be seen that by the use of the machine hereinabove set forth it is possible to adjust the platen toward and away from the rolls. It is also possible to adjust all of the 35 sandpapering-rolls toward and away from the platen, and it is also possible to simultaneously move one or more rolls into operative engagement and the balance of the rolls out of operative engagement. The material being treated may be reciprocated beneath the 40 sandpapering-rolls, and the rolls may be brought into operative contact therewith until the material is brought to the required smoothness. It will thus be seen that the 45 material may be completely finished before it is necessary to again handle the same.

It is evident that changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of our invention. Hence we do not 50 wish to limit ourselves strictly to the structure herein set forth; but

What we claim is—

1. In combination, a platen for supporting 55 the material to be operated upon, sandpapering-rolls for operating upon the material, means for moving the platen toward and away from the sandpapering-rolls and an adjusting device common to all of the rolls for moving the rolls simultaneously toward 60 and away from the platen, substantially as set forth.

2. In combination, a platen for supporting the material to be operated upon, sandpaper- 65 ing-rolls for operating upon the material, means for moving the platen toward and

away from the sandpapering-rolls and means for simultaneously moving a roll into and another roll out of operative engagement with the material upon the platen, substantially 70 as set forth.

3. In combination, a platen for supporting the material to be operated upon, sandpaper- 75 ing-rolls for operating upon the material, means for moving the platen toward and away from the sandpapering-rolls, means for simultaneously moving the rolls toward and away from the platen and means for simultaneously moving a roll into and another roll 80 out of operative engagement with the material, substantially as set forth.

4. In combination, a platen for supporting the material to be operated upon, a plurality of sandpapering-rolls, a stationary support- 85 ing-frame therefor and means for simultaneously moving one roll into and another roll out of operative engagement with the material, substantially as set forth.

5. In combination, a platen for supporting the material to be operated upon, a plurality 90 of sandpapering-rolls, a stationary supporting-frame therefor, means for adjusting the platen toward and away from the said rolls and means for simultaneously moving a roll 95 into and another roll out of operative engagement with the material upon the said platen, substantially as set forth.

6. In combination, a platen for supporting the material to be operated upon, a plurality of sandpapering-rolls, a stationary support- 100 ing-frame therefor, means for simultaneously moving the rolls toward and away from the platen and means for simultaneously moving a roll into and another roll out of operative 105 engagement with the material, substantially as set forth.

7. In combination, a platen for supporting the material to be operated upon, a plurality of sandpapering-rolls, a stationary support- 110 ing-frame therefor, means for moving the platen toward and away from the sandpapering-rolls, means for simultaneously moving the rolls toward and away from the platen and means for simultaneously moving a roll 115 into and another roll out of operative engagement with the material, substantially as set forth.

8. In combination, a reciprocating platen for supporting the material to be operated upon, sandpapering-rolls for operating upon 120 the material, means for moving the platen toward and away from the sandpapering-rolls and an adjusting device common to all of the rolls for simultaneously moving the rolls toward and away from the platen, substantially 125 as set forth.

9. In combination, a reciprocating platen for supporting the material to be operated upon, sandpapering-rolls for operating upon the material, means for moving the platen 130 toward and away from the sandpapering-rolls and means for simultaneously moving a roll

into and another roll out of operative engagement with the material upon the platen, substantially as set forth.

10. In combination, a reciprocating platen
5 for supporting the material to be operated upon, sandpapering-rolls for operating upon the material, means for moving the platen toward and away from the sandpapering-rolls, means for simultaneously moving the rolls to-
10 ward and away from the platen and means for simultaneously moving a roll into and another roll out of operative engagement with the material, substantially as set forth.

11. In combination, sandpapering-rolls, a

reciprocating platen-supporting frame, a 15
platen carried thereby, and means for adjusting the platen toward and away from the sandpapering-rolls, substantially as set forth.

In testimony that we claim the foregoing as our invention we have signed our names, in 20
presence of two witnesses, this 11th day of March, 1901.

AUGUSTUS M. HALL.
CHARLES C. STUART.

Witnesses:

FREDK. HAYNES,
HENRY THIEME.