(No Model.) 2 Sheets—Sheet 1.

J. H. STIMPSON.

LINK FITTING APPARATUS.

No. 318,217. Patented May 19, 1885.

Fig. 4

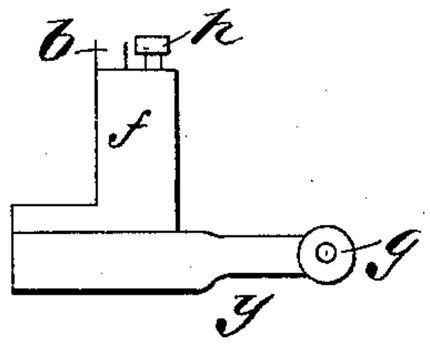


Fig. 3

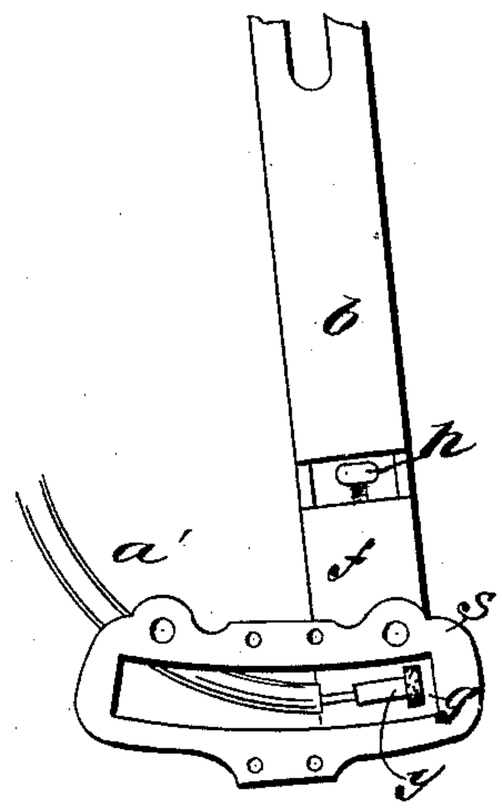


Fig. 2

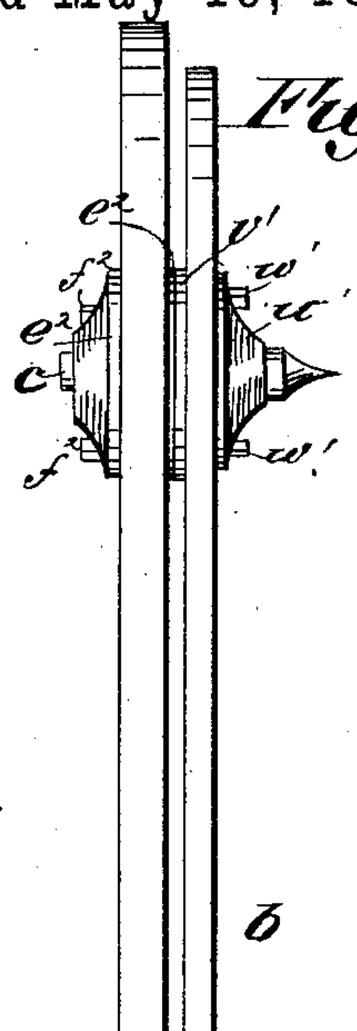
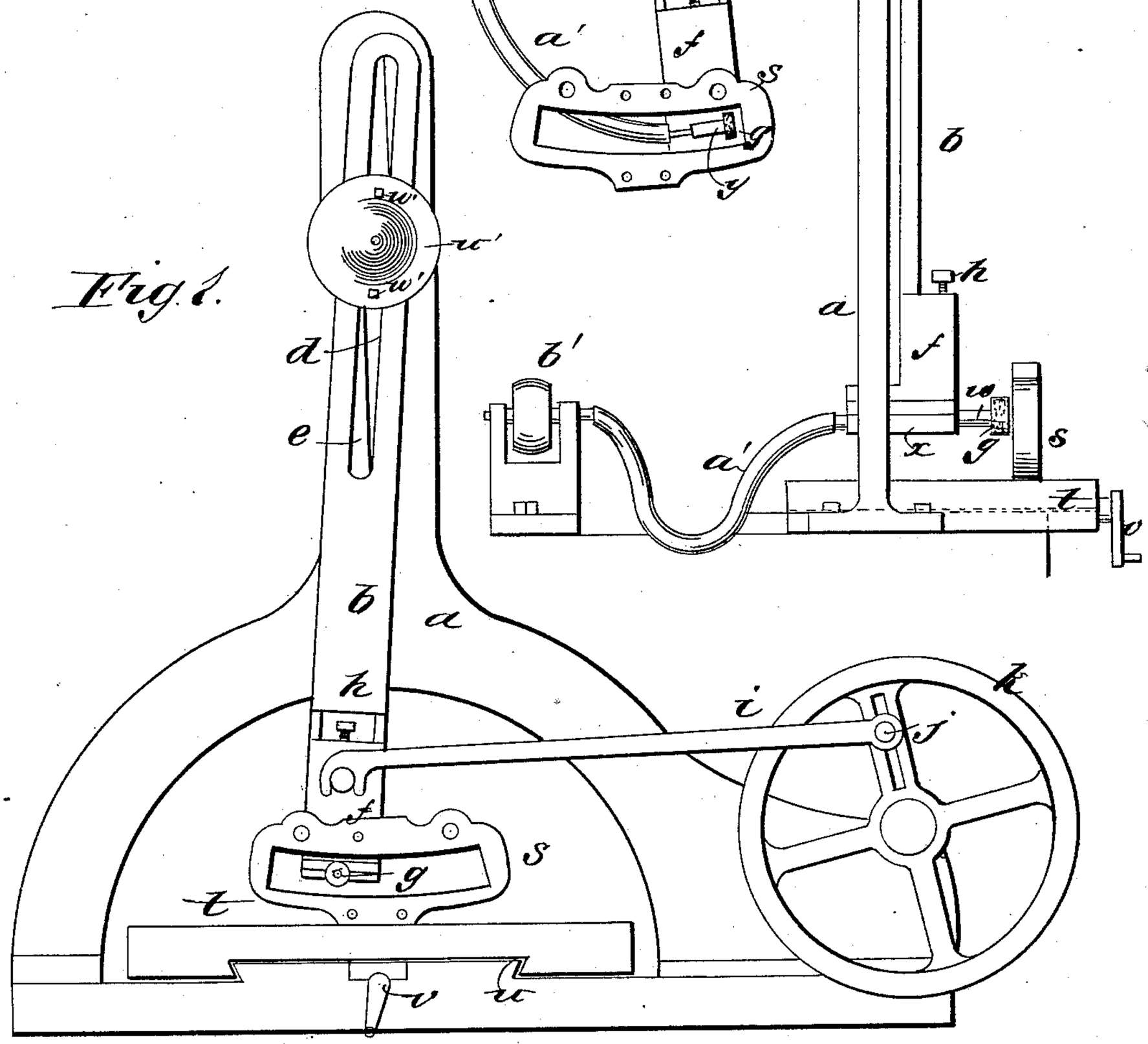


Fig. 1.



WITNESSES:

S. McArdle.

C. Sedgwick

INVENTOR:

J. H. Stimpson

BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

J. H. STIMPSON.

LINK FITTING APPARATUS.

No. 318,217. Patented May 19, 1885.

Fig. 5

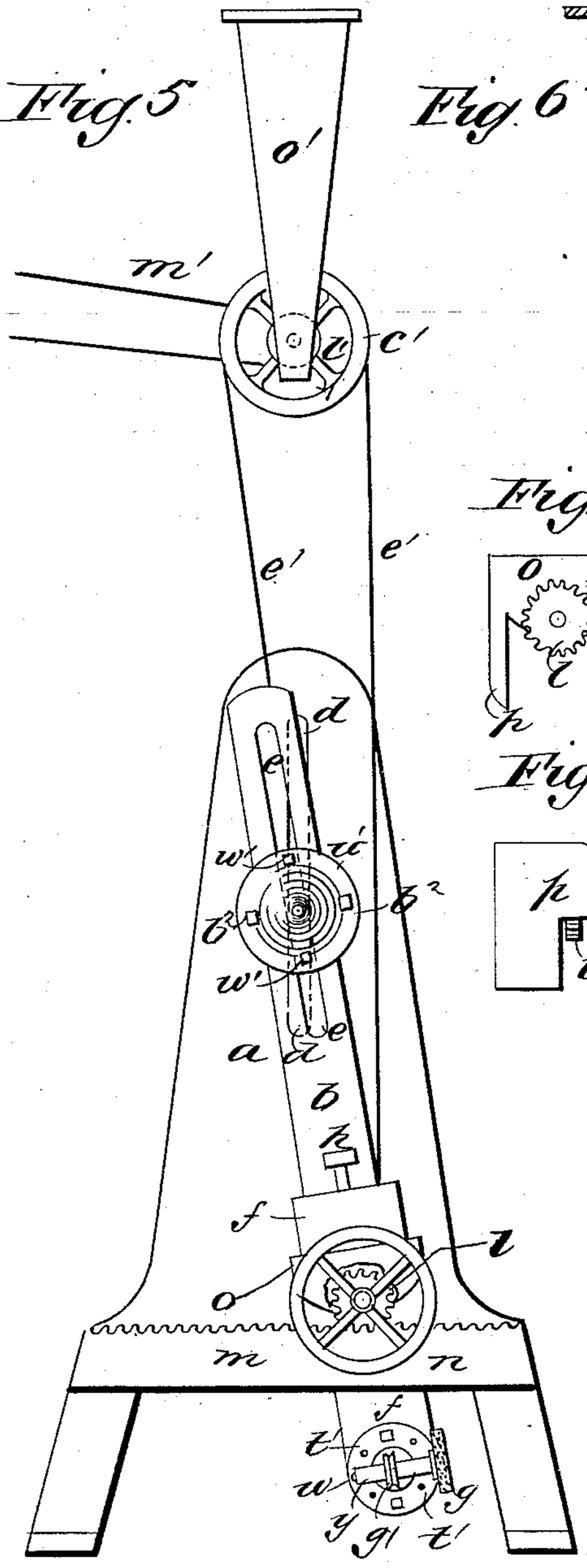


Fig. 6

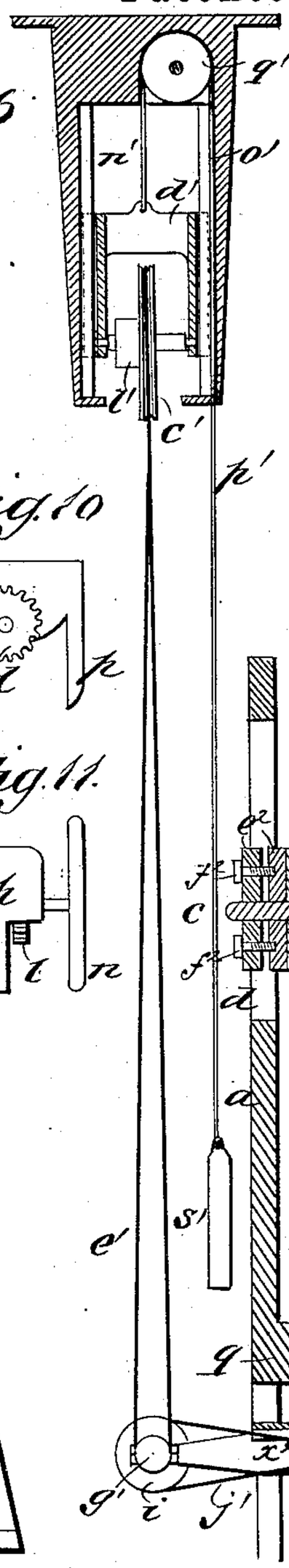


Fig. 7.

Fig. 10

Fig. 11.

Fig. 8

Fig. 9

WITNESSES:

F. M. Antle

C. Sedgwick

INVENTOR:

J. H. Stimpson

BY Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES H. STIMPSON, OF SPRINGFIELD, ILLINOIS.

LINK-FITTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 318,217, dated May 19, 1885.

Application filed May 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. STIMPSON, of Springfield, in the county of Sangamon and State of Illinois, have invented a new and Improved Link-Fitting Apparatus, of which the following is a full, clear, and exact description.

My invention consists of improvements in contrivances for milling and grinding the inside wearing-surfaces of reversing and regulating links of steam-engines, also the sliding blocks working therein, both in the first finishing and the subsequent refitting of them, and if desired to finish the exterior of the link or portions thereof, the said contrivances consisting of a pendulum device adjustable as to its center pivot and carrying rotary milling-tools or emery grinders adapted to work in the link and on the slide, and having means for swinging the pendulum and at the same time revolving the tools carried thereon along the corners of the link together with a sliding bed for holding and adjusting the links and blocks to be dressed, all as hereinafter fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation, Fig. 2 a side elevation, and Figs. 3 and 4 are details, of my improved fitting apparatus in arrangement for rotating the fitting-tools by a flexible shaft and for swinging the pendulum by a crank and connecting-rod. Fig. 5 is a side elevation, and Fig. 6 a sectional elevation, of the same with modifications of the driving and swinging mechanism. Figs. 7, 8, and 9 are details of the fitting-tool as arranged in Figs. 5 and 6. Figs. 10 and 11 are details of the mechanism for swinging the pendulum of Figs. 5 and 6.

On a suitable upright support, *a*, I mount a pendulum-bar, *b*, by a pivot, *c*, which is vertically adjustable on said support, and on which the pendulum is also adjustable, the pivot device sliding in a vertical slot, *d*, of the support, and the pendulum having a slot, *e*, to shift on the pivot. The pendulum carries a tool-slide, *f*, at the lower end on which the mandrel *w* of an emery-wheel, *g*, or it may be a milling-tool, is mounted, and which is vertically adjustable by a screw, *h*, and said pendulum is provided with means for swinging it, which may consist of the connecting-rod *i* and a crank-pin, *j*, of a wheel, *k*, said wheel to be rotated by any approved means; or a pinion, *e*, may be used, said pinion being mounted on the pendulum suitably for meshing with a toothed rack, *m*, attached to the upright support *a*, and said pinion having a crank or a hand-wheel, *n*, by which it may be turned by the attendant. The pinion *l* is to be mounted on the pendulum by a cross-head, *o*, having gib-flanges *p*, embracing the two sides of the pendulum and of the tool-carrying slide *f* at right angles to the front of the slide along which the cross-head extends, and extending down into the space between the bar *m* and the face *q* of the support *a*, by which said cross-head is suitably confined on the pendulum to allow the pendulum to shift lengthwise in the cross-head in the manner due to its vibratory action on the center *c*, while the pinion *l* travels along the straight line of the bar *m*. This arrangement also allows of shifting the pendulum on the center *c*, according to the radius of the link to be dressed, without interfering with the relations of the pinion *l* and its toothed bar *m*. The link *s* to be fitted is to be fastened by any suitable means to the bed-plate *t*, which is fitted by dovetail or other ways, *u*, to slide forward and backward under the pendulum at right angles to the plane in which the pundulum swings, or in the plane of the pivot *c* to shift the link laterally to the tool *g*, said bed having a cranked adjusting-screw, *v*, by which to shift it. The tool-slide *f* is fitted to slide up and down on the pendulum as the tool-slide of a planer is arranged, or it may be fitted in any approved way, and the slide is contrived to carry the mandrel parallel to the pivot of the pendulum or at right angles thereto, according as the tool is to be used for traversing the link to dress the curves, or is to be run in the angles of the slot for dressing them out square, the pendulum being in that case held in a stationary position and the link being shifted forward and backward with relation to the tool by the slide *t* for enabling the tool to work

across the link from side to side. When the tool is to be arranged parallel with the pivot *c*, the mandrel is to be secured to the lower end of the tool-slide *f* by a box, *x* or *x'*, bolted up to the lower end of said tool-slide, and the mandrel will be of suitable length to extend in front of the tool-slide as far as is required to carry the tool into the link, and back of said slide far enough to gear with means for driving the mandrel; but when the mandrel is to be parallel to the plane of the traverse of the pendulum a shorter mandrel will be used, and it will be mounted in a suitable bearing-support, *y*, attached to and projecting forward of the slide. This bearing-support may be contrived to bolt up under the tool-slide, as in Fig. 4, or it may be attached to the end of a box, x^2, that takes the place of box *x'* for this arrangement of the tool. When a flexible shaft, *a'*, is used for driving the grinding or milling tool, it may be connected directly to the end of the mandrel in either position of the mandrel, as in Figs. 2 and 3, with any approved contrivance of the driving-pulley *b'* as to its location; but I prefer to drive the mandrel of the milling or grinding tool by a belt, and for this purpose have arranged a driving-pulley, *c'*, in a counterbalanced and vertically-shifting hanger, *d'*, above the pivot *c* of the pendulum, from which to run the belt *e'* directly onto the pulley *f'* of the mandrel *w* when the long mandrel supported by the box *x'* is used, and onto the pulley *g'* on a counter-shaft, *h'*, having a pulley, *i'*, from which the belt *j'* runs onto the pulley *k'* of the mandrel *w* when the tool is to be run in the plane of the link. The shaft of the driving-pulley *c'* has a pulley, *l'*, on which a belt runs from any suitable source to apply the power. The hanger *d'* is fitted to guide-ribs *n'* of brackets or housings *o'*, pendent from an overhead support, and is suspended by the cord *p'* passing over a pulley, *q'*, pivoted above said hanger, and having the counter-balance *s'* suspended from it to allow the hanger *d'* to rise and fall as the tool-slide does by the vibrations of the pendulum.

When I arrange the bearing *y* for carrying the tool in the link-slot to bolt onto the box x^2 by flanges *z*, I make said flanges circular and provide a series of holes, *t'*, to enable the mandrel to be set either at right angles to the pendulum for running in the link-slot or obliquely thereto for shifting the tool up or down to run against the side of the link above or below the link-slot to fit the sides of it, the link being turned from side to side on the bed *t* for presenting both sides to the tool. The pendulum *b* is adjustably clamped between the head *u'* of the pivot *c* and the washer *v'* by bolts *w'* extending through the slot *e* and bolts b^2 outside of the pendulum. The support for the pivot *c* consists of the two disks e^2, clamped to the respective sides of the support *a* by bolts f^2 passing through the slot *d* of said support and clamping fast to the support to hold the pivot at any point along the support where it may be desired to set the pivot.

The pendulum may be shifted up and down between head *u'* and disk *v'*, as desired, by adjusting-bolts *w'* and b^2.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a pendulum, *b*, and slide *f*, carrying a grinder or a milling-tool, and means for securing it to the slide in positions to revolve parallel with and at right angles to the slide, whereby the tool is adapted to dress the link lengthwise and transversely, substantially as described.

2. The combination, with the pendulum *b*, of the vertically-adjustable slide *f* and grinder or milling tool *g*, supported in a box secured to said slide, whereby the link may be dressed on the upper and lower faces of the slot, substantially as described.

3. The combination, with the pendulum *b*, slide *f*, and rotary tool *g*, of means, substantially as described, for vibrating the pendulum and at the same time revolving the rotary fitting-tool, substantially as herein set forth.

4. The combination of the pendulum *b*, having the adjustable tool-slide *f*, with the reciprocating bed *t*, working at right angles to the plane in which the pendulum swings and being adapted for holding the work, substantially as described.

5. The combination of the pendulum *b*, having the adjustable tool-slide *f*, and a rotary fitting-tool, *g*, located thereon, with the laterally-moving bed *t*, the said tool being provided with means for causing it to rotate while it is swung by the pendulum, substantially as described.

6. The pendulum *b*, mounted adjustably on a pivot, *c*, which is adjustable on the support *a*, the pendulum being provided with an adjustable tool-slide, *f*, carrying a rotary fitting-tool, *g*, in combination with the laterally-traversing bed *t*, substantially as described.

7. The combination of the rotary fitting-tool *g*, detachable supporting-box therefor, driving mechanism for said rotary tool, and the adjustable slide *f*, with a pendulum-bar and work-holding bed, substantially as described.

8. The combination of the driving-pulley *c'*, mounted in the adjustable hanger *d'*, and having means for driving it, with the pendulum *b*, carrying a rotary fitting-tool, *g*, substantially as described.

9. The combination of the driving-pulley *c'*, adjustable hanger *d'*, and counter-balance *p' s'*, with the pendulum *b*, carrying a rotary fitting-tool *g*, substantially as described.

10. The combination of the cross-head *o*, pinion *l*, mounted thereon, and the toothed bar *m*, with the pendulum *b*, carrying a rotary fitting-tool, *g*, substantially as described.

11. The combination of the cross-head *o*,

having gib-flanges *p*, and carrying the pinion *l*, with the pendulum *b*, carrying the rotary tool *g*, and with the toothed bar *m* and face *q* of the support *a*, between which the pendulum swings, substantially as described.

12. The combination of the box x^2 and bearing *y*, adjustably connected by flanges *z*, with the slide *f* and pendulum *b*, the said bearing *y* carrying the rotary fitting-tool, and the box x^2 being attached to said slide *f*, substantially as described.

JAMES H. STIMPSON.

Witnesses:
JAMES H. MARTIN,
W. R. TUCKER.