(No Model.) 2 Sheets—Sheet 1.

H. B. SARGENT & A. A. PAGE.

SCREW MACHINE.

No. 589,143. Patented Aug. 31, 1897.

Fig. 1.

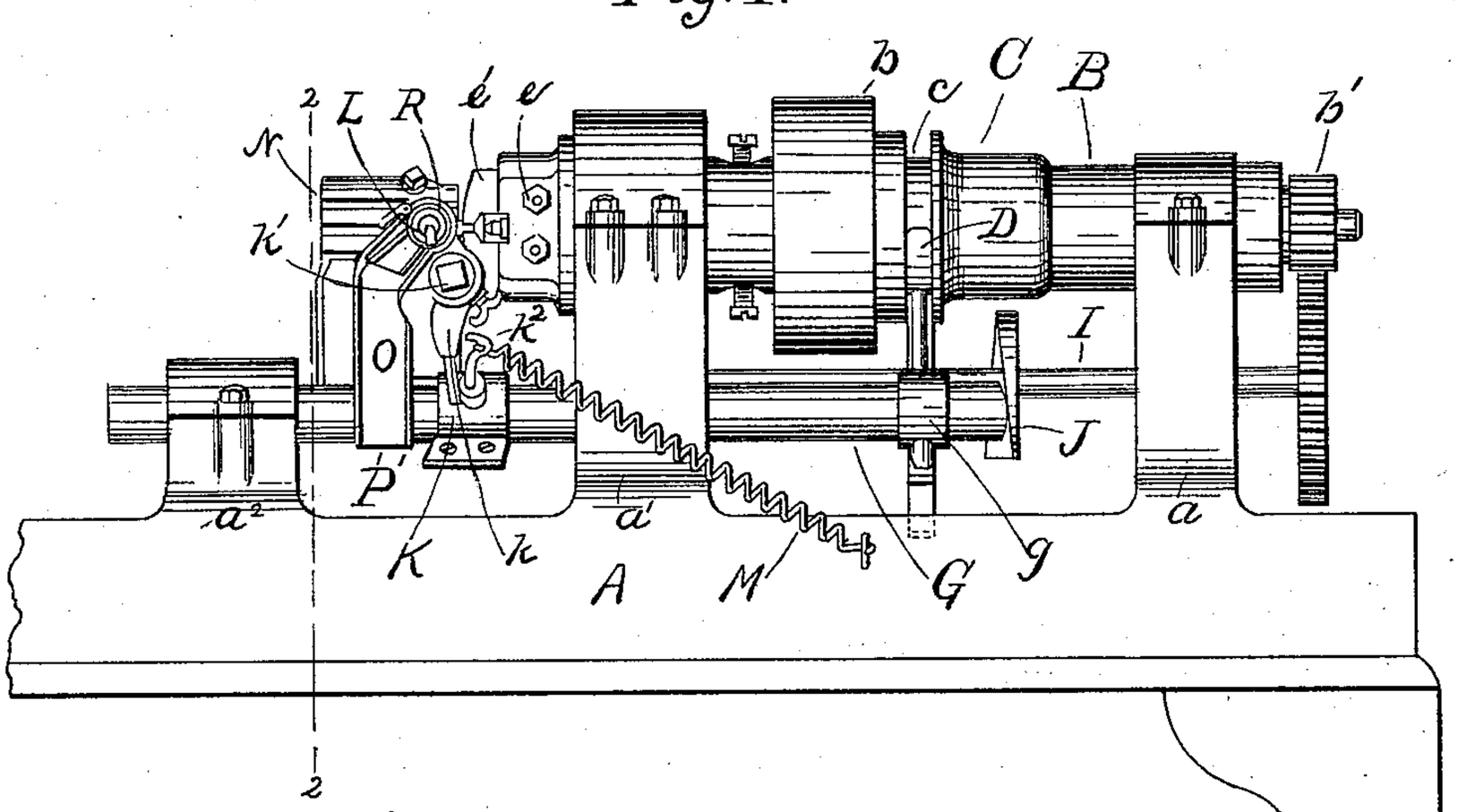


Fig. 4.

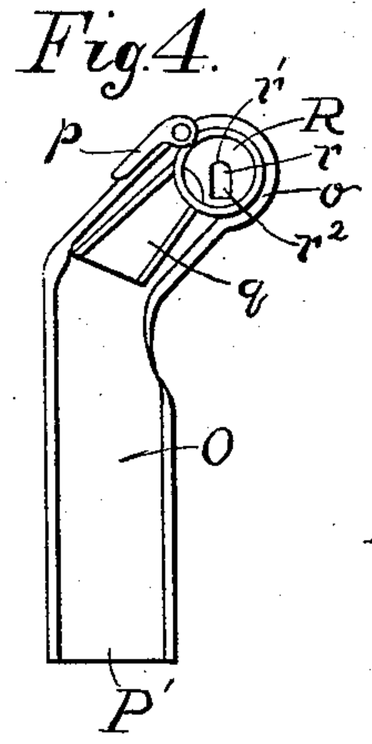
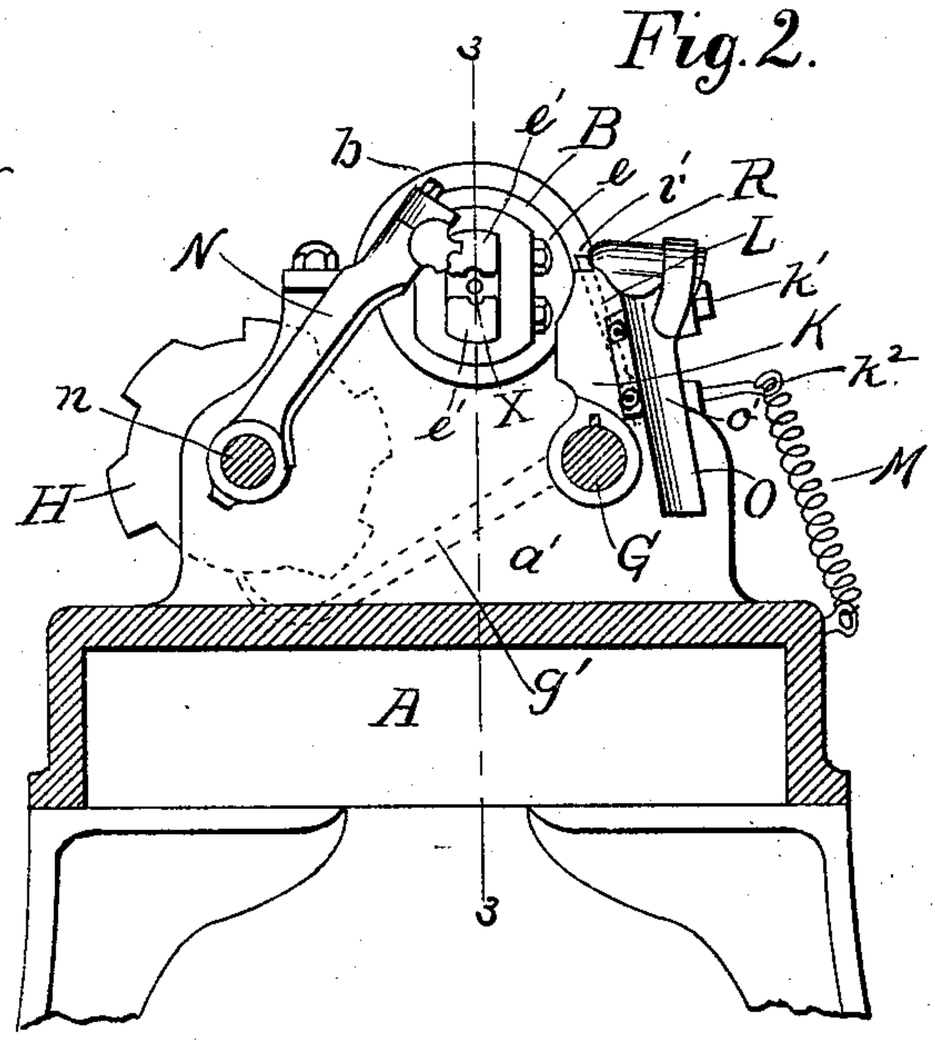


Fig. 2.



WITNESSES:

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

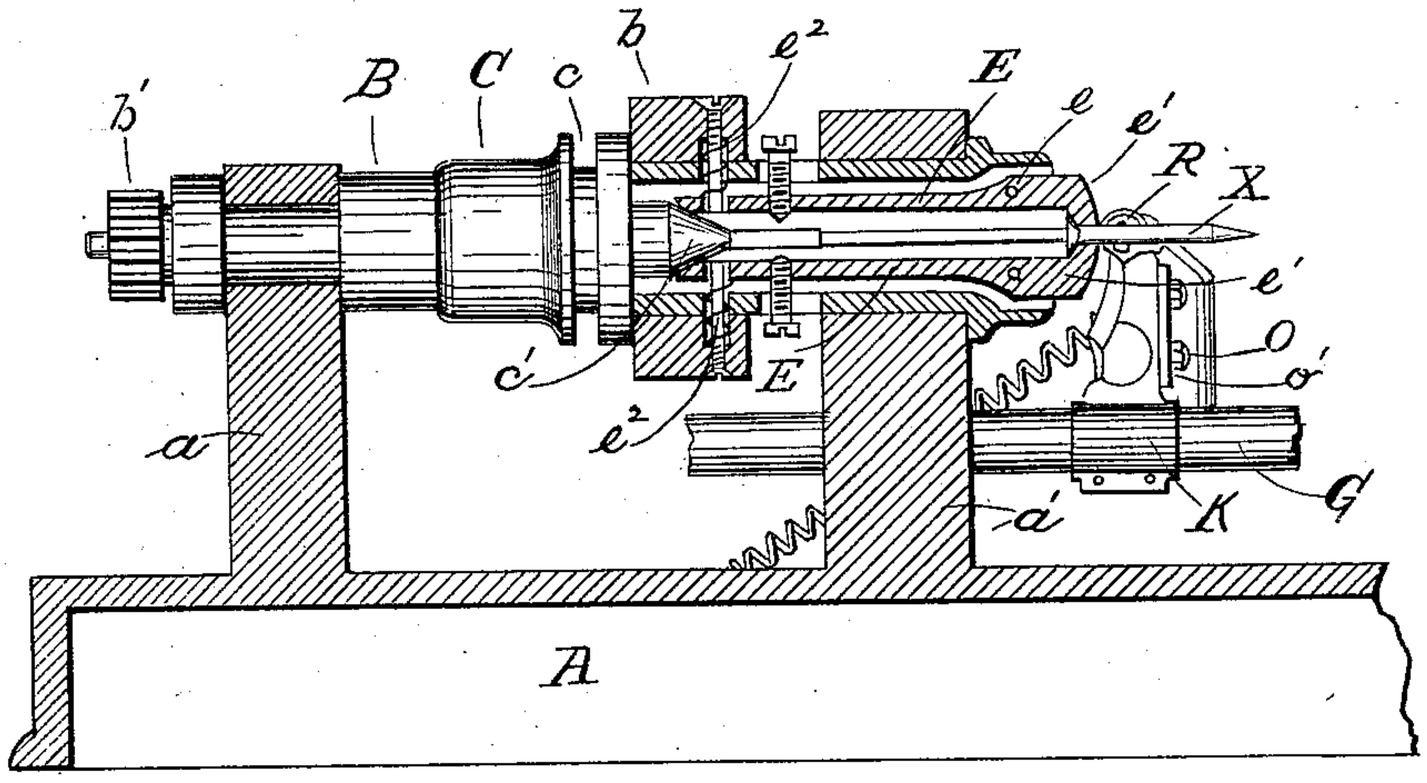


Fig. 6.

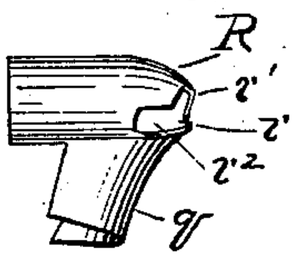


Fig. 8.

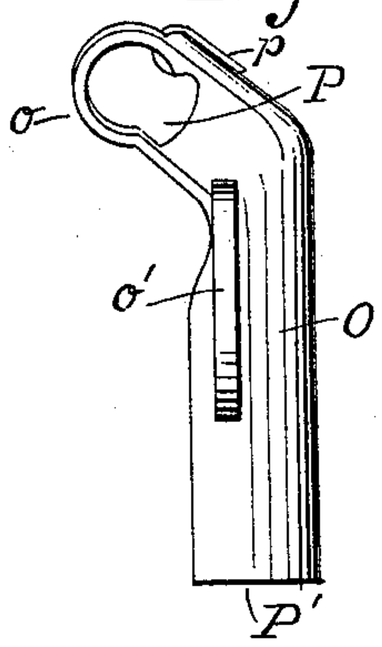


Fig. 5.

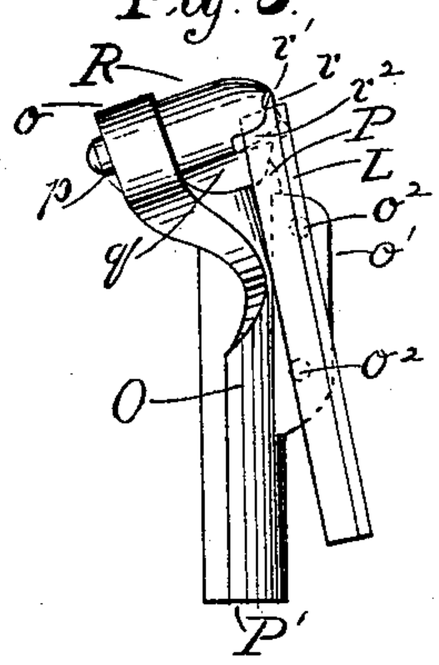
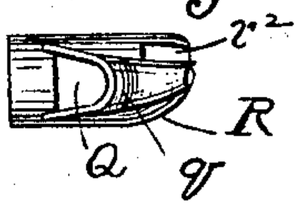


Fig. 7.



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UNITED STATES PATENT OFFICE.

HENRY B. SARGENT, OF NEW HAVEN, AND ALBERT A. PAGE, OF EAST HAVEN, CONNECTICUT, ASSIGNORS TO THE SARGENT & COMPANY, OF NEW HAVEN, CONNECTICUT.

SCREW-MACHINE.

SPECIFICATION forming part of Letters Patent No. 589,143, dated August 31, 1897.

Application filed April 23, 1897. Serial No. 633,530. (No model.)

To all whom it may concern:

Be it known that we, HENRY B. SARGENT, of the city of New Haven, and ALBERT A. PAGE, of the town of East Haven, in the county of New Haven, State of Connecticut, have invented a new and useful Improvement in Screw-Machines, fully set forth and described in the following specification, taken in connection with the accompanying drawings, which form a part thereof, and in which—

Figure 1 is a side elevation of a screw-machine embodying our invention; Fig. 2, a transverse vertical section on lines 2 2 of Fig. 1; Fig. 3, a longitudinal vertical section on lines 3 3 of Fig. 2; Figs. 4 and 5, enlarged detail views of the separator and conduit together in front and side elevations, respectively; Figs. 6 and 7, side and bottom detail views of the separator, and Fig. 8 a rear detail view of the conduit.

In all figures similar letters of reference represent like parts.

This invention relates to screw-machines; and it consists in a novel construction for separators or mechanism for separating the chips or shavings from the blank as they are cut therefrom by the tool, and of a conduit which, together with the separator, guides the chips in the desired direction.

The invention is shown in the drawings applied to a single-spindle screw-machine, of which A represents the bed, having standards a, a', and a^2, and the spindle B, journaled in the standards a and a', to be revolved therein by a band passing over the pulley b, rigidly secured thereto. A collar C, feathered on the spindle B to revolve therewith, but allowed an independent longitudinal movement, is provided with an annular groove c for the forked end of a reciprocating arbor D, the mountings for which are not shown in the drawings. Extending from the forward end of the collar C, within the spindle B, is a wedge-shaped extension c' to project between and separate the rear ends of two levers E, pivoted at e in the spindle B and adapted at their forward ends e' to hold the blank or stock x.

Springs e^2 within the spindle B constantly bear on the rear ends of the levers E to force them together and hold the forward ends or jaws e' open for the reception of the stock, Fig. 3.

When the blank x is placed between the open jaws e', the movement of reciprocating arbor D toward the right, Fig. 3, moves the collar C in the same direction and wedges the extension c' between the rear ends of levers E, forcing them apart (against the tension of springs e^2) and the jaws e' toward each other to grip the blank x. When the stock has been operated, the reverse movement of arbor D withdraws extension c' from between the rear ends of levers E, and the springs e^2 force them toward each other, opening the jaws e' to allow the blank to be thrown out by an ejector or other means.

Loosely journaled in the standards a' and a^2 is a reciprocating rocking shaft G, on which is mounted the tool-holder K, carrying a clamp k and a hook k^2. A spring M, secured to the hook k^2 and bed A of the machine, tends to draw the shaft G toward the right, Fig. 1, and to rotate it so that the tool-holder is swung away from the blank, (to the right, Fig. 2.) The tool or threading-die L is adapted to be securely held in the tool-holder K with the clamp k by means of a bolt k'. A collar g, keyed on the right-hand end of the shaft G, rocks therewith, but retains an independent longitudinal movement. An arbor or dog g', rigidly secured to the collar G, bears against a cam H, rotated by gearing meshing with the pinion b' on the spindle B. A second cam J on the shaft I, journaled in the standards a and a', bears with one face on the right-hand end, Fig. 1, of rocking shaft G.

In operation the tool-holder K, carrying tool L, is normally held away from the blank by the spring M, as shown, until upon the rotation of cam H the shaft G is rocked by the arbor g' (against the tension of spring M) toward the left, Fig. 2, so that the tool L is brought into engagement with the blank. The tool first engages with that end of the blank near the jaws e' and is forced toward the other end of the blank upon the longitudinal movement of the shaft G produced by the cam J overcoming the tension of spring M. The continued rotation of the cam H permits the shaft G to be rocked in the reverse

direction by spring M to swing the tool-holder K, with tool L, away from the blank, and the further rotation of cam J allows the spring M to draw the shaft G toward the right, Fig. 1, preparatory to a repetition of its operation.

A support N is shown mounted on a rocking shaft *n*, Fig. 2, and is adapted to bear on the opposite side of the blank from the tool L while the tool is in operation to steady the work. By its rocking movement (not described or shown in detail) the support N may be withdrawn from the blank when the tool is not in engagement therewith, so that the finished product may be forced out of the jaws at the proper moment.

A conduit or trough O, formed, as shown in Figs. 4, 5, and 8, with a loop portion *o* at its upper end, is provided on its under side with a flange *o'*, having screw-holes *o²*, through which screws or bolts may secure it rigidly to the tool-holder, Figs. 2 and 3. The upper end P of the conduit O is adapted to be substantially beneath the point where the tool engages with the stock *x*, so that the chips or shavings when falling naturally therefrom will enter the conduit. The main portion of the conduit extends in the general direction which the chips would naturally take as they leave the blank, while beneath the lower end P' of the conduit may be placed a vessel or other receptacle for the reception of the chips.

Into the loop portion *o* of the conduit is adapted to fit a separator R, which is provided with a slot or opening *r*, the upper edge *r'* of which forms an engaging surface adapted to be held (during the time the tool is in operation with the blank) in close proximity to the cutting edge of the tool L, so that the chips or shavings as they are cut from the tool rise in contact therewith and are deflected or guided thereby in the desired direction.

In the particular form shown in the drawings the separator consists of a substantially cylindrical body R, one end of which is conical-shaped and is provided with contiguous slots *r* and *r²*, one, *r*, being vertical, the other, *r²*, horizontal. The cylindrical body portion R of the separator is adjustable in the loop portion *o* of the conduit, in which it is held by a clamp *p*. The upper or, more properly, engaging end of the tool L projects into the horizontal slot *r²* of the separator and extends into the vertical slot *r*, so as to leave a slight clearance between it and the separator *r'*, Fig. 5. As the separator is adjustable on the conduit, which is rigidly secured to the tool-holder, the separator may be varied in its relation with the end of the tool, so that the exact clearance desired may be obtained.

The operation of the separator is as follows: As the tool-holder rocks on its shaft to bring the tool into contact with the stock, the separator R and conduit O, being mounted on the tool-holder, are brought into their proper position during the operation of the tool. The chips or shavings arising from the stock or blank extend into the clearance between the tool and separating edge *r'* and are deflected or guided by the separating edge *r'* into the interior of the separator.

In the under side of the separator is an orifice Q, which communicates with the conduit O when the separator is in place, so that the chips are guided in the interior of the separator and naturally pressed downward into the conduit. An apron or screen *q* partially surrounds the orifice Q and extends into the conduit, more effectively guiding the chips from the separator into the conduit. From the conduit the chips pass naturally into the receptacle placed beneath. By this construction the chips or shavings produced by the operation of the tool upon the blank or stock are separated from the blank while it is still held by the chuck, are prevented from being thrown in various directions upon the revolution of the spindle holding the stock, and are guided in the desired direction and deposited in the proper receptacle. When, however, the stock is discharged from the spindle, the conduit and separator are withdrawn (with the tool-holder) from possible interference with the finished product as it falls in its proper receptacle.

Having now described our invention, which may vary greatly without departing from the spirit thereof and may be applied to different types of machines and styles of tool-holders, what we claim, and desire to secure by Letters Patent, is—

1. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; and a separator adapted to fit over and in close proximity with the end of the tool, when engaging the stock, to deflect or guide the chips from the stock, substantially as described.

2. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; and a separator adapted to fit over and in close proximity with the end of the tool, and to move synchronously therewith, to deflect or guide the chips from the stock, substantially as described.

3. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; and a separator also mounted on the tool-holder and adapted to fit over and in close proximity with the end of the tool, when engaging with the stock, to deflect or guide the chips from the stock, substantially as described.

4. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; and a separator adjustably mounted on the

tool-holder, and adapted to fit over and in close proximity with the end of the tool, when engaging with the stock, to deflect or guide the chips from the stock, substantially as described.

5. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a rocking reciprocating shaft; a tool-holder mounted on said shaft, adapted for carrying the tool and to bring it into proper engagement with the stock; and a separator mounted on the tool-holder to move therewith and adapted to fit over and in close proximity with the end of the tool, when engaging with the stock, to deflect or guide the chips from the stock substantially as described.

6. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a rocking reciprocating shaft; a tool-holder mounted thereon for carrying the tool and bringing it into proper engagement with the stock; and a conduit also mounted on the tool-holder and extending from substantially beneath the point of engagement between the tool and stock, to guide the chips from the stock in their proper direction, substantially as described.

7. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; a conduit to guide the chips from the stock in their proper direction; and a separator adapted to fit over and in close proximity with the end of the tool, when engaging with the stock, to deflect or guide the chips from the stock, substantially as described.

8. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; a conduit mounted on the tool-holder to guide the chips from the stock in their proper direction; and a separator mounted on the conduit, and adapted to fit over and in close proximity with the end of the tool, when engaging with the stock, to deflect or guide the chips from the stock, substantially as described.

9. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; a conduit mounted on the tool-holder to guide the chips from the stock in their proper direction; and a separator adjustably mounted on the conduit, and adapted to fit over and in close proximity with the end of the tool, to deflect or guide the chips from the stock, substantially as described.

10. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; and a separator having a slot into which the end of the tool is adapted to extend when engaging with the stock, so as to allow a clearance between one end of the slot and tool, into which the chips from the stock are deflected or guided, substantially as described.

11. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; a conduit to guide the chips from the stock in their proper direction; and a separator mounted on said conduit, provided with a slot into which the end of the tool is adapted to extend, when engaging with the stock, so as to allow a clearance between one end of the slot and tool into which the chips from the stock are deflected or guided by the separator; and an orifice in the separator through which the chips may pass into the conduit, substantially as described.

12. In a screw-machine, the combination with a rotary spindle for carrying stock or blanks; of a tool-holder; a tool mounted thereon to engage with the stock carried by the spindle; a conduit to guide the chips from the stock in their proper direction, and provided with a loop at its upper end; and a separator mounted in said loop on the conduit and provided with a slot into which the end of the tool is adapted to extend, when engaging with the stock, so as to allow a clearance between one end of the slot and tool into which the chips from the stock are deflected or guided by the separator, and an orifice in the separator through which the chips may pass into the conduit, substantially as described.

In witness whereof we have hereunto set our hands, at New Haven, in the county of New Haven, State of Connecticut, this 21st day of April, 1897.

HENRY B. SARGENT.
ALBERT A. PAGE.

Witnesses:
WILLIAM T. COOKE,
CHARLES L. BALDWIN.