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3 Sheets—Sheet 1.

J. J. HOW.

PIN MACHINE.

Patented June 22, 1832.

Fig. 1.

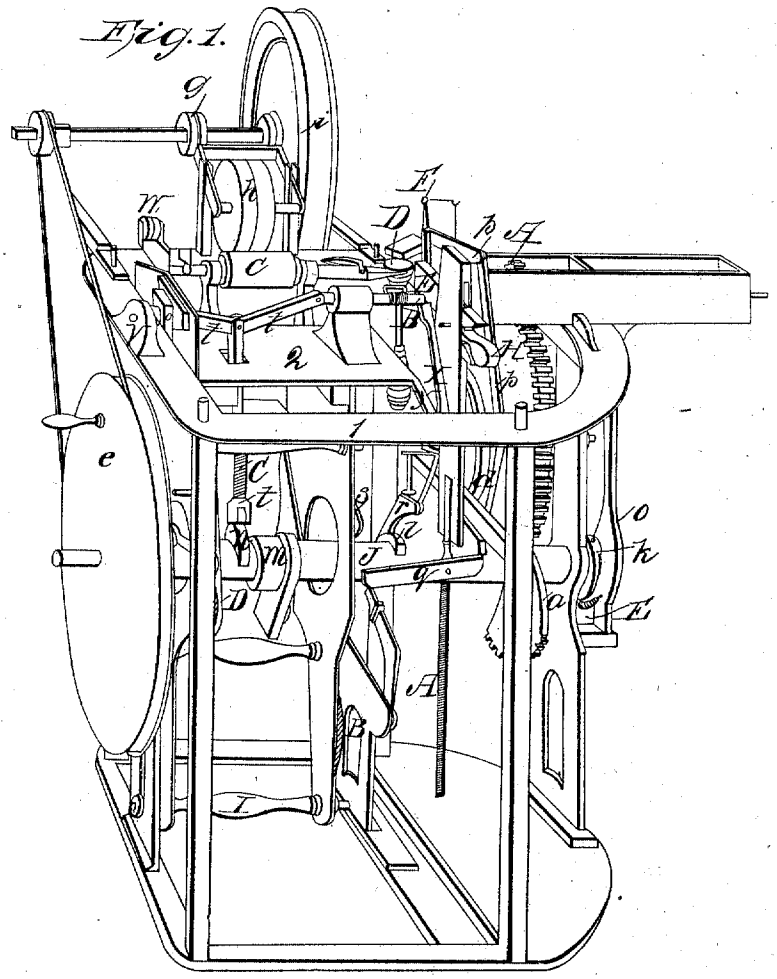

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Fig. 3.

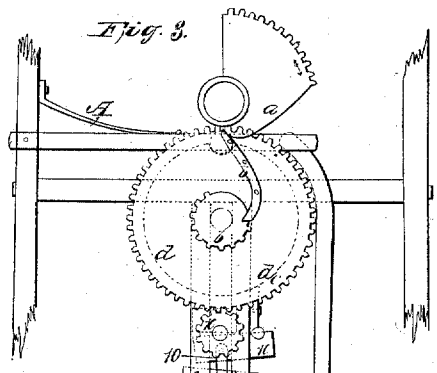


Fig. 2.

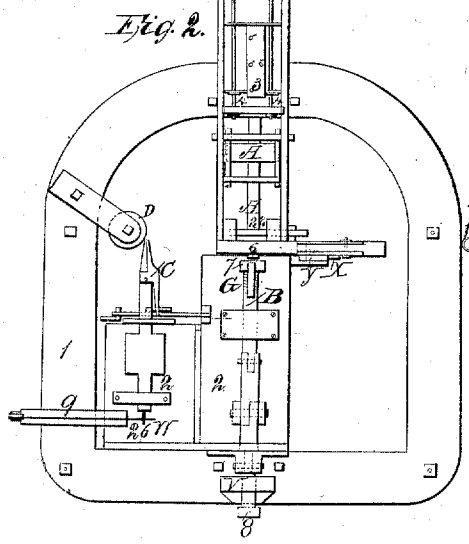


Fig. 5.

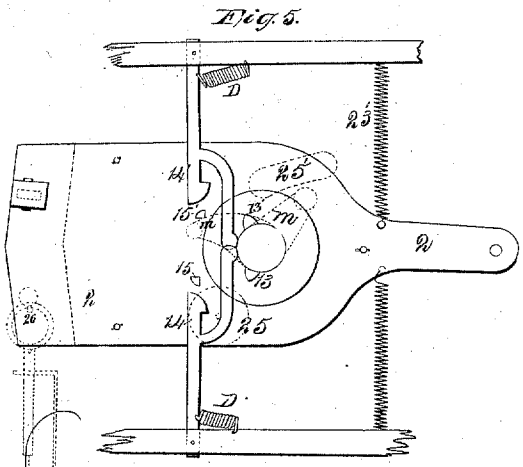
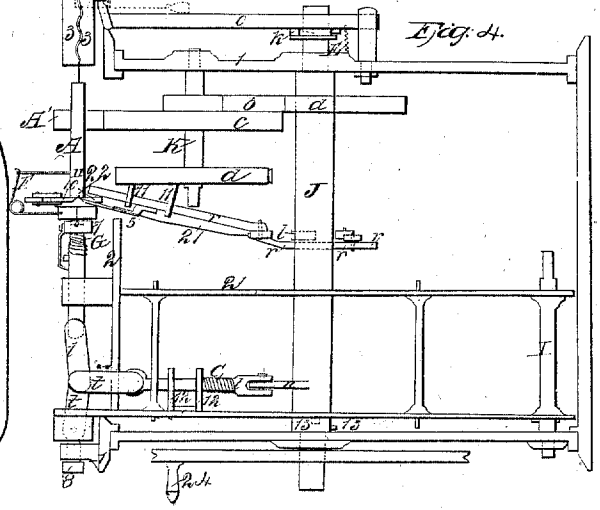


Fig. 4.



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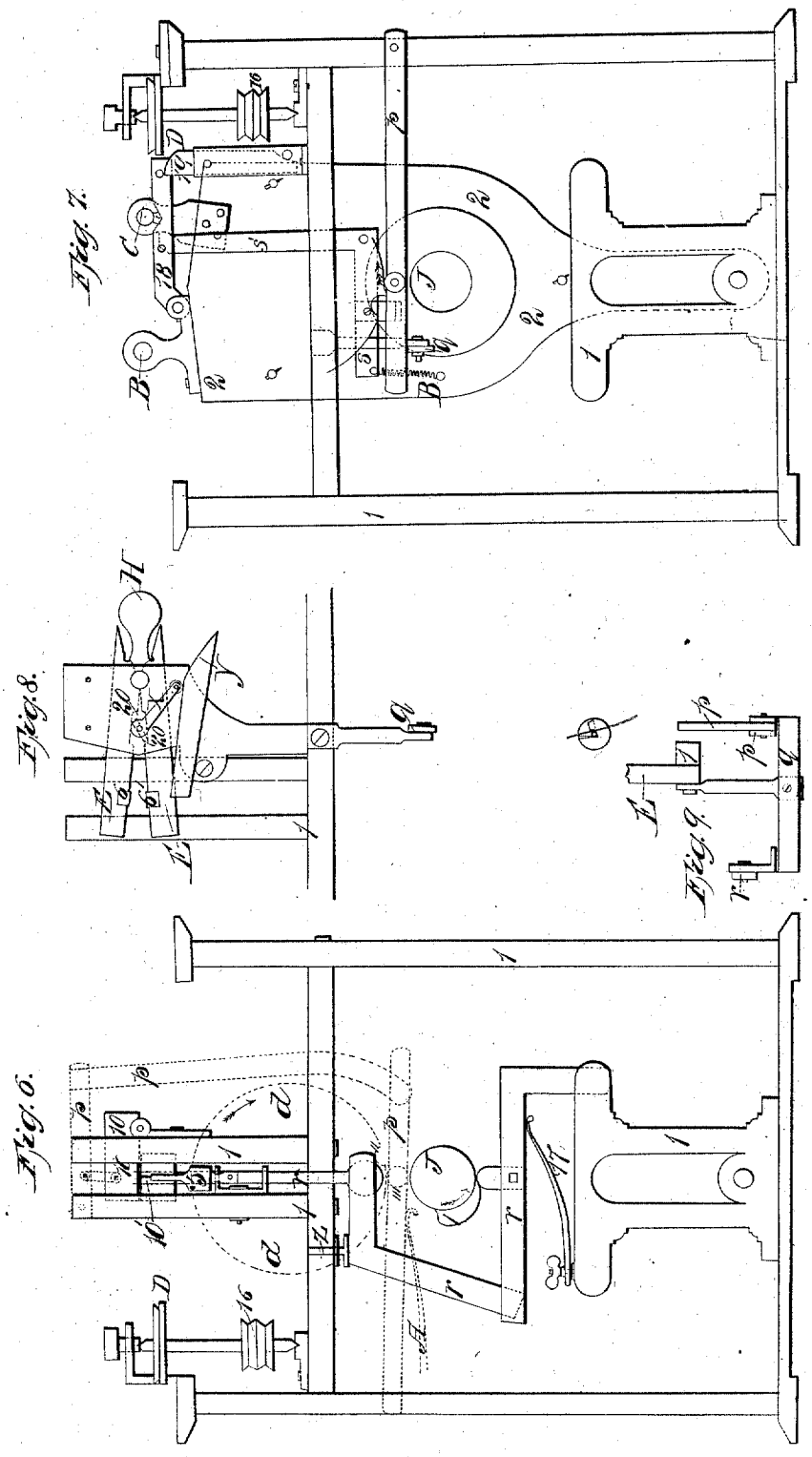

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June 22. 1832

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John I. Howe
Letters Patent

The schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said John I. Howe himself of his improvement in the machine for manufacturing pins.

To all whom it may concern. Be it known that I John I. Howe have invented an improved machine for manufacturing common Pins by means of which the wire is straightened, cut into lengths, headed and pointed, and the pin delivered in a state ready for whitening; and that the following is a full and exact description thereof. and of the manner in which it operates, reference being had to the accompanying drawings which make a part of this specification. Fig 1. is a perspective view of the machine. Fig 2. a Plan showing the principle working parts. Fig 3. a section showing the action for winding the wire and cutting off the wires &c. Fig 4. a section parallel to the main Shaft, showing some of the necessary parts of the machine. Fig 5. end elevation of the moveable frame or carriage. Fig 6 Vertical section at right angles to the main Shaft. with the feeding apparatus &c. Fig 7. Section in the same direction, showing the means of opening the pointing forceps and other parts. Fig 8 the heading vice and its appendages. Fig 9. the apparatus concerned in closing the pointing forceps, fig 7. &c

The individual parts of the machine are marked in the respective figures with Roman Capitals with small roman Letters with Italic capitals, and with numbers. The same marks on the different figures refer in all cases to similar parts.

A Wire straightening apparatus. B. Wire drawing apparatus. C. pointing forceps. D pointing tool. E. Heading vice. F. Shearing the wire and tool.

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a. An eccentric sheave, combined with a segment having teeth or cogs which together extend over one half of the circumference of the main Shaft, and not leaving one half its revolution upon —

h are combined, connected with a pinion which, during the ought to re-
lieve revolution by the action of n at each revolution of the main shaft.

The cranes V V h, are each, involute, evolved from a circle having
for its radius half the distance between the shafts marked V V K
each of them extends over one quarter of a circle and from a circle
corresponding with the pitch lines of the pinions h, to one corresponding
with that of the sections or cogs on K. In operation they act
and recoil when each other reaches a centre. They being a novel and
peculiar mode of effecting the kind of motion required, I have more
fully & at greater extent shown most of the parts of the machine which,
although new in their combination, are not considered as such in
their separate action. C Wheel, driving the pinion 1' they be-
ing in each other as 1 to 8. d. a shifter or lever having on its fulcrum
pin having a projection and a semicircular notch" Mechanism
whereby the system of levers p. governing the movements of the blades 101

e. f. g. h. i. Band wheels, communicating motion from the main
shaft to the pointing, feeding, and pointing wheels.

k. A lever acting on lever o carrying back the feeder 3' which
is withdrawn the moment it is released by the spring k

l. Lever acting when a system of levers, carrying back the head-
ing wire feeder, which is brought up by a spring l"

m. m' Arms with friction rollers at their ends and acting on
cams, which serves to move the carriage 2' back and forth.

n. Lever giving action to the head compressing apparatus.

o. Lever acting on the feeder 3' p. (not referred to in d)

q. Lever, which by the action of p. operates on 3 a bent lever which
keeps them the pointing & feeders during the required period.

r. Lever 3 carrying back the heading wire feeder 3'

t. Head compressor lever. v. Standard on frame 1 for the
regulating screw 8' w acting regulating the position of the point-
ing forceps previous to their being opened

x arm connected with a bent lever (20) acting between
the jaws of the heading wire k. and opening them when required

Y. Inclined plane which by the moving of the carriage (2) acts upon
X. a screw governing the supply of heading wire.

A. Spring, which acting through the lever p &c. elevates the blade (10)
B. Spring, which by drawing down one arm of the bent lever s &c. forces the shoulder at the extremity of the other arm under the pin (A) in the beam (18) when said beam is elevated impressing over the inclined plane (1) on the cam (19).
C. Spring retracting the head compresser B. D.D' Springs which bring down the eyelets (11, 11'.)
E. Spring retracting the lever O. who is relieved from the action of the wiper K. F. Spring, which elevates the inner extremity of the separater A to admit the free passage of wire over the stationary blade 10' G. Spring to regulate the position of the cash. (7) on the extremity of the head compresser B.
H. Spring to close the vice K. I. shaft, on the extremities of which the carriage (2.) vibrates. J. Main shaft, from which the particular motions are derived. K Shaft of the wheel C. and its appurtenances.

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1. Stationary or permanent frame. 2 Carriage or moveable frame.
3. Feeders, which deliver wire for the eyelets of the pin.
4 Regulating nuts, which by being screwed off or on, shorten or length on the pin. 5. Wheeled which depresses the heading wire.
6, 6' Heading dies. 7 A Cash which fits snugly in the dies C. C. when they are closed, and serves to prevent their separating when the compression is made to form the head. 8. A regulating screw, to graduate the pressure on compressing the head. 9 A fixture attached to the frame 1. which at one end has a slot which serves to guide the arm, "of the wire W. and at the other end" a small pulley m
10. 10' Two blades with cutting edges which serve the purpose of cutting off pin or pincer. feed holding the two wires while the heading wire is winding around them and the feeders are carried back. and then at the proper time cutting off both wires.

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11. 11' & 12. 12' Guides. 13. 13' Wipers which lift the catches.
14. 14' Catches which respectively retain the carriage 2 in a fixed position during certain stages of the operation of the machine.
15. 15' Pins of which the above catches take hold.
16. A pulley by means of which the pointing wheel D receives its motion from the wheel C.
17. A spring which carries up the feeder 3.
18 A lever which serves to open the pointing forceps C.
19 A cam which serves to elevate the lever 18.
20 A cam placed between the jaws of the vice E to separate them at the proper period in the operation of the machine.
21 Heading wire. 22 Lips on the winder
23. 23' Spiral springs which act upon the carriage 2. drawing it towards the centre when it is inclined to one side or the other. 24. Bench. 25. 25' Cams on the carriage 2.
26 Cranked pin or crank attached to the shaft of the pointing forceps C. The drawings with the exception of the perspective view fig 1. are on a scale reduced about one half from the actual machine. The skilful machinist by an examination of the foregoing references and the accompanying drawings will readily trace the general operation of the machine, and will perceive that two separate wires are introduced one for the formation of the body and the other that of the head of the pin. The wire for the Body is passed in between the straightening jaws 3. 3' of the feeder fig 4. It passes thence through the head winder A which is tubular, and also between the cutting blades 10. 10'. The space between the straightening jaws is represented by the screw marked I', II', III'. These operate upon the common principle adopted for straightening such wire.

The wire for the head is passed between the jaws of the feeder 3. the end of it passing between the blades 10. 10' The jaws of the feeder are made to hold the wire with sufficient firmness by means of a screw. In this situation of the machine the wire for the body of the pin passes on from right to left from the feeder 3.

to No 7. and lies between the cutting edges of the blades 10. 10'. The heading wire also passes between these blades but from left to right and in this case if the machine be set in motion the various parts which concur in the formation of the pin will be simultaneously or successively acted upon. In forming the head of the pin the movable blade 10' will halfway close on the fixed blade 10 holding the two wires firmly between their edges. The head winder K will receive, catching the end of the heading wire in a lip or projection L. at its end and winding it spirally upon the body wire in contact with the blades. These movements are effected in the following manner. The eccentric cam or ring connected with the segment of cogs a (fig 3.) comes in contact with the eccentric connected with the pinion b on the shaft K (fig 3.) the former carrying the latter forward until the teeth of the segment a. strike into gear with the leaves of the pinion b. In this part of the movement, each of the shafts J & K passes through one fourth of a revolution. in the subsequent part of the movement, that is when the segment a acts upon the pinion b. the main shaft J passes through one fourth whilst the shaft K passes through $\frac{3}{4}$ of a revolution. so that K makes one entire revolution and J but one half, and the pinion on the inner A is driven through four revolutions during half a revolution of J and is at rest during the other half. at which period the operations are effected preparatory to the winding of another head.

As some of the respective operations go on simultaneously, it may be supposed that previously to the winding process just described other heads had been wound the head perfected and the pin cut off and [illegible] into the pointing forceps, and carried to the pointing wheel, I shall however carry the one on which I have supposed the head to be wound through its several stages. When the pointing forceps have arrived in a position to take hold of a pin. the head of which had been completed, the wheel d. will have arrived at the position in which it is shown in fig 6. The forceps will then be closed on the pin previously projected, and the wires cut off by the action of the wheel d. which will deposit the movable head upon the fixed one. Immediately after the movement last described,

cutted there for feeding in the wire for the body of the pin. The movable blade is raised, and the front end of the winder, A. is elevated. The former is affected by the spring A. acting on the lever P. and its appendages, the pin "Collar", falling into the notch" in the wheel d. as shown in fig 3. The latter takes place immediately upon the cutting off the wire by means of the spring P. Figs 1 & 4. a wire from which descends to the frame in which the winder A. revolves, and which it lifts to a distance requisite to allow the body wire of the pin, with the unfinished head on it to pass free by over the stationary blade. 10

The jaws of the heading vice B. being at this time open, and the feeders 3. & 3. being released from the action of their respective wipers are brought up by the springs shown at E. Fig 4. and at F. Fig 6. The feeder 3. is drawn forward, the wire with the unfinished head is thereby passed between the blades of the heading vice, which closes on it by the action of the spring H. embracing it just at the back of the unfinished head. The pointing forceps had seized the one previously headed, and carried it to the pointing wheel, by the lateral motion of the carriage 2. which at the same time brings the heading appparatus B. & the unfinished head. The wiper N. upon the shaft I. advances the die on the end of B. to its proper position in which and in the jaws B. are opened by the lever 21. The pointing forceps having opened and dropped their pointed pin. pass between the jaws B. and grip the newly headed pin. A new vibration of the carriage removes the forceps with their charge bringing the unfinished point against the revolving pointing wheel D.

The pulley of the pointing forceps shaft comes in contact with and receives a rotary motion from the wheel b. driven by a band from the wheel B. Fig 1. The point of the pin consequently revolves on the revolving wheel D. and there receives a regular conical point.

The pointing wheel is formed of two circular plates of steel, bevelled on their edges and united by their smaller faces thus, forming a groove. The bevelled edges are formed into teeth or points of the requisite fineness. The bevels in the two plates are made of different angles to avoid the concavity which would otherwise exist on the front. The pointing wheel

may vary in its velocity ranging between 30 and 100 revolutions for one of the main shaft. During the pointing the carriage remains stationary, being held in a fixed position by the catch W. (fig 5.) holding upon the pin 13. which prevents its moving towards the centre, whilst being drawn by the spring 23. towards the centre, it is prevented from receding farther. The mode of engaging and disengaging the catches will be made manifest by attention to the drawings, and the references to them. Connected with the motion of the carriage (2.) are several others which must be simultaneously performed. One of these is, the giving to the pointing forceps, the proper position for seizing the next pin, that is, with its lower jaw downwards. This is effected by means of the excentric pin 24. on the back end of its shaft the ring W. embracing this pin. and being acted upon by a weight and cord passing over a pulley turns the forceps from any other position into that required; the manner of opening the pointing forceps is shown in fig 7. where the carriage is supposed to be moving from right to left. C. is a section of the forceps shaft, and 51. a section of the arm (1. fig 2.) connected with the moveable blade of said forceps near its extremity. In the motion of the carriage, the pin 7 projecting from the side of the lever 15. slides upon the inclined plane 19 carrying the lever up against the arm 51, and pressing it against the shaft of the pointing forceps, depresses the moveable jaw. This and the subsequent action of closing it, as well as many of the individual parts of the machine, may be variously modified so as to answer the same end, and do not therefore require to be minutely described, as every competent workman would actually make such variations, whilst the general principle of the action of the whole apparatus would be still retained.

Although the individual parts of the before described machine, such as the levers, cams, springs, forceps, dies, wheels, pinions, and other appendages, are the common elements of many other machines, and several of them have been used as instruments for manufacturing pins, and cannot therefore be claimed as new. I have yet so combined them as to give a specific character and action to my machine, producing by them new combinations, new and useful results, and it is therefore my

in this combination of parts that I mainly rest my claim to its exclusive use, and, besides this general arrangement, I claim the specific arrangement of the appendages, by which the winding of the wire to form the head of the pin, is effected, and I also claim the peculiar arrangement of the eccentric cutters and segments, represented in figure 6. the main working parts of which are marked A.B.B. which arrangement produces a rotary motion varying in its velocity, and which may be advantageously applied in the construction of other machinery where such a motion may be advantageous. such application however to any machine will.... be considered as a violation of my right."

Witnesses
Thos Jones
Robt. Clarke

John J. Howe

[illegible]

(Patented 22. June 1832.)