

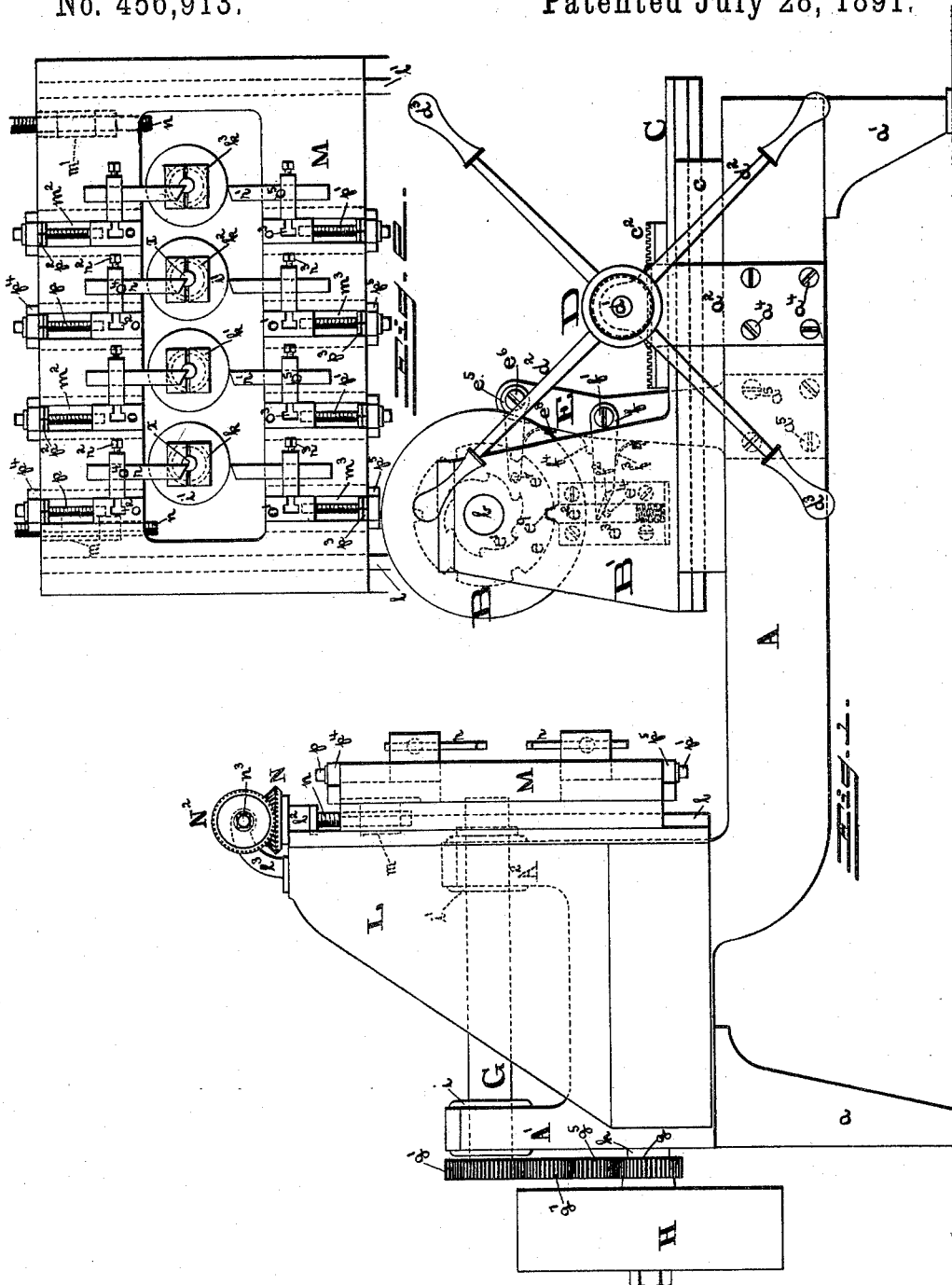
(No Model.)

2 Sheets—Sheet 1.

G. A. SMITH.
MACHINE FOR MAKING SCREWS.

No. 456,913.

Patented July 28, 1891.



WITNESSES
Oliver N. Lissom.
George Turp

INVENTOR
George A. Smith,
By his Attorney,
Wm. B. Powell.

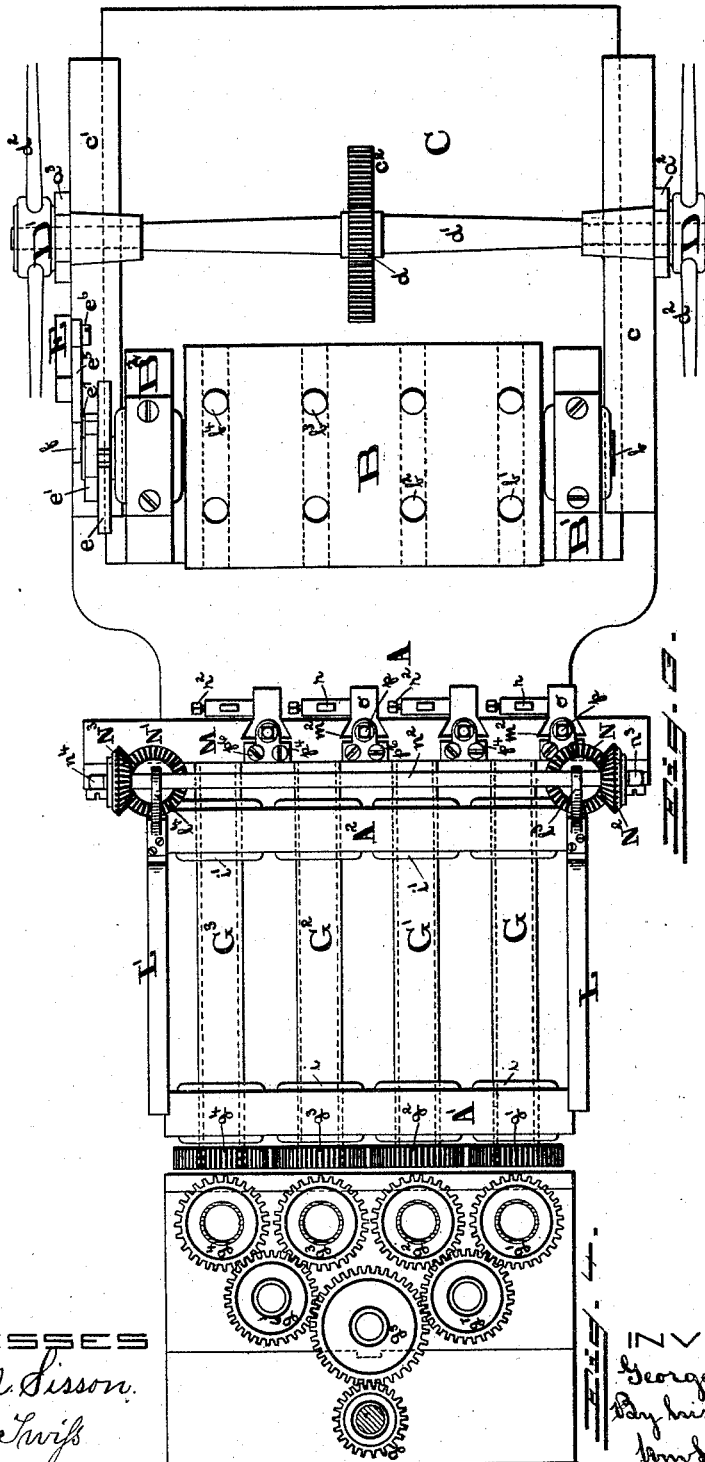
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2 Sheets—Sheet 2.

G. A. SMITH.
MACHINE FOR MAKING SCREWS.

No. 456,913.

Patented July 28, 1891.



WITNESSES

Oliver N. Sisson.
George Swift

INVENTOR

George A. Smith,
By his Attorney,
Amos Powell.

UNITED STATES PATENT OFFICE.

GEORGE A. SMITH, OF NORRISTOWN, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WILLIAM H. KNEAS, OF SAME PLACE.

MACHINE FOR MAKING SCREWS.

SPECIFICATION forming part of Letters Patent No. 456,913, dated July 28, 1891.

Application filed February 2, 1891. Serial No. 379,890. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. SMITH, a citizen of the United States, residing at Norristown, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Screw-Machines, of which the following is a specification.

My invention has relation to screw-machines, and has for its object to improve the construction and thereby increase the capacity thereof.

My invention consists in the details of construction and the combinations of parts, as hereinafter fully described and claimed, and as illustrated in the accompanying drawings.

My invention has reference, principally, to the provision of a multiplicity of parallel spindles for rotating the wire, and a horizontal turret having rows of holes for reception of the milling tools or dies, such rows corresponding in number to that of the spindles, and the holes therein being in axial alignment with the latter; also, to the provision of a vertically-sliding cutting-off rest carrying the cutting-off and back tools, and to the particular means whereby all of said parts operate and are arranged, the same being as hereinafter more fully described and claimed, and as shown in the accompanying drawings, wherein—

Figure 1 is a side elevation of the improved machine. Fig. 2 is a face view of the cutting-off rest and its appurtenances. Fig. 3 is a plan view of the improved machine in the position shown in Fig. 1, and Fig. 4 is an end view of the same, showing the arrangement of the driving-gears.

In said drawings, A represents the frame of the machine, mounted on the legs $a\ a'$.

B represents the revolving turret, sustained on the shaft b , and $B'\ B^2$ the housings in which the shaft is journaled, such housings being supported on the bed-plate C, which plate has its edges retained by the guides $c\ c'$, secured to the frame A, said guides having grooves therein, which afford slideways for the plate.

c^2 is a rack secured on the plate C and meshing with the pinion d on the shaft d' , which shaft is journaled in the standards a^2

a^3 , secured to the sides of the frame A by the screws a^4 , and is provided with the capstan-heads $D\ D'$, the arms d^2 thereof, provided with the handles d^3 , facilitating the rotation of the shaft d' by said heads. One end of the shaft b is extended beyond the housing B^2 , upon which end are secured the locking-disk e and the ratchet-wheel e' .

e^2 is a spring-controlled detent, provided with a pin e^4 and secured in the box e^3 , said box being fast to the rear side of the housing B^2 , as shown in dotted lines in Fig. 1. The detent e^2 normally engages with one of the notches in the disk e , preventing the rotation of the shaft b , and consequently the turret B, and the ratchet-wheel e' , when the disk is released, being actuated by the pawl e^5 . The pawl last mentioned is pivoted on the screw e^6 in the upper end of the standard E, and is formed with a lateral extension e^7 for engagement with the teeth of the wheel e' .

e^8 represents a curved spring secured to the edge of the standard E and supporting the pawl in such position that its lateral extension will be in the path of the ratchet-wheel, said standard being secured to the side of the frame A by the screws a^5 .

f represents an arm pivoted on the screw f' in the standard E and having a beveled lateral extension f^2 on its outer end, said arm being held in position by the curved spring f^3 , secured to the standard, and is limited in its upward movement by the stop f^4 , secured to the latter.

$G\ G'\ G^2\ G^3$ represent the hollow spindles, in number corresponding to the number of annular rows of die-holes $b'\ b^2\ b^3\ b^4$ in the turret B and in alignment with the center of said turret, rotating all in the same direction, and having their bearings in the boxes $i\ i'$ in the transverse walls or extensions $A'\ A^2$ of the frame A, said spindles having thereon the gear-wheels $g'\ g^2\ g^3\ g^4$, which receive their similarity of motion from the main driving-gear g on the main shaft h , through the intermediate gears $g^5\ g^6\ g^7$, said main shaft also having thereon the driving-pulley H. The other ends of the spindles have thereon the usual form of chucks $k\ k'\ k^2\ k^3$ for holding the stock or wire x , which, as usual, rests within the interior of said spindles.

L L' represent housings mounted on the rear portion of frame A and having formed on their front edges the vertical ribs $l l'$.

M represents the cutting-off rest, having 5 vertical grooves in its rear side for reception of said ribs, forming slideways for the rest.

$m m'$ are lugs on the rest M, provided with threaded openings for reception of the right and left handed screws $n n'$.

10 l^2 are boxes on the upper front edges of the housings L L', in which the screws $n n'$ are swiveled, said screws having secured on their upper ends the miter-gears N N'.

$N^2 N^3$ are gears similar to and meshing 15 with the gears N N' and secured on the ends of the rod n^2 , such rod having its ends squared, as shown at $n^3 n^4$, for reception of a key or wrench.

$l^3 l^4$ are brackets secured to the top edges 20 of the housings L L', and affording bearings for the rod n^2 . Therefore according as the screws $n n'$ are turned through the medium of the rod n^2 and the miter-gears will the rest M be raised or lowered. The outer side of 25 the rest M has formed therein four pairs of dovetailed grooves $m^2 m^3$, in which grooves are located the dovetailed slides of the tool-stocks $o o'$, which slides have vertically-threaded openings therein for reception of the screws 30 $p p'$, the latter being provided with angular heads and having thereon the jam-nuts $p^2 p^3$. $o^2 o^3$ are bayonet-slots in said tool-stocks for reception of the bases of the laterally-extending tool-posts $o^4 o^5$.

35 $p^4 p^5$ are plates secured by the screws p^6 to the upper and lower edges of the rest M at the entrances of the grooves $m^2 m^3$, in which plates are swiveled the screws $p p'$, affording means for adjustment of the tool-posts and 40 the mediums of connection between the latter and the rest M.

$r r'$ represent, respectively, the cutting-off and back tools, secured in the posts $o^4 o^5$ by 45 the bolts $r^2 r^3$ in such position as to permit of their coming into contact with the wire x when the rest is operated, such rest having a central rectangular clearance space for the chucks on the spindles, which permits of the unimpeded sliding of the rest in the desired 50 direction.

The operation is as follows: The spindles, after the stock is secured in the chucks, are started and the cutting-off and back tools adjusted. The rest M is slid upwardly through 55 the operation of the rod n^2 , bringing the four back-tools simultaneously into contact with the four pieces of wire or stock, accomplishing the turning of such wire down to the proper diameter. The shaft d' is rotated toward the right, causing the plate C to carry 60 the turret B toward said wires, and thus bring the dies in the turret-holes into threading relation therewith. The shaft d^8 is then turned in the other direction, causing the plate C to recede from the position last mentioned and 65 bringing the pin e^4 on the detent e^2 to ride

over the inclined extension f^2 of the arm f , thereby drawing the end of said detent clear out of the notch e^3 in the locking-disk e . By 70 this time the ratchet-wheel e' has reached the end e^7 of the pawl e^5 , and, the return motion of the plate C being continued, such end thereby engages with the tooth of said wheel which is nearest thereto, causing the rotation of the 75 ratchet-wheel and the turret. Such rotation being stopped by the engagement of the end of the detent with the next notch in the disk, into which notch said end is forced by its spring, the pin e^4 in the meantime having passed to the rear of the extension f^2 , thus bringing another 80 set of dies opposite the stock or wire x . The motion of the plate being again changed, in this event toward the left, the spring f^3 allows the arm f to dip sufficiently to allow the pin e^4 to pass over the top of the incline f^2 and assume its position in front thereof. Finally 85 the rest M is slid downwardly, through turning the rod n^2 , bringing the cutting-off tools into operation.

With the construction hereinbefore described, and as shown in the drawings, four 90 screws can be formed at the same time and as quickly and easily as can one, thus cheapening the cost of manufacture without effecting a depreciation in the quality thereof. 95

What I claim as my invention is as follows:

1. In a screw-machine, the combination of a multiplicity of spindles in the same plane, provided with chucks, tool-posts adjacent to the 100 chucks, and a sliding turret with die-holes therein in rows corresponding in number to that of the spindles.

2. In a screw-machine, the combination of a multiplicity of spindles in the same plane, provided with chucks, tool-posts adjacent to 105 each chuck, a sliding rest carrying the tool-posts, and a sliding turret with die-holes therein in rows corresponding in number to that of the spindles.

3. In a screw-machine, the combination of 110 a multiplicity of spindles in the same horizontal plane, provided with chucks, tool-posts adjacent to each chuck, a sliding rest carrying the tool-posts, and a horizontal turret with die-holes therein in rows corresponding in 115 number to that of the spindles.

4. In a screw-machine, the combination of a multiplicity of spindles provided with chucks, tool-posts adjacent to each chuck, a turret with die-holes therein in rows corresponding in number to that of the spindles, a 120 sliding plate with journal-supports for the turret and provided with a rack, and a suitably supported and operated rotary shaft with a pinion thereon meshing with the rack. 125

5. In a screw-machine, the combination of a multiplicity of spindles provided with chucks, tool-posts adjacent to each chuck, a sliding rest carrying the tool-posts, a sliding 130 turret with die-holes therein in rows corresponding in number to that of the spindles, a sliding plate with journal-supports for the

turret and provided with a rack, and a suitably supported and operated rotary shaft with a pinion thereon meshing with the rack.

6. In a screw-machine, the combination of
5 a multiplicity of spindles provided with chucks in the same horizontal plane, tool-posts adjacent to each chuck, a vertically-sliding rest carrying the tool-posts, a horizontal turret with die-holes therein in rows corresponding in number to that of the spindles,
10 a sliding plate with journal-supports for the turret and provided with a rack, and a suitably supported and operated rotary shaft with a pinion thereon meshing with a rack.

15 7. In a screw-machine, the combination of a multiplicity of spindles provided with chucks, tool-posts adjacent to each chuck, a turret with die-holes therein in rows corresponding in number to that of the spindles, a
20 locking-disk and ratchet-wheel on the turret-shaft, a sliding plate supporting the latter and provided with a rack, a suitably supported and operated rotary shaft with a pinion thereon meshing with the rack, a detent for said
25 disk, and a pawl for turning said wheel after the release of the disk.

8. In a screw-machine, the combination of a multiplicity of spindles provided with chucks, tool-posts adjacent to each chuck, a
30 sliding rest carrying the tool-posts, a turret with die-holes therein in rows corresponding in number to that of the spindles, a locking-disk and ratchet-wheel on the turret-shaft, a sliding plate supporting the latter and provided with a rack, a suitably supported and
35 operated rotary shaft with a pinion thereon meshing with the rack, a detent for said disk, and a pawl for turning said wheel after the release of the disk.

40 9. In a screw-machine, the combination of a multiplicity of spindles in the same horizontal plane, provided with chucks, tool-posts adjacent to each chuck, a vertically-sliding rest carrying the tool-posts, a horizontal turret with die-holes therein in rows corresponding in number to that of the spindles, a locking-disk and ratchet-wheel on the turret-shaft, a sliding plate supporting the latter and provided with a rack, a suitably supported and
45 operated rotary shaft with a pinion thereon meshing with the rack, a detent for said disk, and a pawl for turning said wheel after the release of the disk.

50 10. In a screw-machine, the combination of a multiplicity of spindles in the same horizontal plane, provided with chucks, tool-posts adjacent to each chuck, a vertically-sliding rest carrying the tool-posts, a horizontal turret with die-holes therein in rows corresponding in number to that of the spindles, a locking-disk and ratchet-wheel on the turret-shaft, a sliding plate supporting the latter and provided with a rack, a suitably-operated rotary shaft sustained on the frame with a pinion
55 thereon meshing with the rack, a detent with a projection thereon for said disk, an arm with a beveled end in engagement with said

projection and actuating the detent, and a pawl for turning said wheel after the release of the disk.

11. In a screw-machine, the combination of a multiplicity of spindles provided with chucks, tool-posts adjacent to each chuck, a sliding rest carrying the tool-posts and provided with threaded openings, screws in said
70 openings, suitably operated and sustained miter-gears for actuating the screws, and a sliding turret with die-holes therein in rows corresponding in number to that of the spindles.

12. In a screw-machine, the combination of a multiplicity of spindles in the same horizontal plane provided with chucks, tool-posts adjacent to each chuck, a vertically-sliding rest carrying the tool-posts and provided with
85 threaded openings, screws in said openings, suitably supported and operated miter-gears for actuating the screws, and a horizontal sliding turret with die-holes therein in rows corresponding in number to that of the spindles.

13. In a screw-machine, the combination of a multiplicity of spindles provided with chucks, a sliding rest provided with threaded openings and dovetail grooves, tool-posts adjacent to each chuck, with dovetail bases independently adjustable in the grooves, screws in said threaded openings, suitably supported and operated miter-gears for actuating the screws, and a sliding turret with die-holes
90 therein in rows corresponding in number to that of the spindles.

14. In a screw-machine, the combination of a multiplicity of spindles in the same horizontal plane, provided with chucks, a vertically-sliding rest provided with threaded openings and vertical dovetail slots, tool-posts adjacent to each chuck with dovetail bases independently adjustable in said grooves, screws in said threaded openings, suitably supported and operated miter-gears for actuating the screws, and a horizontal sliding turret with die-holes therein in rows corresponding in number to that of the spindles.

15. In a screw-machine, the combination of
115 a multiplicity of spindles provided with chucks, a sliding rest provided with threaded openings and dovetail grooves, screws in said openings, suitably supported and operated miter-gears for actuating the screws, tool-
120 posts adjacent to each chuck having dovetail bases with threaded openings therein in said grooves, screws sustained on the rest and engaging with the openings last mentioned, and a sliding turret with die-holes therein in rows
125 corresponding in number to that of the spindles.

16. In a screw-machine, the combination of a multiplicity of spindles in the same horizontal plane, provided with chucks, a vertically-sliding rest provided with threaded openings and vertical dovetail grooves, screws in said openings, suitably supported and operated miter-gears for actuating the screws,
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tool-posts adjacent to each chuck, having dovetail bases with threaded openings therein in said grooves, screws sustained on the rest and engaging with the openings last mentioned, and a horizontal sliding turret with die-holes therein in rows corresponding in number to that of the spindles.

17. In a screw-machine, the combination of a multiplicity of spindles in the same horizontal plane, provided with chucks, a vertically-sliding rest provided with lugs having threaded openings and vertical dovetail grooves, screws in said openings, suitably-operated miter-gears sustained on the frame

for actuating the screws, tool-posts adjacent to each chuck, having dovetail bases with threaded openings therein in said grooves, screws sustained in plates at the entrances of the grooves and engaging with the openings last mentioned, and a horizontal sliding turret with die-holes therein in rows corresponding in number to that of the spindles.

In testimony whereof I have hereunto set my hand this 29th day of January, A. D. 1891.

GEORGE A. SMITH.

Witnesses:

R. DALE SPARHAWK,
WM. H. POWELL.