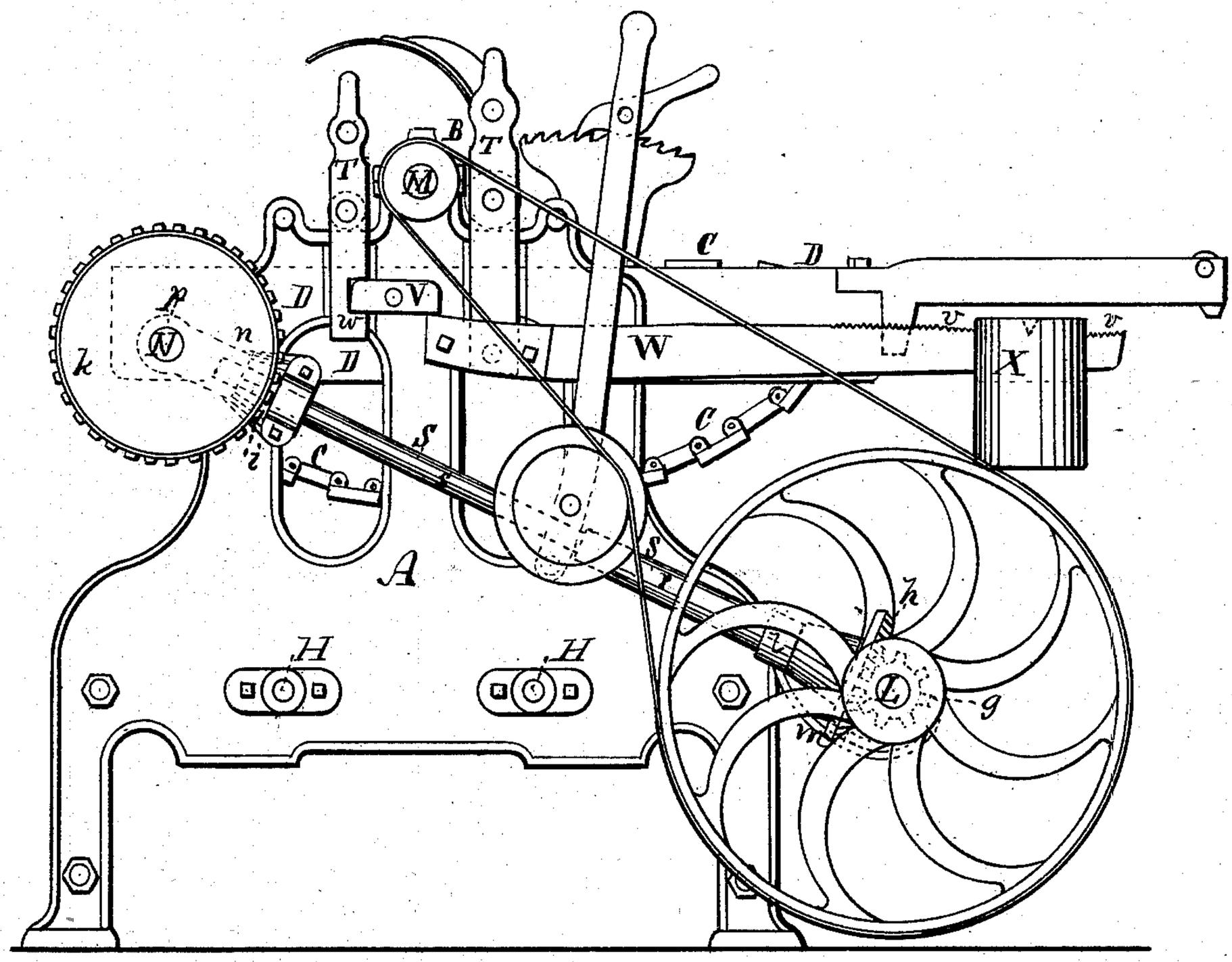
(No Model.) 3 Sheets—Sheet 1.

# J. M. COOK & J. S. PERKINS.

## PLANING MACHINE.

No. 274,886. Patented Mar. 27, 1883.

*Fig. 1.*

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(No Model.) 3 Sheets—Sheet 2.

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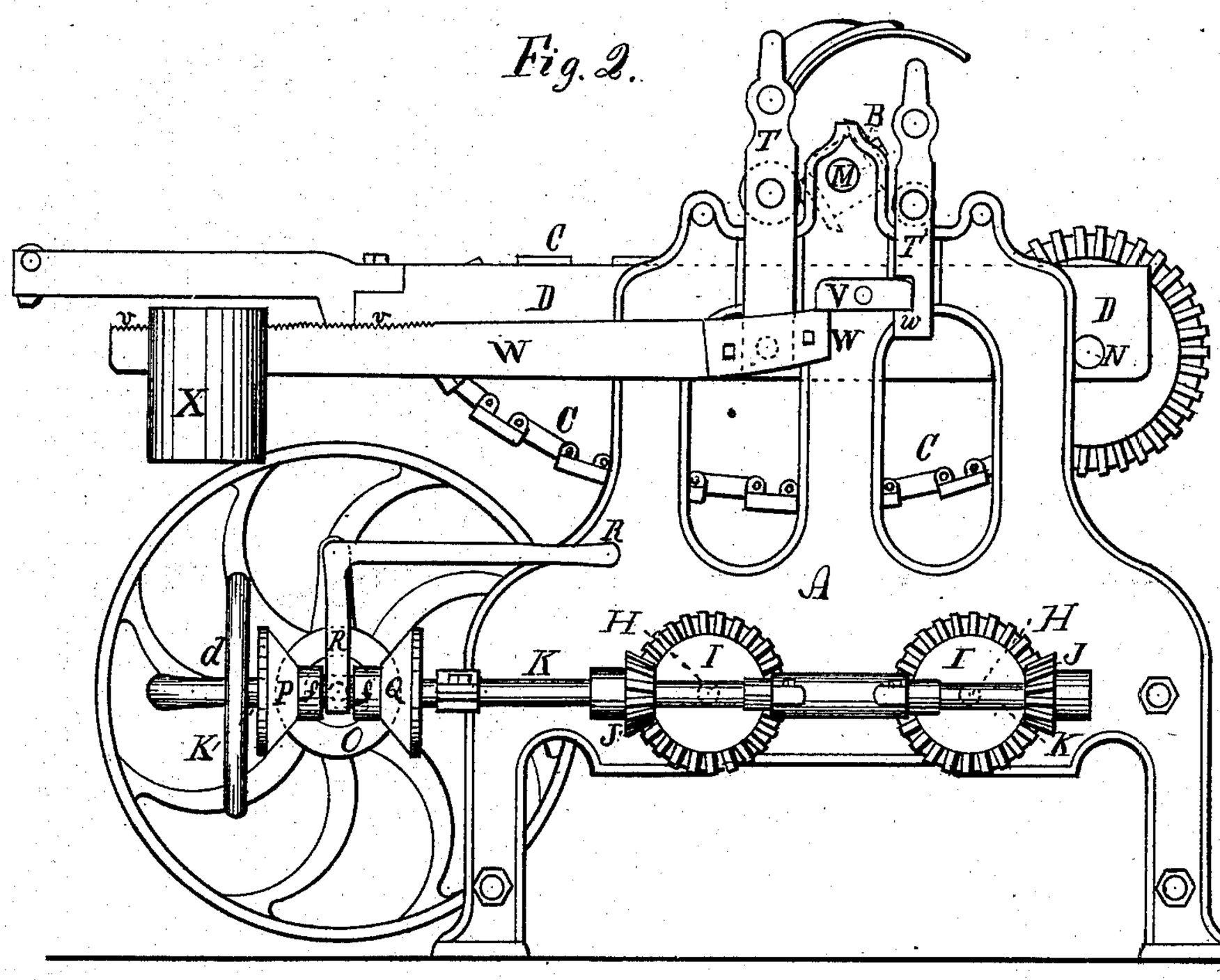
*Fig. 2.*

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3 Sheets—Sheet 3.

# J. M. COOK & J. S. PERKINS.

## PLANING MACHINE.

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Fig. 3.

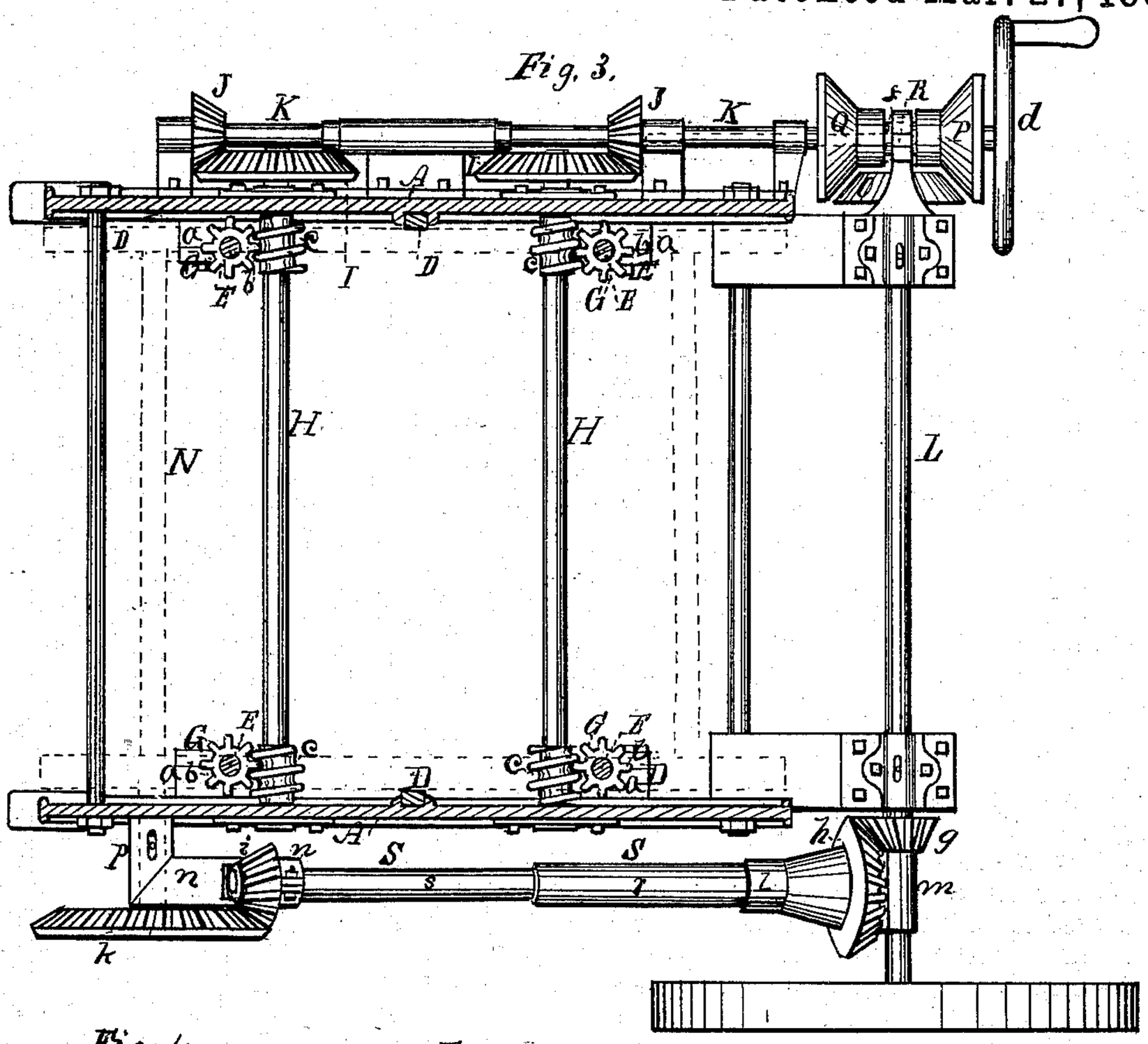


Fig. 4.

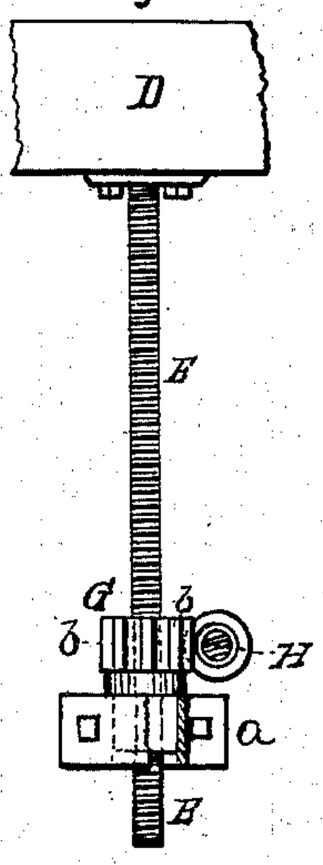


Fig. 5.

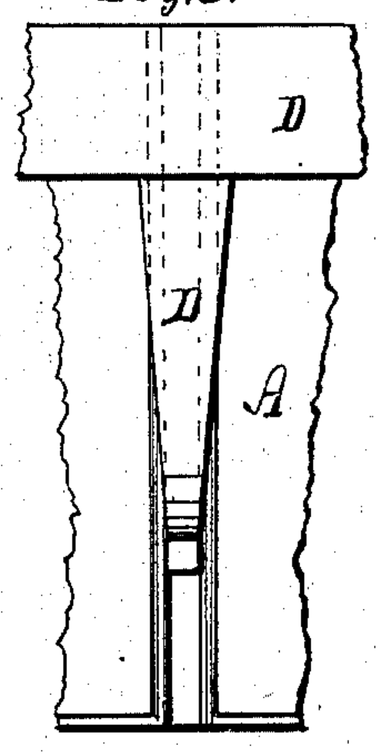


Fig. 6.

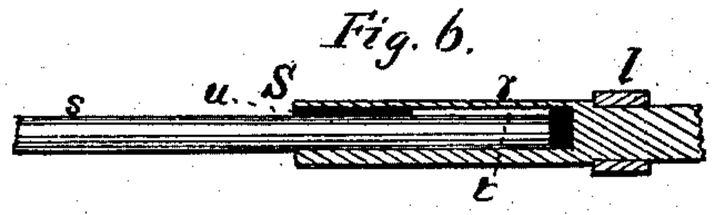


Fig. 7.


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# UNITED STATES PATENT OFFICE.

JACOB M. COOK AND JESSE S. PERKINS, OF LAKE VILLAGE, NEW HAMPSHIRE; SAID COOK ASSIGNOR TO SAID PERKINS.

## PLANING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 274,886, dated March 27, 1883.

Application filed January 3, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, JACOB M. COOK and JESSE S. PERKINS, of Lake Village, in the county of Belknap and State of New Hampshire, have invented Improvements in Planing-Machines; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a side view of a planing-machine provided with our improvements; Fig. 2, an opposite view of the same; Fig. 3, a horizontal section thereof in a plane indicated by the line *x x*, Fig. 1; Figs. 4, 5, 6, and 7, views of parts detached.

Like letters designate corresponding parts in all the figures.

Our improvements belong specially to the class of planing-machines in which the boards or stuffs are fed to the cutters by an endless belt or chain of lags; and our invention consists in improved means for adjusting this endless belt or chain of lags up and down, for changing the thickness of the planed stuffs and for adapting this adjustment to other operative parts of the machine, and in means for effecting this adjustment by the action of the machine while it is in motion, all substantially as hereinafter specified.

In the drawings, A A represent the sides of the frame; B, the cutter-head, and C the endless chain of lags, mounted on sprockets, which have their bearings in a frame, D, that is required to be adjusted up or down to produce any required thickness of planed stuff, and this adjustment must be made uniform in all parts, so that the endless chain of lags shall remain horizontal on the upper or holding and carrying surface, or constantly parallel with the upper or counter feed-rollers and with the axis of the cutter-head. It is also necessary, for good work, to have this frame held very firmly in all its positions. Heretofore only two adjusting-screws have been employed for effecting the adjustment, located under the middle of the lag-frame, respectively at opposite sides thereof, and these do not give the firmness of support and exactness of adjustment so desirable to have.

Our improved means of adjusting the lag-frame up and down consists in the employment of four adjusting-screws, E E E E, respectively located as near the four corners of the frame as practicable, so as to widen the support sufficiently to sustain all parts firmly, and in the means for imparting a uniform motion to all the screws simultaneously from one source of motion or single operating device. These screws are suitably secured at their upper ends to the under side of the lag-frame D, to be adjusted up or down thereby, are all vertical and parallel, and respectively pass down through revolving nuts G G G G, the screws themselves not revolving. The nuts revolve in suitable strong bearings, *a a a a*, and have on their respective peripheries worm-gears *b b b b*, into which worm-screws *c c c c* gear, each to each. The worm-screws are mounted on two horizontal shafts, H H, which extend crosswise of the main-frame sides A A, and have their bearings therein, each shaft serving two of the nuts, as represented in the drawings. On one end of each shaft H, outside of the main frame, is secured a bevel-wheel, I, and both of these bevel-wheels gear respectively into bevel-pinions J J, secured upon a shaft, K, extending at right angles to the shaft H H and properly mounted in bearings on the main frame. The gearings are all arranged so as to turn all the screws E E E E equally simultaneously and in the proper direction to raise or lower the lag-frame D equally in all parts. Consequently the turning of the shaft K in one direction or the other raises or lowers the lag-frame at will. A turning wheel or crank, *d*, mounted on the end of the shaft, enables the attendant to adjust the lag-frame by hand; but we provide for doing this by the action of the machine itself, thus saving labor and time. To effect this we employ means as follows, or an equivalent device:

The shaft L, which receives motion from the shaft M of the cutter-head and transmits motion to one of the sprocket-shafts N of the endless chain of lags to give the feed-motion thereto, extends across the main frame to a position near the shaft K, its center being in line with the center of the latter shaft. On the shaft L is a (preferably) beveled friction-wheel, O, and on the shaft K are two (preferably) beveled friction-wheels, P Q, attached to a sleeve, *f*, having a sliding movement on the shaft. These wheels P Q are so located in relation to the wheel O, and at such a distance apart, that

when they are in the position shown in Fig. 2 both are entirely out of contact with the said wheel O; but when the lag-frame is to be raised for planing thinner stuff one of the wheels, as P, is brought into contact with the wheel O, (their beveled surfaces fitting together,) with sufficient pressure to revolve the shaft K by the revolution of the shaft L, and when the lag-frame is to be lowered for planing thicker stuff the other wheel, as Q, is brought with pressure into contact with the wheel O. Thus, since the shaft L constantly revolves while the machine is in operation, the adjustment of the lag-frame or planer-bed is effected by the movement of the machine itself. The sleeve *f* is moved one way or the other to bring either of the friction-wheels P Q into contact with the wheel O and back to a central position by means of a hand-lever, R, provided with a fork to embrace the collar, and arranged as shown in Fig. 2, or otherwise, with similar effect.

The motion for moving the endless chain of lags is communicated from the shaft L to the sprocket-shaft N of the lags by means of a revolving shaft, S, extending obliquely from one to the other, and gearing into each by means of beveled cog-wheels *g h* and *i k*, respectively. The beveled-gear wheel *g* on the shaft L gears into the larger beveled-gear wheel, *h*, on the lower end of the communicating-shaft S, and the smaller beveled-gear wheel, *i*, on the upper end of the said communicating-shaft gears into the larger beveled-gear wheel, *k*, on the sprocket-shaft N. The relative sizes of these two pairs of beveled-gear wheels are such as to produce the desired rate of speed to be given to the feed-lags. As the sprocket-shaft N, mounted in the lag-frame, moves vertically up and down with said lag-frame in adjusting the same to the thickness of stuff to be planed, the distance between the said shaft and the shaft L necessarily varies with such adjustment, and consequently the length of the communicating-shaft S must vary at the same time, as well as its angle of position. To provide for these variations we employ the following means:

First. To provide for the angular adjustment of the communicating-shaft S, its lower bearing, *l*, is attached to a flange-plate, *m*, which extends down and surrounds the adjacent shaft L, and is held thereon so as to turn concentrically around the same. The upper bearing, *n*, of the said communicating-shaft likewise is extended in a part, *p*, to surround the sprocket-shaft N and turn on the same.

Second. To provide for the lengthening and shortening of the communicating-shaft S, it is made in two parts, one a sleeve part, *r*, and the other part, *s*, extending into and sliding in the sleeve part, as shown in Figs. 6 and 7. A projection or spline, *t*, on the periphery of the part *s* slides in a longitudinal groove, *u*, in the sleeve part *r*, or any other suitable means is employed to prevent one part from turning around on the other. The length of the lapping between the two parts should be sufficient and the fit between them should be sufficiently close to prevent any bending of the united parts or complete shaft.

For equalizing and adjusting the pressure of the upper or counter rollers on the stuff, we employ an improved device, as follows: At each side of the machine each roller is mounted in a bearing, T, which is arranged to slide in vertical ways in the side frame, A. Between the two bearings on each side of the machine is located a short lever, V, pivoted at its middle to the frame and bearing at one end on a shoulder or hook, *w*, of one of the sliding bearings, while the other end of this lever bears on the end of a counter-weighted lever, W, which is pivoted to the other roller bearing on that side of the machine. The levers are so arranged, as shown in Figs. 1 and 2, that the downward draft on the two sliding bearings shall be equal, so that a counter-weight, X, suspended from the lever W, will cause an equal downward pressure on two sliding bearings. The counter-weight X is adjustable to different positions on the lever, and thus the leverage is varied, and consequently the pressure of the rollers is adjusted at will. The use of counter-weights instead of springs enables the counter force to be exactly determined and made equal on each side. The counter-weights are adjusted along the levers, preferably by notches *v*, marked and numbered so as to readily determine the force of the pressure exerted by each counter-weight and make them always equal.

What we claim as new, and desire to secure by Letters Patent, is—

1. In combination with the lag-frame D, the four adjusting-screws E E E E, revolving nuts G G G G, provided with worm-gears *b b b b*, shafts H H, provided with worm-screws *c c c c*, and shaft K, connected by gearing with the shafts H H, substantially as and for the purpose herein specified.

2. In combination with means for adjusting the lag-frame D up and down, actuated by a shaft, K, a shaft, L, continually revolving when the planing-machine is in operation, and means, O P Q R, for communicating motion from the shaft L to the shaft K, whereby the chain of lags is adjusted up and down by the action of the machine itself, as herein specified.

3. The combination of the sliding bearings T T and weighted levers W W, pivoted thereto, with the sliding bearings T T′ and intermediate equalizing-levers, V V, bearing respectively upon the levers W W and said bearings T′ T′, substantially as and for the purpose herein specified.

In testimony whereof we affix our signatures in presence of two witnesses.

JACOB M. COOK.
JESSE S. PERKINS.

Witnesses:
S. C. CLARK,
THOS. HAM.