

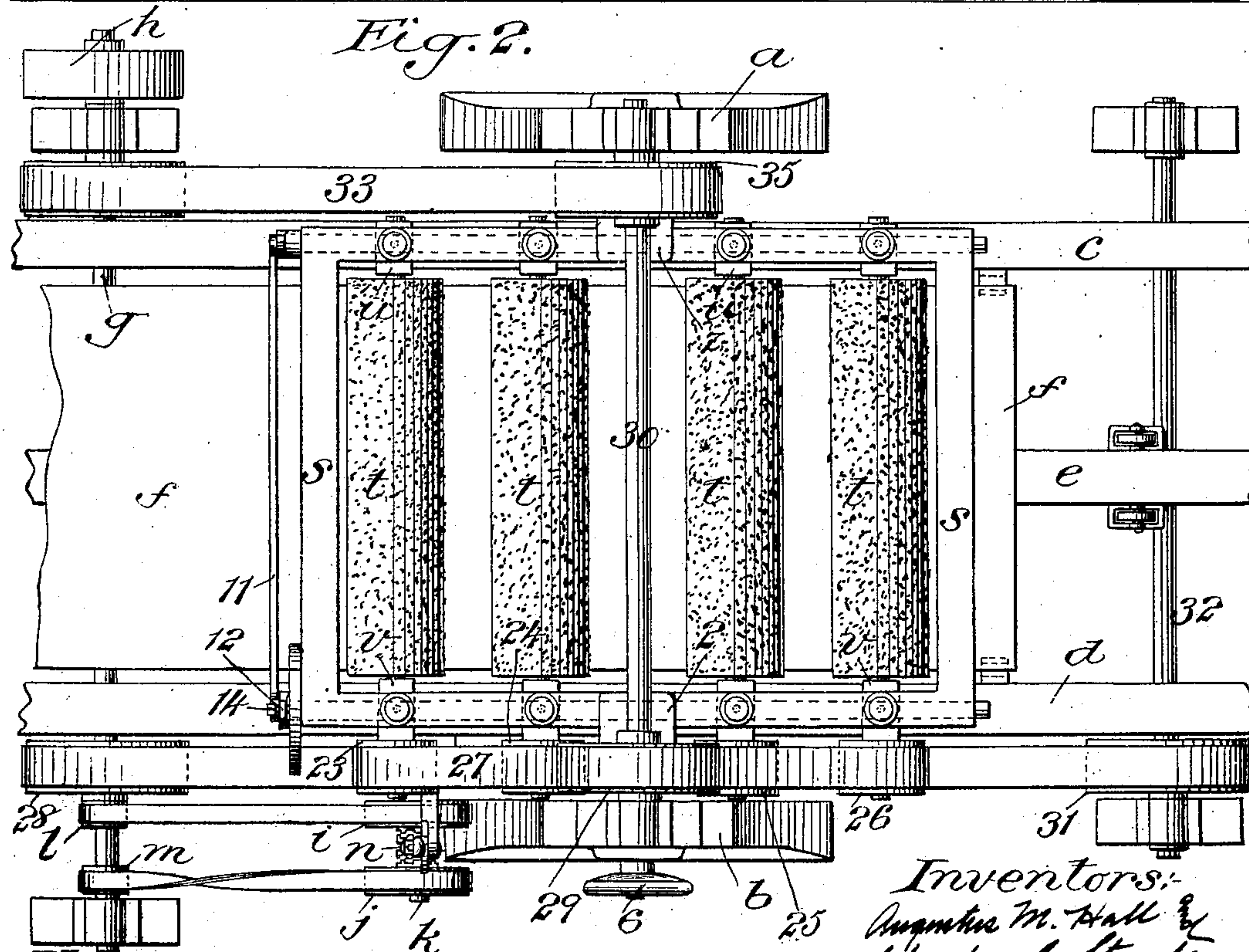
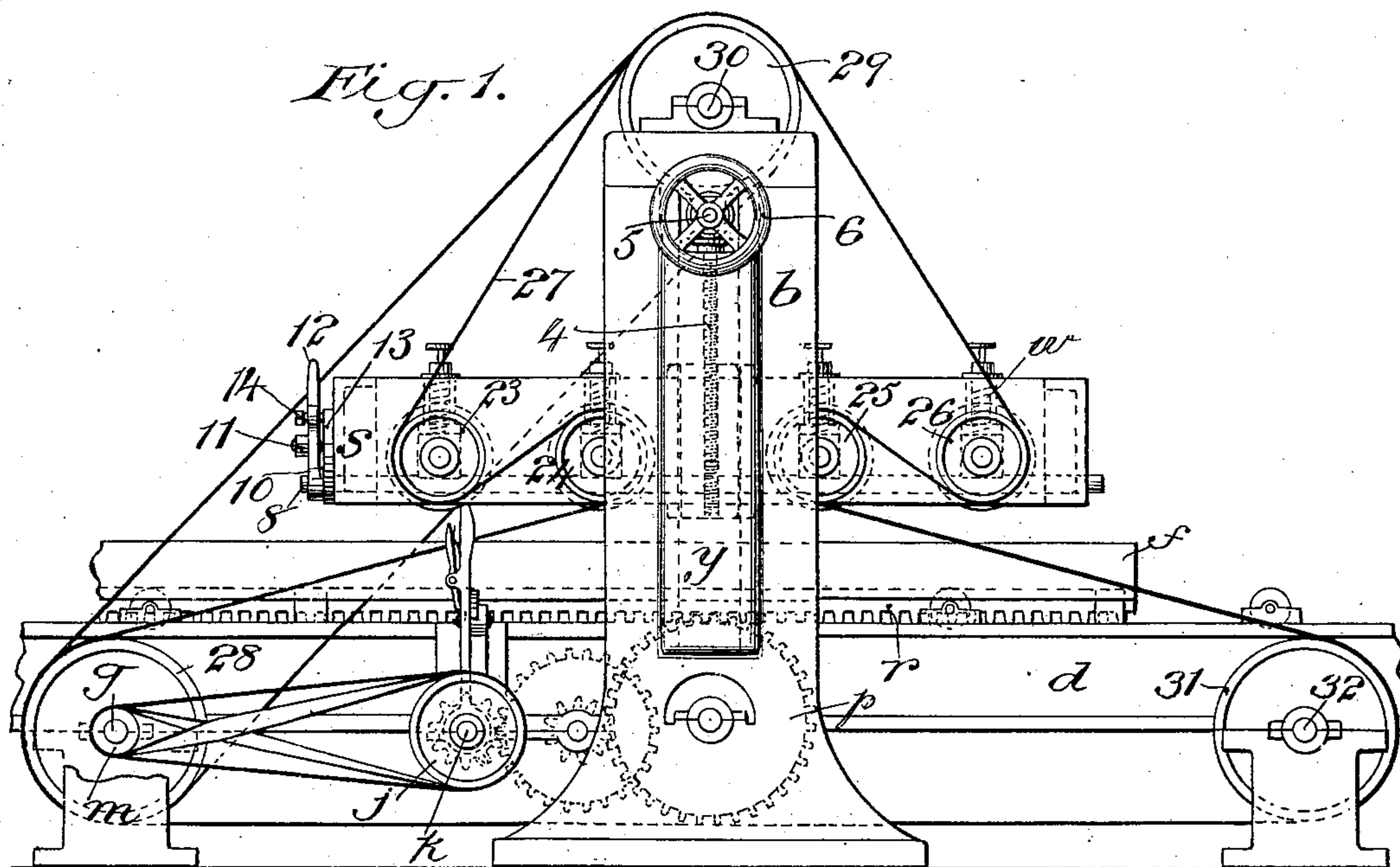
A. M. HALL & C. C. STUART.

SANDPAPERING MACHINE.

(Application filed Jan. 24, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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Henry Plumb

Inventors:
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No. 688,511.

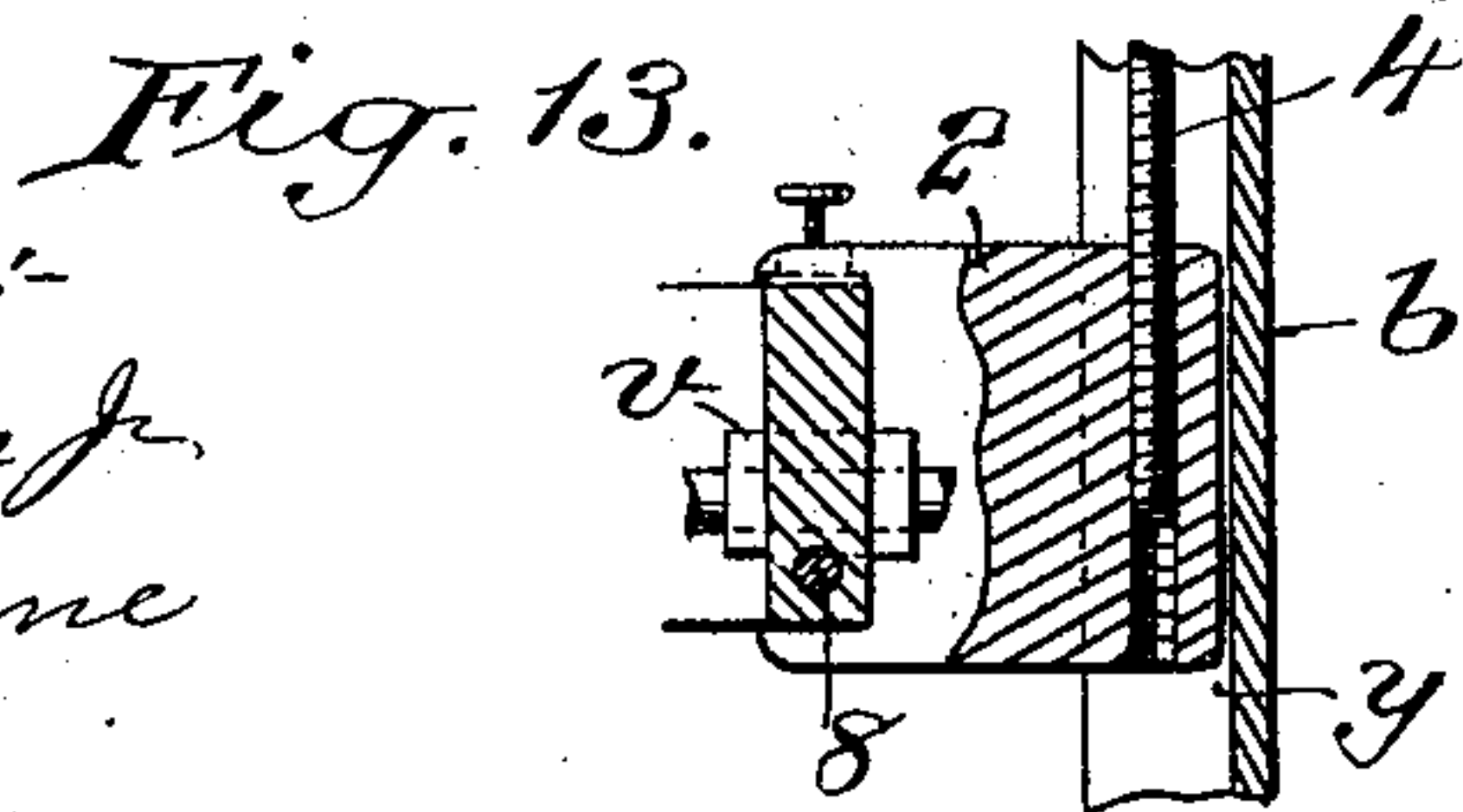
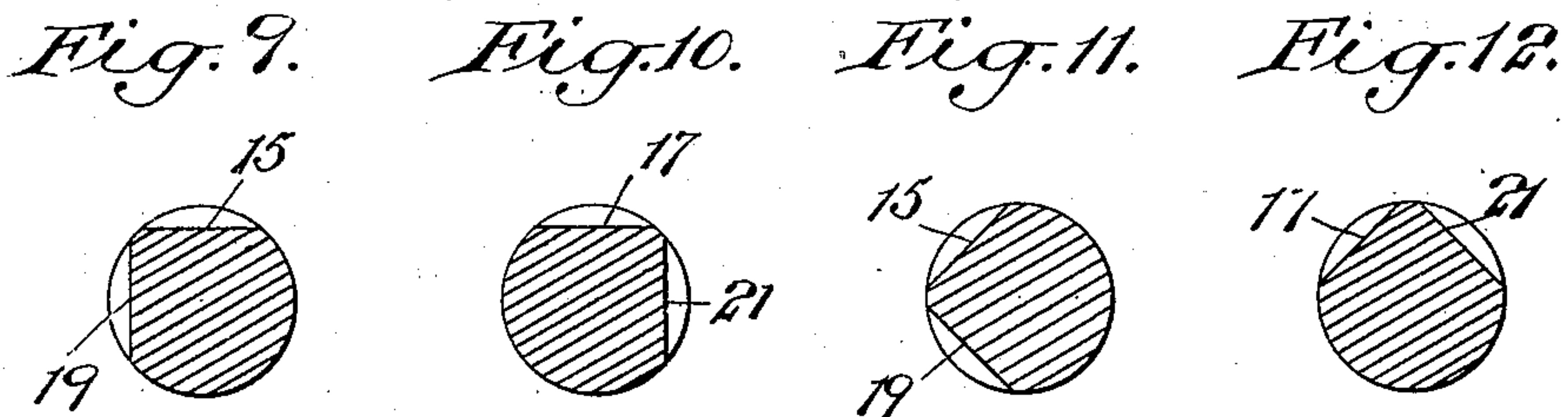
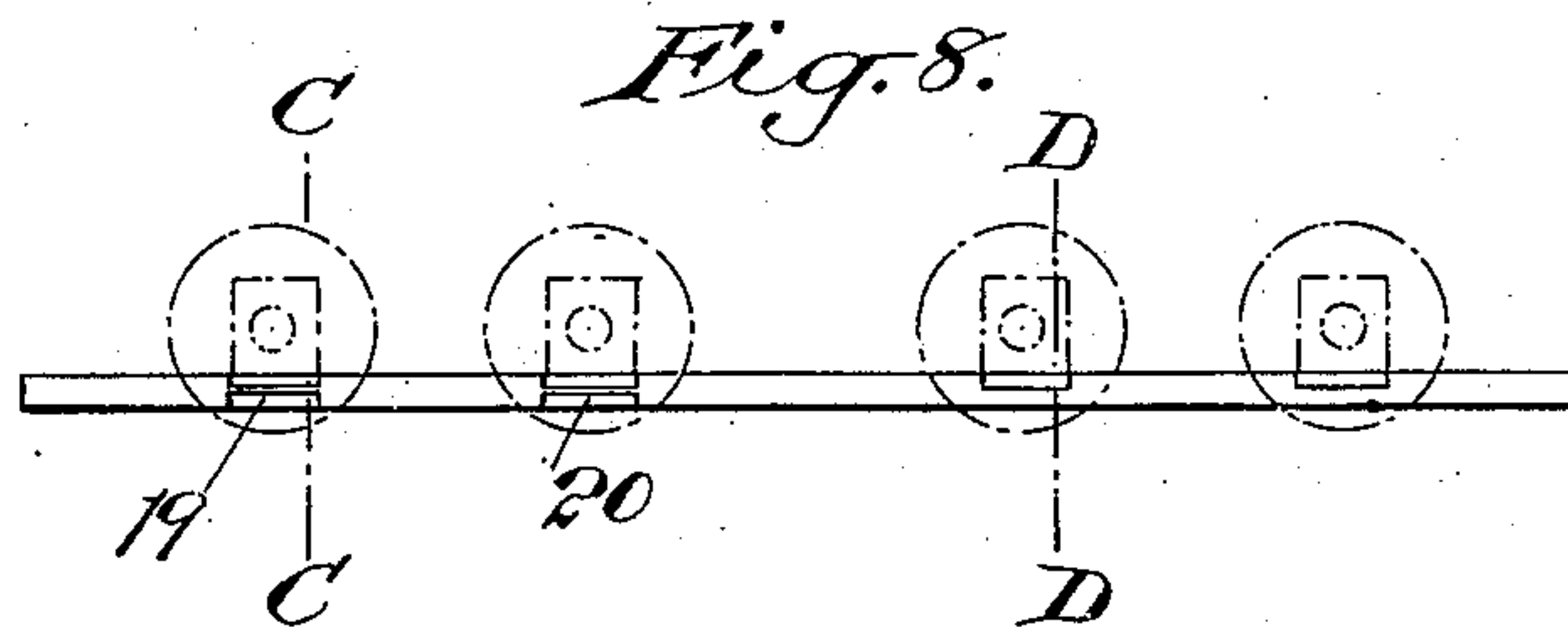
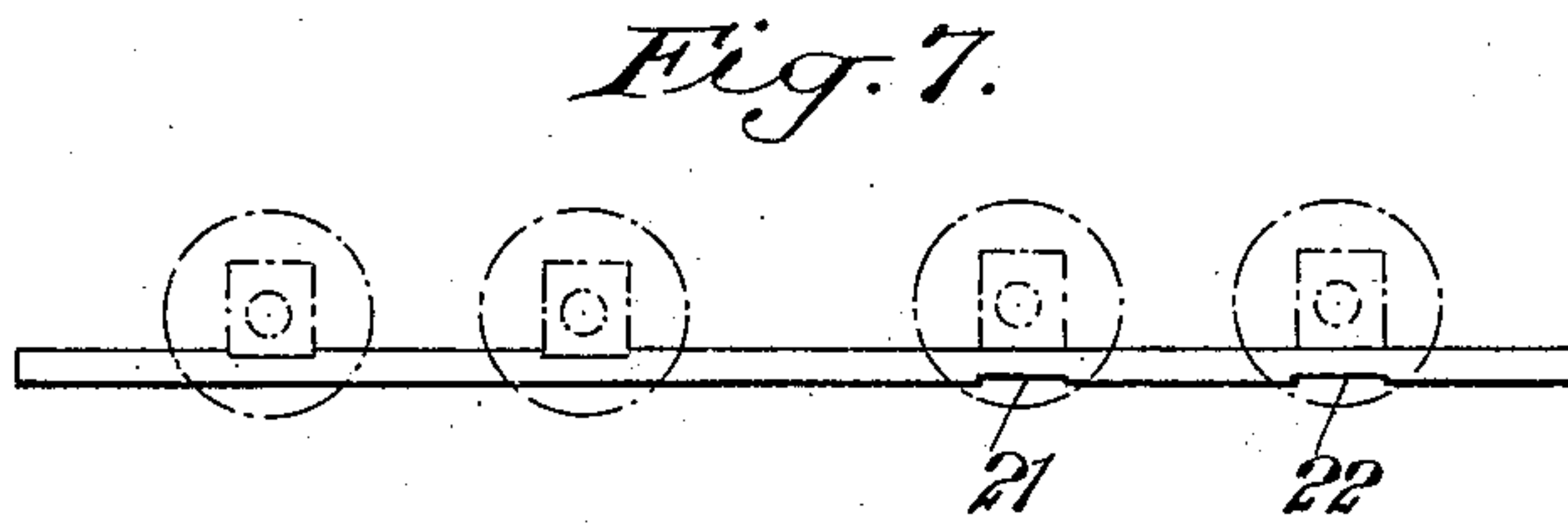
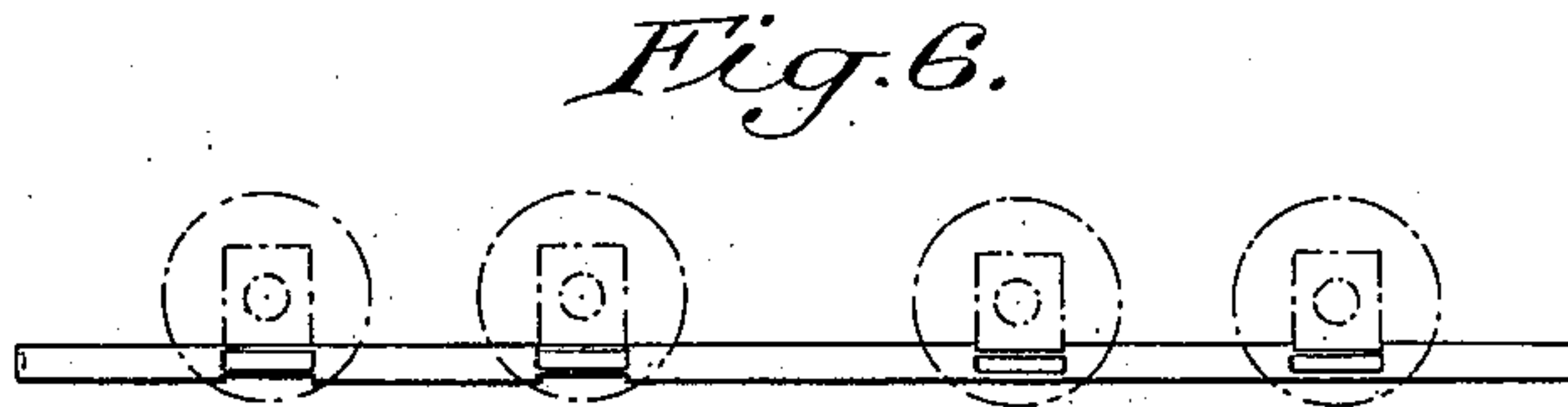
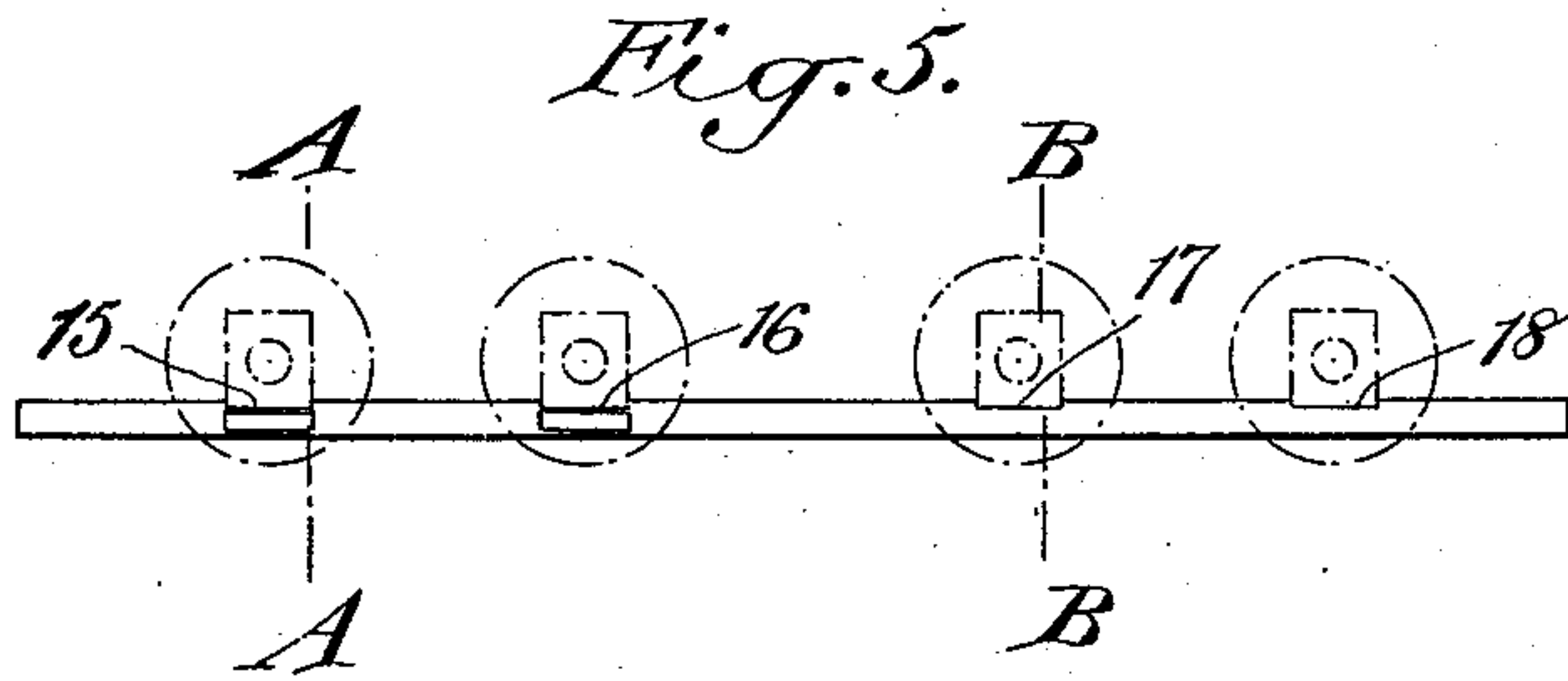
Patented Dec. 10, 1901.

A. M. HALL & C. C. STUART.
SANDPAPERING MACHINE.

(Application filed Jan. 24, 1901.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:-
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UNITED STATES PATENT OFFICE.

AUGUSTUS M. HALL AND CHARLES C. STUART, OF CAMPVILLE,
CONNECTICUT.

SANDPAPERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 688,511, dated December 10, 1901.

Application filed January 24, 1901. Serial No. 44,493. (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 new and useful Improvements in Sandpapering-Machines, of which the following is a specification.

Our invention relates to certain new and useful improvements in sandpapering-machines, and has for one of its objects to provide a machine of the above character in which the stock-supporting table or platen is made to reciprocate beneath a plurality of sandpapering-rolls together with means for moving all of the rolls simultaneously toward and away from the reciprocating platen.

A further object is to provide a movable platen for supporting the stock to be operated upon combined with a plurality of sandpapering rolls adjustable toward and away from the movable platen and an adjusting device common to the said rolls.

A further object is to provide a structure in which the plurality of rolls are arranged in sets and to provide means for raising and lowering the several sets of rolls independent of the means for moving the entire series of rolls toward and away from the reciprocating 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 stock 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 frame being broken away. Fig. 2 is a top plan view of the same. Fig. 3 is a transverse vertical view, partly in section, through the machine. Fig. 4 is a longitudinal vertical section through the machine. Fig. 5 represents 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. 6 is a simi-

lar 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 still permitted to rest in its lowered position with respect to the bar. Fig. 7 is a similar view when the bar has been rotated a quarter-turn in the opposite direction from the position shown in Fig. 5, showing the reverse positions of the sets of rolls to that represented in Fig. 6. Fig. 8 is a similar view showing the bar turned to an intermediate position where both sets of the rolls are held at the limit of their upward movement with respect to the bar. Fig. 9 is an enlarged cross-section through the bar, taken in the plane of the line A A of Fig. 5. Fig. 10 is an enlarged cross-section through the bar, taken in the plane of the line B B of Fig. 5. Fig. 11 is an enlarged cross-section through the bar, taken in the plane of the line C C of Fig. 8. Fig. 12 is an enlarged cross-section through the bar, taken in the plane of the line D D of Fig. 8; and Fig. 13 is a detail sectional view showing the means for moving the plurality of rolls bodily toward and away from the reciprocating platen.

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 stock to be operated upon is denoted by *f*, and it, together with the beams *c*, *d*, and *e*, may be made of any desired length to suit different requirements.

A main drive-shaft *g* is mounted to rotate in the main frame of the machine, and it extends transversely across the same. This drive-shaft is provided with a fixed pulley *h*, whereby the shaft may be rotated from a source of power not shown herein.

The stock-supporting platen *f* is reciprocated by the following means: A pair of loose pulleys *i* and *j* are mounted on a cross-shaft *k*, which pulleys have respectively a straight and crossed belt connection with a pair of fast pulleys *l m* on the drive-shaft *g*. A suitable clutch mechanism *n* is mounted on the cross-shaft *k* in position to connect the one or the

other of the oppositely-rotating pulleys *i j* to the shaft *k* for rotating the shaft in either of two directions. This shaft *k* is provided with two trains of gears for rotating a pair of pinions *o p*, which mesh with a pair of rack-bars *q r*, located along the under surface of the platen *f*. This geared connection between the pinions and the clutch-shaft *k* is preferably so arranged as to reduce speed to a considerable degree to permit a slow movement of the platen. The platen *f* may be suitably supported and guided in the usual manner upon the central beam *e* and the two side beams *c* and *d*.

The sandpapering-roll-support frame *s* is herein shown as of oblong rectangular form for supporting therein a plurality of sandpapering-rolls *t*. The opposite ends of each of the roll-shafts are mounted in sliding boxes *u v* in the opposite side bars of the frame *s*, which boxes are held yieldingly at the limits of their downward movements by heavy springs *w*. This spring tension will permit the rolls to yield when any undue strain is brought to bear thereon that would tend to break or disarrange the same. This roll-supporting frame *s* may be adjusted toward and away from the platen *f* in the following manner: The inner faces of the uprights *a b* are provided with 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 *s*. These guide-blocks *z* and *2* are provided with vertical screw-threaded holes therethrough arranged to receive the adjusting-screws *3* and *4*, which are mounted in the uprights *a* and *b*. These screws are simultaneously rotated in either a direction to raise the roll-supporting frame or lower the same by providing a 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 of the machine.

The means which we employ for moving one or more of the plurality of sandpapering-rolls into operative position and at the same time moving one or more of the said rolls out of 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 *s* in contact with the journal-boxes at the opposite ends of the sandpapering-roll shafts. These cam-bars are connected so that they will be rotated together 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* 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 cam-bar *8*, and the handle *12* is provided with a clamping-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 will describe one only of the said bars. The cam-bar is provided at the points where it engages the bearing-boxes of the several rolls with a series of depressions or flattened portions *15*, *16*, *17*, and *18* in alinement with each other 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 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 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 present 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* and *20* for operating one set of the rolls and upon the other 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 when one set of rolls is brought into operative position the other set of rolls is brought away from its operative position. When the cam-bar is turned to points intermediate the full series of depressions and the two side series of depressions, it will be seen that the boxes, and thereby the rolls, will all be raised away from their operative positions.

The shafts of the several sandpapering-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 *g*, around a fast pulley *29* on a shaft *30*, mounted on the tops of the uprights *a* and *b*, and also around an idler-pulley *31*, mounted on a shaft *32* in a position corresponding to the shaft *g* upon the other side of the uprights *a* and *b*. The several pulleys around which this belt travels are so related to each other that the roll-supporting frame *s* may be raised and lowered without interfering with the movement of the belt. The belt is passed around the several pulleys of the rolls in such a direction as to rotate the two rolls of each set in 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 *g* and around a fast pulley *35* on the shaft *30*, which carries the fast pulley *29*, hereinbefore described.

It will be seen that by the use of the machine hereinabove set forth it is possible to adjust all of the sandpapering-rolls toward and away from the reciprocating platen and then bring into operation against the surface

of the stock being treated one or more of the rolls—such, for instance, as those having the coarser sandpaper thereon—the operation of the rolls upon the stock not being limited to passing the stock once beneath the same, but as many times as may be desired to obtain the required smoothness. The adjusting device may then be operated to move the roll or rolls which had been in operation out of operation and simultaneously bring into operation the roll or rolls with which it is next desired to treat the stock—as, for instance, rolls provided with a finer grain of sandpaper. It will thus be seen that the stock may be completely finished before it is necessary to again handle the same.

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

What we claim is—

1. The combination with a movable platen for supporting the stock to be operated upon, of a plurality of sandpapering-rolls and means for simultaneously moving a roll into and another roll out of operative engagement with the stock, substantially as set forth.

2. The combination with a movable platen for supporting the stock to be operated upon, of a plurality of sandpapering-rolls, means for simultaneously moving the rolls toward and away from the movable platen and means for simultaneously moving a roll into operative position and another out of operative position, substantially as set forth.

3. The combination with a suitable frame, of a platen mounted to reciprocate therein, a series of sandpapering-rolls, a supporting-frame therefor, and means for moving the frame and thereby the rolls toward and away from the reciprocating platen, substantially as set forth.

4. The combination with a movable platen for supporting the stock to be operated upon, of a series of sandpapering-rolls arranged in sets, means for simultaneously moving the rolls toward and away from the movable platen and auxiliary means for moving the sets of rolls into and out of operative position, substantially as set forth.

5. The combination with a movable platen for supporting the stock to be operated upon, of a series of sandpapering-rolls arranged in sets and means for moving the several sets into and out of operative position, substantially as set forth.

6. The combination with a movable platen, of a series of sandpapering-rolls arranged in sets and means for simultaneously moving one set of rolls toward the platen and the other set of rolls away from the platen, substantially as set forth.

7. The combination with a movable platen, a series of sandpapering-rolls arranged in sets and a single operating means for moving one

set of rolls toward the platen and the other set of rolls away from the platen and for moving all of the rolls simultaneously toward and away from the platen, substantially as set forth.

8. In combination, a plurality of sandpapering-rolls, a supporting-frame therefor, and a cam-bar common to the said rolls, for simultaneously moving a roll into and another roll out of operative position, substantially as set forth.

9. In combination, a series of sandpapering-rolls, a supporting-frame therefor and an adjusting device common to all of the rolls arranged to move the series of rolls bodily in the same direction and also to move members of the series of rolls bodily simultaneously in opposite directions.

10. In combination, a plurality of sandpapering-rolls, a supporting-frame therefor and an adjusting device common to the rolls comprising a pair of connected cam-bars, substantially as set forth.

11. In combination, a roll-supporting frame, a plurality of sandpapering-rolls mounted in journal-boxes in the frame and an adjusting device common to the said rolls comprising a pair of connected cam-bars mounted in the frame in engagement with the said journal-boxes, substantially as set forth.

12. In combination, a roll-supporting frame, a plurality of sets of spring-actuated journal-boxes mounted to slide therein, a plurality of sandpapering-rolls mounted in said boxes and an adjusting device common to the rolls comprising a pair of cam-bars mounted in the frame in engagement with the said spring-actuated journal-boxes, substantially as set forth.

13. The combination with a removable platen for supporting the stock to be operated upon, of a plurality of sandpapering-rolls and a cam-bar common to the rolls for simultaneously moving a roll into and another roll out of operative position and for moving all of the rolls bodily toward and away from the platen, substantially as set forth.

14. The combination with a suitable frame, of a movable platen for supporting the work to be operated upon mounted therein, a plurality of sandpapering-rolls, a supporting-frame therefor, an adjusting device for moving the roll-supporting frame and thereby the rolls toward and away from the platen and a cam-bar carried by the roll-supporting frame for simultaneously moving a roll into and another roll out of operative position, substantially as set forth.

15. The combination with a movable platen for supporting the stock to be operated upon, of a plurality of sandpapering-rolls, a supporting-frame therefor and a pair of connected cam-bars engaging the opposite ends of the rolls for moving them toward and away from the platen as the cam-bars are operated, substantially as set forth.

16. The combination with a movable platen,

- of a plurality of sandpapering-rolls, a supporting-frame therefor, yielding bearings for the opposite ends of the rolls and a pair of connected cam-bars mounted in the roll-supporting frame in position to engage the yielding bearings at the opposite ends of the rolls for moving the rolls toward and away from the platen as the cam-bars are operated, substantially as set forth.
- 10 17. In combination, a suitable frame, a drive-shaft mounted therein having a drive-pulley thereon, a roll-supporting frame, a plurality of sandpapering-rolls mounted therein and carrying drive-pulleys thereon, a movable
15 platen, means for moving the roll-supporting frame toward and away from the platen, idler-pulleys carried by the frame and a single transmission-belt in engagement with the drive-shaft pulley, the idler-pulleys and the sandpapering-roll pulleys, substantially as set forth.
- In testimony that we claim the foregoing as our invention we have signed our names, in presence of two witnesses, this 14th day of January, 1901.
- AUGUSTUS M. HALL.
CHARLES C. STUART.
- Witnesses:
FREDK. HAYNES,
C. S. SUNDGREN.