H. A. PERKINS.

FEED MECHANISM FOR WOOD PLANERS.

APPLICATION FILED NOV. 30, 1908.

916,934.

Patented Mar. 30, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

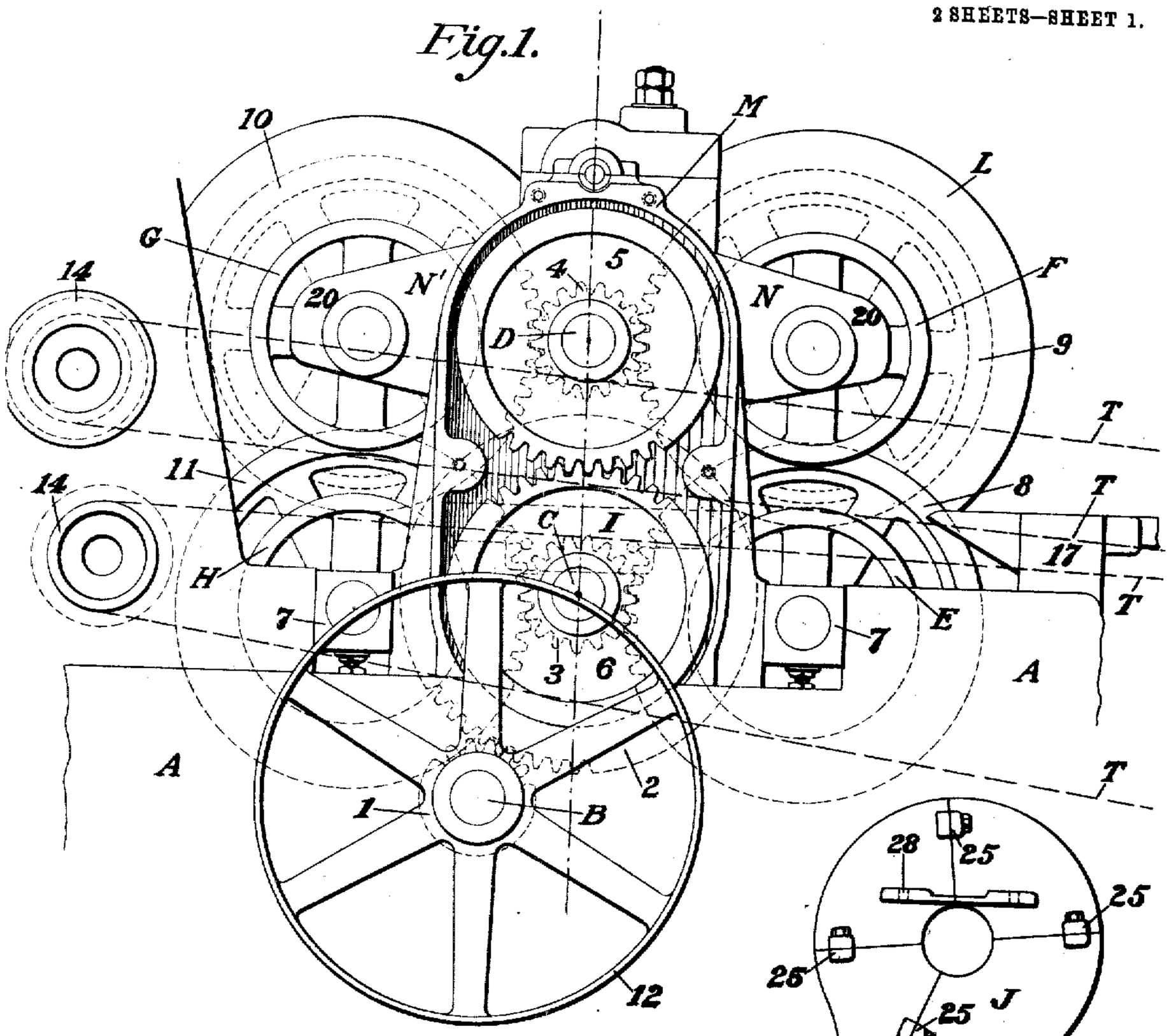
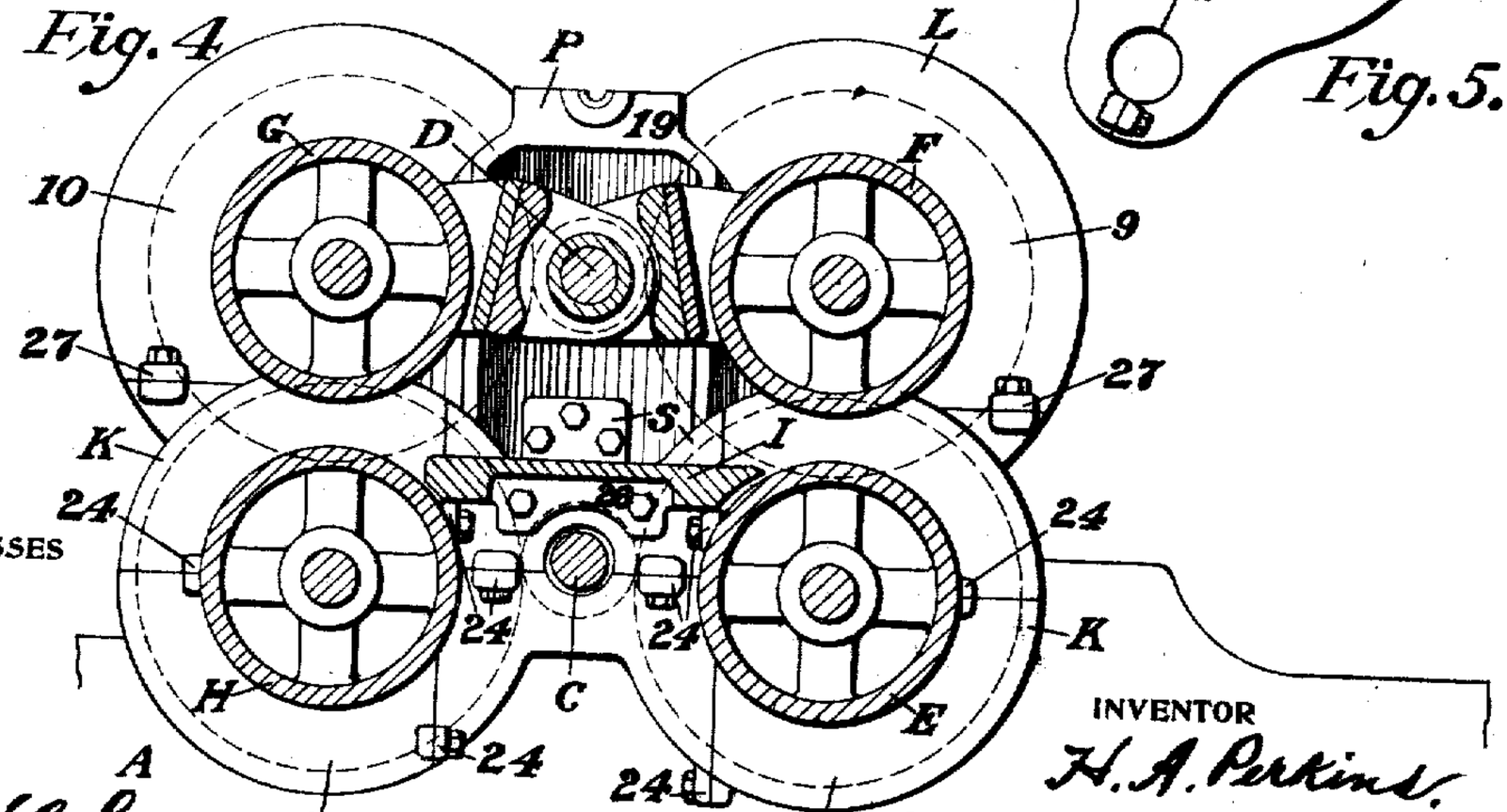


Fig. 5.

Fig. 4.



WITNESSES

Harry L Gould

C. M. Catlin

INVENTOR

H. A. Perkins.

BY

Benj. R. Catlin.

ATTORNEY

H. A. PERKINS.

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2 SHEETS—SHEET 2.

Fig. 2.

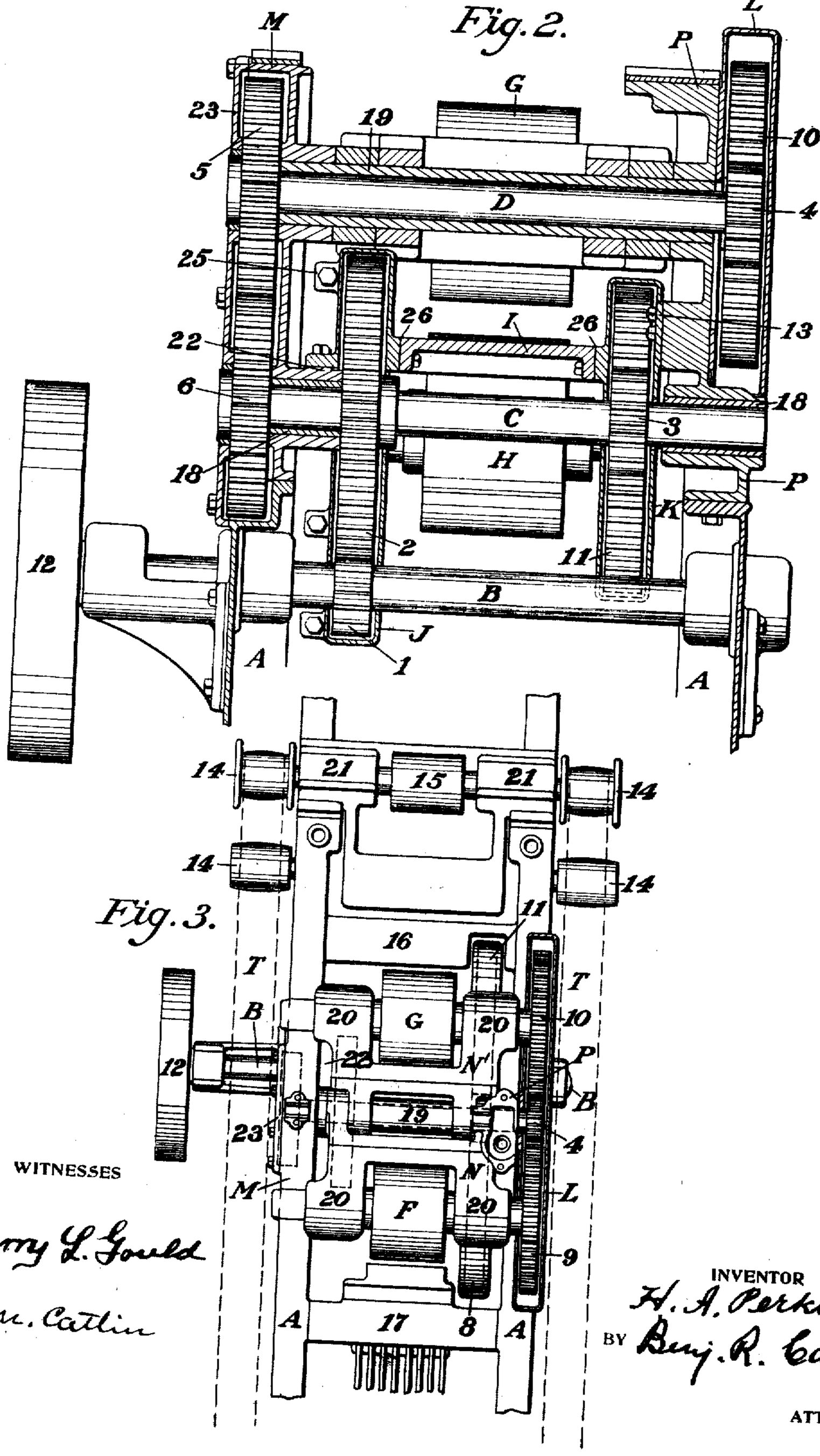

Fig. 3.

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C. M. Catlin

INVENTOR

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ATTORNEY.

UNITED STATES PATENT OFFICE.

HIRAM A. PERKINS, OF ROCHESTER, NEW YORK, ASSIGNOR TO AMERICAN WOOD WORKING MACHINERY CO., OF ROCHESTER, NEW YORK, A CORPORATION OF PENNSYLVANIA.

FEED MECHANISM FOR WOOD-PLANERS.

No. 916,934. Specification of Letters Patent. Patented March 30, 1909.

Application filed November 30, 1908. Serial No. 465,307.

To all whom it may concern:

Be it known that I, HIRAM A. PERKINS, of Rochester, New York, have invented a new and useful Feed Mechanism for Wood-Planers, of which the following is a specification.

My invention relates to a new method of mounting and operating the feed rolls of a wood planing machine and to a novel arrangement of gearing for the same, and it consists in such a construction of the parts and disposition of the gearing as to produce the results hereinafter described and not heretofore obtainable.

In the accompanying drawing Figure 1 is a side elevation of my invention; Fig. 2 is a sectional elevation at right angles to Fig. 1. Fig. 3 is a plan view; Fig. 4 is a section parallel to Fig. 1. Fig. 5 is a detail.

A A, Figs. 1 and 2, represent the framing of a wood planer, upon which are supported roll stands M and P. Shafts C and D pass through these roll stands and extend across the machine, the lower one having bearings in bushings 18, secured in the roll stands: the upper shaft D has bearings in a sleeve or quill 19, which extends across the machine parallel with shaft C, and is secured at both ends in the roll stands in a suitable manner. Upon this sleeve are hinged roll yokes N N′, each having suitable boxes 20, for carrying the rolls F G. The yokes N N′ are free to adjust vertically about the hinge-sleeve 19, and may be held down by weights or springs in any suitable manner. The lower rolls E H are journaled in boxes 7, suitably supported on the frame A.

The construction above described is not new, being in common use on machines of this kind. Instead, however, of placing the gears for driving the feed rolls in the usual positions overhanging or projecting outside of the frame of the machine, I locate all the gearing approximately or quite inside of the vertical outline of the frame.

Referring to Figs. 1 and 2, first feed shaft B carries a pinion 1, meshing into the master gear 2, which is keyed to the lower operating shaft C, inside the frame A. Roll stand M is recessed in one side so as to receive the transit or conveying gears 5 and 6 connecting the two shafts C and D, thus using the space for gearing heretofore occupied by the roll stand or the machine frame. 8 and 11 are gears considerably larger in diameter than the rolls, and they are keyed to the lower roll shafts inside of the frame A. A pinion 3, keyed to shaft C, meshes into both gears as indicated in dotted lines in Figs. 1 and 4. 9 and 10 are similar gears secured to the shafts of upper rolls F and G, outside of the boxes 20, and therefore not in the same plane of rotation as gears 8 and 11, thus permitting the upper gears to pass the lower when the rolls are running near together. A pinion 4, on shaft D, drives both upper rolls similarly to the lower rolls. 17 indicates the in-feed table or stock support, and I, Figs. 2 and 4, the central guide support or bridge.

It will be observed that gears 9 and 10 overhang the frame but very little, and this might still be reduced if desirable; but as a matter of fact the slight projection shown in Fig. 2 is not objectionable in view of the results obtained by the novel arrangement of gearing described, viz; on account of the compactness of the gearing transversely to the machine frame, I am enabled to run the belts T, driving the surfacing cylinders 15, in the space heretofore occupied by gearing, thus permitting the cylinder pulleys to be located close to the boxes 21, Fig. 3, and the boxes in turn can thus be brought close to the ends of the cutting knives. By this means the steadiness of the cylinder and the rigidity of its bearings are greatly increased, and the quality of the surfacing correspondingly improved: furthermore by reason of the arrangement of the feed roll gearing in three trains, in addition to the master gear 2 and pinion 1, I am enabled to distribute the tooth strains so that the pressure on any one tooth is never more than what is necessary to drive one feed roll; for instance, gears 9 and 10 are both driven by pinion 4 on opposite sides of the center, whereby different teeth are engaged with each roll gear at the same instant; similarly gears 5 and 6, while actually moving two feed rolls, sustain tooth pressure of less than that required by one roll, because the ratio of gears 5 and 4 is about two and one-half to one; furthermore in all the driving gears the strain is transmitted from the shaft to the pitch circumference of the gear, and in all receiving gears vice versa; therefore no gear receives and delivers strain circumferentially, and consequently gearing arranged according to my

system is practically indestructible, so far as breakage caused by tooth pressure is concerned. In order, however, to further protect the gearing and avoid accidents from outside sources I provide casings or housings which cover the gears completely. J, Figs. 2 and 5, is a casing covering the master gear 2 and pinion 1, and made in sections so as to be readily attached after the gearing is in place; it is secured to the machine by means of a projecting flange arranged to be bolted to a ledge 22, Figs. 2 and 3, on the roll stand M. On the roll stand M, I provide a cover 23, which is bolted in place over the recess in which gears 5 and 6 are located. Over the lower roll gears 8 and 11, I provide a casing K, which is also made in sections so as to be bolted together around the gears, and is securely bolted against the face of the roll stand P, as shown at 13, in Fig. 2. This casing also covers the driving pinion 3. For the upper roll gears a corresponding cover L is provided which must either be attached to the roll yokes N N′, so as to rise and fall with the gears, or if made stationary like casing K, must be made large enough internally to accommodate such vertical movement of the gears 9 and 10. All of these casings are machine fitted in all the joints and at points of attachment to the machine, so that they are dust proof and come into accurate relation with all the contiguous parts of the machine. Thus it will be seen that the gearing within the machine frame is absolutely protected from splinters, broken lumber or chips, and the outside gears protected from shavings, dust or other accidental interference, and the machine made safe for operator and workman.

It is necessary in machines of this kind to have a guide support or bridge between the lower rolls, to which the side guide is usually attached. I therefore provide such a bridge I, Figs. 2 and 4. As one method of securing this bridge in position, flanges 26 are formed at both ends and fitted to drop in between the casings J and K, to which the flanges are securely bolted. By this means the casings are rigidly secured together, and the bridge firmly attached to the machine. Substitutes for the flanges 26 might be devised, but they would not change the character of the device. In this connection it will be noted that the roll stand P is not bodily vertically over the frame A, but is offset toward the center of the frame from a point just above the bearing of the shaft C, and the object of the offset is to provide space within the vertical outline of said frame for the location of the roll gears 9 and 10. This construction in connection with the recess in the roll stand M, to receive the transit gears 5 and 6, is an important point in my invention.

In order to assemble the gear casings after the gears are in place I make them in suitable sections, each case being divided on lines where the parts will embrace gears, shafts and boxes, so as to be tight when finally clamped together. Casings K and L are shown in Fig. 4, L being made in two parts which are held together by bolts through lugs 27, Fig. 4. K is made in six parts, and all sections can be bolted together by means of lugs 24, the upper central section S being secured to the roll stand P by bolts through one wall, and the bridge I bolted to the opposite wall, as before mentioned. Similarly casing J is made in four parts held together by lugs and bolts 25, Fig. 5. These gear casings thus become a part of the machine independent of their protecting function for the gearing.

I do not wish to be confined to the exact sectional division of the gear casings shown and described, as other means of applying them might be devised which would not change the character of my invention.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a wood planing machine, upper and lower feed rolls, power receiving gears on each roll, said lower gears not being in same plane of rotation as the upper ones, upper and lower operating shafts with one pinion each to drive said roll gears, independent transit gears connecting the operating shafts, whereby all strain is distributed from the center of each gear to the pitch circumference, or vice versa, and the pressure on any single tooth is never more than that required to drive one feed roll.

2. In a wood planing machine, upper and lower feed rolls, power receiving gears on each roll, said lower feed roll gears not being in the same plane of rotation as the upper ones, operating shafts with one pinion each to drive said roll gears, independent transit gears connecting the operating shafts, all of said gearing being located substantially within the exterior vertical outlines of the machine frame, for the purposes set forth.

3. In a wood planing machine, upper feed rolls, power receiving gears on each roll, lower feed rolls with similar gears, but out of the plane of rotation of the upper ones, upper and lower operating shafts with one pinion each to drive said roll gears, independent transit gears connecting the operating shafts, a master gear on one operating shaft located within the frame of the machine, and a pinion and shaft to drive the same, for the purposes set forth.

4. In a wood planing machine, lower feed rolls with receiving gears located between the bearings, upper feed rolls with gears attached outside the bearings, separate driving pinions on separate operating shafts for upper and lower rolls, which shafts are connected by independent transit gears, a master gear located between the bearings on one of the operating shafts, all of said gearing being lo-

cated substantially within the exterior vertical outlines of the machine frame, for the purposes set forth.

5. In a wood planing machine, a roll stand or support arranged to carry bearings for roll driving shafts, gears on said shafts, a recess in said roll stand to receive and cover said gears, whereby the plane of rotation of the gears is within, or approximately within the vertical outline of the machine frame.

6. In a wood planing machine, a pair of roll supporting stands made to receive bearings for roll driving shafts, one of such stands being recessed to receive and cover gears on said shafts, and the other stand offset inward with reference to the machine frame to give space for roll driving gears within the vertical outline of the machine frame, or nearly so, for the purposes set forth.

7. In a wood planing machine, gears for driving the lower feed rolls located within the machine frame, covers or housings for such gears, provision on the housings for attaching them to a rigid part of the machine, and other provision for attaching bridges or cross girths to said housings where required.

8. In a wood planing machine, upper and lower feed rolls, gearing for driving the same located substantially within the vertical outline of the machine frame, protecting casings for said gears made in sections, so as to be convenient for assembling after the gearing is in place, said casings having provision for securing them rigidly to a contiguous part of the machine.

HIRAM A. PERKINS.

Witnesses:
F. H. CLEMENT,
G. C. SOUTHARD.