No. 771,373. PATENTED OCT. 4, 1904.

G. LANGEN.

GEARING.

APPLICATION FILED FEB. 3, 1904.

NO MODEL.

Fig. 1.

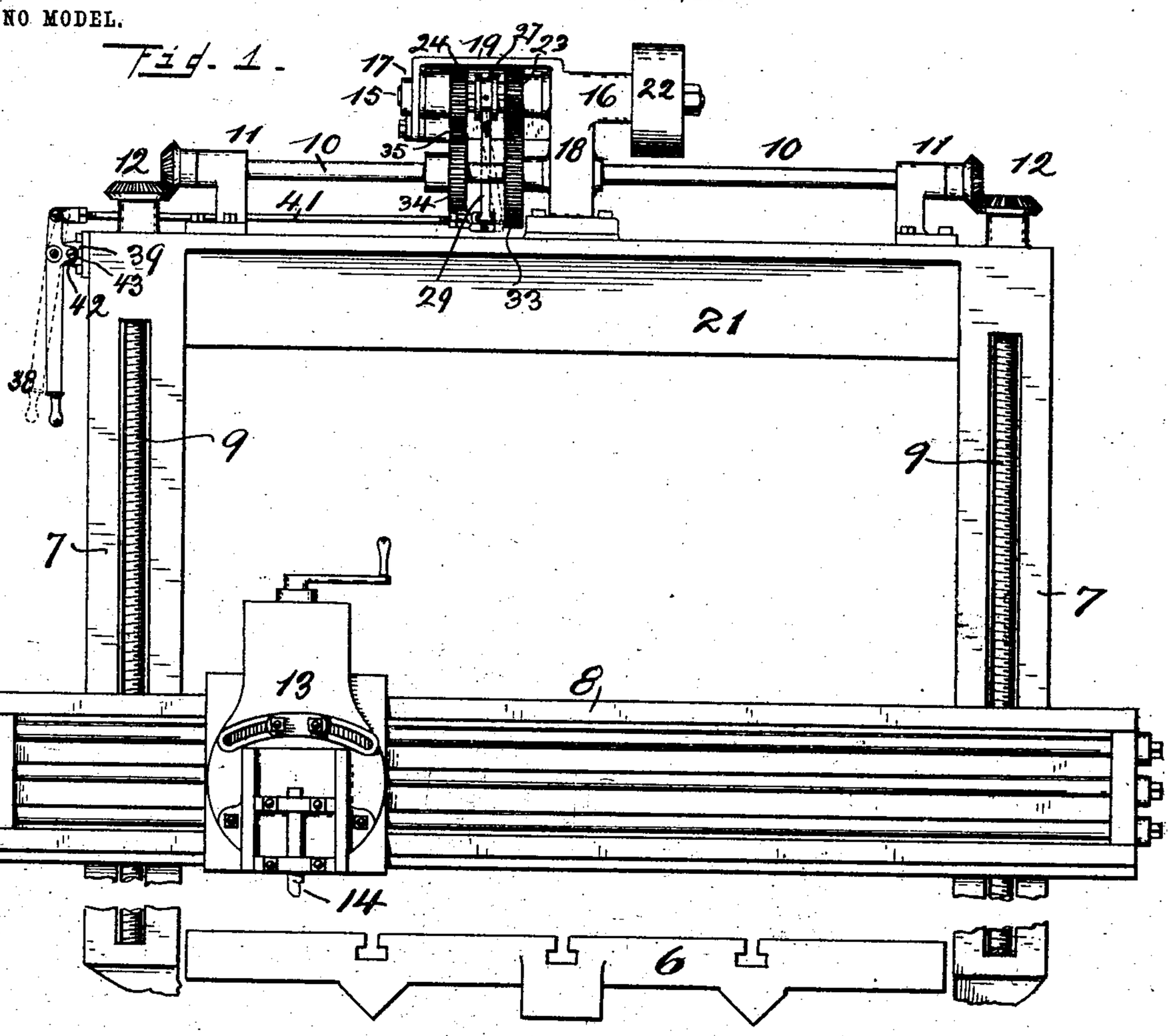


Fig. 3.

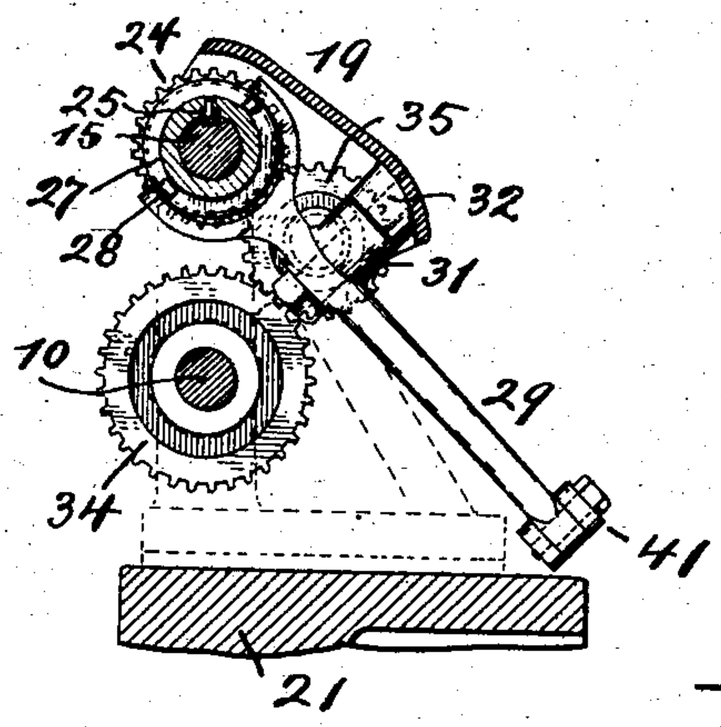


Fig. 2.

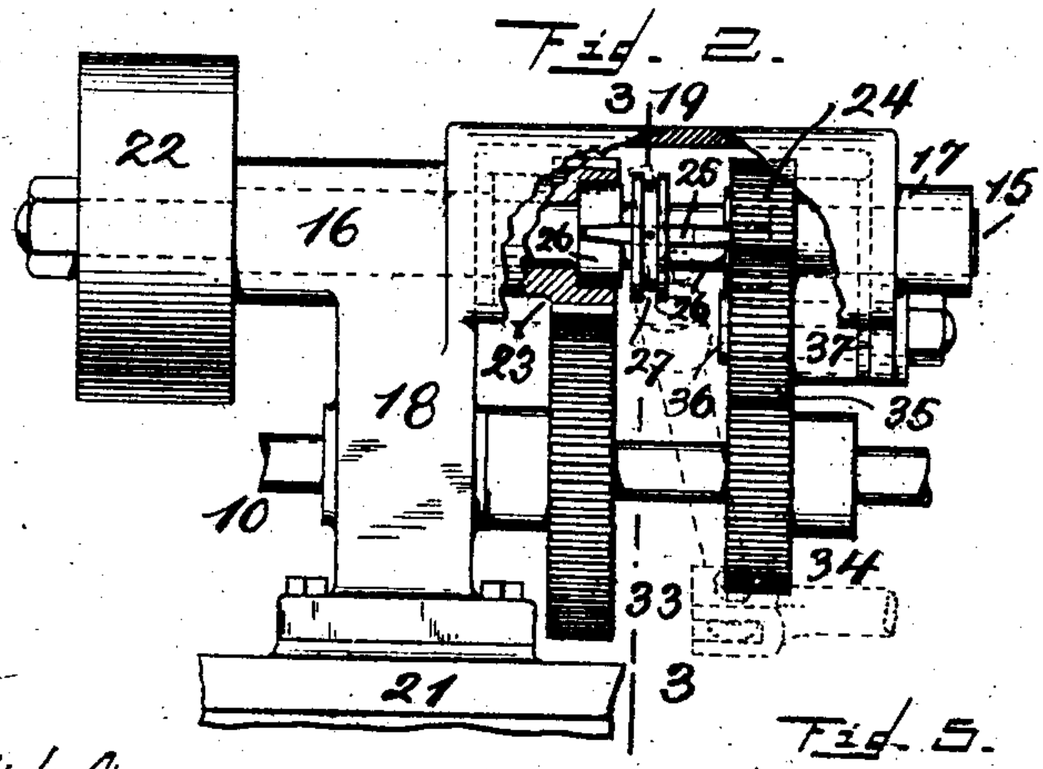


Fig. 4.

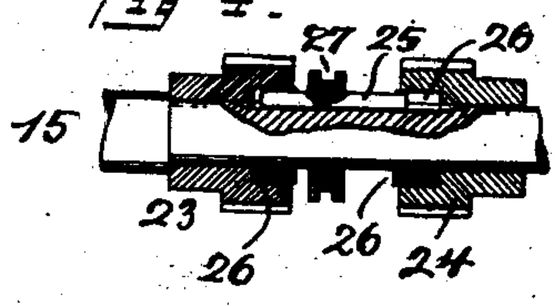
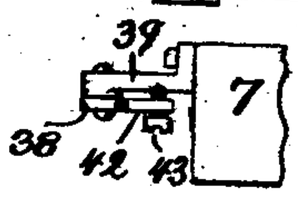


Fig. 5.



Witnesses
H. C. Robinson
Arthur Kline

Inventor
George Langen
by C. Spengel atty.

No. 771,373. Patented October 4, 1904.

UNITED STATES PATENT OFFICE.

GEORGE LANGEN, OF CINCINNATI, OHIO, ASSIGNOR TO THE CINCINNATI PLANER CO., OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

GEARING.

SPECIFICATION forming part of Letters Patent No. 771,373, dated October 4, 1904.

Application filed February 3, 1904. Serial No. 191,785. (No model.)

To all whom it may concern:

Be it known that I, GEORGE LANGEN, a citizen of the United States, residing in the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Gearing for Planers; and I do declare the following to be a clear, full, and exact description thereof, attention being called to the accompanying drawings, with the reference characters marked thereon, which form also a part of this specification.

This invention relates to improvements in elevating devices for machine-tools of the planer type, meaning thereby that mechanism whereby in such tools the so-called "rail" carrying the tool-head is adjusted to bring the tool in proper relation, vertically considered, to the work on the work-holding table. In general such tools are provided with two upright longitudinally-fixed screws which engage the rail by means of complementary nuts on it, so that when these screws are rotated the rail will move in either direction, according to direction of rotation. For the simultaneous rotation of these screws there is a driving-shaft connected to each of them by means of bevel-gearing, so that when this shaft is rotated both of these screws will also rotate. The mechanism for rotating this shaft is more particularly called the "elevating" device and consists of a train of gear-wheels and means whereby this train may be caused to rotate said shaft in either direction, so that the rail may be caused to rise or to descend. This mechanism is usually driven by means of a belt and pulley from a counter or line shaft. As at present arranged and constructed these elevating devices operate with one speed in either direction, so that the rail moves with the same speed either ascending or dropping.

The object of my invention is to provide two speeds, and more particularly to provide for a faster one when the rail descends, since at that time no weight has to be moved—that is, lifted—and the weight of the rail tends to aid the operation during the lowering movement.

The invention consists of the particular construction as the same, together with its operation, is hereinafter described and claimed and as such construction is illustrated in the accompanying drawings, in which—

Figure 1 shows in part a front view of a machine-tool of the customary planer type provided on the top cross-rail of its frame with my improved elevating device. Parts below the work-table are omitted. Fig. 2 is an enlarged rear view of the upper part of Fig. 1, it being limited to show more particularly the elevating device. Fig. 3 is a cross-section of Fig. 2 on line 3 3 thereof and looking toward the right of said figure. Fig. 4 is a detail view showing the clutch device in longitudinal section. Fig. 5 is an enlarged detail view of the upper end of the operating-handle as shown in Fig. 1.

In the drawings, 6 indicates the planer-table, the front end of it being shown. On each side of it there are the uprights 7 7 of the frame or housing and on the faces of each of which the rail 8 is carried in a manner to be vertically adjustable. For such adjustment there are upright screws 9 9, provided in recesses one on each side in each of the uprights of the housing and each screw so supported as to be held in a fixed position longitudinally. From the rear side of the rail project nuts (not shown) into these recesses and engage these screws, so that when these latter are turned the rail will ascend or drop, according to direction of their rotation. The rotation of these screws is a simultaneous one by means of a shaft 10, supported in bearings 11, its operation being transmitted to the upper ends of these screws by sets of bevel-wheels 12 12.

13 is the tool-head, carried on rail 8 in a manner to be adjustable thereon in a longitudinal direction and transversely with reference to the table. 14 is the tool attached to said head. The work is done while the object to be planed is carried back and forth by the longitudinally-reciprocating planer-table, to which it is held, so as to be within cutting range of the tool.

The position of the tool with reference to the work is adjusted before operations are

started horizontally by means of the head on rail 8 and vertically by means of this latter on the uprights of the housing. As before stated, it is this latter adjustment which is concerned in this invention. As already explained, screws 9 are used for such purpose and rotated by means of shaft 10. For driving this latter I provide a short shaft 15, supported in two bearings 16 and 17, the first one formed in the upper part of a standard 18 and the other one formed at the end of a bridge member 19, projecting laterally from the same standard. This latter rests on the upper cross-rail 21 of the machine-frame and is so shaped as to clear shaft 10, or this latter may pass through it, and thus find an additional bearing. Shaft 15 may be rotated by any suitable means—as, for instance, by a pulley 22 driven from a counter-shaft, line-shaft, or otherwise. A customary loose pulley may be provided in such case to stop operation when not required. Loosely mounted on this shaft, between its bearings and below bridge member 19, there are two pinions 23 and 24, with sufficient space between them to permit provision of a clutch device by means of which when accordingly adjusted either one of these pinions may be locked to shaft 15, so as to rotate therewith, or both may be left inactive. In detail this clutch device consists of a sliding wedge-key 25, seated in a keyway in shaft 15 and adapted to be shoved with either one of its tapering ends into a space between the separated ends of a split ring 26, of which there are two, one in each of a recess in the opposite sides of pinions 23 and 24. The effect of such movement is that the split ring is spread and caused to bind against the contiguous surface of the particular pinion within the recess thereof, thereby locking such pinion to the shaft. As shown in Figs. 2 and 4, pinion 23 is locked to the shaft and operative. It is also to be noted that neither of the ends of the wedge leaves entirely the space between the separated ends of the split rings, both of which always rotate with the key, so that no matter how moved the key never misses to enter one of these spaces. For moving this key-wedge there is a sliding clutch-collar 27, to which it is connected and which collar is slidably mounted on shaft 15. It has a groove in its face to receive pins 28 of a customary forked clutch-lever 29, whereby said collar, with the wedge-key, may be shifted either way without interfering with their rotation with shaft 15. This lever has a hub 31 and is pivoted to a boss 32 on the under side of bridge 19. The motion of these pinions as transmitted by them to shaft 10 is received by this latter as to pinion 23 by a gear-wheel 33 and as to pinion 24 by a gear-wheel 34, the transmission in the latter case being, however, not a direct one, but by means of an interposed idler 35, so as to cause the transmission also to be one of reversed rotation. This idler is mounted on a stud-shaft 36, supported in a bearing 37, formed in the depending end of bridge 19.

It will now be seen that two gear-trains are provided, either one of which may be used to rotate shaft 10, one train consisting of gears 23 and 33 and the other of gears 24, 35, and 34 and the operation of one being in opposite direction to the one of the other. Furthermore, by proportioning the sizes accordingly the speed of the operation of one gear-train may also be so arranged as to be different with reference to the operation of the other. Thus, as will be seen, gear 33 being larger than gear 34 transmits a slower rotation and is used to rotate shaft 10 when rail 8 is to be elevated. Gear 34 being smaller is used and caused to rotate shaft 10 when the rail is to be lowered, such rotation being faster, since no work is to be done at that time—that is, no weight is to be lifted—and the weight of the descending rail with the tool-head on it favors this motion. The adjustment of the rail from a high position to a lower one and closer to table 6 may thus be accomplished quicker than with present devices in use.

In order to bring the manipulation of clutch-lever 29 within convenient reach of the machinist, I provide a hand-lever 38, pivoted to the side of the housing by means of a bracket 39 and connected with its upper end to clutch-lever 29 by means of a rod 41. It is to be understood that while the planer is in use pulley 22 and shaft 15 rotate continuously and with this latter also key-wedge 25, split rings 26 within the recesses of the pinions 23 and 24, and clutch-collar 27. The parts are, however, in an intermediate position, as shown in Fig. 1, and neither one of the split rings engages with its respective pulley, so that no motion is transmitted to gear-wheels 33 and 34 and none is received by shaft 10. The object of this continuous rotation is to have all parts continually in readiness to enable the operator without further preparatory manipulation or adjustment to adjust rail 8 up or down at once whenever he needs it during the execution of his work by simply moving hand-lever 38. Such operative positions are shown in Fig. 4 and in dotted lines in Figs. 1 and 2.

The parts may be locked in the intermediate position shown in Fig. 1 to guard against any possible accident or disturbance after adjusted, and particularly in case rail 8 is to remain in a certain position for a considerable length of time and during which the use of the elevating device is not frequent. For such purpose I provide a lateral extension 42 on hand-lever 38, which carries a set-screw 43, the inner end of which may be caused to enter a depression or socket in bracket 39, whereby when in such position manipulation or accidental movement of the hand-lever is prevented. (See Fig. 5.) It will be noted that by this arrangement all

gear-wheels remain continually in mesh, thus avoiding possibility of breakage of teeth when disengaged wheels or an intermediate idler are suddenly thrown into mesh broad face.

I am aware that reversing devices have heretofore been used for similar purposes, and therefore do not claim such a device as broadly new nor the combination of a reversing device with a planer. I claim merely a reversing device constructed as shown and the particular means and the details of their construction shown and whereby such a reversing device becomes adapted for attachment and use in combination with a planer of the type shown.

Having described my invention, I claim as new—

1. In means for adjusting vertically in a planer the position of the tool-carrying devices above the work-holding table, the combination of a driven shaft, a driving-shaft, bearings for this latter, a standard which contains one of the bearings for each shaft and is provided with a laterally-projecting bridge member, having at its free end a depending extension which contains the other bearing for the drive-shaft, two gear-trains to transmit motion from one shaft to the other mounted between these bearings, they being arranged so that the transmission by one gear-train is different as to speed and direction of rotation from the other, a clutch device arranged between these two gear-trains whereby either one or neither of them may be engaged and used, and a clutch-lever to operate this clutch device pivoted to the bridge member.

2. In gearing for a rail-elevating device for adjusting vertically in a planer the position of the rail with reference to the work-holding table, the combination of a driven shaft, a driving-shaft, two pinions loosely mounted on this latter with a space between the two, a corresponding gear-wheel for each on the driven shaft, the engagement between one set of these gears being a direct one, an idler interposed between the two gears of the other set, the proportional arrangement of the two sets being also such that the speed transmitted by one is different from the speed of the other, a stud-shaft for the idler, bearings for it and the driving-shaft, a standard on which this latter shaft is supported, one bearing being at the upper end of the same, this standard having a lateral extension which bridges the space between the two pinions and has on its under side a boss and at its free depending end the other bearing for the driving-shaft and the one for the stud-shaft, a clutch device arranged in the space between the two pinions and below this lateral extension, a clutch-lever pivoted to the boss mentioned and means to manipulate the same.

In testimony whereof I hereunto set my signature in the presence of two witnesses.

GEORGE LANGEN.

Witnesses:

C. SPENGEL,

ARTHUR KLINE.