(No Model.)

E. C. ATKINS.

MACHINE FOR DIPPING SAWS.

No. 294,346. Patented Mar. 4, 1884.

Fig. 2.

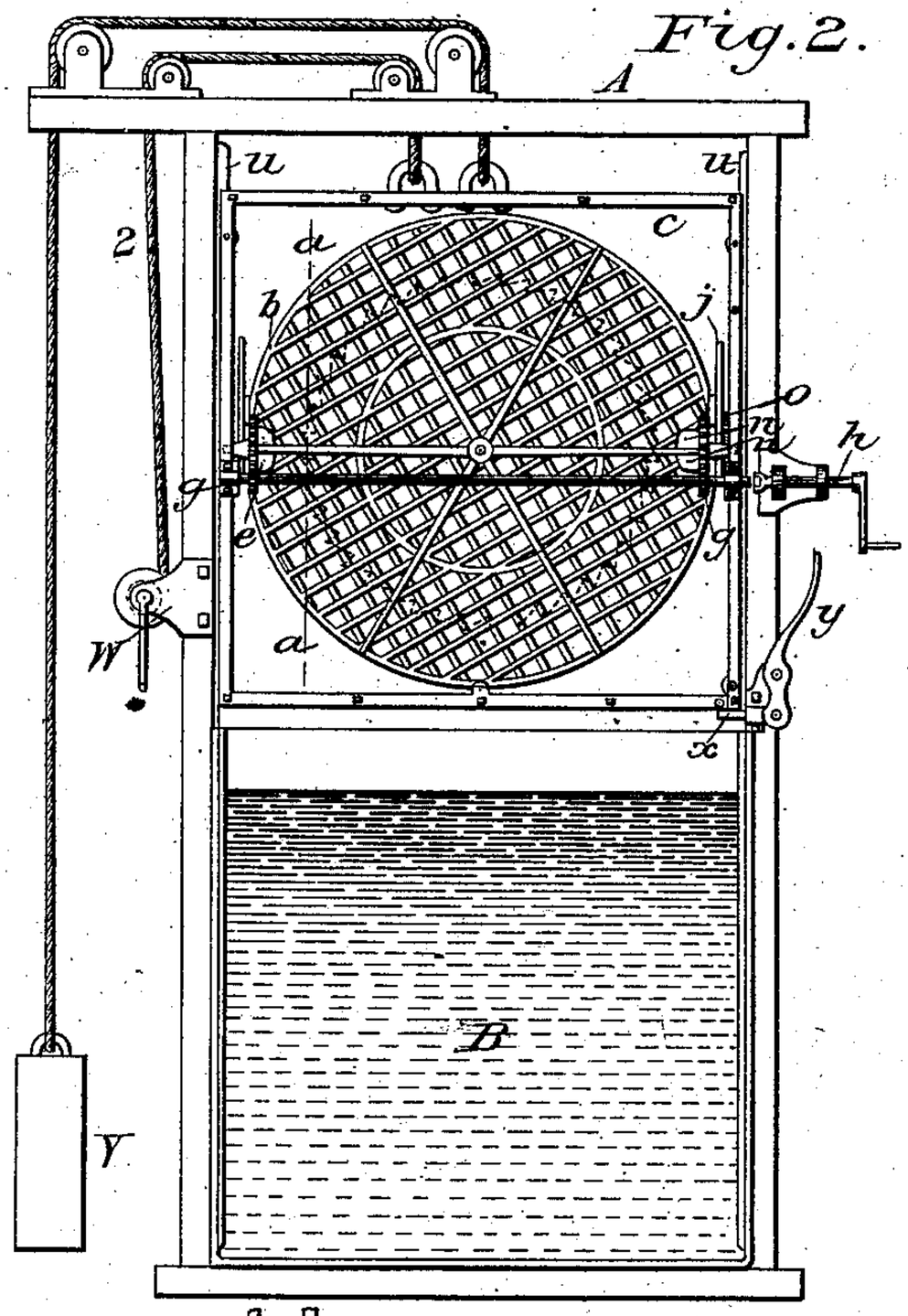


Fig. 1.

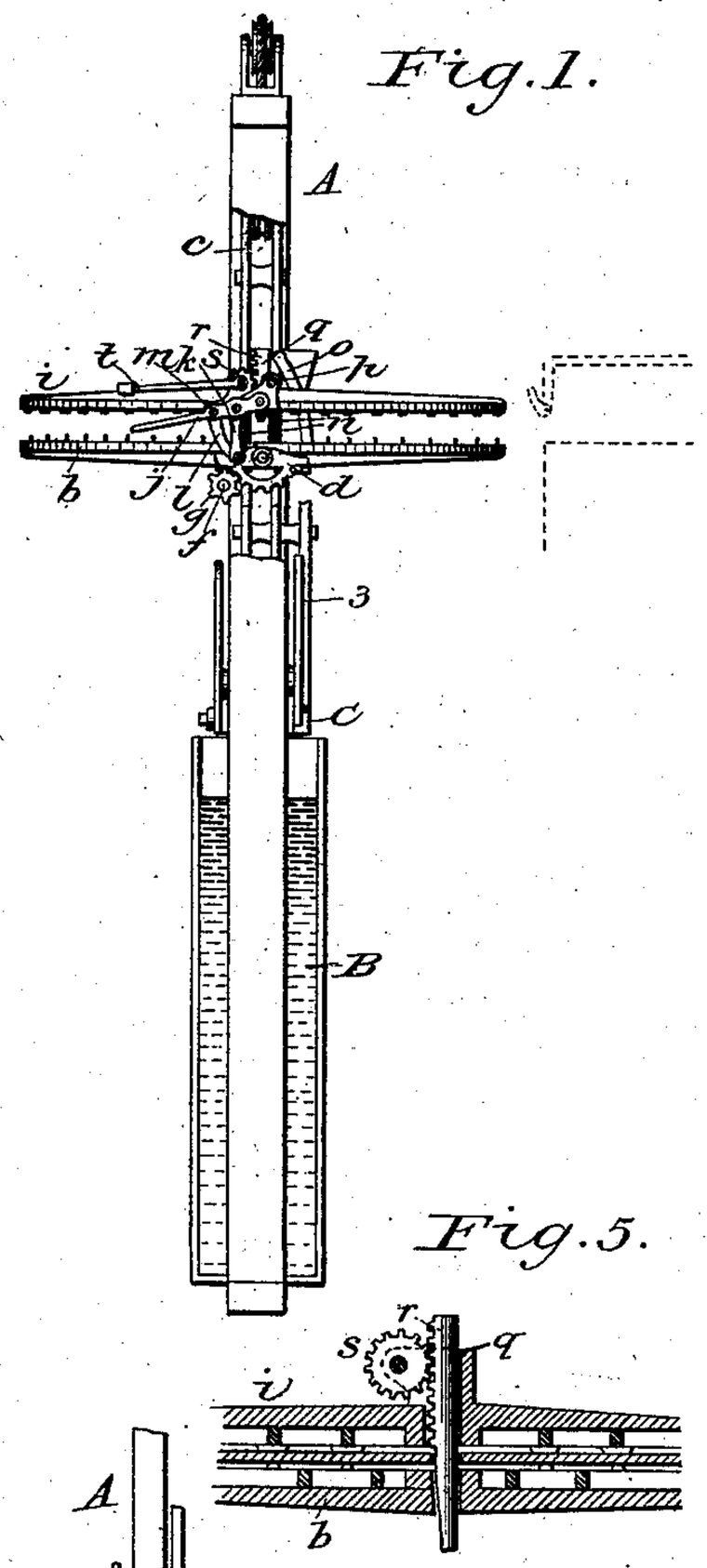


Fig. 5.

Fig. 3.

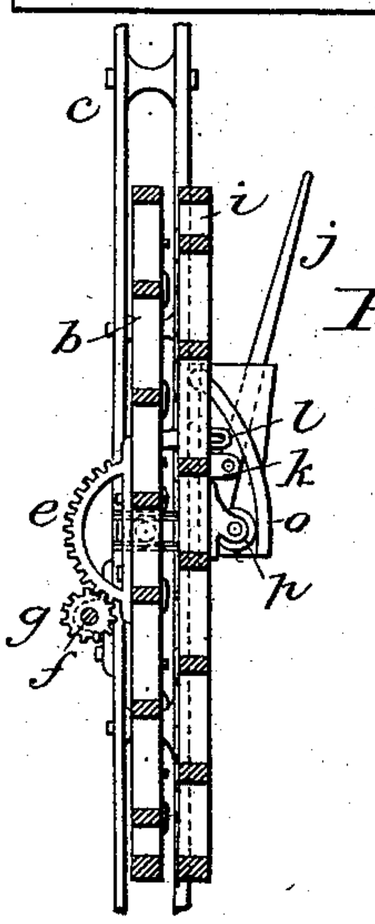
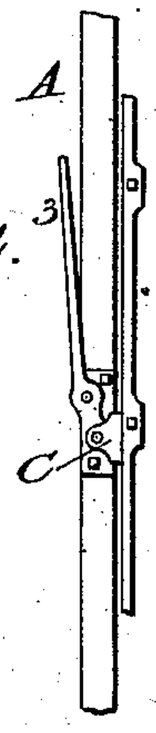


Fig. 4.



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MACHINE FOR DIPPING SAWS.

SPECIFICATION forming part of Letters Patent No. 294,346, dated March 4, 1884.

Application filed October 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, ELIAS C. ATKINS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Improved Machine for Dipping Saws, of which the following is a specification.

My invention relates to an improved machine for handling and dipping circular saws in the process of hardening them.

The objects of my improvement are to receive the saw, when hot, in a horizontal position, to clamp the saw on each side in such a manner as to hold it true and flat and admit of the hardening-fluid coming in contact with all parts of the saw, to turn the saw, while so held, from a horizontal to a vertical position, and to immerse the saw edgewise quickly in the hardening-bath, and to withdraw it easily therefrom.

The accompanying drawings illustrate my invention.

Figure 1 is a side elevation with a portion broken away, showing the clamping-disks in a horizontal position. Fig. 2 is front elevation, showing the clamping-disks inclosing the saw and turned to a vertical position. Fig. 3 is an enlarged vertical section on the line *a a*. Fig. 4 is a partial rear elevation, showing a brake for controlling the descent of the saw into the hardening-bath. Fig. 5 is a partial section of the clamping-disks.

Like letters indicate the same parts.

b is a circular skeleton disk of cast-iron, formed with a series of parallel bars running across the disk, with open spaces between. Said disk is suspended on trunnions projecting outward from opposite edges of the disk, and journaled in bearings on a sliding rectangular frame, *c*. Segmental gear-wheels *d e* are secured to disk *b*—one on each side—concentric with the trunnions on which said disk is suspended. A shaft, *f*, mounted in bearings secured to sliding frame *c*, carries at each end toothed pinions *g g*, which intermesh with the segmental gears *d e*. One end of shaft *f* projects beyond its bearing, and is squared to fit a corresponding socket in the end of a crank-shaft, *h*, mounted in bearings secured to the main frame A. Said shaft is adapted to have a limited longitudinal movement in its bearings, for the purpose of engaging with and disengaging from the squared end of shaft *f*.

i is a circular disk, of the same size and construction as disk *b*. The working-faces of disks *b* and *i* are studded with slight narrow projections, as seen in Fig. 1, and these projections are faced off to form true parallel surfaces, between which the saw is grasped and held, as hereinafter explained. Disk *i* is suspended above disk *b*, with the parallel bars of which it is formed crossing those of disk *b* at right angles by means of a lever, *j*, link *k*, and arm *l*, there being one of each on opposite edges of the disk, as shown. Lever *j* is pivoted at one end to the edge of disk *i*, and is fulcrumed on link *k*, which is in turn pivoted at its lower end to the edge of disk *b*. By this arrangement, when the long arm of lever *j* is depressed, disk *i* is raised away from disk *b*, in which position it is sustained by a pin at *m* in the lever, engaging a hole in arm *l*, which is rigidly secured to disk *b*.

For the purpose of guiding disk *i* and keeping it in proper relation to disk *b*, steady-pins at *n n* are secured to disk *i* and pass through holes in disk *b*. For the purpose of holding disk *i* closely against disk *b* when in a vertical position, eccentric guide-bars, like *o*, are secured one to each side of sliding frame *c*, in such a position as to impinge against a friction-roller, *p*, secured to the top of disk *i*. The arrangement of the guide-bars, and their relation to the trunnions on which disk *b* turns, is such that the disks may be widely separated when in a horizontal position; but as they are turned to a vertical position disk *i* is forced toward disk *b* by the contact of rollers *p* with the inner surface of bars *o*. For the purpose of holding the saw concentric with disks *b* and *i*, and also to prevent it from slipping from between the disks as they are turned from a horizontal to a vertical position, a pin, *q*, having a rack, *r*, formed on its upper portion, is arranged to slide vertically in a central hole in disk *i*, and to pass through the mandrel-hole in the saw and a central hole in disk *b*. Said pin is raised and lowered by means of a pinion, *s*, which is journaled in a projection from disk *i*, and intermeshes with the rack-teeth in pin *q*. Said pinion is mounted on a short shaft, to which is secured a lever, *t*, and the pin is operated by turning

said lever from side to side. Frame *c* is adapted to slide vertically on ways *u u*, secured to main frame A. Said frame *c* and the disks, with their working mechanism, are nearly counterpoised by a weight, *v*, sufficient preponderance of weight being allowed to the frame and disks and their attachments, including the saw, when in position, to carry them by force of gravitation down into the tank B, which is nearly filled with oil or other liquid, forming a hardening-bath.

w is a windlass, to which a rope, 2, is attached for raising the frame *c* from the hardening-bath.

x is a bolt or sliding stop, operated by means of lever *y*. When thrown inward, said bolt engages a projecting pin secured in frame *c*, and holds the frame up. To prevent frame *c* from moving down too rapidly when carrying a large saw, a brake, C, Fig. 4, is secured to frame A, and impinges against a flange on frame *c*, being operated by means of lever 3.

The operation of my machine is as follows: Disks *b* and *i* lying in a horizontal position and separated by means of levers *j*, as before explained, as seen in Fig. 1, the saw is drawn from the furnace (represented in dotted lines) onto disk *b*, its position thereon being determined by thrusting pin *q* through the hole in the center of the saw, by means of lever *t* and pinion *s*. Levers *j* are now released from the arms *l*, and disk *i* falls and closes down on the saw. Crank-shaft *h* is now slid inward, so as to engage with shaft *f*, and as shaft *f* is revolved the disks, carrying the saw between them, are turned to a vertical position, as shown in Fig. 2. The eccentric guides *g*, of which there are two—one on each side of frame *c*—force the disks closely together, thus straightening the saw and holding it firmly in shape. Crank-shaft *f* is now withdrawn from shaft *f*, and bolt *x* withdrawn. Frame *c*, carrying the disks and the saw, now slides by force of gravitation down ways *u* into the tank B, thus immersing the saw edgewise in the hardening-bath, which flows freely through the open-work of the disks, and the saw is evenly hardened throughout without warping. Frame *c* is now raised, by means of windlass *w*, to its former position, and the disks returned to a horizontal position and separated, as at first, and the saw removed.

I claim as my invention—

1. A machine for dipping saws, consisting of the following elements, namely: a pair of skeleton disks adapted to clamp a saw-plate between them and mounted on trunnions in a vertically-sliding frame; means for separating and for forcing together said disks; a frame mounted on vertical ways and adapted to slide thereon; means for turning said disks from a horizontal to a vertical position in said frame; a tank containing liquid and adapted to receive said frame and disks, and means for raising and lowering said sliding frame and disks, all combined and arranged to co-operate substantially as and for the purpose specified.

2. In a machine for dipping saws, the combination of a frame mounted on vertical ways and adapted to slide thereon and a pair of skeleton disks mounted in said frame and adapted to clamp a saw-plate between them and to turn from a horizontal to a vertical position in said frame, all substantially as specified.

3. In a machine for dipping saws, the combination, with a vertical sliding frame and a pair of disks, one of which is pivoted to said frame and the other movable therein, of a pair of clamping-bars secured to said frame eccentrically to the pivots on which said disk is mounted, and friction-rolls secured to said movable disk so as to come in contact with said bars, whereby said disks are clamped together when turned to a vertical position, substantially as specified.

4. The combination, with disks *b* and *i*, of center-pin *q*, having rack *r*, pinion *s*, and means for turning said pinion, all arranged substantially as and for the purpose specified.

5. The combination, with sliding frame *c* and disk *b*, pivoted thereto, of segment-gears *d e*, secured to said disk, shaft *f*, mounted in bearings on said frame, pinions *g g*, and means for turning shaft *f*, all substantially as and for the purpose specified.

6. The combination, with disks *b* and *i*, pivoted in sliding frame *c*, segment-gears *d e*, pinions *g g*, and shaft *f*, of the detachable crank-shaft *h*, mounted in bearings on frame A, for the purpose set forth.

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