(No Model.)

4 Sheets—Sheet 1.

J. S. DETRICK.

MACHINE FOR PLANING METAL.

No. 414,503. Patented Nov. 5, 1889.

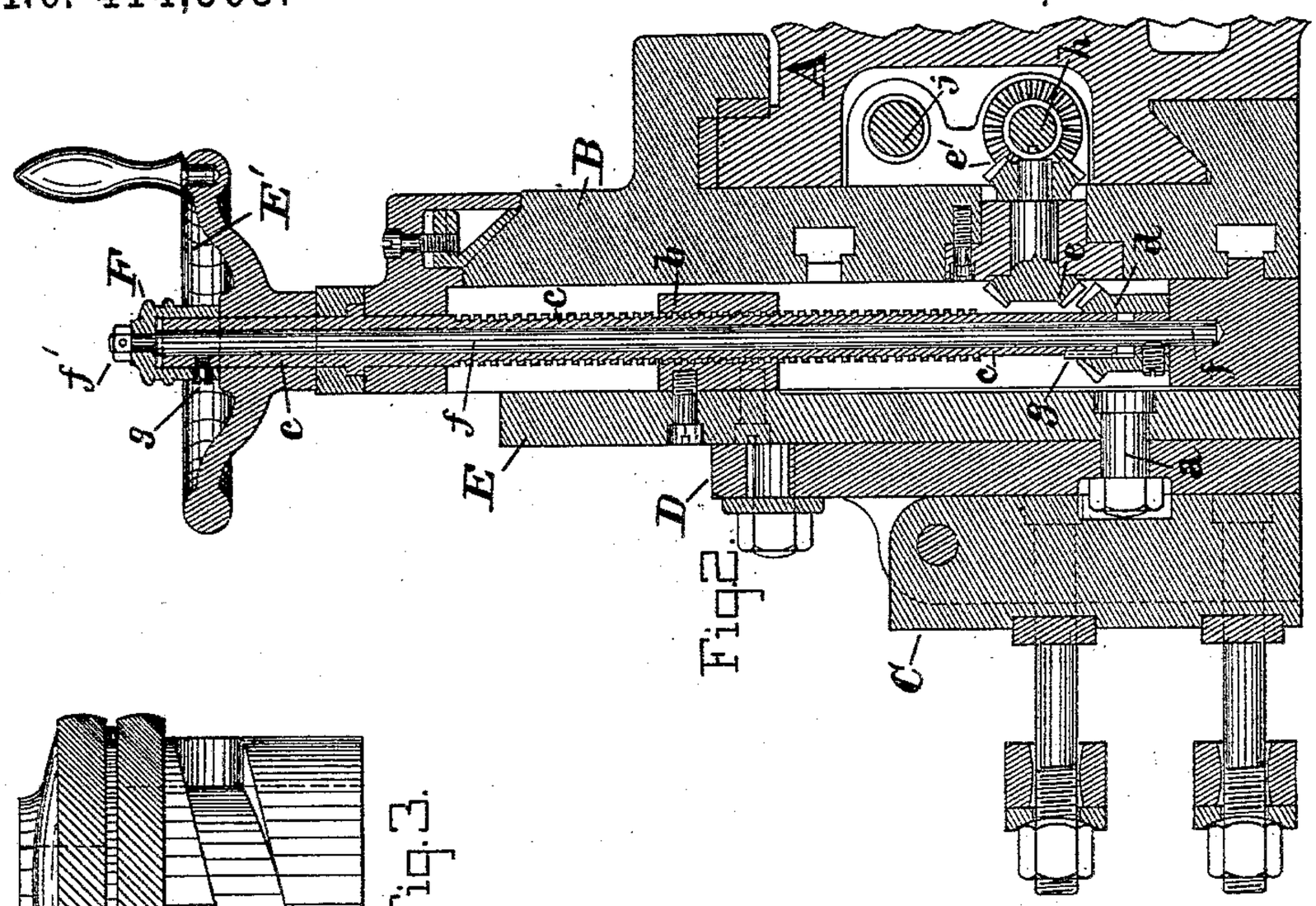


Fig. 2.

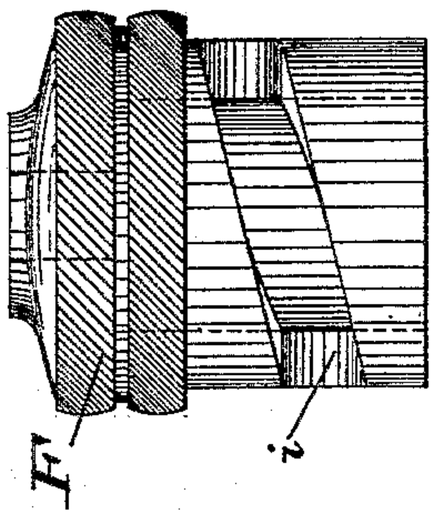


Fig. 3.

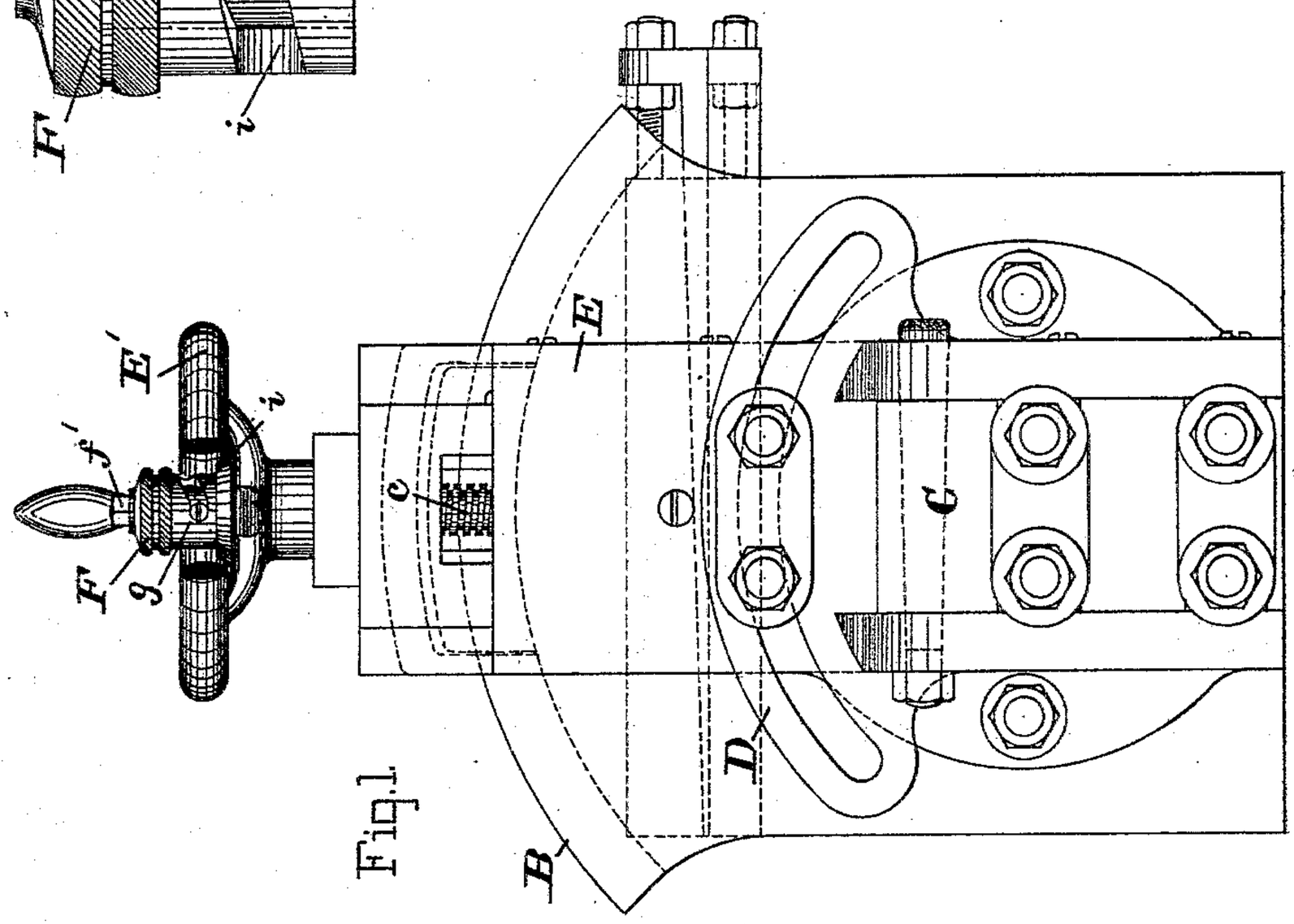


Fig. 1.

WITNESSES:

John E. Morris.

A. D. Babendreier.

INVENTOR:

J. S. Detrick

BY Chas B. Mann

ATTORNEY

(No Model.) 4 Sheets—Sheet 2.

J. S. DETRICK.

MACHINE FOR PLANING METAL.

No. 414,503. Patented Nov. 5, 1889.

Fig. 4.

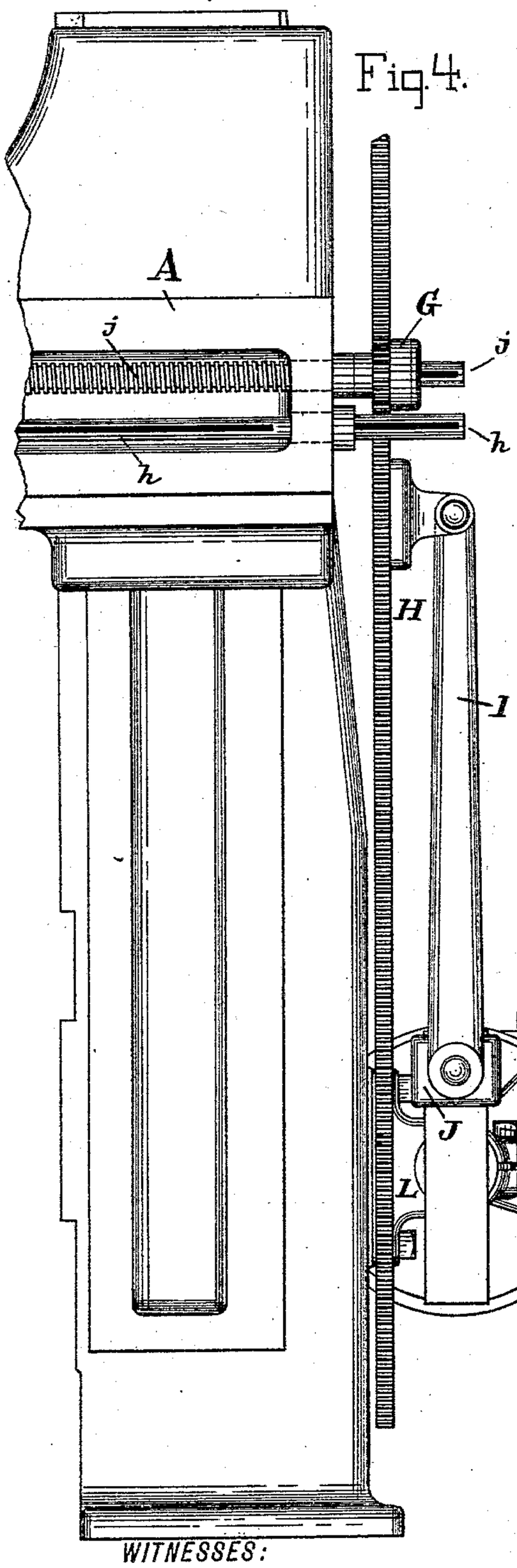


Fig. 6.

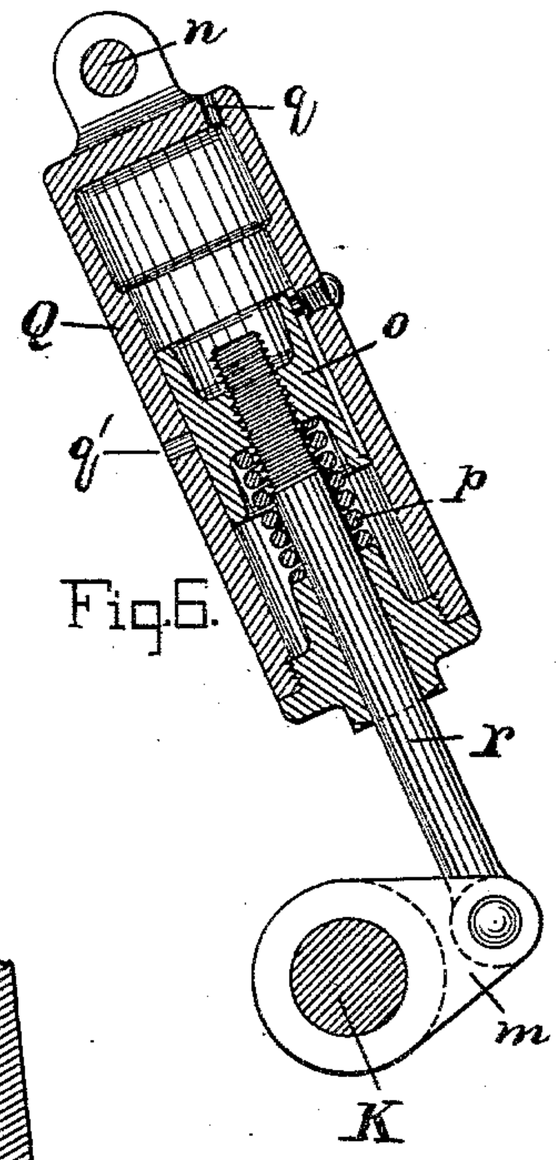
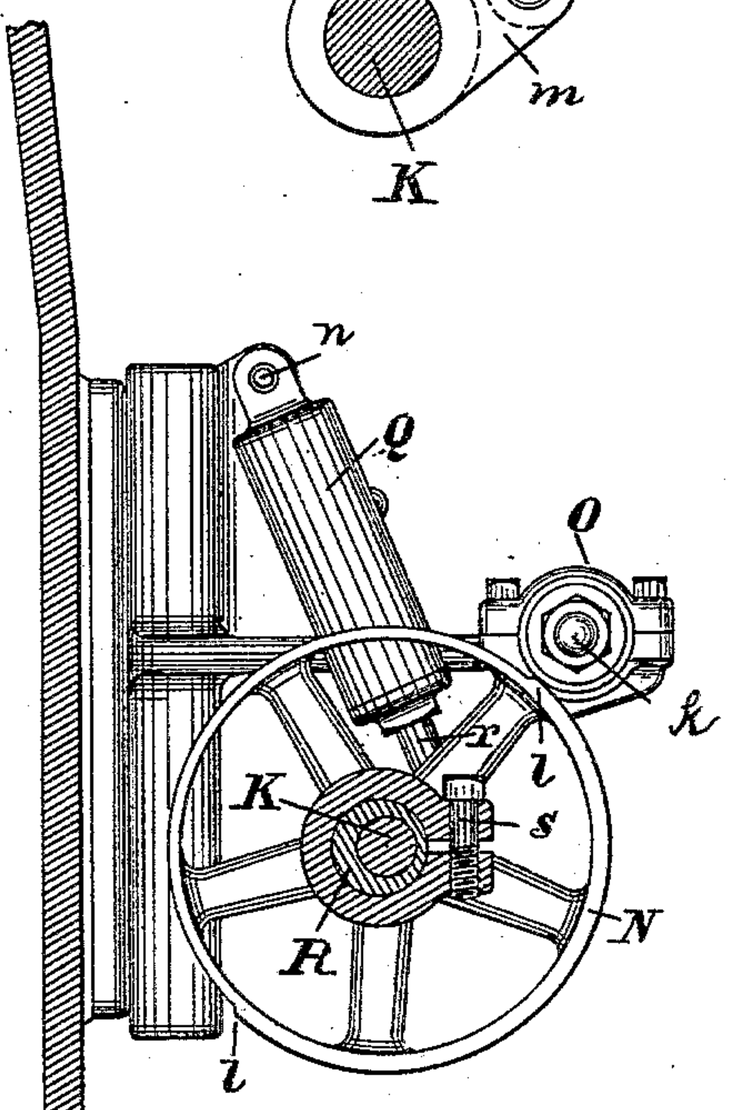


Fig. 5.



WITNESSES:

John E. Morris.

A. P. Babendreier.

INVENTOR

J. S. Detrick

BY

Chas B. Mann

ATTORNEY

(No Model.) 4 Sheets—Sheet 3.

J. S. DETRICK.

MACHINE FOR PLANING METAL.

No. 414,503. Patented Nov. 5, 1889.

Fig. 9.

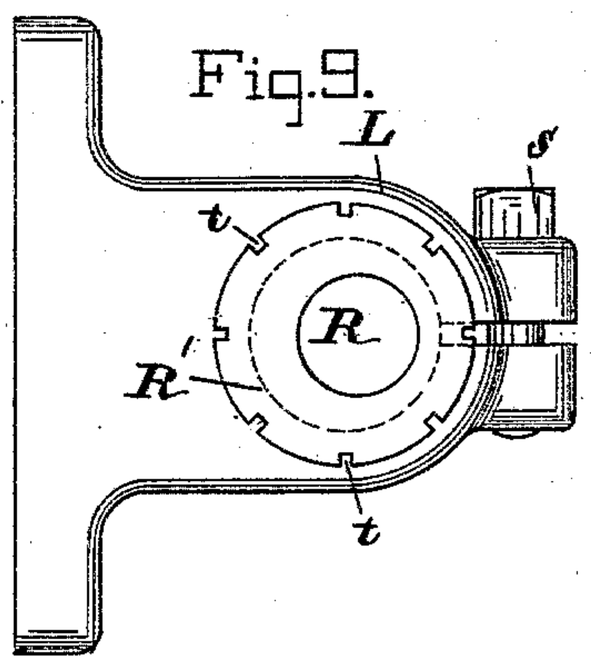


Fig. 10.

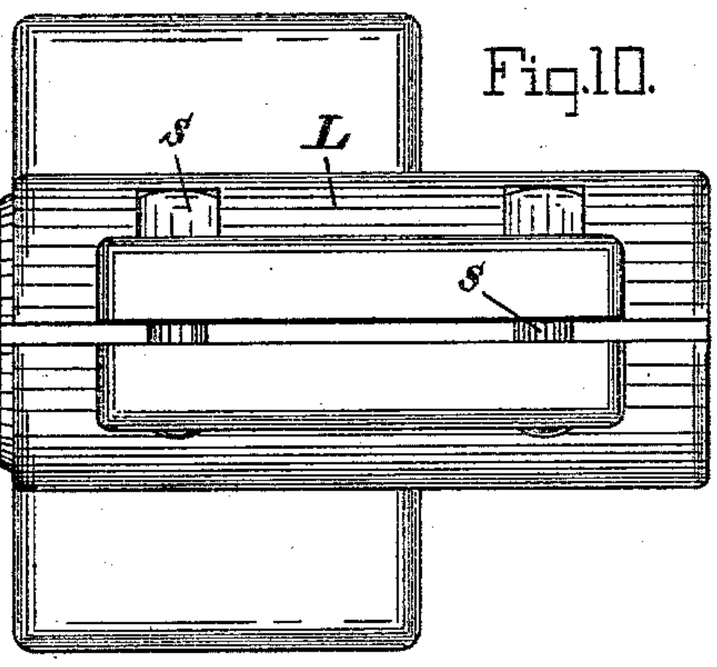
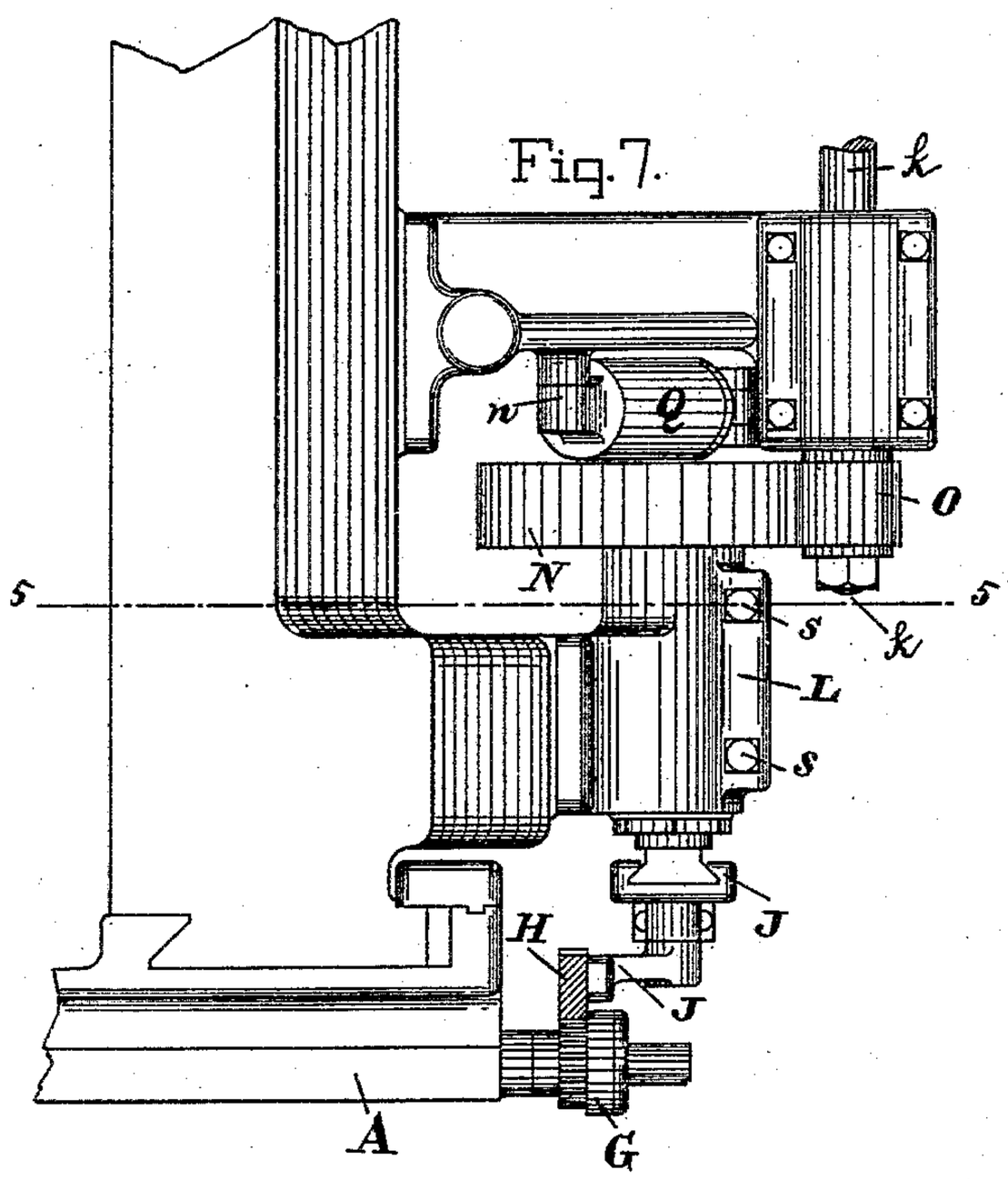


Fig. 7.



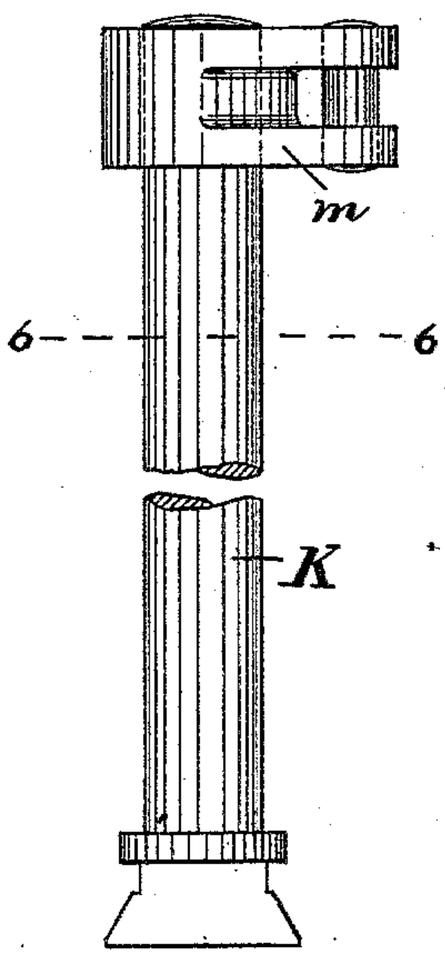


Fig. 8.

WITNESSES:

John E. Morris

A. D. Babendreier.

INVENTOR:

J. S. Detrick

BY Chas B. Mann

ATTORNEY.

(No Model.) 4 Sheets—Sheet 4.

J. S. DETRICK.

MACHINE FOR PLANING METAL.

No. 414,503. Patented Nov. 5, 1889.

Fig. 15.

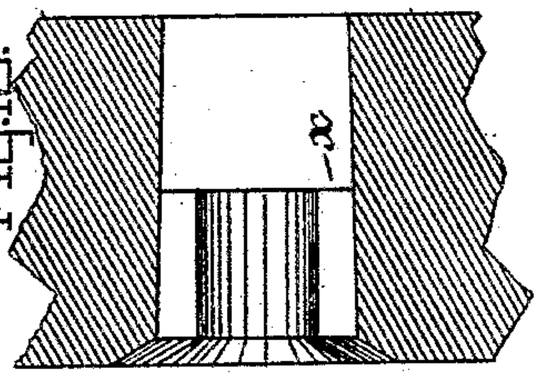


Fig. 16.

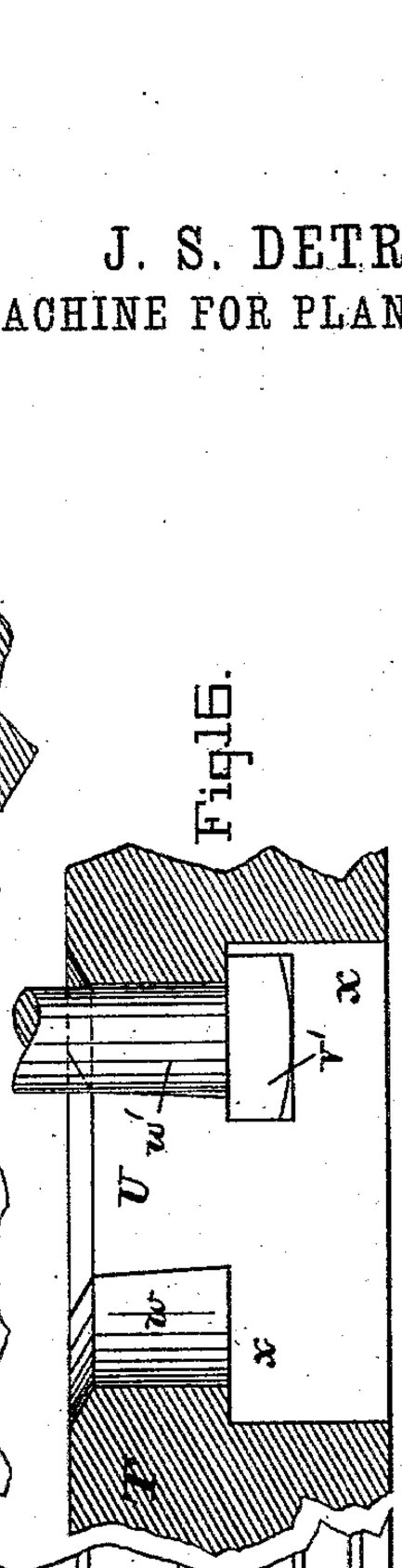


Fig. 14.

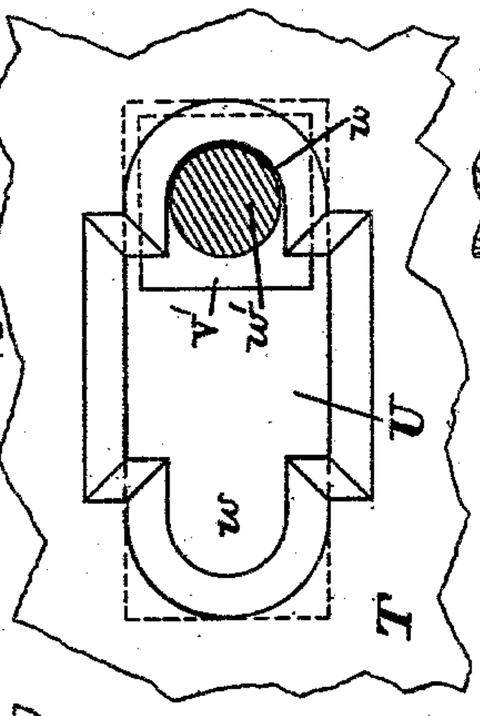


Fig. 13.

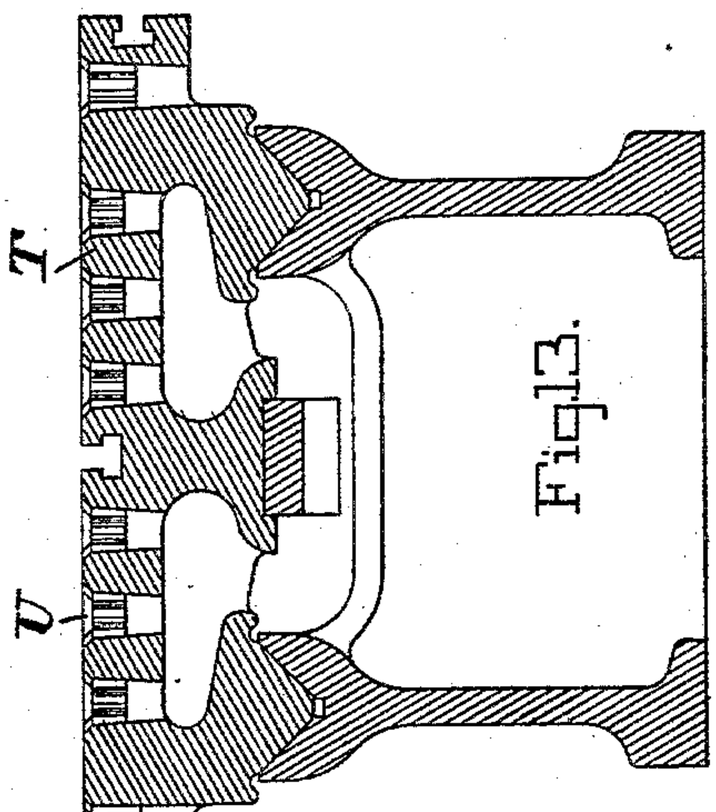


Fig. 11.

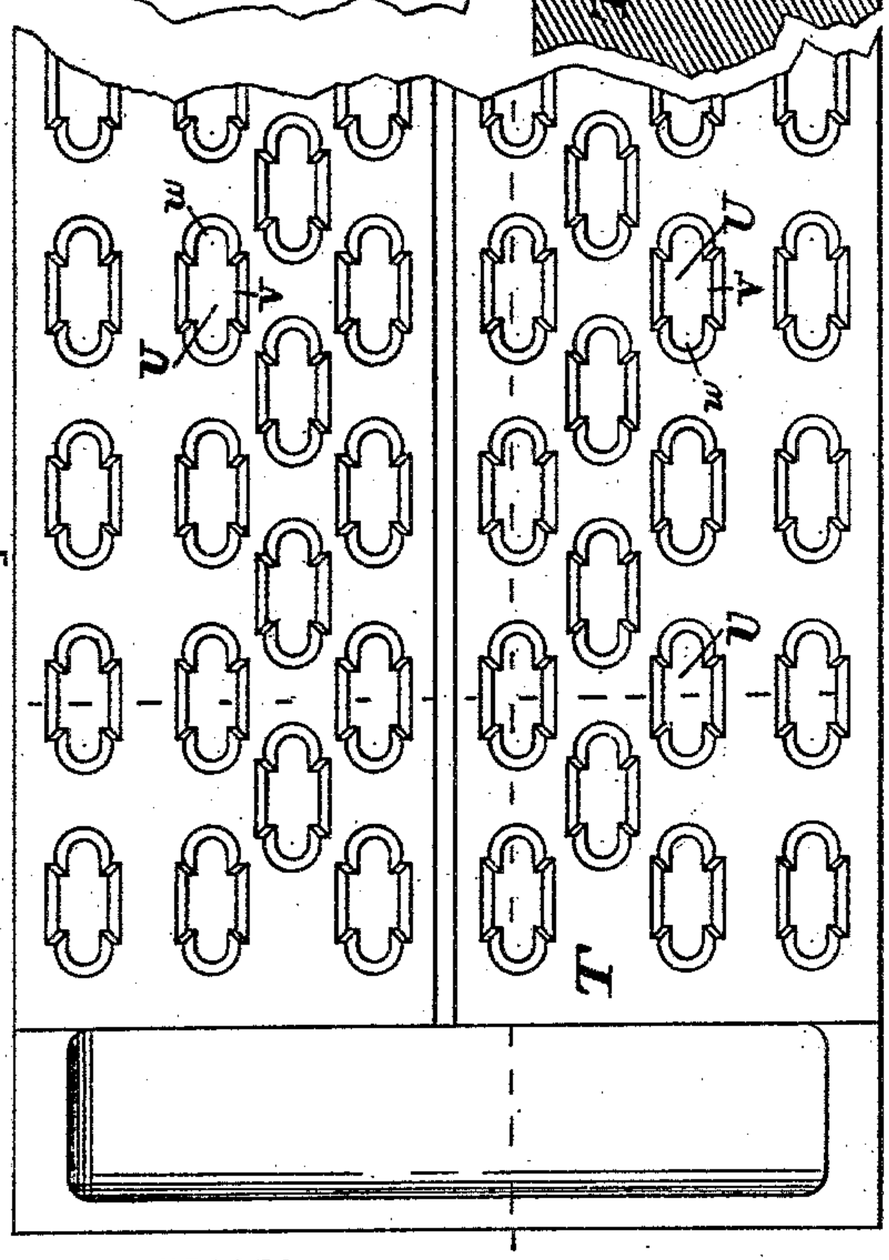
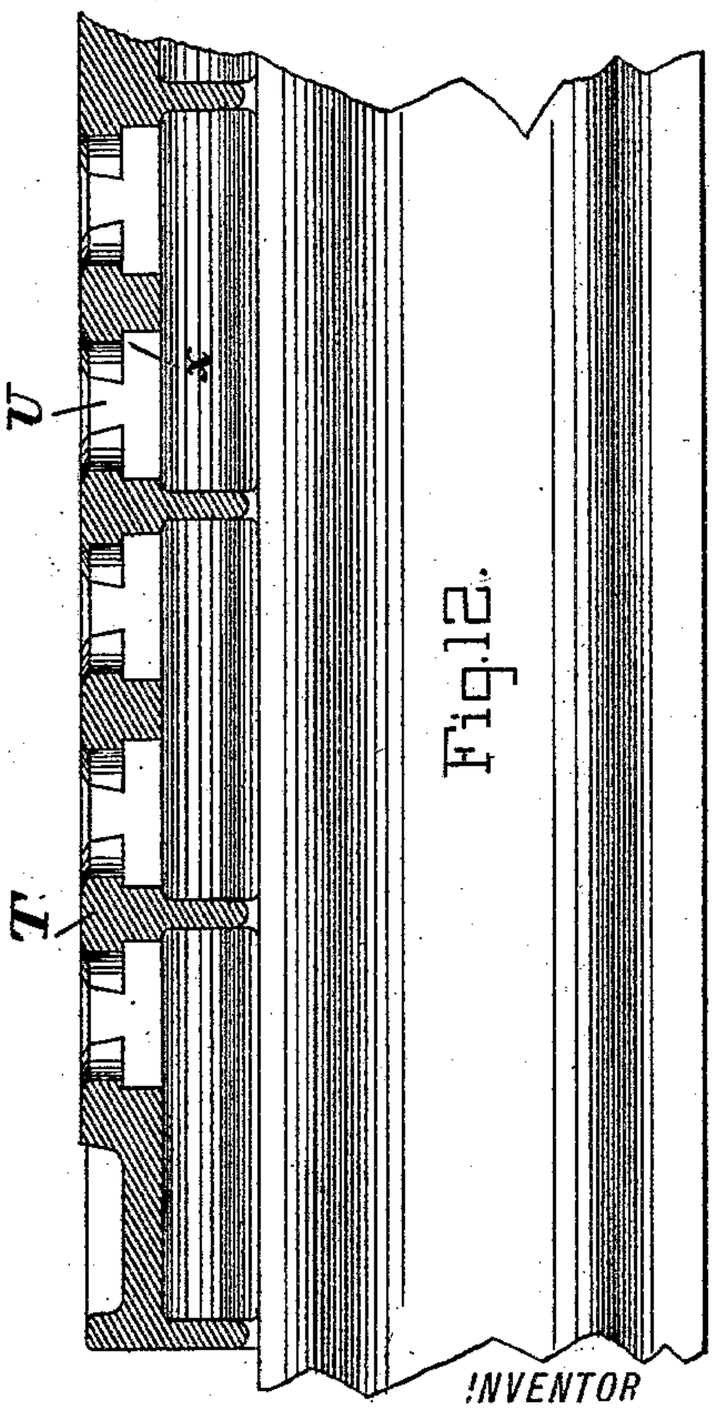


Fig. 12.



WITNESSES:

John E. Morris.

A. D. Babendreier.

INVENTOR

J. S. Detrick

BY

Chas B. Mann

ATTORNEY

UNITED STATES PATENT OFFICE.

JACOB S. DETRICK, OF BALTIMORE, MARYLAND.

MACHINE FOR PLANING METAL.

SPECIFICATION forming part of Letters Patent No. 414,503, dated November 5, 1889.

Application filed March 22, 1889. Serial No. 304,331. (No model.)

To all whom it may concern:

Be it known that I, JACOB S. DETRICK, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Machines for Planing Metal, of which the following is a specification.

My invention relates to improvements in metal-planing machines, and is illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the tool-holder and saddle. Fig. 2 is a vertical section of the same parts, and shows the vertical feed mechanism. Fig. 3 is a side view of the cap. Figs. 4 and 5 are elevations of the power mechanism for feeding the tool-holder. Fig. 6 is a view of a device employed with the friction-gear which drives the tool-holder-feeding mechanism. Fig. 7 is a top view of the power mechanism for feeding the tool-holder. Fig. 8 is a view of the crank-shaft gear. Figs. 9 and 10 are views of the bearing and eccentric bushing of the shaft. Fig. 11 is a top view of the reciprocating platen. Fig. 12 is a longitudinal section of the platen, and showing also a part of the bed of the machine. Fig. 13 is a cross-section of the platen and bed of the machine. Figs. 14, 15, and 16 are views in detail of the holding-bolt and slot in the platen.

The letter A designates the horizontal slide or cross-beam; B, the saddle, which fits and moves thereon; C, the tool-holder apron attached to the swing-frame D, which is swiveled by the pin *a* to the vertical slide E, which has a nut *b* for the vertical feed-screw *c*, which is tubular,

One feature of my invention relates to means for effecting the engagement or disengagement of the vertical feed mechanism. The vertical feed-screw *c* (see Figs. 1 and 2) may be turned by the hand-wheel E′ to adjust and set the slide E and tool-holder C to any desired position up or down; but said vertical feed-screw *c* will not otherwise turn unless the bevel-pinions *d e* be brought into gear, when its turning will feed or move the tool-holder C up or down. A shaft *f* passes down through the tubular feed-screw *c*, and its lower end projects below said screw, and thereat has a bevel-pinion *d* keyed fast to the shaft and connected with the tubular feed-screw by a groove and spline *g*. The shaft *f* is arranged to admit of sufficient up-and-down movement in the tubular screw to engage and disengage its pinion *d* and the pinion *e*, which is driven by gearing *e′*, with the splined shaft *h*, extending longitudinally of the slide-beam A. The tubular screw *c* and the shaft *f* both project above the hand-wheel E′, and a knurled cap F is secured to the upper end of the said shaft by a nut *f′*, and the skirt of said cap sits down on and surrounds the upper end of the tubular screw *c* like a hood, and also bears upon the hand-wheel E′. This cap has in its side an inclined slot *i*, and a pin-screw *g*, entered into the tubular screw, has its head in the said slot. This pin-screw does not impinge against the shaft *f*.

The cap F is free to be partly turned back and forward around the tubular screw, and when so turned the action of the inclined slot *i* on the pin-screw *g* will be to raise or lower the shaft *f*, and thereby engage or disengage the pinions *d e*, which set in gear the vertical feed mechanism from the shaft *h*.

The horizontal feed mechanism comprises the usual screw-shaft *j*. The two shafts *h j* are revolved with an intermittent motion by the ratchet box and pinion G—a well-known device and not necessary to describe here. At present this ratchet-box G is shown on the screw-shaft *j*; but it may be slipped off the splined end of that shaft and placed on the end of the other shaft *h*. It is thus interchangeable on either of the two shafts and receives its motion from the vertical rack H, which a rod I connects with a crank-head J on the end of a shaft K. This crank-shaft K has a bearing L at the side of the machine-frame and carries a sector friction-pulley N, which is driven first one way and then the opposite way by the driving-pulley O on the shaft *k*, which reverses at each movement of the platen T.

The construction of the machine is such that the back movements are much more rapid than the forward or cutting movement, and this would occasion a jar or thud at the end of the back movement, which it is important to avoid. It is also important that the ends *l* of the bearing-surface of the sector friction-

pulley N shall be kept in contact with the driving-pulley O, in order to insure frictional engagement at once upon the reversal of the said pulley O. To accomplish these two ends, the shaft K has a crank-arm *m*, and a spring check device is attached to said crank-arm. This device is shown in Figs. 5, 6, and 7, and comprises a cylinder Q, secured or pivoted by its upper end at *n* and fitted with a piston *o*, and having a spring *p* between one side of the piston and one end of the cylinder. The other end of the cylinder is provided with an air-hole *q*. A rod *r* connects the piston *o* and crank-arm *m*.

It will be seen by reference to Fig. 6 that the cylinder is provided in its side with an air-hole *q'* and that upon the piston passing the said hole the air thereby confined in the cylinder will serve to cushion the parts and prevent the jar or thud that would otherwise arise from the sudden arrest of a rapid motion and a reversal of that motion.

When the sector friction-pulley N has turned until one of the ends *l* of its bearing-surface disengages from the driving-pulley O, the spring *p* in the cylinder Q will then be in a state of compression and serve to draw on the rod *r*, crank-arm *m*, shaft, and pulley N, and at once bring the said disengaged end *l* of the bearing-surface in contact with the driving-pulley O, so that immediately upon said pulley reversing frictional engagement will ensue.

It is important in frictional gear to maintain a certain pressure between the two pulleys in contact. Owing to wear of the parts this contact-pressure is gradually reduced. To meet this want, I have provided an eccentric bushing R for the crank-shaft K. (See Figs. 5, 9, and 10.) This bushing fits in the bearing L, which has two bolts *s*, the tightening of which holds the bushing from turning. The bushing is bored eccentrically for the crank-shaft K, which turns freely in the bushing and at one end is provided with a head R', having peripheral holes or slots *t* for a spanner-wrench, by which the said bushing may be turned in its bearing L. Of course any other provision may be made for turning the bushing. It will be seen that if the contact-pressure between the two friction-pulleys N O should not at any time be sufficient to prevent slipping, it is only necessary, first, to loosen the bolts *s* and then partly turn the eccentric bushing R, thereby shifting the crank-shaft K and pulley N toward the driving-pulley O. By again tightening the bolts *s* the bushing will remain stationary while the shaft turns in the bushing.

The platen T is provided with an improved bolt-slot U, which will allow the bolt to be inserted head first from the top surface downward and then hold the bolt, and also allow chips and dirt to fall through. The slots U open entirely through the platen, and thereby keep clear of chips or dirt which may drop through. On the top surface of the platen the slots are broadest across the center *v*, (see Figs. 11 and 14,) to admit the square bolt-head *v'* downward, and are narrowed or reduced in width at one or both ends *w* to hold the bolt-body *w'*. On the lower surface, below the narrowed part *w*, is a recess *x*, to receive the bolt-head *v'* and prevent it from turning. The lower part of the slot has slightly-contracting sides, (see Figs. 13 and 15,) and is of less width between the lowermost edges than across at the uppermost center part *v*. By this construction tapering pins may be entered from the top to hold the work.

I am aware that platens have had rectangular holding-bolt slots which opened entirely through; but in these the bolt had to be entered point end first from the lower surface upward, which is a very inconvenient thing to do. I am also aware that platens have had holding-bolt slots broadest at the center and of reduced width at each end to allow the bolt to be inserted head first from the top surface downward; but these did not open entirely through and the chips and dirt would soon accumulate in them and interfere with entering the bolt-head. My construction of slot possesses all the advantages of these two kinds of slots and obviates the objections that pertain to each.

Having described my invention, I claim—

1. In a metal-planer, the combination of the vertical slide E, which carries the tool, a tubular feed-screw *c*, a shaft *f*, passed through the said tubular screw, movable endwise therein, and projecting beyond its end, a bevel-pinion *d*, fast on the projecting shaft end, and a spline-and-groove connection *g* between said bevel-pinion and the tubular screw, whereby on moving the shaft endwise in the tubular screw the bevel-pinion on the shaft may be made to engage or disengage the vertical feed mechanism.

2. In a metal-planer, the combination of the vertical slide E, which carries the tool, a tubular feed-screw *c*, a shaft *f*, passed through the said tubular screw, movable endwise therein, and projecting beyond its end, a bevel-pinion *d*, fast on the projecting shaft end, and a cap F, secured to said shaft and having an inclined slot *i*, which acts on a pin-screw in the tubular screw.

3. In a metal-planer, the combination of the vertical rack H, the crank-shaft K, the rod I, connecting the said rack and crank, the sector friction-pulley N, a cylinder Q, fitted with a piston, a rod *r*, connecting the piston and crank-shaft, and a spring *p* in said cylinder, which acts on the piston.

4. In a metal-planer, the combination of a reversing drive-pulley O, a crank-shaft K, a sector friction-pulley N on the crank-shaft, a cylinder Q, fitted with a piston, a rod *r*, connecting the piston and crank-shaft, and a spring *p* in said cylinder, which acts on the piston.

5. In a metal-planer, the combination of a reversing drive-pulley, a sector friction-pul-

ley mounted on a shaft, an eccentric bushing for the pulley-shaft, and a bearing in which the said bushing may be turned to adjust the contact-pressure between the said two pulleys.

6. In a metal-planer, the combination of a reversing drive-pulley, a sector friction-pulley mounted on a shaft, an eccentric bushing for the pulley-shaft, a bushing-head having holes or slots for a spanner-wrench, and a bearing in which the said bushing may be turned.

7. The combination of the plate provided with slots U, which open entirely through and which on the top surface have a broad part *v* to admit the bolt-head and a narrow part *w* to hold the bolt-body, and which at the lower surface have a recess under the narrow part to prevent the bolt-head from turning, and the holding-bolts, as set forth.

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

JACOB S. DETRICK.

Witnesses:
JNO. T. MADDOX,
JOHN E. MORRIS.