(No Model.) 3 Sheets—Sheet 1.

G. A. GRAY & E. RICHTER.

FEED FOR METAL PLANERS.

No. 597,355. Patented Jan. 11, 1898.

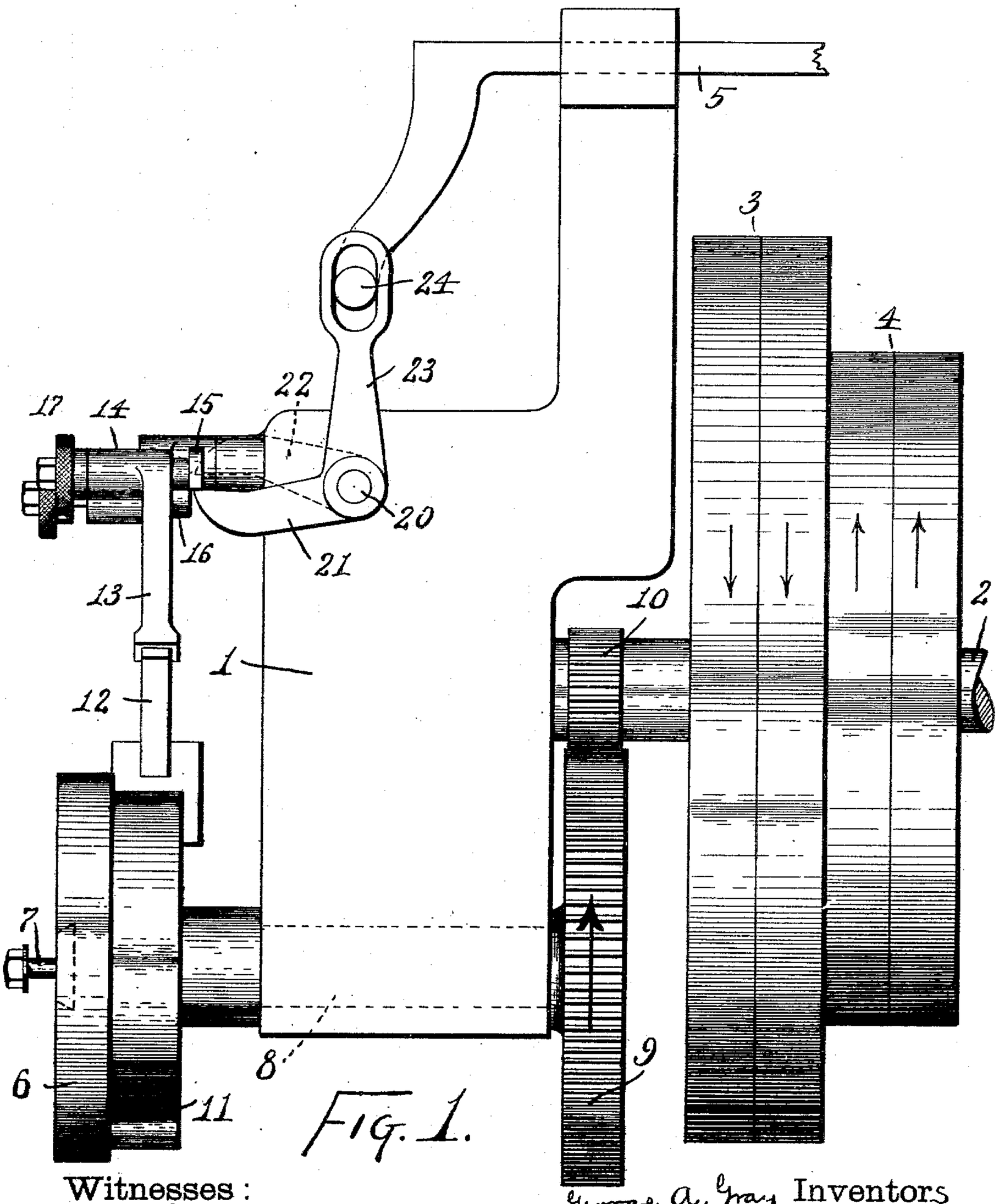

FIG. 1.

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K. M. Laurie

George A. Gray Inventors
Ernst Richter
by James W. See Attorney

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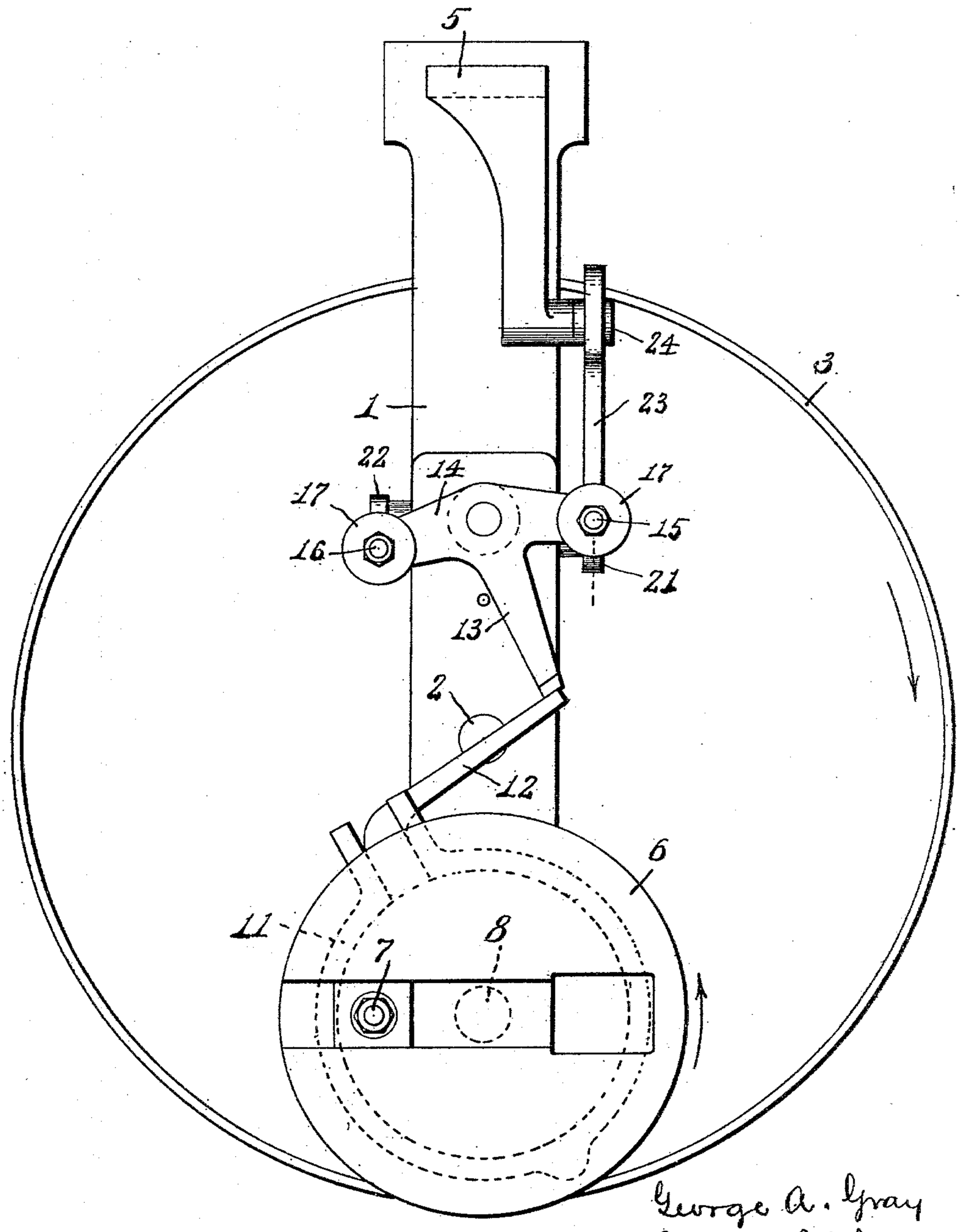

FIG. 2.

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(No Model.) 3 Sheets—Sheet 3.

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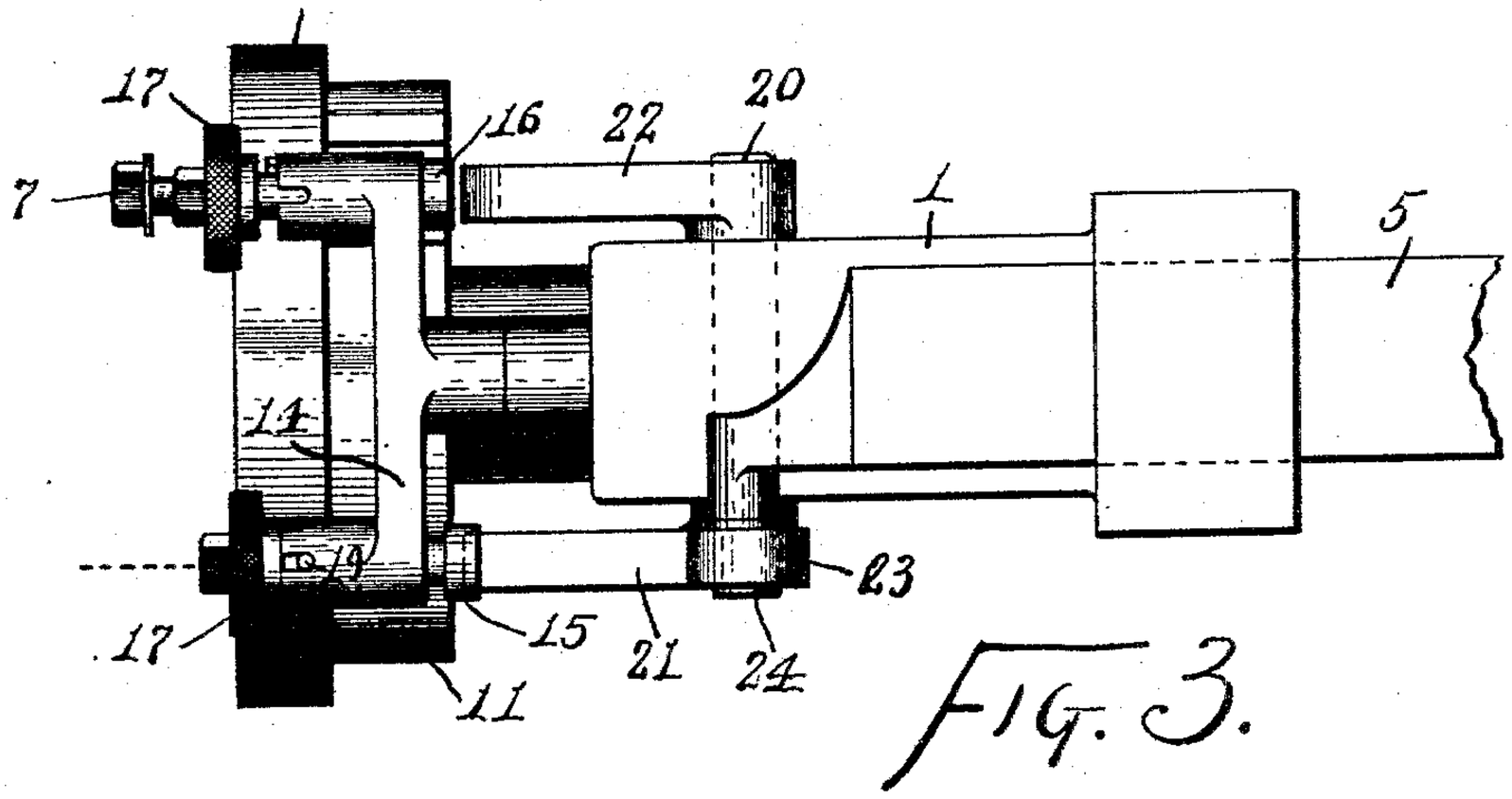

FIG. 3.

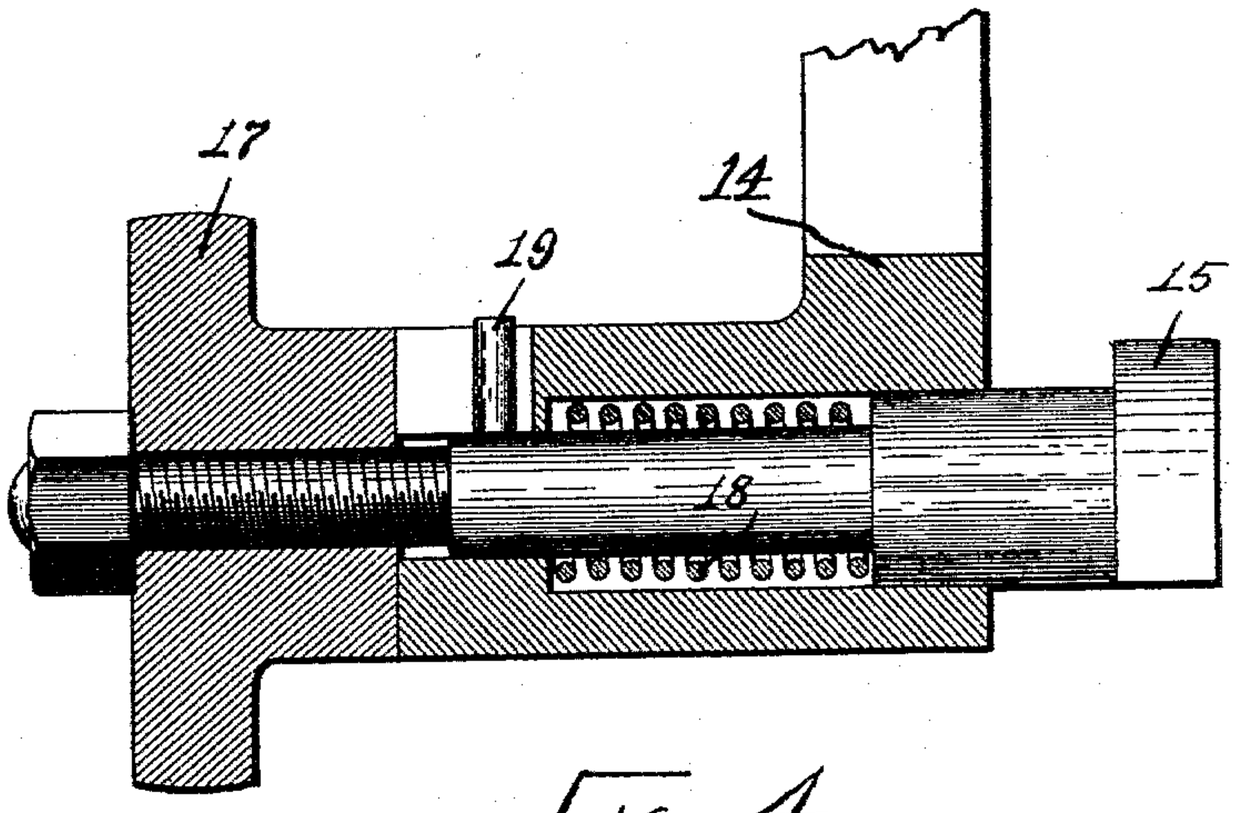

FIG. 4.

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Witnesses:
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by James W. See Attorney

UNITED STATES PATENT OFFICE.

GEORGE A. GRAY AND ERNST RICHTER, OF CINCINNATI, OHIO, ASSIGNORS TO THE G. A. GRAY COMPANY, OF SAME PLACE.

FEED FOR METAL-PLANERS.

SPECIFICATION forming part of Letters Patent No. 597,355, dated January 11, 1898.

Application filed September 10, 1897. Serial No. 651,172. (No model.)

To all whom it may concern:

Be it known that we, GEORGE A. GRAY and ERNST RICHTER, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Feeds for Metal-Planers, (Case A,) of which the following is a specification.

This invention pertains to the feeding devices of metal-planing machines, and relates to improvements whereby the feed of the cutting-tool may take place at the beginning or at the end of the cutting stroke or at both ends of the cutting stroke, as desired.

Our improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a feed mechanism exemplifying our invention; Fig. 2, a front elevation of the same, the front being assumed as at the left in Fig. 1; Fig. 3, a plan, and Fig. 4 a vertical section through the bearing of one of the tripping-pins.

In the drawings, 1 indicates fixed frame parts for the support of the moving mechanism; 2, the driving-shaft of the planer; 3, the tight and loose pulleys for the belt producing the cutting motion of the planer, the left-hand one of these pulleys being assumed as the loose pulley; 4, the tight and loose pulleys for the belt producing the backing motion of the planer; 5, the belt-shifter or some part having an equivalent motion in one direction or the other as the reversal of the planer motion takes place; 6, the usual feed-crank, which, by making a single rotation, causes the proper feeding motion to be imparted to the cutting tool or tools; 7, the usual crank-pin, adjustable in the crank to determine the degree of feed, this crank-pin receiving the usual connections; 8, the shaft of crank 6, the crank being, however, loose with reference to this shaft, as in our Patent No. 447,820, dated March 10, 1891, hereinafter referred to as "our former patent;" 9, a gear fast on shaft 8; 10, a pinion engaging gear 9 and turning with the loose pulley of the pair of pulleys 3; 11, a friction-strap carried by crank 6 and serving when gripping to lock crank 6 to its shaft, as in our former patent; 12, a cam-lever carried by crank 6 and adapted, when the lever is pressed inwardly, to force the friction-strap open and allow shaft 8 to revolve, while the crank 6 remains stationary, as in our former patent; 13, an arm hung on a pivot and standing normally in the path of and engaging the end of cam-lever 12, as seen in Fig. 2, and adapted to swing to the right so as to release the cam-lever; 14, a pair of arms projecting from arm 13, each carrying at its end a bearing-boss, as in Fig. 4; 15, a trip-pin sliding in one of these bearing-bosses and projecting its end to the rear of the boss; 16, a similar trip-pin in the other bearing-boss; 17, handles on the outer ends of the trip-pins, by means of which the trip-pins may be drawn inwardly and turned; 18, springs in the bearing-bosses urging the trip-pins rearwardly; 19, pins projecting from the trip-pins and engaging open slots in the front ends of the bearing-bosses and, while so engaging, preventing the turning of the pins, the construction being obviously such that, by means of its handle, either trip-pin may be drawn forwardly and so turned that pin 19 engages the outer face of the bearing-boss, thus retaining the trip-pin in retracted position; 20, a rock-shaft; 21, an arm fast on this rock-shaft, the extremity of this arm forming a toe engaging under the rear end of trip-pin 15 when that trip-pin is in rearward projected position; 22, a similar arm fast on rock-shaft 20, its toe engaging over trip-pin 16 when that trip-pin is projected; 23, an operating-arm fast on rock-shaft 20 and shown as being integrally formed with arm 21; and 24, a pin carried by belt-shifter 5 and engaging arm 23, so that the reciprocations of the belt-shifter give oscillating motion to arms 21 and 22.

Assume the parts in the position shown in the drawings and assume that gear 9 is turning in the direction of its arrow. This gear and its shaft will turn idly, feed-crank 6 being stationary by reason of the fact that its friction is unlocked and held by arm 13. If, now, by any means arm 13 can be swung to the right, Fig. 2, cam-lever 12 would be released and the friction-strap will clutch feed-crank 6 to its shaft 8, and thereupon the feed-crank

would turn with its shaft and would continue so to turn indefinitely. If, while the feed-crank was so turning, arm 13 be restored to the position shown in the drawings, it would intercept the cam-lever and cause the cam-lever to release the friction-strap, thus holding the feed-crank stationary while its shaft continued its rotation. One rotation of the feed-crank is to produce the proper feeding motion for the planer, and it is the duty of arm 13 to move to the right at the proper time and permit this rotation and then to again take its intercepting position and arrest the feed-crank at the end of its single rotation. The normal position of arm 13 is the intercepting position shown in Fig. 2, and the gravity of the arm tends to hold it in that position or to return it to it if it be swung to the right.

If it be desired that the feeding motion shall take place at the end of the cutting stroke of the planer, then it is only necessary that when the reversal of planer motion takes place at the end of the cutting stroke the arm 13 be swung to the right, so as to free cam-lever 12, and then return to its intercepting position before the feed-crank shall have completed its turn, so that as the feed-crank finishes its rotation its cam-lever will be engaged by arm 13 to release the friction-clutch and arrest the feed-crank. Referring now to Fig. 1, let it be assumed that belt-shifter 5 moves to the right at the end of the cutting stroke of the planer. The effect of such movement of the belt-shifter is to rock arm 21 upwardly, and as the toe of this arm engages under trip-pin 15 it is obvious that arm 13 will be swung to the right, thus releasing the cam-lever and permitting the crank to be rotated by its shaft. The toe of arm 21 in rising quickly passes and disengages from trip-pin 15, thus permitting arm 13 to again take up its intercepting position. It is therefore obvious that the movement of the belt-shifter to the right has permitted a single rotation of the feed-crank. When the planer motion reverses at the beginning of the cutting stroke, the belt-shifter will move to the left and arm 21 will rock downwardly, and in doing so the toe of the arm will again take position below trip-pin 15, the trip-pin moving outwardly against the resistance of spring 18 to permit the toe to pass the pin. While arm 21 has thus been effective on trip-pin 15, arm 22 has been without effect on trip-pin 16 by reason of the fact that the trip-pin 16 is in position of retraction out of reach of arm 22. If now we retract trip-pin 15 and turn it so that its pin 19 engages the end of its bearing-boss, then trip-pin 15 will be out of reach of arm 21 and the movement of the belt-shifter will have no effect upon the feed devices of the planer. Provision is thus made, on the assumption given, for causing the feeding motion of the planer to take place at the end of the cutting stroke or for causing the feeding devices to be entirely idle during the working of the planer.

Assume now that trip-pin 15 is put into its retracted idle position, so that no feeding motion takes place, and assume, further, that trip-pin 16 is released, so as to become projected into the path of arm 22. In such case it is obvious that the movement of the belt-shifter to the left will cause a rocking to release arm 13, thus causing the feeding motion of the planer to take place at the beginning of the cutting stroke, trip-pin 15 and arm 21 in such case being inert. Provision is thus seen to be made for having the feed take place at either the beginning or end of the cutting stroke of the planer. If both trip-pins 15 and 16 be allowed to project into active position, then arm 13 will become disengaged both before and after the cutting stroke, and the feed-crank will make a rotation at each end of the cutting stroke. Provision is thus made for causing the planer-feed to take place at either end of the cutting stroke or at both ends.

It is now in order to analyze the function of the parts to determine the principle of the invention. In the exemplification the shaft 8 is shown as being turned through the medium of pinion 10, turning with the loose pulley pertaining to the cutting motion of the planer. This is a convenient construction and the one we follow in practice, but it will at once be obvious that any means, for turning shaft 8 continuously, or when its turning is needed, will be the equivalent of the specific transmitting means illustrated, it being only necessary that shaft 8 shall be turning at the time the feeding motion is wanted. Again, the friction-clutch arrangement illustrated, being the same as in our former patent, will be found quite satisfactory in practice, but will obviously find its full equivalent in any of the well-known devices for imparting arresting motion between one moving piece of machinery and another piece to be intermittently moved forward by it. Again, in the exemplification the initiating of the feeding motion is brought about by the reciprocations of the belt-shifter 5, which makes a single stroke at each reversal of the planer. The belt-shifter is a convenient part to serve as such initiating agent, but it is obvious that the initiation may be effected by any other part which makes a stroke at each reversal of the planer. It is therefore to be understood that the specific devices set forth are merely exemplifying in character and illustrate the best mode in which we contemplate applying the principle of our invention.

In our Patent No. 447,820, dated March 10, 1891, we employ a feed-clutch with a cam-lever tripped by the belt-shifter, but the feeding-impulse could occur only at one end of the stroke of the planer-table, at the beginning or end of the cutting stroke, as predetermined in the construction of the machine. By means of our present invention the feeding impulse

may be caused by mere adjustment to occur at either end or at both ends of the cutting stroke.

We claim as our invention—

1. In feeds for metal-planers, the combination, substantially as set forth, with a feed part, as the cam-lever of a clutch, to be released and arrested at each feeding impulse, and a reciprocating part, as the belt-shifter, making a stroke at each reversal of the planer motion, of a releasing and arresting device, as an arm structure, and tripping connections between said reciprocating part and said releasing and arresting device to cause the latter to act on said feed part at each end of each stroke of said reciprocating part.

2. In feeds for metal-planers, the combination, substantially as set forth, with a feed part, as the cam-lever of a clutch, to be released and arrested at each feeding impulse, and a reciprocating part, as the belt-shifter, making a stroke at each reversal of the planer motion, of a releasing and arresting device, as an arm structure, tripping connections between said reciprocating part and said releasing and arresting device to cause the latter to act on said feed part at each end of each stroke of said reciprocating part, and removable engaging parts of said tripping connections arranged to suppress the action of said reciprocating part on said feed part.

3. In feeds for metal-planers, the combination, substantially as set forth, with a feed part, as the cam-lever of a clutch, to be released and arrested at each feeding impulse, and a reciprocating part, as the belt-shifter, making a stroke at each reversal of the planer motion, of a rocking arm serving to release and arrest said feed part, a pair of trip-pins carried thereby, tripping-arms engaging said trip-pins and serving to give said rocking arm a releasing motion at each motion of the tripping-arms, and connections between said tripping-arms and said reciprocating part, to cause the tripping-arms to move at each movement of said reciprocating part.

4. In feeds for metal-planers, the combination, substantially as set forth, with a feed part, as the cam-lever of a clutch, to be released and arrested at each feeding impulse, and a reciprocating part, as the belt-shifter, making a stroke at each reversal of the planer motion, of a rocking arm serving to release and arrest said feed part, a pair of retractable trip-pins carried thereby, tripping-arms engaging said trip-pins and serving to give said rocking arm a releasing motion at each motion of the tripping-arms, and connections between said tripping-arms and said reciprocating part, to cause the tripping-arms to move at each movement of said reciprocating part.

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