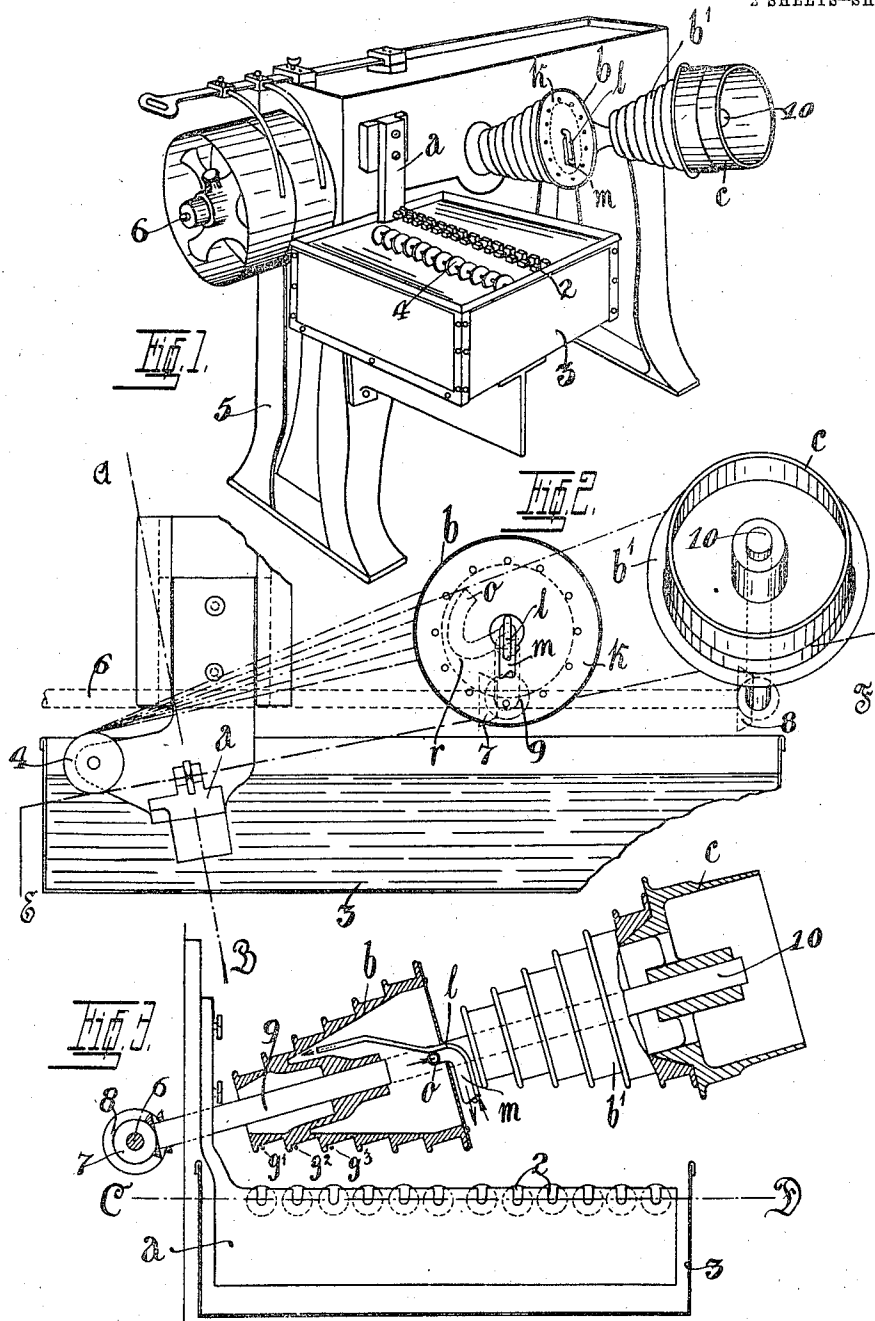


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 MULTIPLE WIRE DRAWING MACHINE.  
 APPLICATION FILED JULY 27, 1911.

1,031,572.

Patented July 2, 1912.

2 SHEETS—SHEET 1.



Witnesses.

*Husli V*  
*Sidney Chick*

Inventor.

*Walther Nacken*

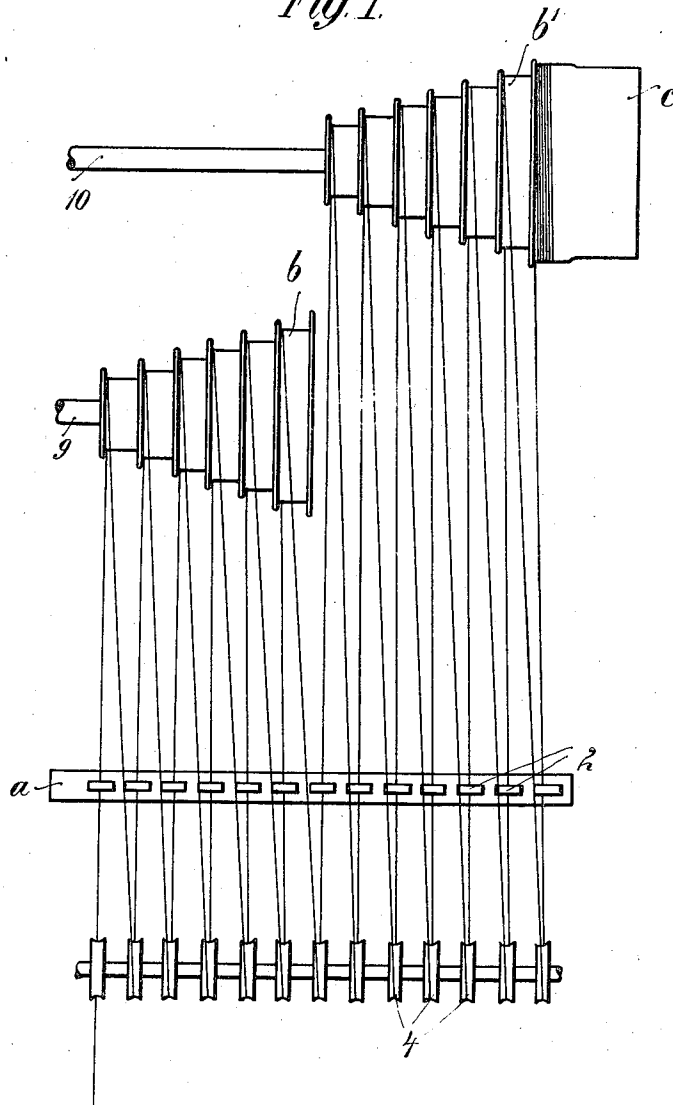
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*Fig. 4.*



*Witnesses.*

*Wilhelm Eckert,*

*Hugo von Falkenhayn*

*Inventor.*

*Walter Macken*

# UNITED STATES PATENT OFFICE.

WALTHER NACKEN, OF ERLAU, GERMANY.

## MULTIPLE-WIRE-DRAWING MACHINE.

1,031,572.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed July 27, 1911. Serial No. 640,909.

*To all whom it may concern:*

Be it known that I, WALTHER NACKEN, a subject of the German Emperor, and residing at Erlau, Saxony, Germany, have invented certain new and useful Improvements in Multiple-Wire-Drawing Machines, of which the following is a specification.

The present invention relates to a multiple wire-drawing machine, and consists essentially in the arrangement, as hereinafter described and claimed, of the drawing-cones and the dies, the latter being immersed in a lubricant and the former being arranged outside the lubricating trough and provided with separate cooling arrangement. The abundant lubrication of the dies thus insured allows of greater speed in the working of the machine, and the splashing of the lubricating liquid by the cones is obviated.

In the accompanying drawings the invention is illustrated, Figure 1 representing a perspective view of the machine, Fig. 2 a front view, partly in section, of the main parts of the machine and Fig. 3 a sectional side view of the same. Fig. 4 is a diagrammatic view showing how the wire is wound through the dies and around the cones.

The machine consists of a frame 5 in which a driving shaft 6 is mounted, said shaft being fitted with bevel gears 7 and 8 for rotating transversely arranged inclined shafts 9 and 10 respectively. The latter shafts carry the drawing cones  $b$  and  $b^1$ .

A trough 3 is connected to the machine frame for the reception of the lubricating liquid. In this trough the die holder  $a$  is arranged and so is a series of guide rollers 4 which guide the wires from the cones through the liquid to the dies.

The dies 2 are fitted in the holder  $a$  in such a manner that, while their apertures are in the same horizontal plane C—D (Fig. 3), the dies themselves are set in an inclined plane A—B (Fig. 2). The dies are held in the lubricant, and the holder may be adjusted for immersing them more or less into the liquid. In conformity with this arrangement of the dies, the stepped drawing cones  $b$  and  $b^1$  are mounted with their shafts over the trough so that the points  $g^1$ ,  $g^2$ ,  $g^3$ , . . . where the wires contact with the cone-grooves, are all disposed in a plane E—F (Fig. 2,) this plane being perpendicular to the plane A—B and to the die-apertures. The threading of the wire through

the machine is facilitated by this arrangement of the cone, since it is easier to wind the wire around an inclined element than around a horizontal one. Only one cone need be employed, but to avoid the employment of a very long and bulky cone, when a great many drawings are required, the arrangement may be as shown in the figures where two small cones of equal size are employed, the second cone being driven at a greater speed so that the wire can be passed from the largest step of the first cone over a guide-roller 4 to the smallest step of the second cone and the drawing continued by the latter. The ready-drawn wire is wound on a drum  $c$  which, according to the invention, is mounted, as shown in the figures, on the second cone  $b^1$ , an easy removal of the wire-bundle being thereby insured.

Owing to the abundant lubrication of the dies effected by the arrangement, the machine can be driven at an accelerated speed. The increased speed, however causes the first cone to be greatly heated by the thick wire running thereon. To counteract this heating a cooling arrangement is provided in which the employment of packing boxes is entirely avoided. The hollow cone  $b$  is closed at its front end by a disk  $k$  having a circular opening in its center. Through this opening two stationary pipes  $l$  and  $m$  are introduced into the cone for the supply and discharge of cooling liquid.  $l$  is the supply pipe and is made considerably narrower than the pipe  $m$  which is the discharge pipe. The pipe  $l$  is carried to the innermost part of the hollow cone for feeding the liquid to this part. The pipe  $m$  is formed with a curve  $r$  (Fig. 2) carried reversely to the rotating direction of the cone and terminates, with its flared nozzle  $o$ , about one quarter of an inch from the disk  $k$  and from the cone-wall at the deepest portion of the latter. The liquid fed by the pipe  $l$  into the inner end of the cone during the rotation of the latter, is guided thence outward along the inclined wall of the cone, owing to the centrifugal action, and collects at the deepest portion thereof. As soon as the liquid ring is sufficiently voluminous, the liquid is caught by the nozzle  $o$  and discharged by the pipe  $m$ . To prevent the liquid from flowing along the outer surface of the pipe  $m$  through the opening in the disk  $k$ , the curve  $r$  is bent to form a sack, as shown in Fig. 2, from the lowest portion

of which liquid following the surface of the pipe trickles back into the cone.

I claim:—

1. In a multiple wire-drawing machine, a lubricating trough, dies arranged in said trough in an inclined position, the apertures of the dies being all in the same horizontal plane, stepped drawing cones mounted on inclined shafts above the trough so that the wires are carried from the dies to the cones in the same plane and perpendicularly to the dies, and guide rollers arranged in the trough so as to guide the wires from the cones through the lubricating liquid to the dies, substantially as and for the purpose set forth.

2. In a multiple wire-drawing machine, a lubricating trough, dies arranged in said trough in an inclined position, the apertures of the dies being all in the same horizontal plane, stepped drawing cones mounted on inclined shafts in a staggered position above the trough so that the wires are carried from the dies to the cones in the same plane and perpendicularly to the dies, the cones being rotated at different speeds so that the wire can be carried from the largest step of the first cone to the smallest step of the second cone and the drawing contin-

ued on the latter, and guide rollers arranged in the trough so as to guide the wires from the cones through the lubricating liquid to the dies, substantially as and for the purpose set forth.

3. In a multiple wire-drawing machine, a lubricating trough, dies arranged in said trough in an inclined position, the apertures of the dies being all in the same horizontal plane, stepped drawing cones mounted on inclined shafts in a staggered position above the trough so that the wires are carried from the dies to the cones in the same plane and perpendicularly to the dies, the cones being rotated at different speeds so that the wire can be carried from the largest step of the first cone to the smallest step of the second cone and the drawing continued on the latter, a drum loosely fitted in the outer end of the last cone to receive the finished wire, and guide rollers arranged in the trough so as to guide the wires from the cones through the lubricating liquid to the dies, substantially as and for the purpose set forth.

WALTHER NACKEN.

Witnesses:

KURT SINGER,  
SIDNEY RICH.