(No Model.) 5 Sheets—Sheet 1.

Z. E. COFFIN.

MACHINE FOR TURNING PIPE FLANGES.

No. 283,376. Patented Aug. 21, 1883.

Fig. 2.

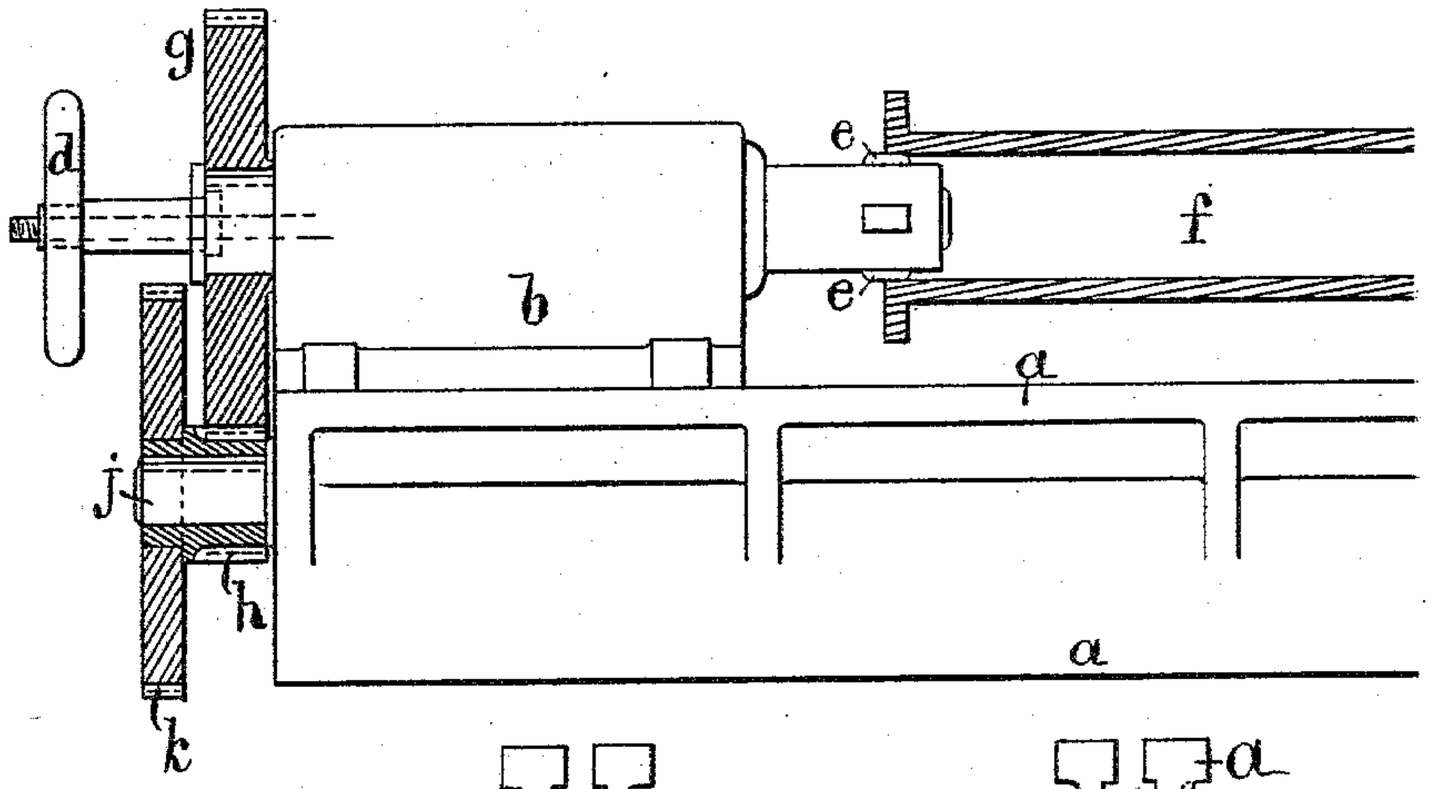


Fig. 1.

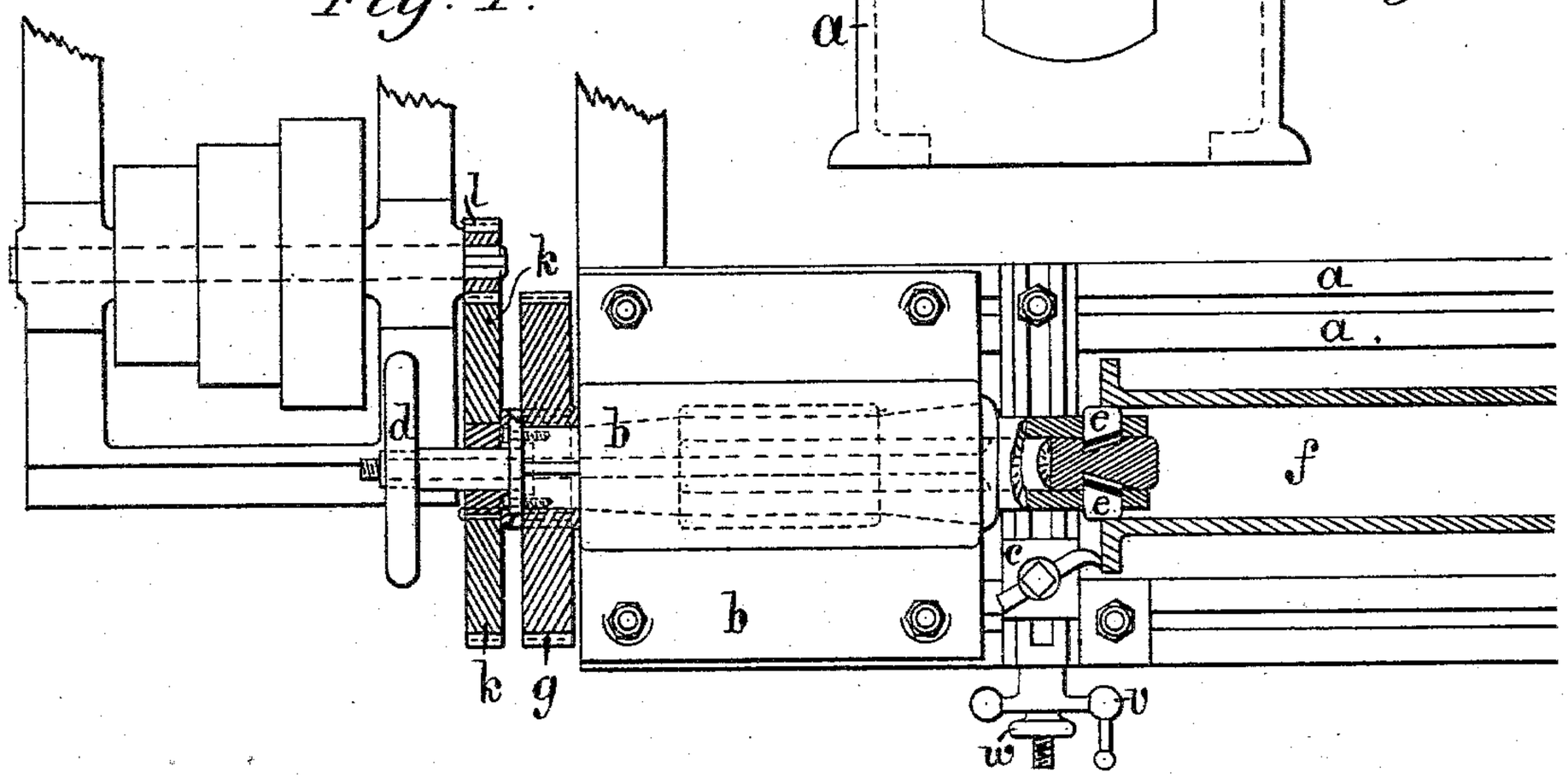
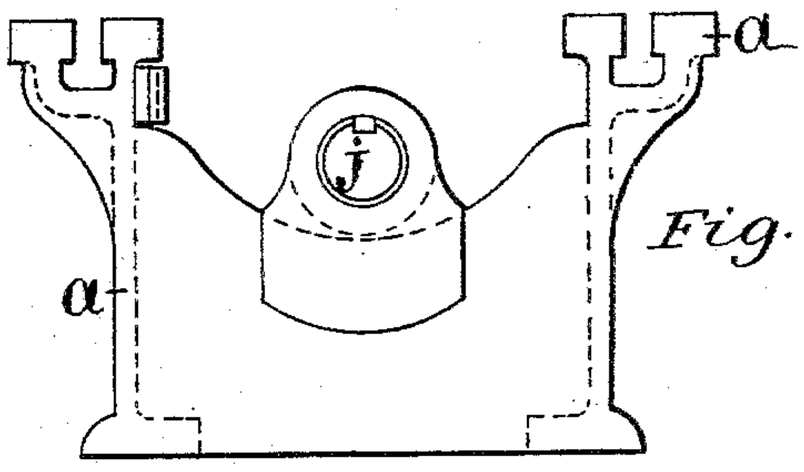


Fig. 3.



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Z. E. COFFIN.

MACHINE FOR TURNING PIPE FLANGES.

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Fig. 2.

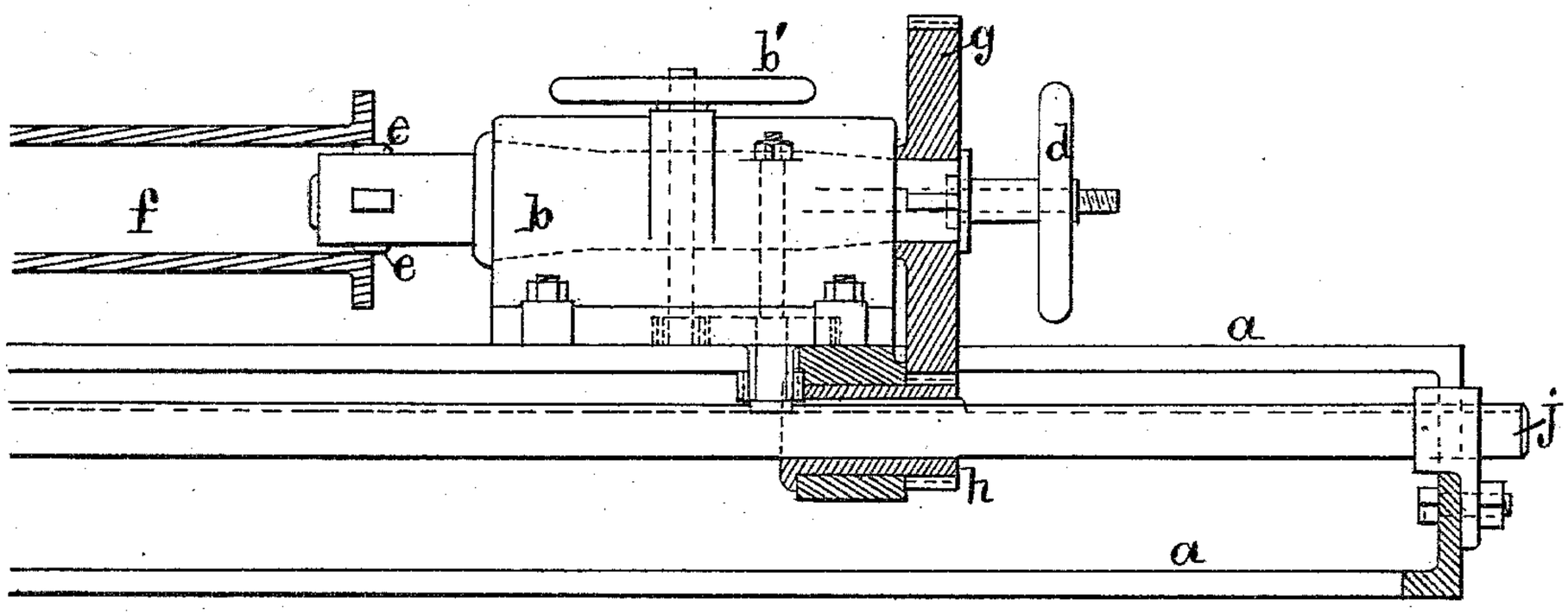


Fig. 4.

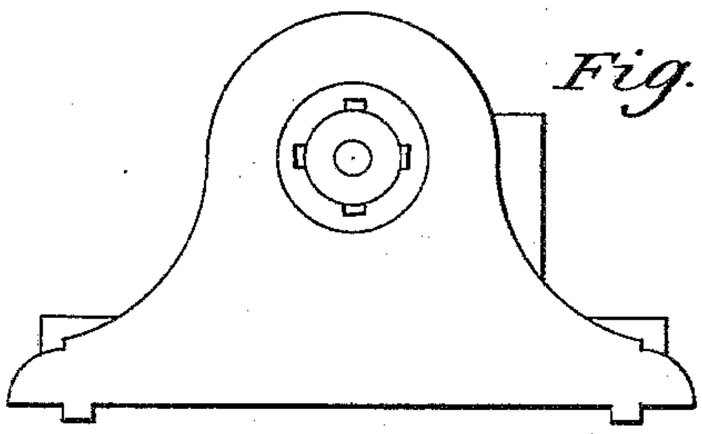
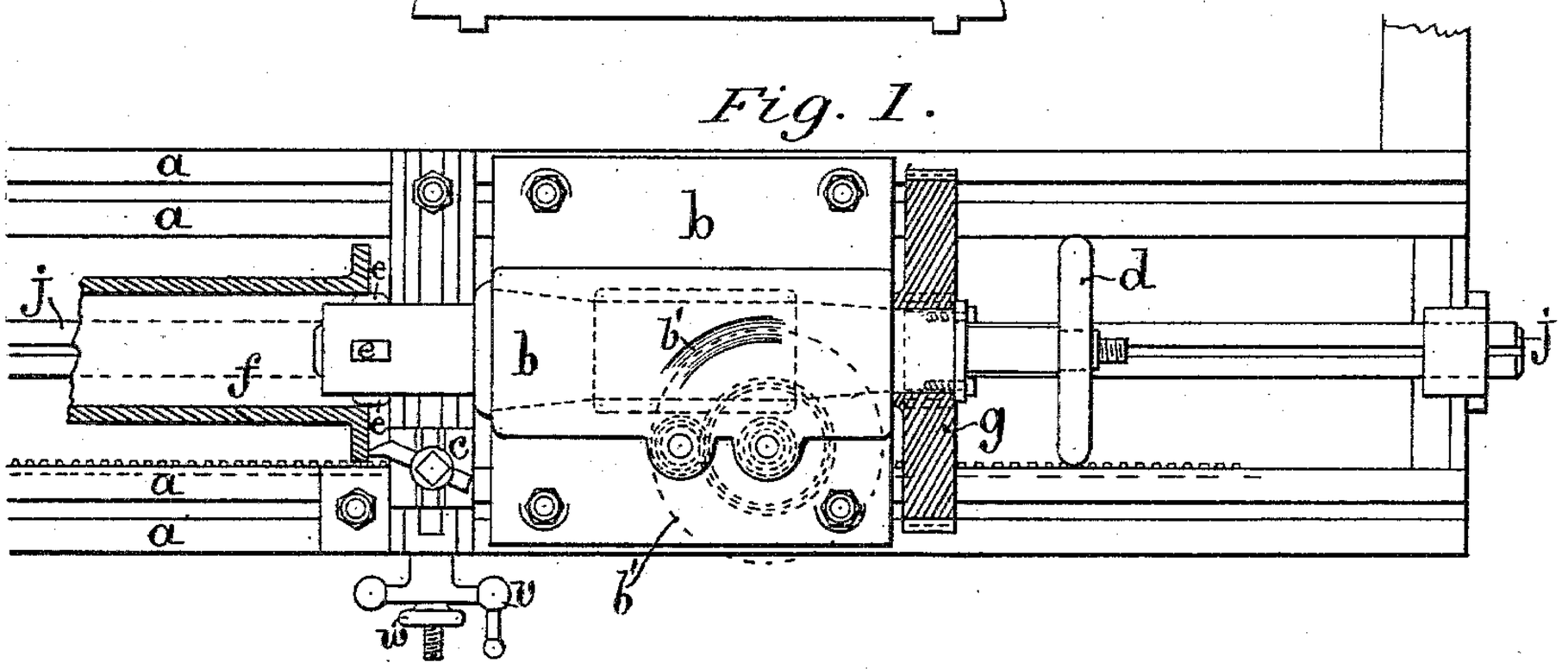


Fig. 1.



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MACHINE FOR TURNING PIPE FLANGES.

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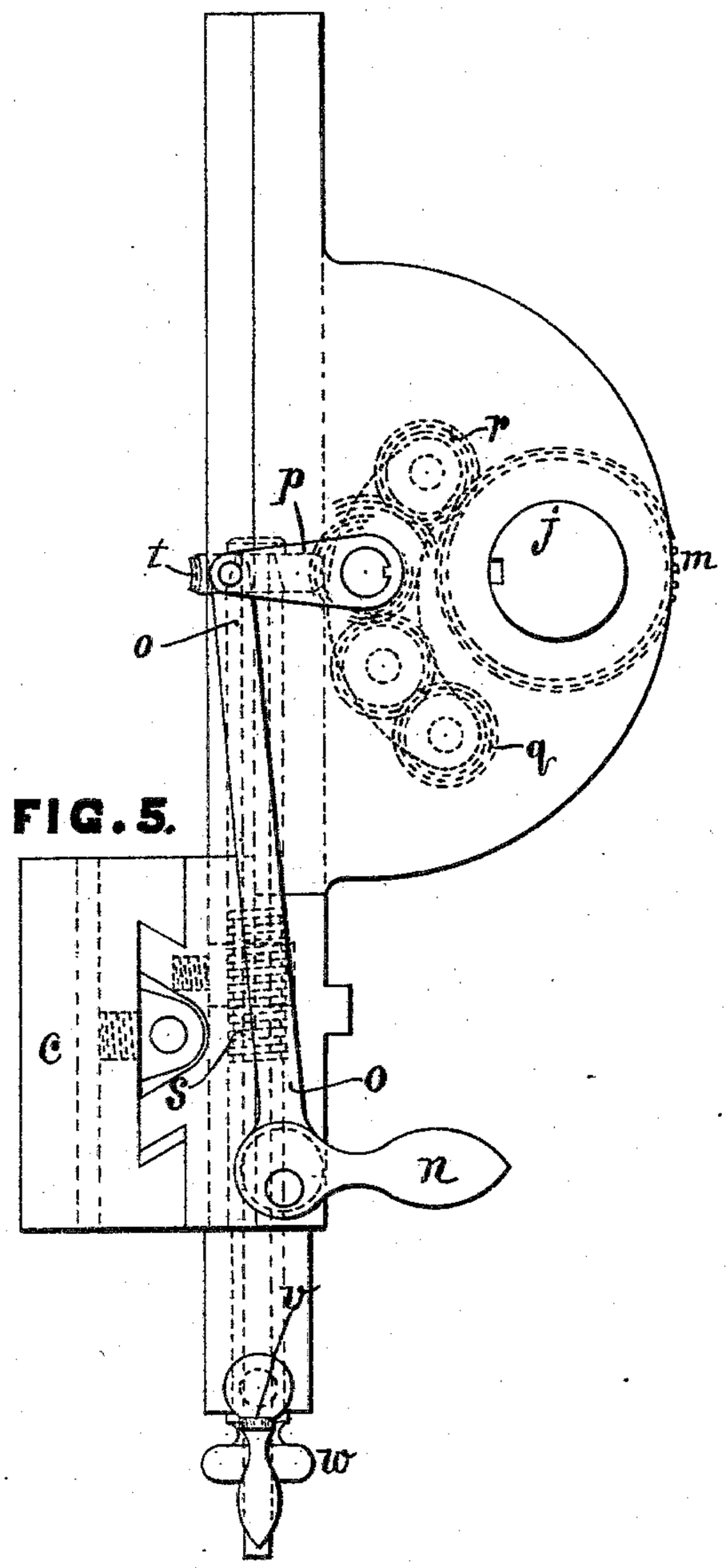

FIG. 5.

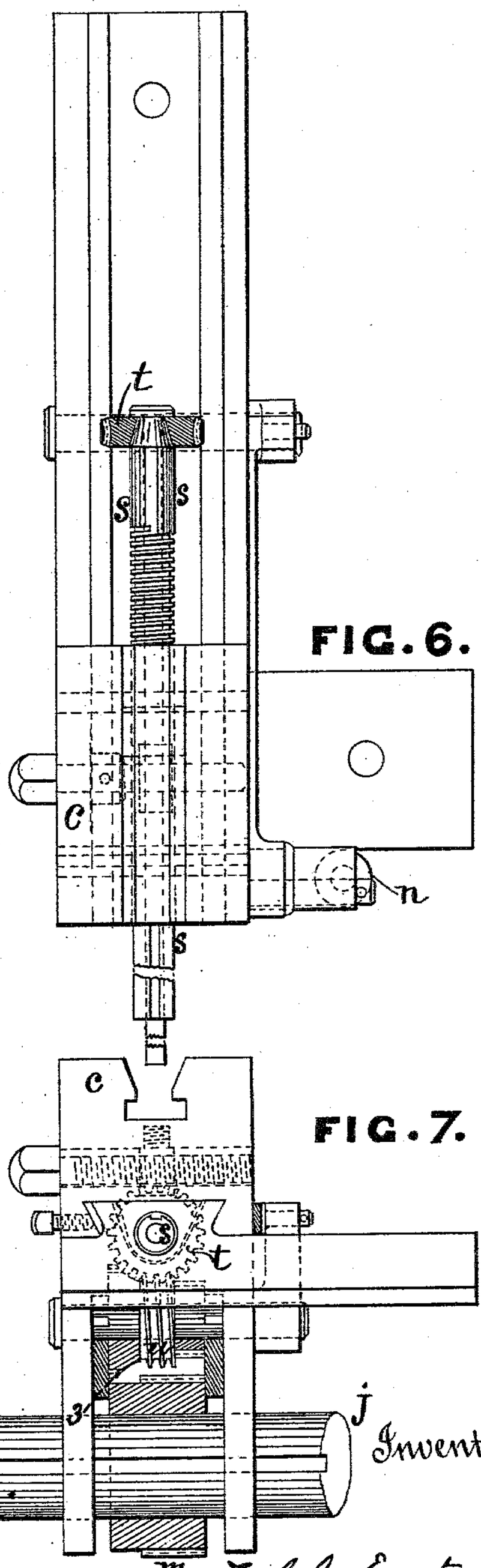

FIG. 6.

FIG. 7.

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Z. E. COFFIN.

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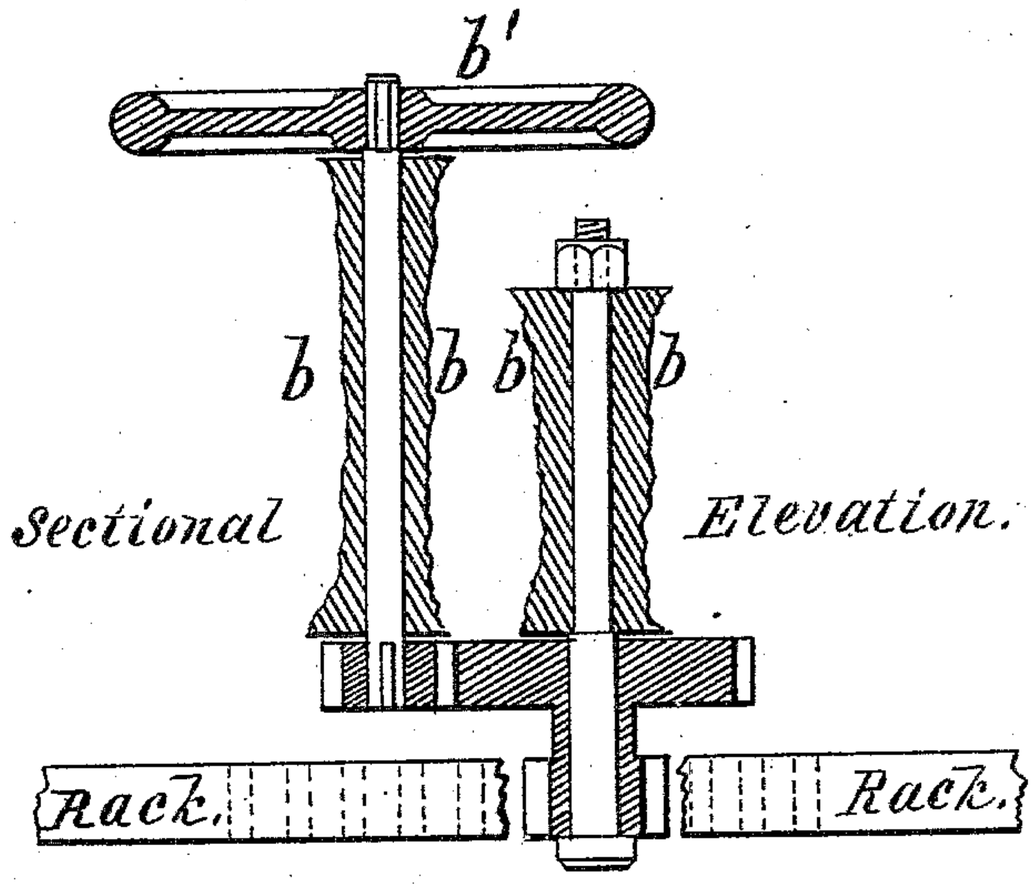
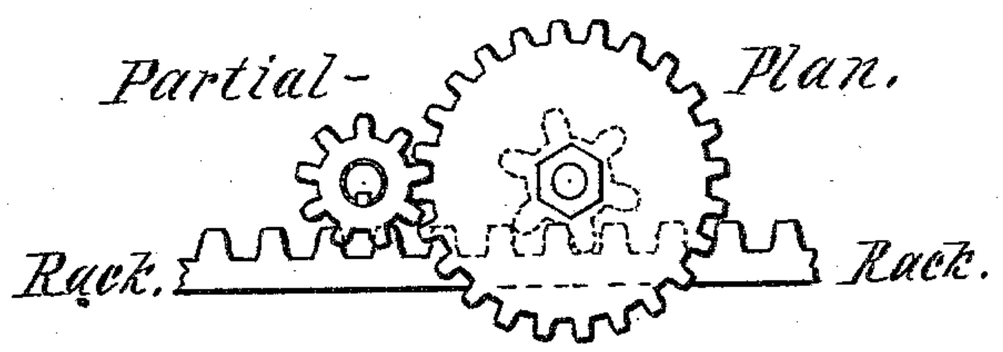


Fig. 8.

Fig. 9.



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Z. E. COFFIN.

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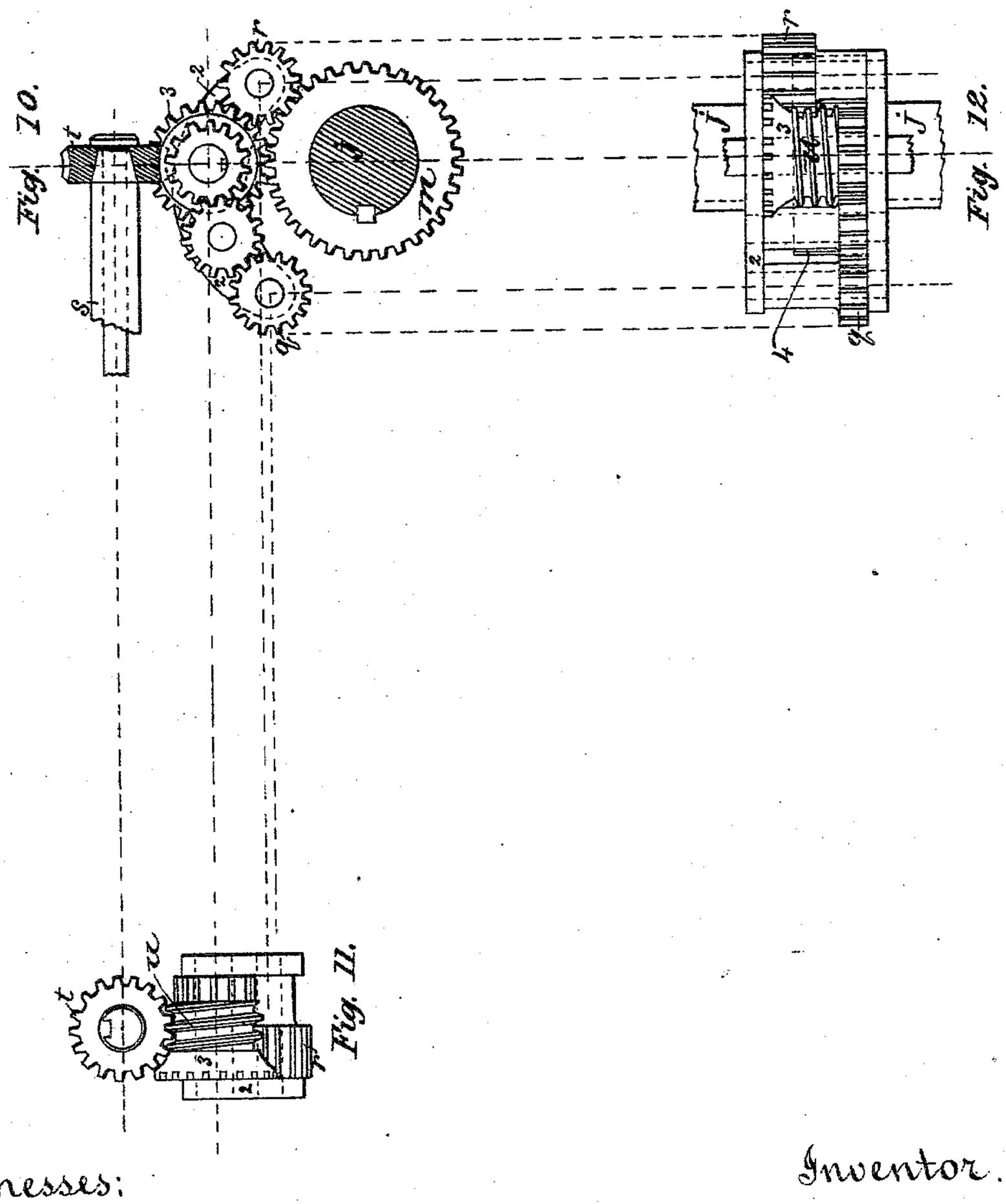

Witnesses:

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UNITED STATES PATENT OFFICE.

ZEBULON ERASTUS COFFIN, OF NEWTON, MASSACHUSETTS.

MACHINE FOR TURNING PIPE-FLANGES.

SPECIFICATION forming part of Letters Patent No. 283,376, dated August 21, 1883.

Application filed August 1, 1881. (No model.)

To all whom it may concern:

Be it known that I, ZEBULON E. COFFIN, of the city of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Facing or Turning the Flanges of Pipes; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In ordinary machines for this purpose it is not practicable to face the flanges at both ends of the pipe at the same time and operation.

The nature of my improvements and invention relates to the construction of the machine and the combination and relation of parts, substantially as herein described, whereby the simultaneous facing of both ends or flanges of the pipe is effected in an expeditious and economical manner.

With reference to the drawings, Figure 1 is a plan, partly in section, showing the machine, and showing a pipe, *f*, in section and in position to be faced by means of the machine. Fig. 2 is an elevation of the same, partly in section. Fig. 3 is an elevation of one end of the bed or ways *a*, &c. Fig. 4 is an elevation of the right-hand head-stock viewed from the position of the pipe. Fig. 5 is an elevation of the tool-carrying rest, with feed-gearing, &c. Fig. 6 is a plan of the same. The other rest (see Fig. 1) is symmetrical. Fig. 7 is a front elevation of the same rest, partly in section. Fig. 8 is a sectional elevation, and Fig. 9 is a partial plan, illustrating the hand-gear and rack for moving the head-stock along the bed or ways. Fig. 10 is an elevation, partly in section, of the gears, &c., contained in the rest. Fig. 11 is a similar partial elevation of the same, viewed from the front. Fig. 12 is a plan of the same. Figs. 3, 4, 5, 6, 7, 8, 9 are drawn on a larger scale than Figs. 1 and 2.

Like letters refer to the same or corresponding parts in all the figures.

A bed or ways of suitable length to provide for taking between the head-stocks the required lengths of pipe, and marked *a*, is provided with two head-stocks, *b*, arranged to face each other, as shown. One or both of these head-stocks *b* are made movable lengthwise upon the ways *a*, and the head-stocks are provided with means whereby they may be fastened to the ways at any required distance from each other. The rotary spindles of both are geared to and driven by one common shaft, *j*, extending lengthwise the bed or ways, and suitably driven for that purpose. These head-stocks are both "live" or active ones. The rotating spindle of each is provided with suitable expanding or radially-movable and concentrically-movable dogs or pipe-holders, *e*.

Two tool-carrying rests, one right and one left, (see one in detail in Figs. 5, 6, and 7, also both are shown in Fig. 1,) carrying the tool-block *c*, are geared to the shaft *j*, which is splined to receive a feather in the gears *m*, as well as one in each gear *h*. These two rests carry each a cutting-tool for simultaneous operation upon both ends or flanges of the pipe *f*. The dogs *e*—two, three, or more in a set (three being sufficient)—are forced out radially and concentrically by means of a central core-piece provided with inclined or angular grooves, into which they are fitted, and may be retracted or drawn in by the same. The center core-piece is drawn or moved back and forth to produce this movement by means of the nut attached to hand-wheel *d*, which fits a screw-thread on the core-piece. A pipe is shown held in position by the dogs, and is marked *f*. Rotary motion is communicated to the spindle carrying the dogs *e* by means of gear *g*, which in turn is rotated by gear *h* on shaft *j*. (See Fig. 2.) The spindle in each head-stock has its gear *g* (see Fig. 1) and the intermeshing sleeve-journaled gear *h* on shaft *j*, by which it is driven.

Shaft *j* is connected by spline or feather to gear *h*, through which it slips freely as gear *h* is traversed back and forth for adjustment to accommodate the machine to different lengths of pipes to be faced. Shaft *j* is driven by gears *k l* and connected cone-shaft from any suitable power.

Referring to Figs. 5, 6, 7, a gear, *m*, is, in like manner to gear *h*, connected by a feather, before alluded to, to shaft *j*, which passes through it, and thereby communicates its motion to the feed-gearing in the tool-carrying rest.

A handle, *n*, (see Figs. 5 and 6,) with eccentric attached, serves, through rod *o* and arm *p*,

to rock or oscillate the feed-gear frame seen in Figs. 5,6,7, which carries gears *q*, *r*, &c., and so to reverse the feed motion by throwing into gear with gear *m* either gear *q* or gear *r*, or, at the pleasure of the operator, to leave both *r* and *q* disconnected from gear *m* at the intermediate position, thus leaving the feed undriven by shaft *j*. The tool-post *c* is moved by means of the hollow screw *s*, first by the feed-gears, as described, through the worm-wheel *t* and worm *u*, (see Fig. 6;) second, without the feed-gears, by means of the hand wheel or crank *v*, Figs. 1 and 5. The sleeve-screw *s* is made at the end of a taper form, to receive the worm-wheel *t*, which is bored to fit the taper. A rod with a head to hold worm-wheel *t* on passes through the center of screw *s*, and is made a screw at the opposite end, to which is fitted the thumb screw or nut *w*. (See Figs. 1 and 5.) The tapers on screw *s* and within the worm-wheel *t* form a friction-clutch, which is operated by the nut *w*. When this clutch is made to act by turning up the nut *w*, the screw *s* will be driven by the worm-wheel *t;* when released by turning back the nut *w*, the screw *s* may be turned by hand to operate the tool-post, as described below.

When it is desired to feed by hand, the gears *r q* may be left in the intermediate position by means of handle *n*, &c., as described, or the thumb-screw *w* may be loosened, thus releasing worm-gear *t* on hollow screw *s*, allowing said screw to be rotated to feed by hand by means of handle *v*. Gear 3 is attached to worm *u* and is driven by gear *r*, while to the opposite end of worm *u* is attached a gear which is driven through an intermediate by gear *q*. The swing-frame carrying gears *q* and *r* is marked 2 in Figs. 10 and 12. It has two parts swinging on the shaft which carries worm *u*, &c., and which are connected together by the journals of gears *q r*, all which will appear in the drawings. If the pipe is adjusted to project past the dogs *e* a little, the tool will traverse the full width of the flange without danger of interfering with the dogs. The rests are secured in proper position to the ways by means of bolts in the inverted-T slots in the ways; so, also, with the head-stocks. In the plan, Fig. 1, is seen the broken connections which join the flange-turning machine to its mate or counterpart, for drilling the flanges for bolting together the pipes. In this plan, also, may be seen the rack, and in the elevation, Fig. 2, the pinion (shown in dotted lines, also in plan) for moving by means of the indicated intermediate gearing and hand-wheel, *b'*, the head-stock (one or both may be so fitted) lengthwise of the bed or ways. The rests may be fitted with like means operating upon the same rack for a similar movement, or may be adjusted by hand lengthwise the bed or ways. The gear *h*, giving impulse to gear *g*, is carried by its sleeve-journal in a suitable stand or bearing secured to the head-stock. The worm-gear *t* is held to the hollow screw *s* by friction applied by the means of thumb-screw *w*, as clearly indicated in Figs. 5 and 6.

I claim—

1. The combination of the sleeve-journaled gears *h*, their journal-boxes attached to head-stocks *b b*, the said head-stocks with their spindles, the spindle-gears *g h*, and splined shaft *j*, constructed to operate together substantially as described.

2. The combination of the rotating spindles, dogs *e*, the means for operating said dogs, the head-stocks, gears *g h*, and shaft *j*, substantially as described.

3. The combination of the hand-wheel *b'*, the ways *a*, attached rack, and intermediate gearing with the rotating spindle, head-stock, the concentrically-adjustable dogs *e*, and means for operating the same for the adjustment and centering of the pipe, substantially as described.

4. In combination with the pipe-rotating arbors, the dogs *e*, rotating with them to drive the pipe and center it at both ends, the screw-rods with inclines for operating said dogs *e*, the wheel-nuts *d*, gears *g* and *h*, and shaft *j*, substantially as and for the purposes set forth.

5. The combination of handle *n*, its eccentric, rod *o*, arm *p*, rocking frame carrying gears *q r*, the intermediate gears and screw, *u*, gear *m*, shaft *j*, the rest, and the bed, substantially as described.

6. The pipe-turning machine, constructed with the ways *a a*, heads *b*, rotating arbors containing adjustable dogs *e*, hand-wheel *d*, gears *g h*, shaft *j*, hand-wheel *b'*, with intermediate gearing, and rack on bed, all arranged and combined substantially as described.

7. The hollow screw-shaft *s*, the screw-rod within worm-wheel *t*, taper friction-clutch within it, worm *u*, and attached gears, with the tool-block, rest, and gears *r*, *q*, and shaft *j*, in combination, substantially as described.

8. The radial pipe-supporting, pipe-adjusting, pipe-driving dogs *e*, in combination with the nut *d*, screw-rod, and inclines which operate said dogs *e*, the arbor and head-stock, substantially as and for the purpose set forth.

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Witnesses:

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