(No Model.) 2 Sheets—Sheet 1.

F. S. GABLE & J. S. DETRICK.

CLUTCH.

No. 507,117. Patented Oct. 24, 1893.

Fig. 2.

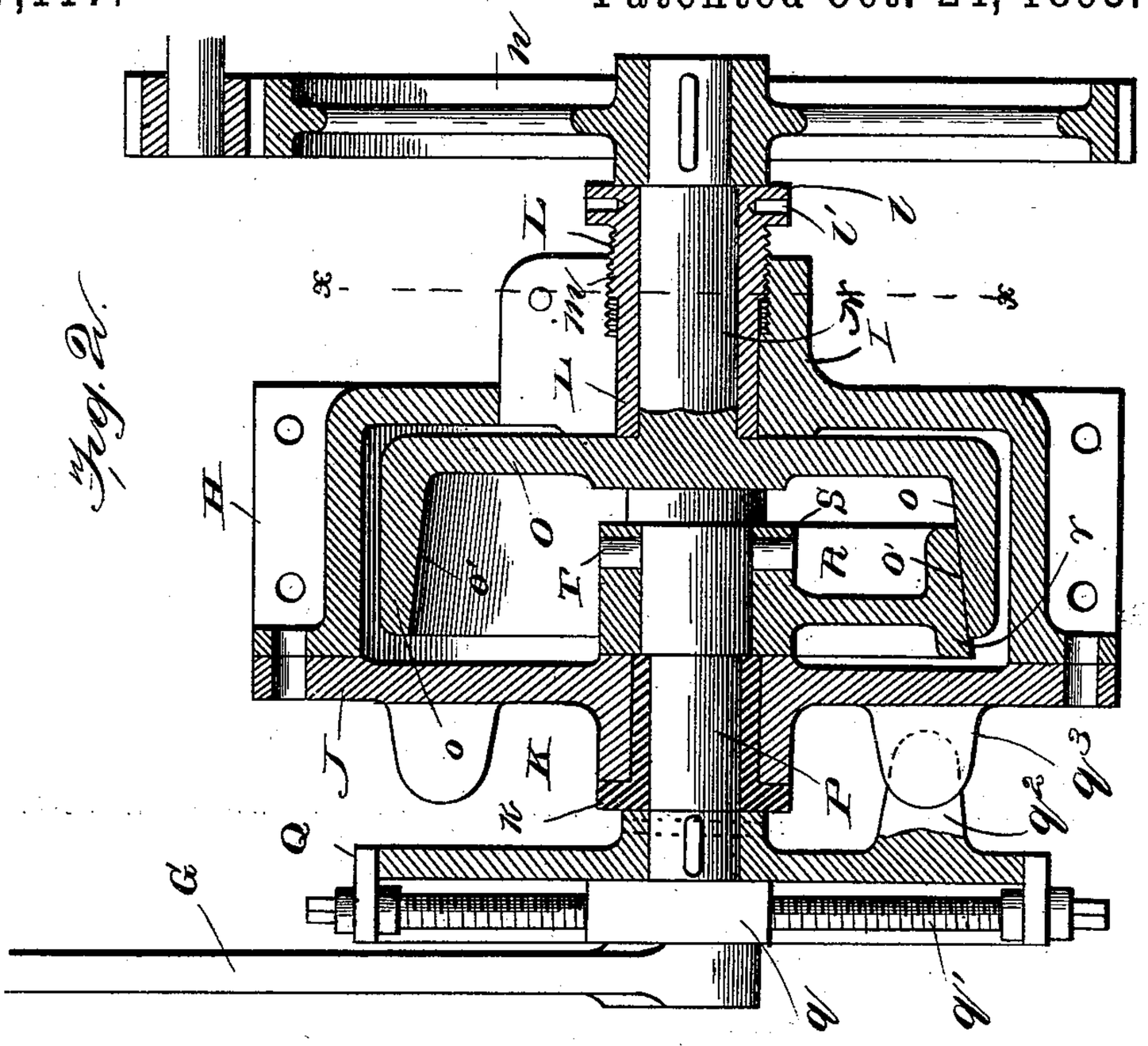
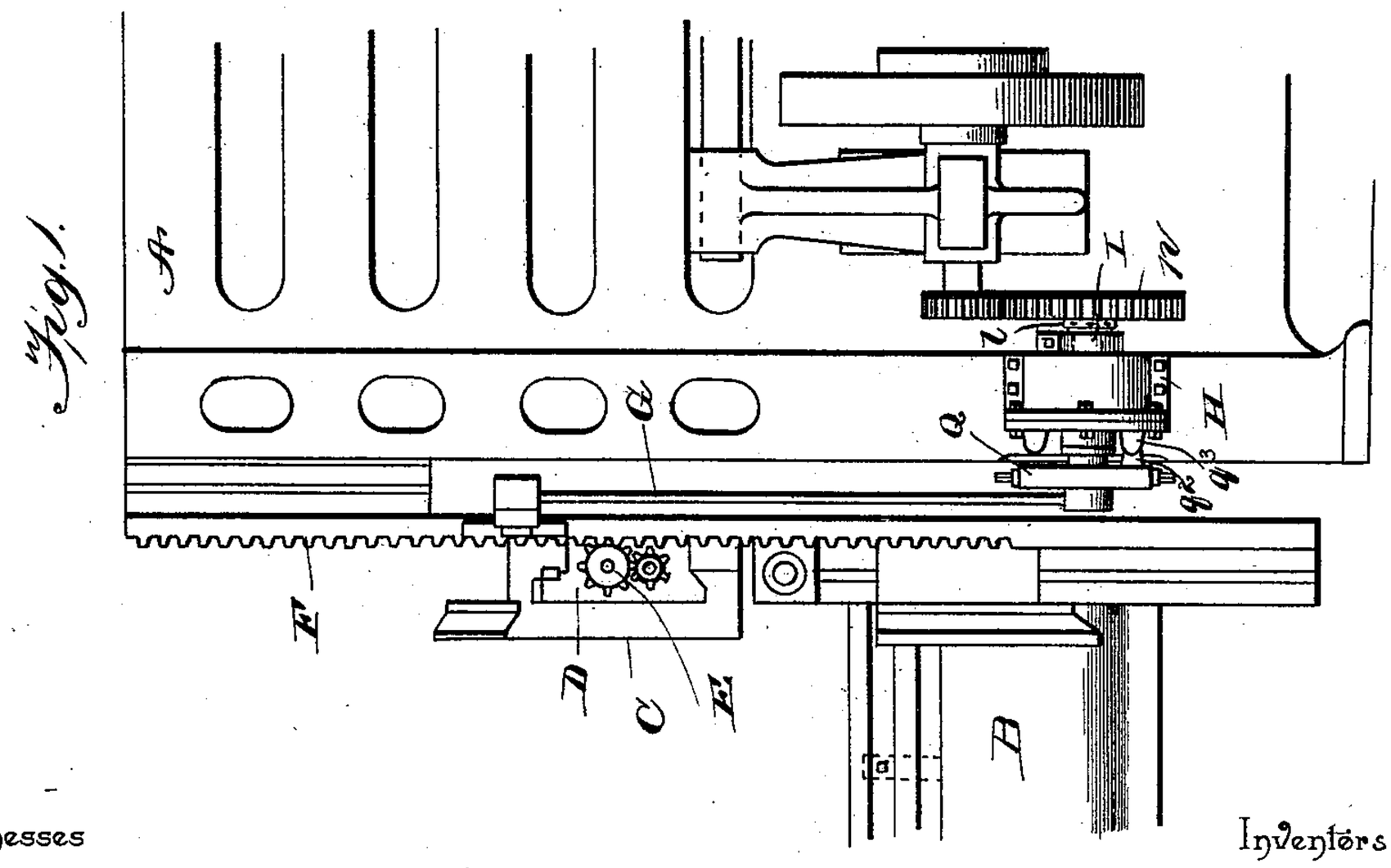


Fig. 1.



Witnesses

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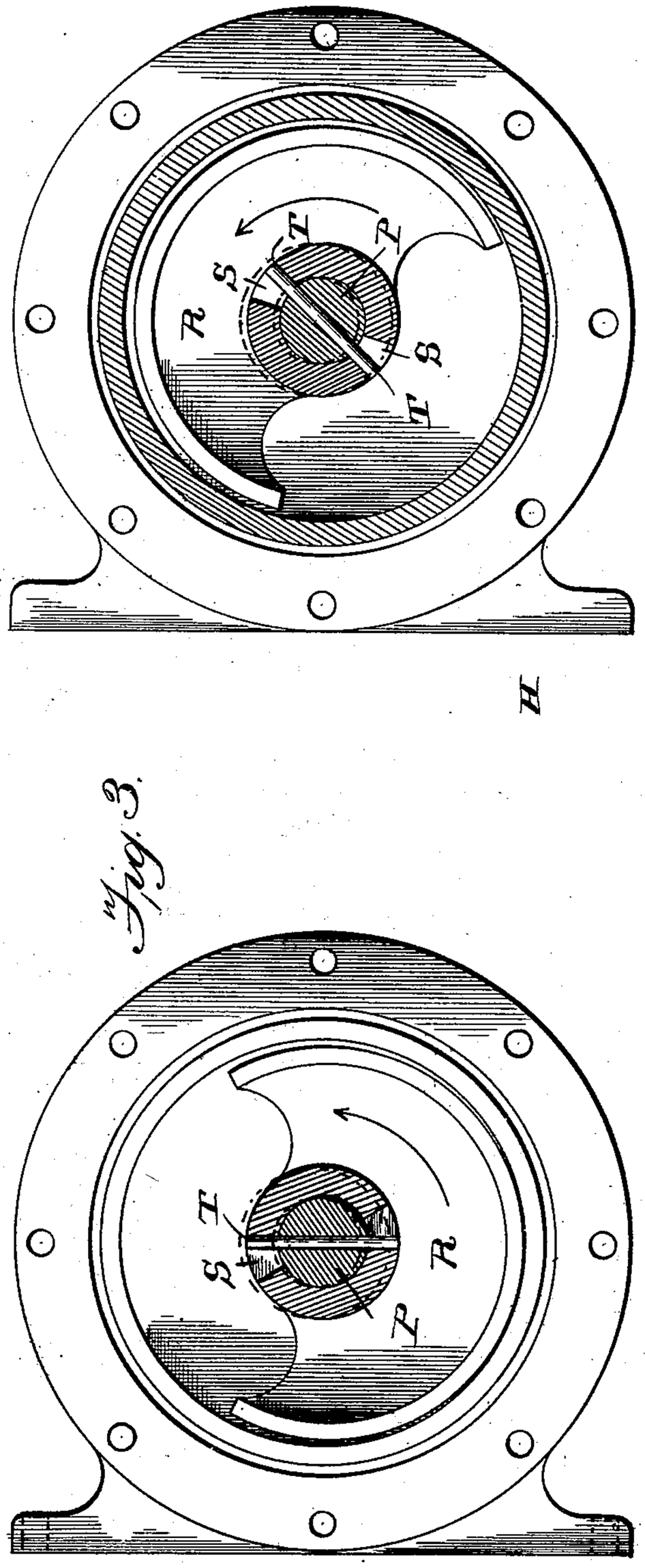

Fig. 4.

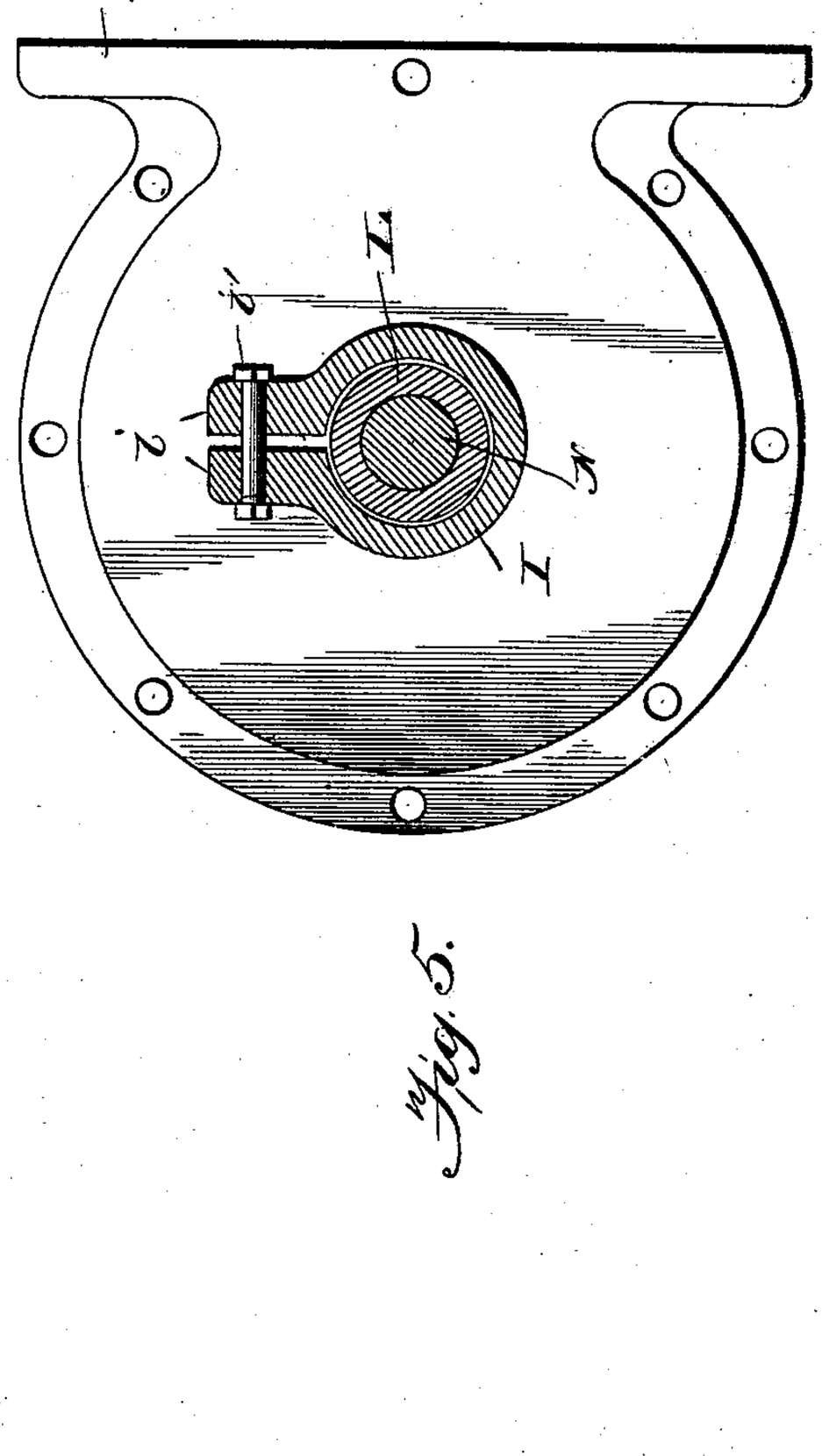

Fig. 5.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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CLUTCH.

SPECIFICATION forming part of Letters Patent No. 507,117, dated October 24, 1893.

Application filed May 27, 1893. Serial No. 475,695. (No model.)

To all whom it may concern:

Be it known that we, FRED S. GABLE and JACOB S. DETRICK, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented a new and useful Metal-Planer Feed, of which the following is a specification.

This invention relates to metal planer feeding devices; and it has for its object to provide certain improvements in the friction feed gear devices of machines of this character, whereby the friction wheels will always be insured a firm gripping contact, which in ordinary planer feeds is frequently lost, by reason of the fact that one of the friction wheels, of its own momentum, is thrown out of contact with the driving friction wheel, and on the reverse rotation of the driving friction wheel is therefore not caught up. These objects will be more readily understood by referring to the description and drawings, but the main and primary object may be stated to be to provide a simple and efficient friction gear for the feeding mechanism of metal planing machines.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts, hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a side view of a portion of a metal planing machine showing the proper position of our improved feed gear connected with the other parts of the feeding mechanism. Fig. 2 is an enlarged vertical longitudinal sectional view of our improved feed friction gear. Fig. 3 is an enlarged side view of our improved friction gear showing the sector friction wheel gripped by the surrounding friction ring, the side plate removed. Fig. 4 is a similar view to Fig. 3, showing the sector friction wheel in the position at which the friction ring leaves it, and such sector friction wheel will fall of its own weight. Fig. 5 is a detail sectional view on the line *x*—*x* of Fig. 2.

Referring to the accompanying drawings, A represents the frame of an ordinary metal planing machine, and B, the reciprocating platen or bed which is arranged to be moved back and forth under the planer stock or head C. The planer stock or head C, is adapted to carry the ordinary planing tool and is arranged to slide on the ordinary cross beam D, and is controlled in its sliding movement by an ordinary ratchet box and pinion E, which is operated by means of the vertically reciprocating rack F. The reciprocating rack F, is moved up and down in the ordinary manner by the connector rod G, clamped thereto at one end and connected at its other end with the feed friction gear devices forming a part of the present invention, and which we shall now proceed to describe.

Suitably arranged at a point adjacent to the rod G, and suitably secured to the frame work of the planing machine at one side, is the flanged boxing or casing H, having a laterally extending bearing neck I, and open at one side, which open side is removably inclosed by a side cap plate J, also having a laterally extending bearing neck K. The laterally extending bearing neck I, is split and has the separate perforated neck-lugs *i*, which receive the clamping screw bolt *i'*, adapted to be tightened to draw the lugs toward each other and thereby hold clamped in its adjusted position, within the neck I, the adjustable sleeve bushing L.

The adjustable sleeve bushing L, registers with the interior bore of the bearing neck I, and is provided at its extreme outer end with an adjusting head *l*, having wrench openings *l'*, which are adapted to receive a wrench or other tool employed for conveniently adjusting the bushing, and adjacent to the head *l*, the bushing is further provided with an enlarged exteriorly threaded portion M, which adjustably engages the interiorly threaded socket *m*, formed in the outer end of the split neck I. By means of this construction, the sleeve bushing can be readily adjusted longitudinally in and out of the flanged boxing or casing, and held fast in any adjusted position, and consequently provides simple and efficient means for the endwise or longitudinal adjustment of the main drive shaft N. The main drive shaft N, is journaled in the sleeve bushing L, which is mounted within the bearing neck I, and has keyed to its outer end, alongside of the adjusting head of the sleeve bushing, the drive wheel *n*, which is driven by means of suitable gearing, and is

designed to be reversed in its movement at the end of each movement of the planer platen, in a manner well understood by those skilled in the art. The main drive shaft N, carries upon its inner end within the boxing or casing H, and alongside of the inner end of the sleeve bushing L, the disk O, from which projects the internal friction ring *o*. The internal friction ring *o*, is entirely inclosed within the boxing or casing and is adapted to turn in reverse directions therein, as the main drive wheel is rotated in either direction, and said internal friction ring is provided with an inner beveled or tapered contact face *o'*, with which is adapted to frictionally come in contact the other part of the gearing to be presently described.

The laterally extending neck K, of the side cap J, may be lined with a bushing *k*, and forms the bearing for the auxiliary shaft P, which may be more properly termed the feed or adjusting shaft. As clearly illustrated in Fig. 2 of the drawings, the bearing neck K, and the feed or adjusting shaft P, journaled therein, are eccentric to the shaft N, or in different horizontal planes, so that both of said shafts may be said to be mounted eccentrically with respect to each other for the purposes which will presently appear.

The shaft P, carries at its outer end the slotted adjuster arm Q, accommodating the adjustable block *q*, controlled or adjusted by the screw *q'*, and to which is pivotally connected the lower end of the connector rod G. It is of course understood that, as the adjuster arm Q, is turned a half turn in both directions as the machine is in operation, the feeding devices for the planer head, will be operated in substantially the same manner as in an ordinary machine, and in order to provide for positively stopping the adjuster arm at the end of each half turn, I provide the same with a single off-standing stop lug q^2, near one end thereof, and adapted to engage the stop lugs q^3 projecting from the outer face of the side cap plate J, and arranged diametrically opposite to each other. The said stop lugs may of course be suitably cushioned to relieve the same from the constant wear due to the continuous hammering of the adjuster arm lug against those on the cap plate.

Loosely arranged on the inner end of the separate auxiliary shaft P, and disposed inside of the internal friction ring *o*, within the boxing or casing, is the sector friction wheel or pulley R, which is of a diameter somewhat less than the internal diameter of the ring *o*, so that the proper "gripping and letting go" will take place as the friction gear is in operation, and the periphery of said friction wheel or pulley R, is exteriorly beveled or tapered as at *r*, to correspond with the bevel or taper of the inner contact face of the ring *o*, thereby providing a construction whereby the contact between the friction wheel and the ring may be adjusted, by the adjustment of the sleeve bushing L, previously described.

The sector friction wheel or pulley R, which is loose on the inner end of the shaft P, within the boxing or casing, is provided in opposite sides of its hub with the widened key or pin grooves or recesses S, into which project the opposite projecting ends of the key-pin T, fastened into the shaft P, and projecting slightly to opposite sides of the same, so that the said friction wheel or pulley R, is permitted a certain amount of axial play or turning, entirely independent of the shaft P. It will also be apparent to those skilled in the art, that the selfsame result will be secured by having the adjuster arm Q, loose on the outer end of the shaft P, with widened key recesses embracing a key-pin projecting from the shaft, thus allowing a movement independent of the shaft, so that the sector friction wheel or pulley will have the same operation inside of the friction ring as it has when it is itself loose on the shaft, as just described.

The dotted lines in Fig. 2 show how the widened key recesses may be formed in the adjuster arm Q.

Now by reference to Figs. 3 and 4 of the drawings, particularly, the operation of our improved feed friction gear will be apparent to those skilled in the art. Assuming the friction ring to be turning in the direction indicated by the arrows in Fig. 3 of the drawings, it will have a widened contact with the sector friction wheel or pulley at its bottom side nearest the shaft P, on which the wheel or pulley is mounted, so that, as the ring continues its rotation, it will carry the friction wheel or pulley up to the point illustrated in Fig. 4 of the drawings, where the ring leaves one end of the friction ring or pulley, and the same will be free to fall of its own weight to its normal position entirely independent of the shaft P, on which it is mounted, owing to the widened key recesses. It will be understood also, that as the ring *o*, is about to leave the friction wheel or pulley, the said wheel or pulley of its own momentum would tend to continue to turn in the same direction with said ring, and therefore if it did not have a play independent of the shaft P, so that it could fall back again into contact with the ring, it would lose its contact, as is the case in the gearing now usually employed for the feed devices of metal planing machines. The construction described therefore provides a friction gear which always insures the contact of the friction ring and the friction wheel at the very moment the friction ring is reversed by the usual reversing gear, to feed the rack bar F, up and down. As already noted, the same result will be secured if the connection of the adjuster arm to one end of the shaft P, was similar to the connection of the wheel R, to such shaft, and the wheel fixed on the shaft.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sac-

rificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a feed friction gear of the class described, the combination of the main drive shaft a friction ring, carried by said shaft an auxiliary shaft mounted eccentric to the main drive shaft a sector friction wheel or pulley on one end of the auxiliary shaft, and a feed connection at its other end, either said wheel or pulley or said feed connection having a limited play on the shaft, substantially as set forth.

2. In a feed friction gear of the class described, a main friction ring adapted to be rotated in a reverse direction, an adjacent auxiliary shaft, eccentrically disposed to and in line with the center of the friction ring a sector friction wheel or pulley mounted for a limited play on one end of the auxiliary shaft independent of the rotation thereof and adapted to be engaged by the main friction ring, substantially as set forth.

3. In a feed friction gear of the class described, a longitudinally adjustable drive shaft having a friction ring at one end, an auxiliary shaft adjacent to the drive shaft and eccentric thereto, and a friction wheel or pulley mounted on the auxiliary shaft for a limited play thereon and adapted to engage said friction ring, substantially as set forth.

4. In a friction gear of the class described, a main drive shaft longitudinally adjustable a friction ring carried on one end of said shaft and provided with an inner beveled or tapered contact face, an adjacent auxiliary shaft eccentric to the drive shaft, a sector friction wheel loosely mounted on the auxiliary shaft and having an exteriorly beveled or tapered periphery adapted to contact with the correspondingly shaped friction ring, and means for limiting the play of the friction wheel on said auxiliary shaft, substantially as set forth.

5. In a friction gear of the class described, an inclosing boxing or casing having a split clamp neck at one side, a sleeve bushing mounted for adjustment in said neck, a main drive shaft journaled in said sleeve bushing and adapted to be adjusted therewith, boxing or casing drive shaft carrying at one end, within the boxing or casing, an internal friction ring, arranged on one end of the main drive shaft inside of the boxing or casing an auxiliary feed shaft eccentric to the main drive shaft, and a sector friction wheel or pulley mounted on the inner end of the auxiliary shaft and adapted to work inside of and in contact with said friction ring, substantially as set forth.

6. In a friction gear of the class described, a main drive shaft a friction ring, on one end of said shaft an adjacent eccentric auxiliary shaft a key pin projecting from the auxiliary shaft, and a sector friction wheel or pulley loosely mounted on the auxiliary shaft and having a widened key recess embracing said key pin, substantially as set forth.

7. In a friction gear of the class described, an inclosing boxing or casing, a main drive shaft arranged at one side of the boxing or casing and having a friction ring at its inner end working therein, an auxiliary shaft mounted in the opposite side of the casing eccentric to the main drive shaft a key pin projecting from opposite sides of the auxiliary shaft, a sector friction wheel or pulley loosely mounted on the inner end of the auxiliary shaft inside of the friction ring and of less diameter than the same, said friction wheel or pulley having in its hub opposite widened key recesses embracing the projecting extremities of the key pin, and a feed connection at the outer end of the auxiliary shaft, substantially as set forth.

8. In a gear of the class described, the combination of the gear casing having diametrically opposite stop lugs, and the gear controlled feed-connection arranged outside of the casing and having a single off-standing stop lug adapted to contact with those of the casing, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

FRED S. GABLE.
JACOB S. DETRICK.

Witnesses:
GEO. E. TAYLOR,
EDGAR F. DOBSON.