No. 782,440. PATENTED FEB. 14, 1905.

H. E. & F. L. EBERHARDT.

FEED MECHANISM.

APPLICATION FILED JAN. 26, 1904.

2 SHEETS—SHEET 1.

Fig. 3.

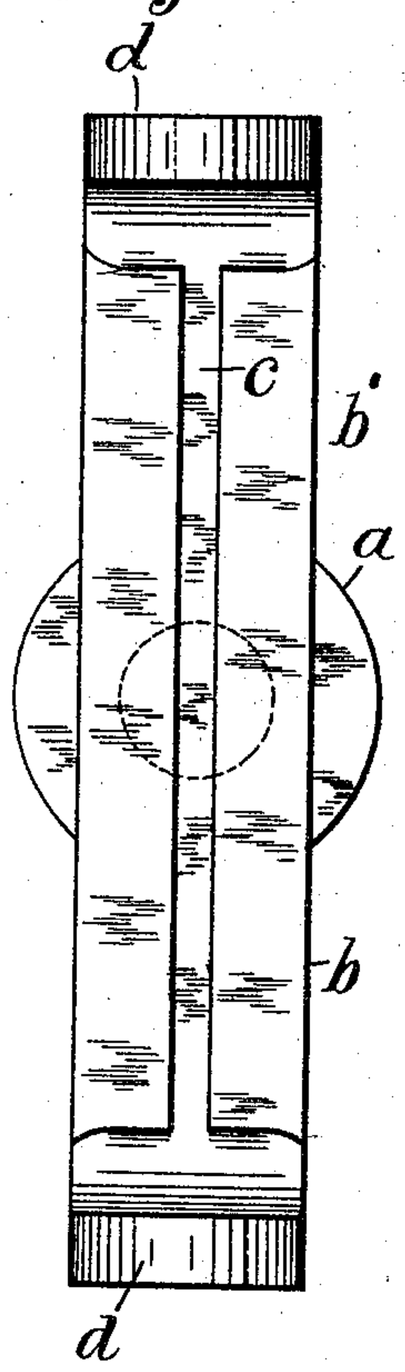
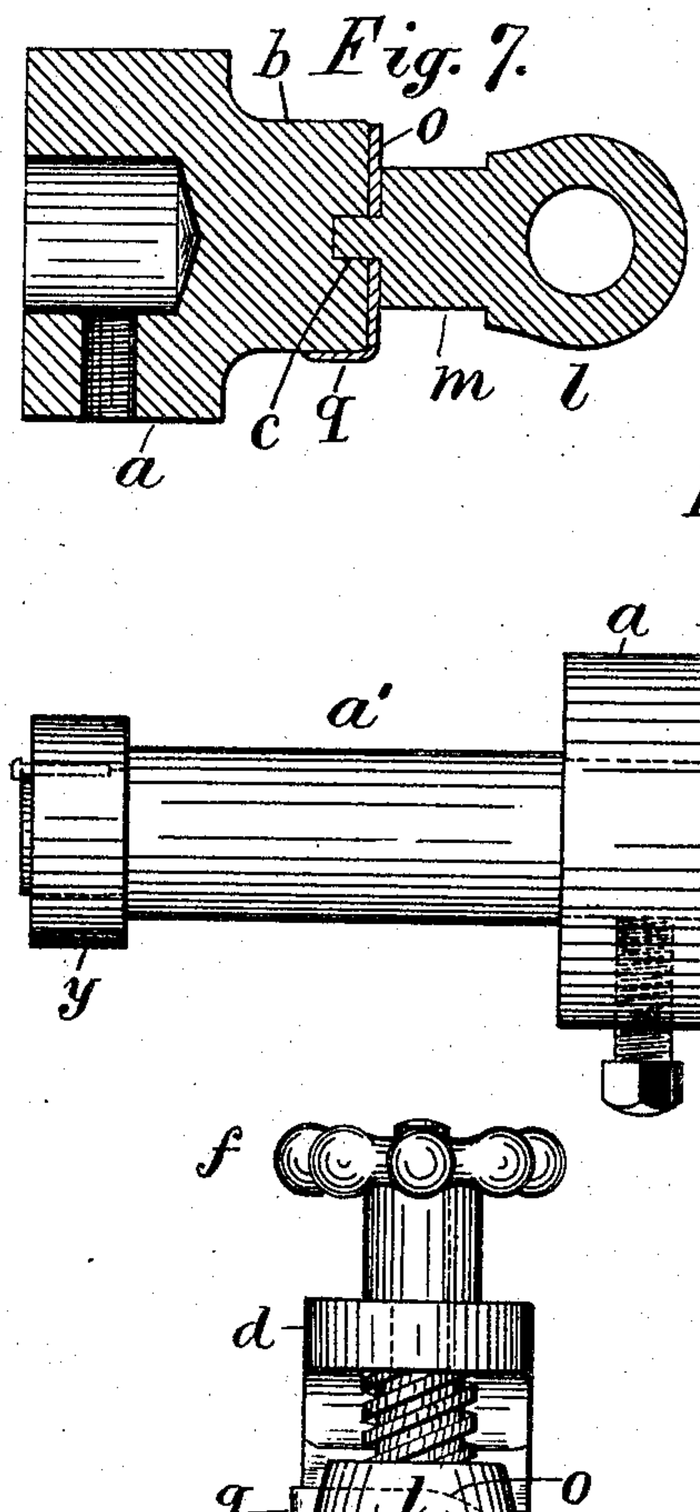


Fig. 7.



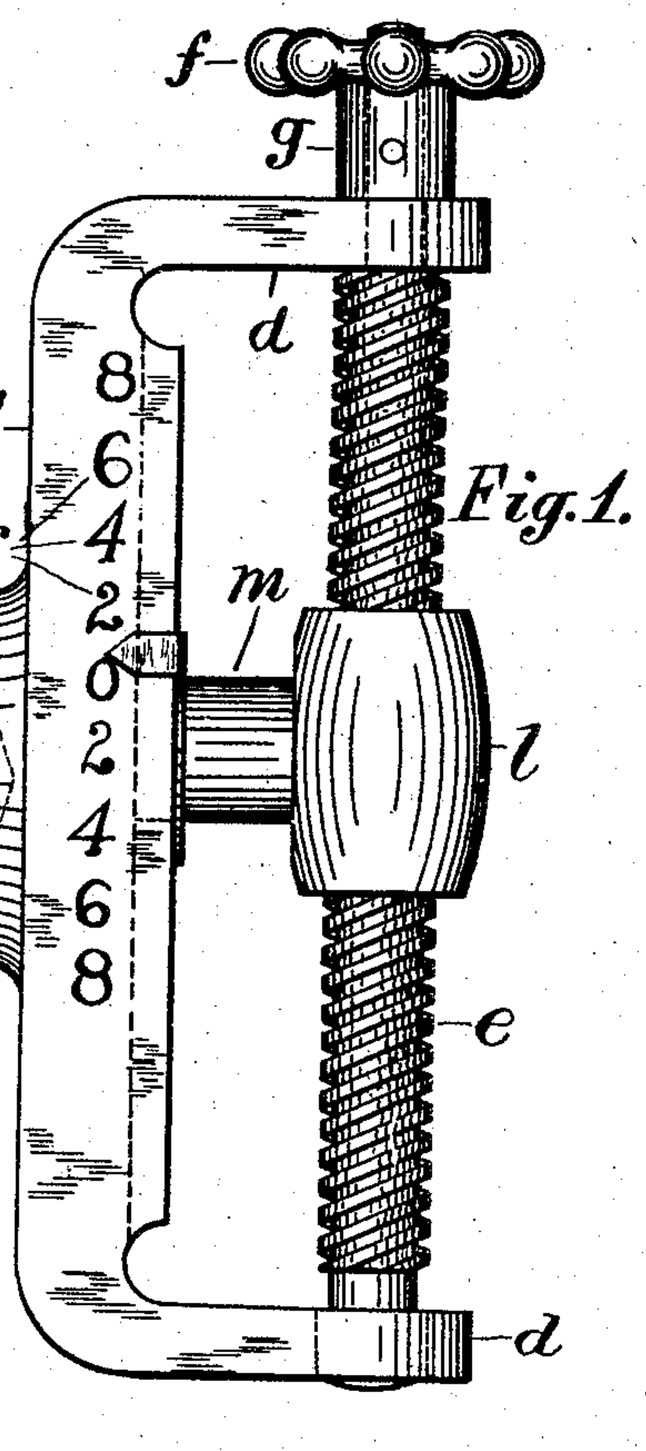
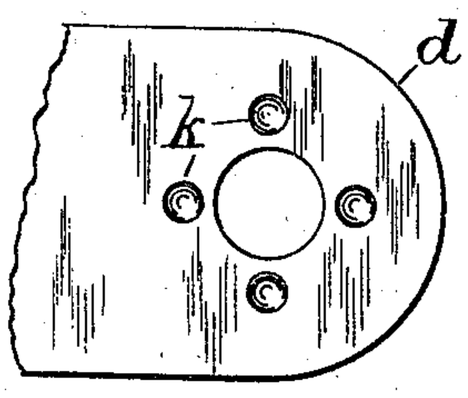


Fig. 1.

Fig. 2.

Fig. 4.



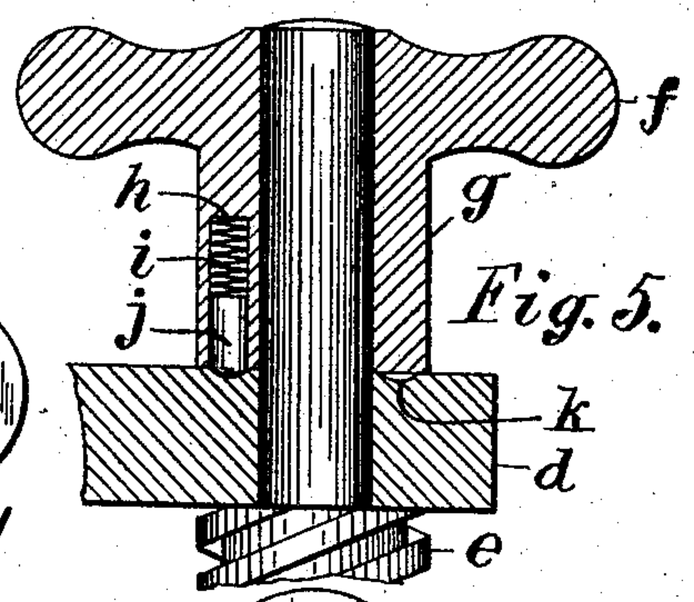


Fig. 5.

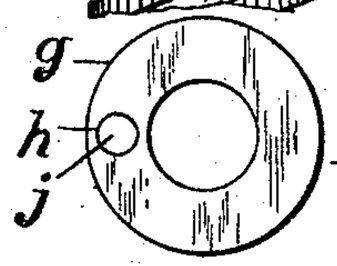


Fig. 6.

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2 SHEETS—SHEET 2.

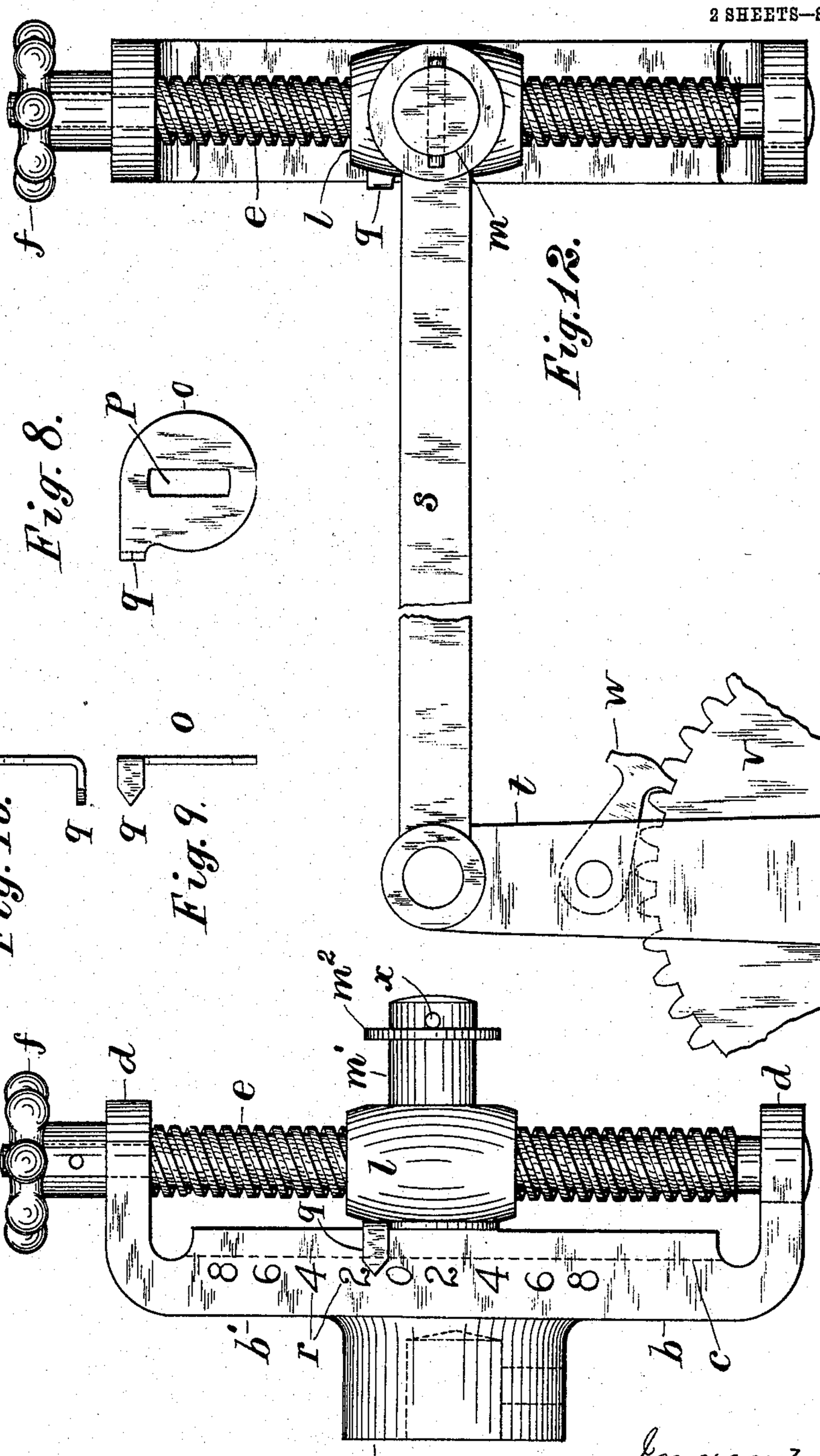

Fig. 12.

Fig. 8.

Fig. 10.

Fig. 9.

Fig. 11.

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No. 782,440. Patented February 14, 1905.

UNITED STATES PATENT OFFICE.

HENRY E. EBERHARDT AND FRED L. EBERHARDT, OF NEWARK, NEW JERSEY, ASSIGNORS TO GOULD & EBERHARDT, A CORPORATION OF NEW JERSEY.

FEED MECHANISM.

SPECIFICATION forming part of Letters Patent No. 782,440, dated February 14, 1905.

Application filed January 26, 1904. Serial No. 190,646.

To all whom it may concern:

Be it known that we, HENRY E. EBERHARDT, whose residence and post-office address is 113 Orchard street, and FRED L. EBERHARDT, whose residence and post-office address is 17 Hillside avenue, Newark, county of Essex, State of New Jersey, both citizens of the United States, have invented certain new and useful Improvements in Feed Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention is an attachment for that class of metal-working machines in which a feed-screw is intermittently rotated through a given arc by a toothed wheel and a pawl carried by a pivoted pawl-arm. In such machines the pawl-arm is oscillated by a so-called "feed-crank" having an adjustable crank-pin; and the present invention comprises a particular construction for the feed-arm of the crank and the means of adjusting the crank-pin thereon by which the crank-pin is afforded a double support and is thus rendered more durable and more firm in its operation.

In the following description the term "feed-crank" is applied to the entire device, while the term "feed-arm" is applied to that portion which is grooved to afford a support to the crank-pin.

In the present invention the feed-arm has a groove upon the face; but the adjusting-screw is not located in such groove, as is usual, but is journaled in bearings projected forwardly at opposite ends of the groove, so that the screw stands wholly outside the face of the feed-arm. A slider is constructed to fit the screw and the groove and to carry the crank-pin, the slider being formed with a nut fitted to the thread of the screw, which nut has the crank-pin projected therefrom and a stud fitted to the groove of the feed-arm. By locating the adjusting-screw outside the face of the feed-arm the slider has a double bearing or support upon the feed-crank—namely, one support upon the screw and another support in the groove—and such support is at different points in the length of the slider, and thus sustains the pin with more firmness than when the screw is located within the groove of the feed-arm and the crank-pin is wholly overhung.

The drawings also include an improved construction of index and scale to show the adjustment of the crank-pin and a spring-plug in a hub attached to the screw and fitted to depressions in one of the screw-bearings, so that the operator in turning the screw may by the sense of feeling turn the screw through a prescribed arc or set it in a prescribed position. The plug prevents accidental shifting of the screw.

Two forms of the invention are shown in the annexed drawings, in which—

Figure 1 is a side view of the device. Fig. 2 is a front view of the device. Fig. 3 is a front view of the feed-crank shaft. Fig. 4 is a plan of one of the feed-screw bearings. Fig. 5 is a longitudinal section through the screw and its hand-wheel and adjacent bearing, and Fig. 6 is a plan of the inner end of the hub carrying the spring-plug. Fig. 7 is a cross-section of the feed-crank, taken through the center of the nut in Fig. 1. Fig. 8 is a plan of the index, and Figs. 9 and 10 show the edge of the same viewed from the left-hand side and the upper side of Fig. 8. Fig. 11 is a side elevation with the crank-pin constructed alternately to that shown in Fig. 1. Fig. 12 is a front view of the same with connections to a pawl-arm.

a is the hub of the feed-crank, which is shown with two feed-arms *b* and *b'* extended directly opposite one another, and therefore in the same line, and the front of such double crank is provided with the groove *c*.

d represents bearings at the opposite end of the feed-crank, and *e* a feed-screw journaled in such bearings, having a hand-wheel *f* attached to one end by a hub *g*. The hub is shown in Fig. 5 with a longitudinal socket *h*, containing a spring *i* and plug *j*, the end of which is rounded, and four recesses or depressions *k* are formed in the adjacent side of the bearing *d*, which engage the end of the plug as the screw is turned around. The rounded end of the plug slips out of such recesses automatically when the screw is turned; but the

resistance occasioned thereby indicates to the operator when the plug is engaged with the recess, and thus enables him to set the screw in four equidistant positions during each rotation. The chief value of the spring-plug is to prevent jars and vibrations from shifting the screw voluntarily.

A nut *l* is shown upon the screw, and in Fig. 1 the screw is set at a sufficient distance outside the face of the feed-crank to extend a crank-pin *m* inwardly from the nut to the face of the crank. The crank-pin is made round, and a stud *n* is formed thereon by flattening its opposite sides so that the stud fits snugly in the groove *c* of the feed-crank and firmly resists all lateral thrust upon the crank-pin. The nut *l*, crank-pin *m*, and stud *n* form a slider which is movable upon the feed-arm by rotating the screw. It is common to form a dovetailed or T-shaped groove in such cranks and fit a nut to the groove, with a screw extended through the groov eand the nut to adjust the latter. In such cases the crank-pin is overhung from the outer face of the feed-crank and is supported only at one end, and the screw is necessarily limited in size to fit it within a groove on the surface of the feed-crank.

In the present construction the screw and nut may be made of any desired size irrespective of the size of the groove on the feed-crank, and the crank-pin *m* has a double support, as the lateral pressure upon it is resisted both by the nut and the stud in the groove.

An index to show the required adjustment of the crank-pin for varying the stroke of the rod *s*, which is connected thereto, is formed by an index-plate consisting of a washer *o* with a hole *p*, fitted to the stud *n* between the inner end of the crank-pin and the face of the feed-crank, as shown in Fig. 1. The inner end of the crank-pin is made to clear the face of the feed-crank sufficiently to insert the washer.

The washer is formed with an index-pointer *q*, extended laterally and bent to move along the side of the feed-crank, which is formed parallel with the groove *c*, and such side of the feed-crank is provided with a scale *r*, (represented by the figures 2 4 6 8,) which cooperate with the pointer to show the operator the required setting for the crank-pin. The index-pointer is so attached to the slider that it projects from one side of the same over the edge of the feed-arm, and such edge of the feed-arm is made parallel with the groove in the arm, so that the index-pointer may travel close to the side of the arm or in close proximity to the marks upon the scale. As the side of the feed-arm is at right angles to the face of the feed-arm, the index-point is necessarily bent at right angles from the face to lie against the side of the arm. While Figs. 1 and 2 show the crank-pin intermediate to the nut and the face of the feed-crank, Figs. 11 and 12 show the crank-pin upon the outer side of the nut, but still furnished with a double support by the engagement of the nut with the screw and the engagement of the stud with the groove in the feed-crank. In this latter construction the screw may be set closer to the face of the feed-crank, as shown in Fig. 11, with space provided between the nut and the face of the feed-crank for the application of the index-washer *o*.

It is well known that the chief thrust upon the crank-pin is exerted laterally (against the side of the crank) and the double support, which is shown in both the constructions illustrated, operates to doubly reinforce the crank-pin against such lateral thrust.

Fig. 12 shows a connecting-rod *s*, attached to a pawl-arm *t*, which is pivoted upon a feed-screw *u*, having a toothed wheel *v*, upon which the pawl *w* operates intermittently as the connecting-rod is reciprocated.

Only a part of the toothed wheel is shown upon the drawing for want of room, and such pawl-and-gear mechanism is wholly immaterial to the present invention, which may be used with any class of pawl-operating devices, as it is adapted, through the connecting-rod *s*, to convey an oscillating or reciprocating motion thereto.

It will be observed that where the crank-pin, as shown in Fig. 1, is located between the screw and the face of the feed-crank the latter is only adapted to an oscillating motion, as the bearings *d* would, if rotated, intersect the connecting-rod attached to the crank-pin; but where a rotary motion is necessary the construction shown in Fig. 11 may be employed, where the crank-pin, although having a double support, is overhung, and the feed-crank may therefore be rotated without any hindrance from the connecting-rod.

In the present construction the screw is supported at both ends, so that by making it of suitable dimensions it may possess the required rigidity intermediate to its ends for sustaining the lateral thrust upon the crank-pin.

In Figs. 1 and 2 the hub *a* of the feed-crank is shown provided with a rock-shaft *a'* and a rocker-crank *y* for the feed-crank; but the means for actuating the feed-crank form no part of the present invention.

Having thus set forth the nature of the invention, what is claimed herein is—

1. A feed-crank for a metal-working machine comprising a feed-arm having a groove upon the face and having forwardly-projecting bearings at the opposite ends, an adjusting-screw journaled in said bearings, a slider having a nut upon said screw, a crank-pin for a connecting-link projected from said nut toward the crank-arm, and a stud upon such pin extended into the groove, whereby the crank-pin has the double support of the screw and groove.

2. An oscillating feed-crank for a metal-working machine having a central hub with crank-arm extended in the same line at opposite sides thereof, and having a continuous groove upon the face, said arm having at the ends forwardly-projecting bearings and an adjusting-screw journaled in said bearings, a slider having a nut upon said screw, a crank-pin for a connecting-link projected from said nut toward the said groove, and a stud upon such pin extended into the groove, whereby the crank-pin is supported at both ends, and may be adjusted to operate the feed in either direction.

3. The feed-crank herein described for a metal-working machine, comprising the feed-arm having in its face the groove *c* materially smaller than the crank-pin, and the bearings *d* projected forwardly beyond the line of its face at opposite ends of the arm, the feed-screw *e* journaled in the said bearings and disposed wholly outside the face of the feed-arm, the slider having the nut *l* upon the screw, a crank-pin for a connecting-link, and a stud extended into the groove, whereby the crank-pin is supported at two points in its length; namely, at one point by the extension of the stud into the groove *c*, and at another point outside the face of the feed-arm by the nut upon the said screw, substantially as herein set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

HENRY E. EBERHARDT.
FRED L. EBERHARDT.

Witnesses:
THOMAS S. CRANE,
JOS. B. PIERSON.