B. S. ATWOOD.

MACHINE FOR DRIVING NAILS.

No. 184,221. Patented Nov. 14, 1876.

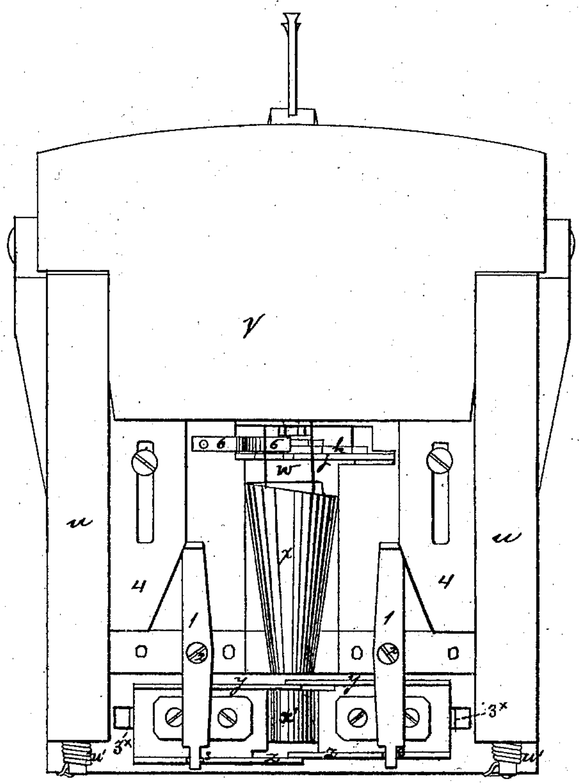

Fig. 1.

Witnesses.

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Chas. H. Drew.

Benjamin S. Atwood

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THE GRAPHIC CO. N.Y.

2 Sheets—Sheet 2.

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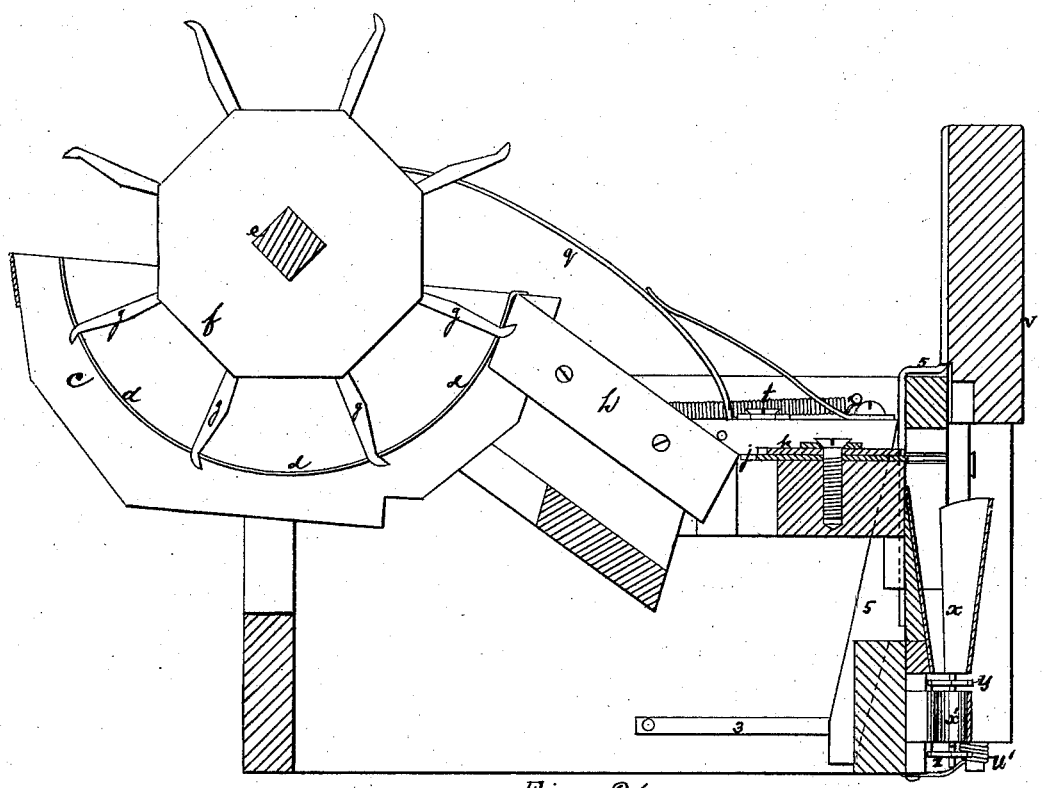

Fig. 2.

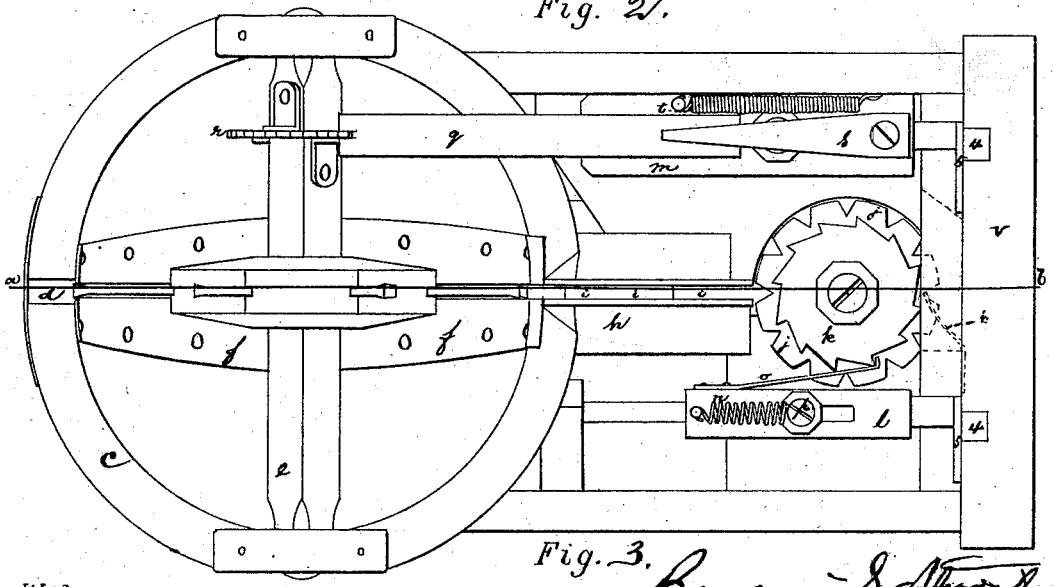

Fig. 3.

Witnesses.

Charles F. Perkins

Benjamin S. Atwood

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UNITED STATES PATENT OFFICE.

BENJAMIN S. ATWOOD, OF SOUTH ABINGTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR DRIVING NAILS.

Specification forming part of Letters Patent No. **184,221**, dated November 14, 1876; application filed August 13, 1875.

To all whom it may concern:

Be it known that I, BENJAMIN S. ATWOOD, of South Abington, in the Commonwealth of Massachusetts, have invented certain Improvements in Machines for Driving Nails, of which the following is a specification:

The object of my invention is to provide a machine for the rapid and effective driving of nails in wood-work, such as boxes, floors, and for other purposes.

In the drawings annexed hereto, Figure 1 represents a front view of a machine embodying my invention. Fig. 2 represents a sectional view on the line *a b*, in Fig. 3, and Fig. 3 is a top view of the same.

My machine is provided with a hopper, *c*, through the center of which runs a groove, *d*, large enough to permit nails to fall point downward, but not large enough to permit them to fall entirely through, the heads catching on the sides of the groove, and being thus held in the groove head upward. As the hopper is hemispherical, all the nails placed in the center must fall into the groove in the way above explained. A shaft, *e*, is placed at right angles with the groove, having its bearings upon the upper edge of the hopper. Upon the center of this shaft is placed an octagonal drum or disk, *f*, at each angle of which is placed an arm, *g g g*, bent at its end, which end extends below the bottom of the hopper into the groove. At one end of the hopper is a spout, *h*, having a groove of sufficient width to allow a nail to fall into it, and be arrested, so as not to fall through it by the head catching upon the sides, and of sufficient depth to permit the nails to stand upright therein, held up by their heads. This groove *i* is continuous with the groove *d*. This spout is so placed that the upper part of its groove *i* is at the upper part of *d* of the hopper *e*, and its lower part so much lower that nails will readily slide down to its lower end. At this lower end is a circular disk, *j*, having triangular nicks or cuts in its periphery sufficiently large to hold a nail below the head, but not permitting the head to pass through it. Upon this disk is a toothed wheel, *k*. On each side of the disk is a bar, *l* and *m*. On the bar *l* is a spring, *n*, and on its side a steel arm, *o*, bent at the end so as to fit into the teeth of the wheel *k*. This bar slides back and forth upon a fixed point, *p*, in the manner which will be described below. The bar *m* has placed at a similar fixed point a bent piece of metal, *q*, the end of which is made to fit into the teeth of a toothed wheel, *r*, on the shaft *e*, and is held down to its proper position by the spring *s* on one end of *m*. On this bar is also placed a spring, *t*, one end fastened to *m* and one end to the side of the stationary part of the machine. This bar also slides back and forth, as will be explained farther on.

In the uprights *u u* are springs fastened to the part *r*, on the lower side of which is placed a hammer, *w*, fitting into the funnel-shaped hopper *x*, and of such size that it can pass completely through the same to the bottom thereof. Just below the lower end of *x* are two arms, *y y*, the two ends of which have slots cut into them, so as to hold a nail therein by the head with the point downward. Below these are two arms, *z z*, also arranged so as to hold a nail as above, and between these two a short cylinder for holding a nail upright in passing from *y* to *z*. The two arms, *y* and *z*, on each side, are of one piece, and slide back and forth in the manner which will be explained below.

Two levers, 1 1, turning upon the point 2, one end fitting into a slot, 3, in each of the arms *z*, move the arms *y* and *z*. Two arms, 4 4, are placed below the part *r*. These arms are beveled at their extremities, and the upper ends of the levers 1 1 rest upon the point where the beveling begins. On the inner side—that is, the side toward the hopper of the part *r*—are fastened securely two arms, 5 5, extending down below the bars *l* and *m*. The part of the arms 5 5 immediately below the bars *l* and *m* when the machine is not in operation is beveled, so that when the two arms 5 5 are raised by the part *r*, to which they are attached, being raised, the beveling pushes back the bars *l* and *m*, and when the part *v* is lowered or restored to the position it has when the machine is at rest the springs *n* and *t* bring back the bars to which they are attached, respectively, to their former positions.

The operation of the machine embodying my invention is as follows: Power is applied in any proper way, the particular source of

the power or mode of applying being no part of my invention, it being evident that steam or compressed air applied in any of many well-known ways will accomplish the purpose. The power is applied directly to the raising of the part *r*, the hopper *c* having had previously a quantity of nails placed in it. The slots in the arms *y* and *z*, with the short cylinder between, are put over the place where the driving of the nails is to begin. The part *v* being raised, the hammer *w* is also raised entirely out of the hopper *x*. At the same time the two arms 4 4 are raised, bringing the lower part of their beveled extremities against the upper ends of the levers 1 1, which have, consequently, sprung back, whereby their lower extremities fitted into the slots 3 3 move forward the arms *y* and *z*, and the slots in the ends of *y* and *z* are closed. Simultaneously the arms 5 5 are raised with *r*, to which they are attached. Their beveled upper part forces back the bars *l* and *m*. The steel arm *o*, on the side of *l*, by means of its bent extremity turns the wheel *k*, causing the disk *j* to revolve. The piece *q* actuates the wheel *r*, which turns the shaft *e*, rotating the drum or disk *f*. The arms *g g g*, rotating in the slot *d*, brings up into the groove in the spout *h* a continuous stream of nails, which descend by gravity to the lower part of the spout, the heads uppermost. These nails are taken away or fed for the action of the hammer by the revolving disk *j* by taking them into the nicks or cuts into its periphery. When the nails are successively brought around by the revolution of *j* to a point immediately below *w* they are pushed off into the hopper *x* by a small piece of metal, 6, fastened in the framework of the machine, and which is so placed that a nail cannot pass between it and the disk. These nails descend point foremost into *x*, but cannot descend farther than *y* until the part *r* is allowed to descend, which is done by the raising power being shut off, when *r* being weighted by means of a weight and the springs *m* the uprights *u u* descends, forcibly driving down the hammer, opening *y* and *z*, so as to admit the passage of the nail, which is thus driven home, and at the same time the springs *u* and *t* bring back *l* and *m*, to which they are respectively attached, to their first position.

I claim—

1. In a box-nailing machine, the slotted or centrally-divided hemispherical hopper *c d* and disk *e f*, provided with long arms or fingers *g*, the ends of which are slightly bent forward and enter the slot *d* in the hopper, so as to engage beneath the heads of the nails hanging therein and convey them up out of the hopper and discharge them over the top edge thereof, substantially as described.

2. In a box-nailing machine, in combination with the centrally-divided or slotted hemispherical hopper *c d* and bent-armed disk *f g*, the trough *h i*, placed in an inclined position from the top edge of the slotted hopper *c d*, and made of such width and depth as to receive and conduct the nails, by their heads, in a vertical position from the top edge of the hopper to the feeding devices, as described.

3. In a box-nailing machine, in combination with the slotted hemispherical hopper *c d*, with armed disk *f g* and inclined trough *h i*, the notched wheel *j* placed and revolving in a horizontal position at the foot of trough *h i*, for receiving the nails from the hopper and feeding them in a proper position for the action of the hammer, as described.

4. In a box-nailing machine, in combination with the feeding-wheel *j* the discharger 6, for removing the nails from the feeding-wheel, substantially as described.

5. In a box-nailing machine, in combination with the armed disk *f g* and tapered arm 5 of the hammer-head, the spring-bar *m t*, spring-pawl or arm *s q*, and ratchet-wheel *r* on shaft of armed disk *f g*, whereby the nail-presenting disk is automatically operated by the action of the hammer, substantially as described.

6. In a box-nailing machine, in combination with the wedge-shaped arm 5 of the hammer-head and horizontally-revolving notched wheel *j*, the spring-bar *l n*, bent pawl *o*, and ratchet-wheel *k*, whereby the nail-feeding wheel *j* is automatically operated by the action of the hammer, substantially as described.

7. In a box-nailing machine, the combination, with hammer *r*, nail-presenting disk *f g*, and nail-feeding wheel *j*, of wedge-shaped arms 5 5, spring-bar *m t*, with spring-pawl *q s*, and ratchet-wheel *r*, and spring-bar *l n*, with bent pawl *o* and ratchet-wheel *k*, for simultaneously operating both nail presenting and feeding mechanism, by the action of the nail-driver, substantially as described.

8. In a box-nailing machine, in combination with the feeding-wheel *j*, the spout *x*, for receiving and conducting the nails in proper position to the holding devices, substantially as described.

9. In a box-nailing machine, in combination with funnel-spout *x*, the double notched or forked slides *y z y z* placed below the funnel-spout and short cylinder *x'*, for holding the nails in position for the action of the nail-driver, substantially as described.

10. In a box-nailing machine, the nail-driving mechanism, composed of weighted head *r*, hammer-nose *w*, and retracting springs *u' u'*, constructed and operating in a vertical frame, *u u*, as and for the purposes described.

11. In a box-nailing machine, the combination, with the nail-driving mechanism *v w*, of arms 4 4 and wedge or tapered arms 5 5, secured to the head and operating in connection therewith to automatically operate the nail presenting, feeding, holding, and driving devices at one and the same time, substantially as described.

12. In a box-nailing machine, in combination with the driving-head *v*, the arms 4 4, secured thereto, pivoted levers 1 2 1 2, and retracting-springs $3^{\times}$ $3^{\times}$, for automatically oper-

ating the nail-holding slides *y z y z*, substantially as described.

13. In a box-nailing machine, in combination with the driving-head *v*, the tapered or wedge-shaped arms 5 5, secured thereto for automatically operating the feeding and presenting mechanism by the action of the driving devices, substantially as described.

14. In a box-nailing machine, the combination and arrangement of nail-presenting devices *f g h i* and feeding devices *j x y z*, substantially as and for the purposes described.

15. In a box-nailing machine, the combination and arrangement, with the nail-presenting devices *c d f g i* and feeding devices *j x y z*, of the nail-driving mechanism *v w w'*, with arms 4 4 and 5 5, all constructed and arranged substantially as and for the purposes described.

BENJAMIN S. ATWOOD.

Witnesses
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CHAS. H. DREW.