

Oct. 16, 1923.

1,471,010

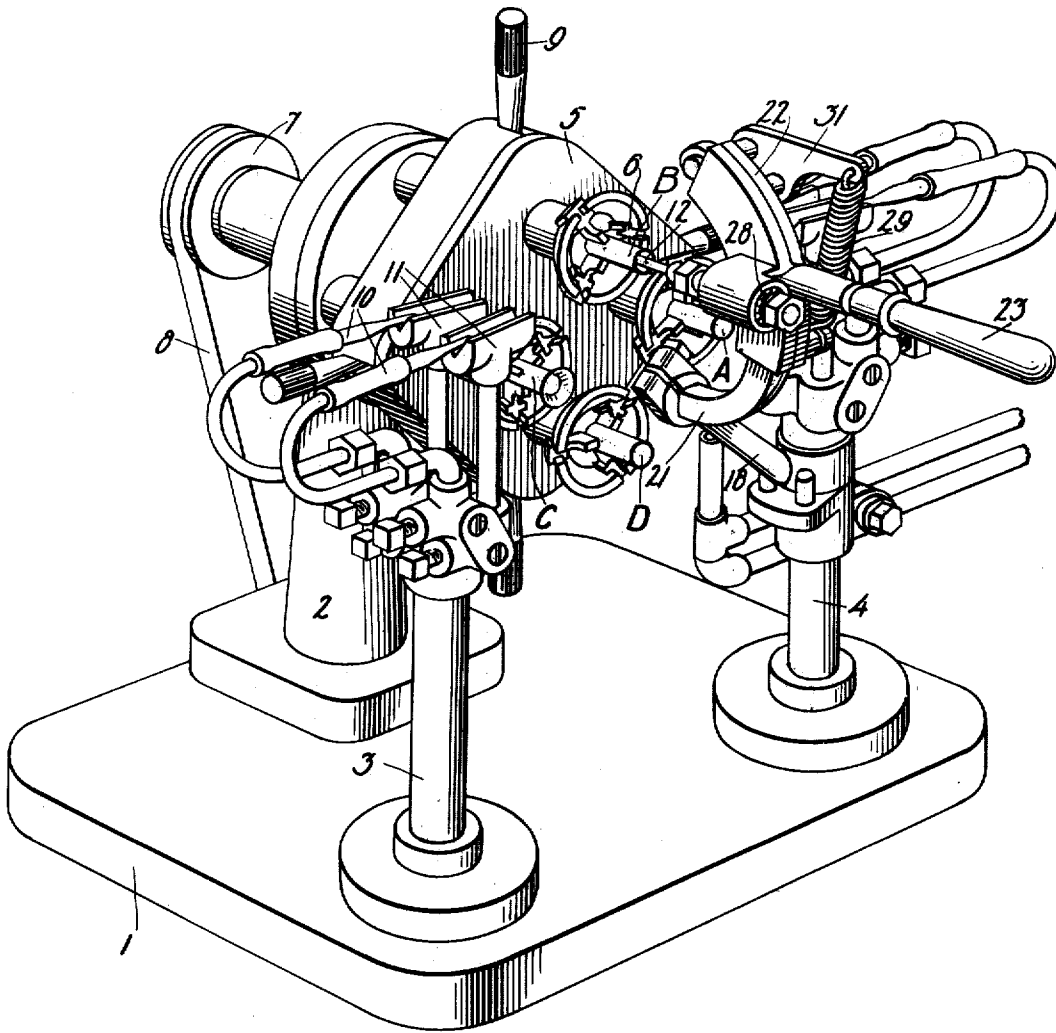
J. N. SELVIG

SPINNING TOOL AND MACHINE

Filed Dec. 11, 1919

2 Sheets-Sheet 1

Fig. 1.



Inventor:
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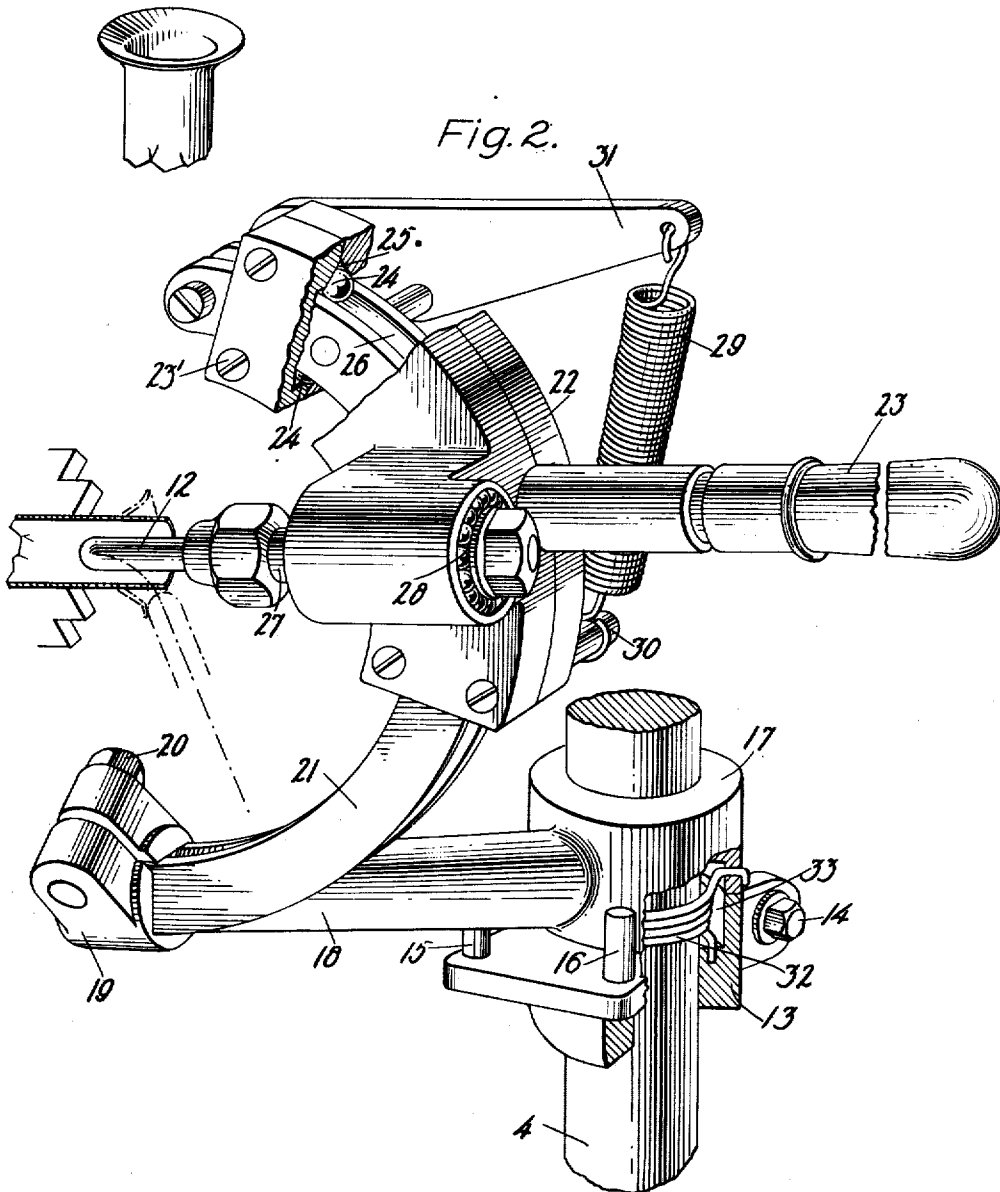
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2 Sheets-Sheet 2

Fig. 3.



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Patented Oct. 16, 1923.

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UNITED STATES PATENT OFFICE.

JOHN N. SELVIG, OF CHICAGO, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SPINNING TOOL AND MACHINE.

Application filed December 11, 1919. Serial No. 344,242.

To all whom it may concern:

Be it known that I, JOHN N. SELVIG, a subject of the King of Norway, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Spinning Tools and Machines, of which the following is a full, clear, concise, and exact description.

My present invention relates to special machinery and more particularly to machines for forming tubular bodies and it has for its object to provide a simple and convenient apparatus for flaring the ends of tubes. To these and other ends the invention resides in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Fig. 1 is a perspective view of an apparatus constructed in accordance with and illustrating one embodiment of my invention; Fig. 2 is an enlarged perspective view of the tool holder and carrier with parts broken away, and Fig. 3 is an enlarged fragmentary perspective view of the article the machine is designed to make. Similar reference numerals throughout the several views indicate the same parts.

The machine of the present embodiment is designed particularly for flaring the base ends of the glass tubes used as stems in vacuum tubes or electric light bulbs in the manner shown in Fig. 3. Referring to Fig. 1, 1 indicates a base carrying three posts or standards 2, 3 and 4, the last named two of which are offset with respect to the first. The post 2 supports a turret chuck 5, the four chuck elements 6 of which are driven by a pulley 7 and belt 8 running to a suitable source of power. The turret itself is rotated intermittently by means of handles 9 successively to present the workpieces held by the individual chucks, in alignment with the tool support, hereinafter described.

The turret is rotated to the left and the glass tube or workpiece is inserted at the position indicated at A or D; is heated by devices hereinafter described as it passes to and while in the forming position B, at which position it is acted upon by the tool and is removed at the position C.

The heating apparatus consists, in the present instance, of two opposed pairs of

blow pipes 10 of any suitable character, provided with directing hoods 11 the pair or set on one side being supported on the standard 3 in a position to direct flames upon the workpieces as they pass to B position and while being acted upon by the tool to maintain the glass soft and pliable. The other pair may be suitably mounted on the standard 4.

The forming tool is of the round nose cylindrical form clearly shown at 12 in Figure 2. It is inserted in the workpiece axially a suitable distance as shown in Figure 2 in full lines, according to the size of the flare that it is desired to produce and is then tilted with a movement that simultaneously withdraws it so that it first engages the end edge of the tube and presses it outwardly. The round nose travels down the side of the tube and finally effects the change in shape indicated by the dotted lines in Figure 2, the final position of the tool also being shown in dotted lines. For producing these movements, there is provided the following mechanism.

On the standard 4 is secured a stop collar 13 that is clamped in place by a bolt 14 and carries stop pins 15 and 16. Above the collar is a hub 17 by means of which the swinging support in the form of an arm 18, is pivoted to the standard and adapted to move between the stop pins 15 and 16. A split collar 19, integral with the outer end of the arm 18, carries an arcuate guide 21 which is secured to the collar by a bolt 20, the split supporting collar being joined to it at its lower end so that the guide is held upright in a plane parallel to the axes of the turret chucks 6. Slidable on the guide is a carriage 22 having a rearwardly projecting fixed operating handle 23. The carriage is preferably made of two recessed arcuate plates held together by screws 23' to enclose ball bearings 24 running in ball races 25 and 26 in the carriage and guide, respectively. The spindle 27 of the tool 12, which rotates to reduce the friction of the tool against the glass, is supported in ball bearings 28 in the carriage so that the tool is disposed substantially radially of the guide. In the present instance, it is not exactly radial for if it were, the tool would tilt on a center lying in its own axis or in the prolongation thereof and the withdrawing motion shown by the full and dotted

lines in Figure 2, would not occur. In that figure, the center upon which the arcuate guide is developed lies below the end of the tool and the axis of the work-
 5 piece. The carriage 22 is normally held on the upper portion of the guide as shown in the figures, to aline the tool 12 in the axis of a workpiece whose chuck is in the position B, by a spring 29 connected to a pin
 10 30 on the carriage and to a rearwardly extending arm 31 fixed to the upper end of the guide.

The supporting arm 18 is normally held in a retracted position against the stop 16
 15 by a spring 32 coiled about the standard 4 in a recess 33 of the collar 13 and hub 17 and having its ends acting upon these two last named parts, respectively.

When the turret is being rotated between
 20 operations of the tool, the latter is in its retracted position with the arm 18 in contact with the stop 16. The tool is operated by grasping the handle 23 and moving it forward, thereby bringing the tool 12 end-
 25 wise and axially into the new workpiece the chuck of which has reached the position B, and depressing the handle 23 thereafter, effects the forming operation by tilting the tool in the tube in the manner previously
 30 described.

The extent to which the tool enters the tube is conveniently controlled by an adjustment of the stop collar 13 to different rotative positions on the standard 4.

35 What is claimed is:

1. In a machine for forming tubes, the combination with a rotary work holder, of a forming tool, a swinging support therefor adapted to carry the tool into and out of
 40 the work in a substantially axial direction and a tool holder movable in an arcuate path on the support to tilt the tool angularly with respect to the work-piece.

2. In a machine for forming tubes, the
 45 combination with a rotary work holder, of a forming tool, a swinging support therefor adapted to carry the tool into and out of the work in a substantially axial direction and a tool holder movable in an arcuate
 50 path on the support in a transverse plane relatively to the swinging movement of the latter to tilt the tool angularly to the work-piece.

3. In a machine for flaring tubes, the
 55 combination with a rotary work holder, of a spinning tool, a swinging support therefor adapted to carry the tool into and out of the work in a substantially axial direction, and a tool holder movable in an arcuate
 60 path on the support on a center located in the region of the end of the tool to tilt the latter angularly to the work-piece.

4. In a machine for flaring tubes, the combination with a rotary work holder, of
 65 a spinning tool, an arcuate guide for the

tool upon which it is slidably movable to angular positions relatively to the work, and a pivoted arm supporting the guide to carry the tool endwise into and out of a work-piece in the holder. 70

5. In a machine for flaring tubes, the combination with a rotary work holder, of a spinning tool, an arcuate guide for the tool upon which it is substantially radially
 75 disposed and is slidably movable to angular positions relatively to the work, a handle for moving the tool on the guide, and a pivoted arm supporting the guide to carry the tool endwise into and out of a work-
 80 piece in the holder.

6. In a machine for flaring tubes, the combination with a rotary work holder, of an arcuate guide, a carriage slidable thereon and having a handle, a substantially
 85 radially disposed tool rotatable in the carriage and normally centered with respect to the work holder and a swinging arm supporting the guide to swing the tool endwise into or out of a work-piece in the holder.

7. In a machine for flaring tubes, the combination with a rotary work holder, of an arcuate guide, a substantially radially disposed tool slidable in the guide and normally withdrawn from the work holder, a swinging arm
 90 supporting the guide to swing the tool endwise into or out of a work-piece in the holder and springs acting upon the arm and guide, respectively, tending to move the tool to the said normal position.

8. In a machine for flaring tubes, the combination with a rotary work holder, of an arcuate guide, a carriage slidable thereon and having a handle, a substantially radially
 100 disposed tool rotatable in the carriage and normally withdrawn from the work holder, a swinging arm supporting the guide to swing the tool endwise into or out of a work-piece in the holder, and springs acting upon the arm and guide, respectively, tending to move the tool to the said normal position. 110

9. In a machine for flaring tubes, the combination with a spinning tool and a blow pipe for directing a flame toward the operative position of said tool, of a turret rotatable about a horizontal axis and having a
 115 plurality of rotatable work holding chucks and adapted to present a plurality of work pieces successively to the flame and to the tool.

10. In a machine for flaring tubes, the combination with a spinning tool and a blow pipe for directing the flame toward the operative position of said tool, of a turret having a plurality of work holders rotatably
 120 mounted thereon and adapted to present a plurality of workpieces successively to the flame and to the tool, and a single shaft for simultaneously rotating said work holders. 125

11. In a machine for flaring tubes, a carrier, a plurality of rotatable tube holders, 130

means for simultaneously rotating said tube holders, means for heating the tubes and means for flaring said tubes while heated.

12. In a machine for flaring tubes, a carrier, means for advancing said carrier step-by-step, a plurality of tube holders, means for rotating said tube holders, means for heating said tubes, means for flaring said tubes while heated, said means comprising a flaring tool, means for advancing said tool toward said heated glass tube and means for withdrawing said tool from said heated glass tube.

13. In a machine for flaring tubes, a shaft, a carrier, a plurality of work holders rotatably mounted on said carrier, said work holders being simultaneously rotated by said shaft, and a spinning tool for flaring tubes carried by said work holders.

14. In a machine for flaring tubes, a shaft, a carrier, a plurality of work holders rotatably mounted on said carrier, said work holders being simultaneously rotated by said shaft, means for heating tubes carried by said holders, and means for flaring said tubes while heated.

15. In a machine for flaring tubes, a rotary work holder, a spinning tool, a swinging support for said tool, said tool being slidably mounted on said support for movement about an axis substantially at right angles to the axis of said support.

16. In a machine for flaring tubes, a rotatable work holder, a spinning tool, a swinging support for said tool, said tool being slidably mounted on said support for movement about an axis at right angles to the axis of said support, and resilient means for normally maintaining said tool substantially at right angles to the axis of said support.

17. In a machine for flaring tubes, a pivotally mounted arcuate support, and a tool slidably mounted on said support.

18. In a machine for flaring tubes, a pivotally mounted arcuate support, and a tool slidably mounted on said support, said tool being arranged off center with respect to said arcuate support.

In witness whereof, I hereunto subscribe my name this 3rd day of December A. D., 1919.

JOHN N. SELVIG.

DISCLAIMER.

1,471,010.—*John N. Selvig*, Chicago, Ill. SPINNING TOOL AND MACHINE. Patent dated October 16, 1923. Disclaimer filed April 4, 1928, by the assignee, *Western Electric Company, Incorporated*.

Hereby enters this disclaimer to that part of the claims in said specification which are in the following words to wit:

"9. In a machine for flaring tubes, the combination with a spinning tool and a blow pipe for directing a flame toward the operative position of said tool, of a turret rotatable about a horizontal axis and having a plurality of rotatable work holding chucks and adapted to present a plurality of work pieces successively to the flame and to the tool.

"10. In a machine for flaring tubes, the combination with a spinning tool and a blow pipe for directing the flame toward the operative position of said tool, of a turret having a plurality of work holders rotatably mounted thereon and adapted to present a plurality of workpieces successively to the flame and to the tool and a single shaft for simultaneously rotating said work holders.

"11. In a machine for flaring tubes, a carrier, a plurality of rotatable tube holders, means for simultaneously rotating said tube holders, means for heating the tubes and means for flaring said tubes while heated.

"12. In a machine for flaring tubes, a carrier, means for advancing said carrier step-by-step, a plurality of tube holders, means for rotating said tube holders, means for heating said tubes, means for flaring said tubes while heated, said means comprising a flaring tool, means for advancing said tool toward said heated glass tube and means for withdrawing said tool from said heated glass tube.

"13. In a machine for flaring tubes, a shaft, a carrier, a plurality of work holders rotatably mounted on said carrier, said work holders being simultaneously rotated by said shaft, and a spinning tool for flaring tubes carried by said work holders.

"14. In a machine for flaring tubes, a shaft, a carrier, a plurality of work holders rotatably mounted on said carrier, said work holders being simultaneously rotated by said shaft, means for heating tubes carried by said holders, and means for flaring said tubes while heated."

[*Official Gazette May 1, 1928.*]