(No Model.) 3 Sheets—Sheet 1.

C. A. GRAFF.

SLIDING PLANER.

No. 304,724. Patented Sept. 9, 1884.

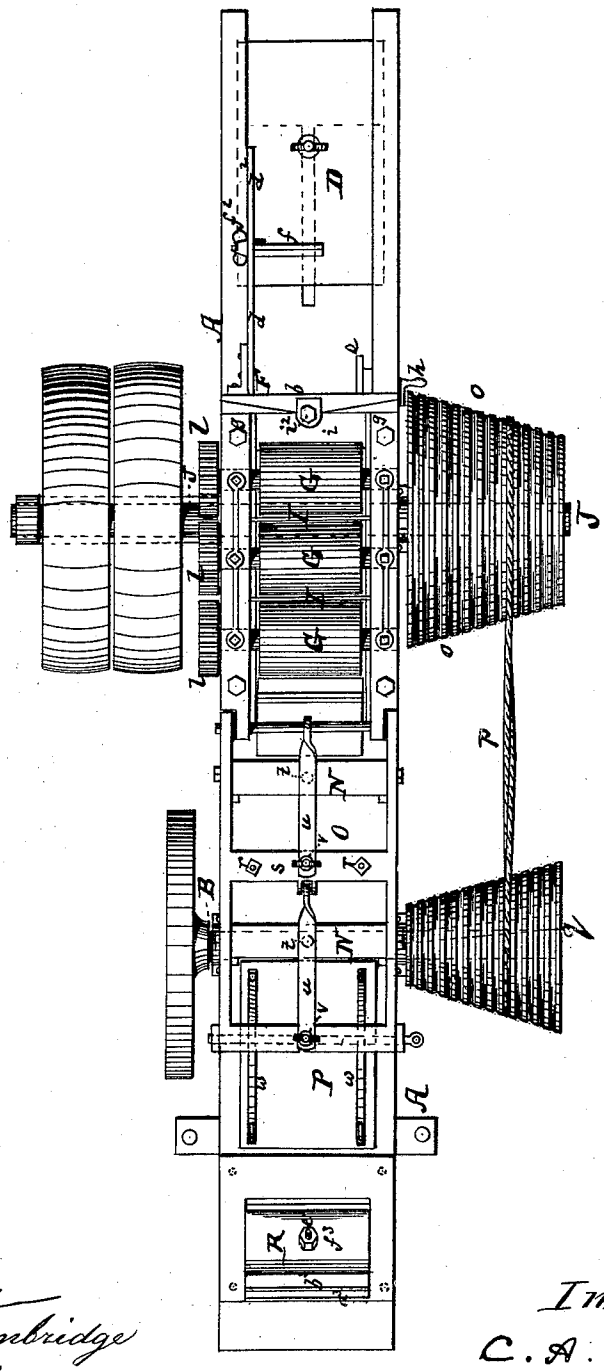


Fig. 1

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John M. Speer.

Inventor:
C. A. Graff
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N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 3 Sheets—Sheet 2.

C. A. GRAFF.

SLIDING PLANER.

No. 304,724. Patented Sept. 9, 1884.

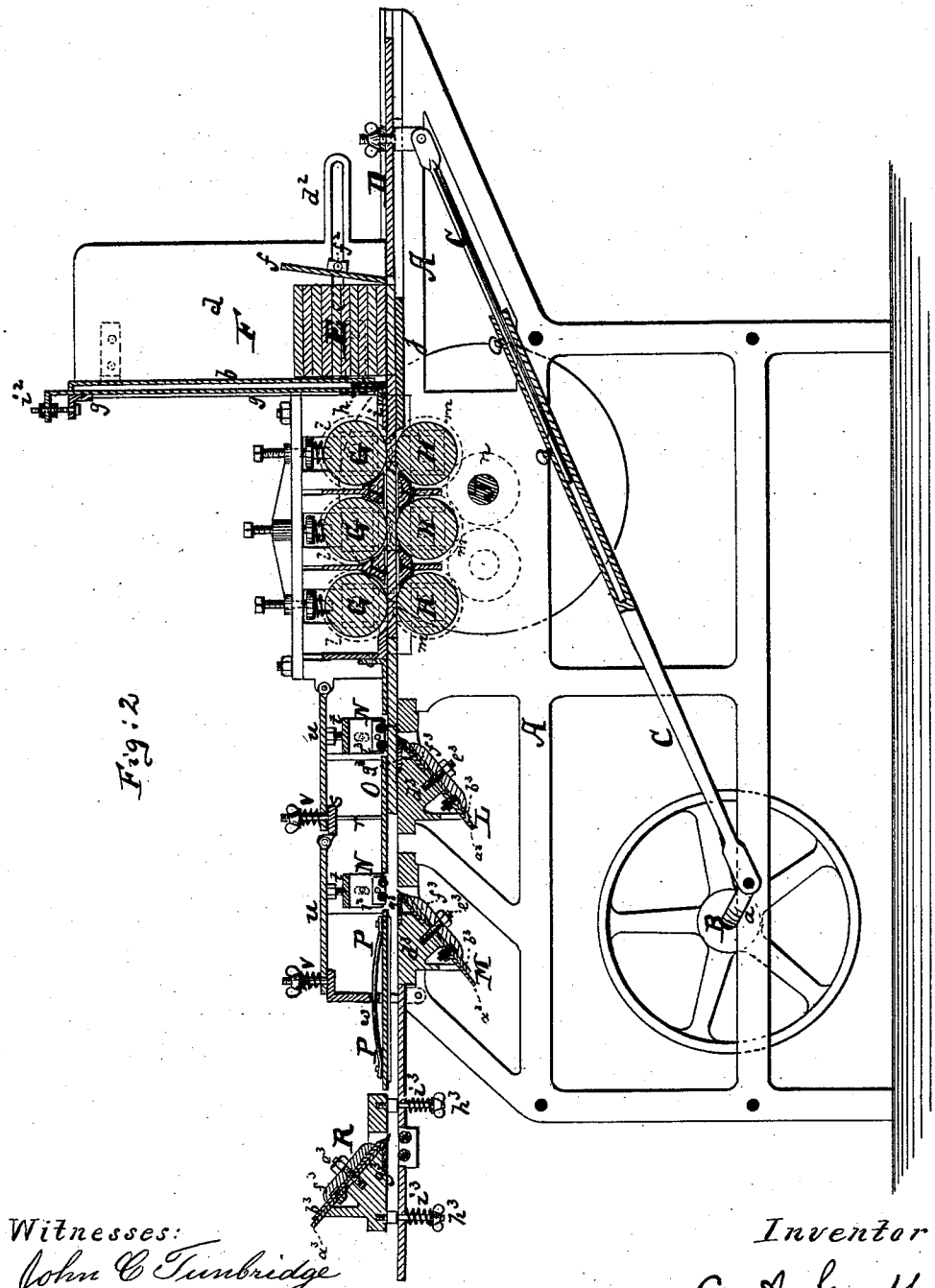


Fig: 2

Witnesses:
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(No Model.) 3 Sheets—Sheet 3.

C. A. GRAFF.

SLIDING PLANER.

No. 304,724. Patented Sept. 9, 1884.

Fig: 3

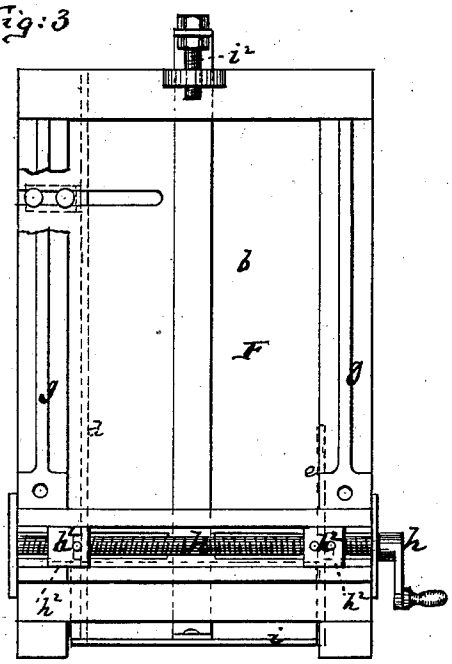


Fig: 4

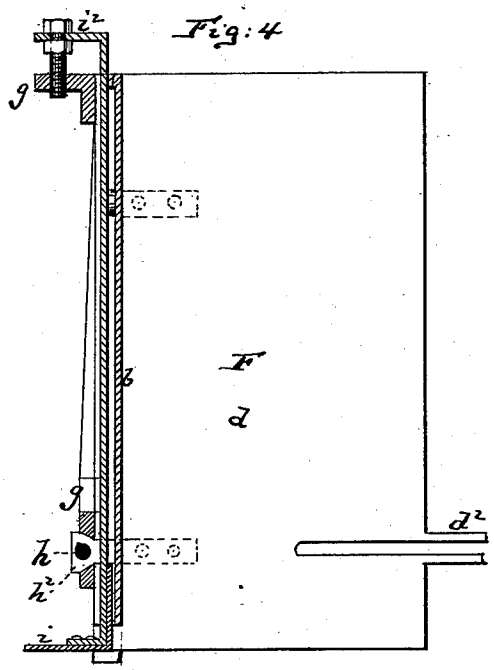


Fig: 5

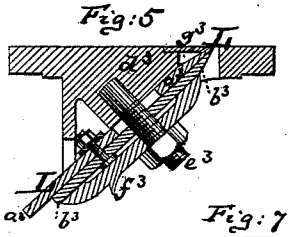


Fig: 6

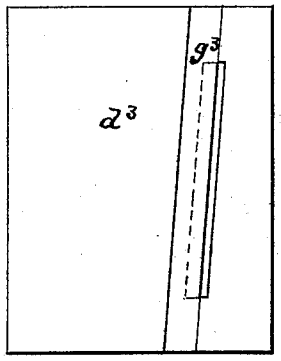


Fig: 8

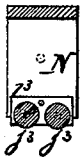


Fig: 7

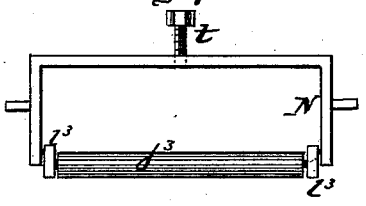
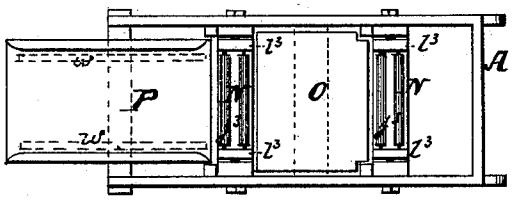


Fig: 9



Witnesses:
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UNITED STATES PATENT OFFICE.

CHRISTOPH ANTON GRAFF, OF NEW YORK, N. Y., ASSIGNOR TO HENRY W. ERICHS, OF SAME PLACE.

SLIDING PLANER.

SPECIFICATION forming part of Letters Patent No. 304,724, dated September 9, 1884.

Application filed May 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPH ANTON GRAFF, a resident of New York city, in the county and State of New York, have invented an Improved Planing-Machine, of which the following is a full, clear, and exact description, reference being made to the accompanying drawings, in which—

Figure 1 is a plan or top view of my improved planing-machine. Fig. 2 is a vertical longitudinal central section of the same. Fig. 3 is an enlarged elevation or end view of the board-holder, which is placed on one end of the machine. Fig. 4 is a vertical central section of the same. Fig. 5 is an enlarged vertical section of the planer used on the machine. Fig. 6 is a detail top view of the plate through which the planing-knife is to protrude. Fig. 7 is a detail face view of the pressure-roller guide which is used on the said machine. Fig. 8 is a central section of the same. Fig. 9 is a bottom view of the pressure devices that are used on the machine.

This invention relates to a new machine for planing thin boards, such as are used for making cigar-boxes or analogous devices.

The object of the invention is to make the machine automatic throughout, and to plane the boards on one or two sides by the use of stationary planers.

The invention consists in a new combination of parts for feeding the boards one after the other to the planers, in a new arrangement of spring-pressers for holding the boards in contact with the stationary planers, in a new manner of securing the planers in position, and in other details of improvement, that are hereinafter more fully described.

In the drawings, the letter A represents the frame of the machine. B is a shaft hung therein and rotated by the means hereinafter stated, or other suitable mechanism. A crank, *a*, on the shaft B connects by a rod, C, with a horizontal slide, D, which lies flat on the frame of the machine. The rod C is extensible, as shown in Fig. 2, to vary the stroke of the slide D.

E is the pile of boards to be planed. The boards lie one on top of the other on the frame of the machine, in front of the slide D. This pile of boards is held in place by the board-holder F, which consists of a front plate, *b*, side plates, *d e*, and a back plate, *f*. The front plate, *b*, is firmly attached to uprights *g*, which are firmly secured to the frame A of the machine. A right-and-left screw, *h*, which is hung transversely in the uprights *g*, (see Fig. 3,) engages with nuts h^2 on the plates *d e*, so that by turning said screw the said side plates, *d e*, may be adjusted and set a suitable distance apart. The back plate, *f*, is hung by a trunnion in a slotted extension, d^2, of the plate *d*, and is clamped in the desired position by a thumb-screw, f^2. All the plates *b*, *d*, *e*, and *f* do not extend down into the way of the path of the slide D. The plate *f* need not extend from the plate *d* clear over to the plate *e*, but may be made considerably shorter than that distance, as is indicated in Fig. 1. The plate *e* need not be as high as the plate *d*, as appears by dotted lines in Fig. 3. The said board-holder F is also provided with a vertically-adjustable foot, *i*, which is raised or lowered by a screw, i^2, (see Figs. 3 and 4,) to permit thicker or thinner boards to pass beneath it. This foot is shown in Fig. 2 directly above one of the boards that is to be planed. The lowermost board of the pile E rests on a platform, *j*, which is fixed in the frame A. As the slide D is moved forward it pushes the lowermost board of the pile E forward from under the pile into engagement with a set of feed-rollers, G G and H H, that are hung in the frame A above and below the said board.

Between the feed-rollers G G, and between the feed-rollers H H, are interposed stationary blocks I I, which also serve as guides for the board. When the slide D is moved back, as in Fig. 2, it allows the pile of boards to drop down upon the platform *j*, thereby bringing another board in front of said slide, to be pushed ahead at the next forward motion of said slide. The rollers G G are hung in adjustable bearings, which are pressed down by suitable springs and screws, or either. The several rollers G G carry toothed wheels *l l* at their ends, which engage with toothed wheels *m m*, that are mounted on the rollers H H, and these again are in gear with a toothed wheel,

n, on the shaft J, which is hung in the frame A of the machine, and which is the driving-shaft. The shaft J is rotated by suitable means, and when rotated causes the rollers G G and H H to be revolved, so as to feed the boards which are pushed between them by the slide D along to the planers. The shaft J also carries the truncated conical pulley *o*, which is connected by a belt, *p*, with a truncated conical pulley, *q*, that is mounted upon the shaft B. By adjusting the belt *p* on these cone-pulleys the relative speed of the slide D, as compared with that of the rollers G H, can be easily regulated. The rollers G H feed the boards that are inserted between them along until they arrive above the planing-irons L and M, which are secured in the frame A below the said boards. Above the boards, when they arrive in contact with the planers, are suspended the series of pressure-guides N N, O, and P. The pressure-guide O is a horizontal plate, which is connected by upright rods *r* with a cross-bar, *s*, which is a fixture of the frame A. The rods *r* allow the plate O to move up and down as they (the said rods) pass freely through the cross-bar *s*. The pressure-guides N N, which are more fully shown in Figs. 7 and 8, are transverse frames, having rollers hung in their lower parts, each of said frames having at its upper part an adjustable screw, *t*, the head of which bears against the under side of a hinged plate, *u*. This plate is hinged at one end to the frame of the machine, and at the other end placed beneath a spring, *v*, which allows the plate *u* to yield upward, and with it also the frame N, which is beneath it. The same description applies to both frames N that are shown in Fig. 2. After the board has been planed by the lower planers, L M, it passes under a spring-guide, P, which is a plate suspended by its spring *w* from the stationary framing of the machine. The planers L and M are alike in construction. A larger view of one is given in Fig. 5. From this figure it appears that the planing-knife proper, a^3, and its cap b^3 are held in inclined position against the inclined face of the supporting-block d^3, which supporting-block is set into the frame A of the machine.

The means of holding the knife a^3 and its cap b^3 to the block d^3 is a screw, e^3, and a large washer, f^3. The block d^3 is mortised vertically at the place where the planing-knife protrudes through it, and this mortise is closed on the non-working side of the knife by a detachable plate, g^3, which is let into a recess of the block d^3, that is provided for its reception in said block. By removing this plate g^3 convenient access is had to the cutting-edge for purposes of inspection, cleaning, and sharpening.

Fig. 6 is a top view of a block, d^3, showing the plate g^3 inserted therein, and showing also the oblique direction of the slot through which the planing-knife protrudes—that is to say, the planing-knife itself stands obliquely to the direction of movement of the board. After the boards have been planed on their lower sides by the planers L M, and after they have passed the pressure-plate P, they may also be planed on this machine on their upper side, for which purpose I have placed a planer, R, above the table of the machine, as shown in Fig. 2. This planer R in its construction resembles the planers L and M. If used, it is fastened to the machine by downwardly-projecting bolts h^3, which are embraced by springs i^3, as shown, so that the upper planer, R, will be vertically yielding, and will, in fact, constitute an elastic pressure-plate.

The operation of the machine, as far as it has not yet been described, is as follows: The slide D pushes the lower board of the pile E into engagement with the feed-rollers G H, then recedes, allows the pile to drop, moves forward again, and pushes the now lower board forward, &c. The extent of stroke of the slide D is regulated by the extension-rod C; its speed by the placing of the belt *p*. The boards are fed along by the rollers G H until they leave contact with said rollers, whereupon they are pushed ahead with the same speed by the boards which are in contact with said rollers. When the boards arrive above the planers L, their lower faces are planed in the rough, as it may be termed, and they are then subject to the second planer M, by which their lower sides are made perfectly smooth. The planers L and M stand obliquely for the purpose of reducing the strain, and also to facilitate the discharge of the shavings. Stationary planers beneath the boards to be smoothed are preferable to rotary planers that are now usually employed, because they produce continuous cuts, instead of the successive hack-like cuts that are produced by rotary planers.

In a cigar-box it is quite essential that the outer sides of its boards should be perfectly planed; hence the lower sides of the boards in my machine, which are to constitute the outer sides of the box, are planed with great care, the said boards being held against the planers by the spring pressing devices N N. These spring pressing devices, being provided with rollers, avoid all unnecessary friction. The upper planer R, which finally planes the upper face of each board, is preferably of the construction shown; but, if desired, a rotary planer may be employed, as it is not so essential that both sides of the boards receive equally good treatment.

The frames N N, which, as already stated, have rollers hung in their lower parts, have these rollers so hung that they are capable of tilting to accommodate boards which may not reach them in a horizontal plane. To this end there is centrally pivoted into the lower part of each frame N a plate, l^3, and into two plates l^3 thus pivoted are hung the rollers j^3. The plates l^3 constitute a pivotal frame for the rollers j^3, which is allowed to tilt if a board should reach the rollers in another than a perfectly horizontal plane. The pivots of the

plates l^3 l^3 are placed in the same direction as the axes of the rollers j^3 j^3—*i. e.*, transversely to the motion of the boards.

I claim—

1. In a planing-machine, the combination of the crank-shaft B with the extensible rod C, reciprocating slide D, and holder F, having adjustable back plate, *f*, substantially as herein shown and described.

2. The combination, in the board-holder F, of the stationary face-plate *b*, with the right-and-left screw *h*, carried in nuts h^2, side boards, *d e*, carrying said nuts, and adjustable back plate, *f*, carried by said side boards, substantially as herein shown and described.

3. The combination of the reciprocating slide D with the board-holder F, adjustable foot *i*, and rollers G and H, substantially as described, for feeding the boards that have been pushed by the slide D, as set forth.

4. The combination of the planing-knife a^3 and its cap b^3 with the block d^3, having inclined face, screw e^3, and obliquely-placed detachable plate g^3, substantially as described.

5. The frame N, having rollers in its lower portion, combined with the screw *t*, hinged plate *u*, and spring *v*, the said hinged plate *u* being located below said spring and above said screw, substantially as described.

6. The combination of the board-holder F with the slide D, rollers G H, and separate planers L M, both of which are located beneath the boards to be planed, as specified.

7. The combination of planers L M, placed underneath the boards to be planed, with the adjustable spring-pressure device N and separate terminal pressure-spring P, substantially as described.

8. The combination of the vertically-adjustable frame N with the rollers j^3 and pivoted roller-frames l^3, the pivots of the frames l^3 being placed in the same direction as the axes of the rollers j^3, as described.

CHRISTOPH ANTON GRAFF.

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