

(No Model.)

N. R. LYMAN.

MACHINE FOR MAKING PRINTERS' LEADS.

No. 315,045.

Patented Apr. 7, 1885.

Fig. 1.

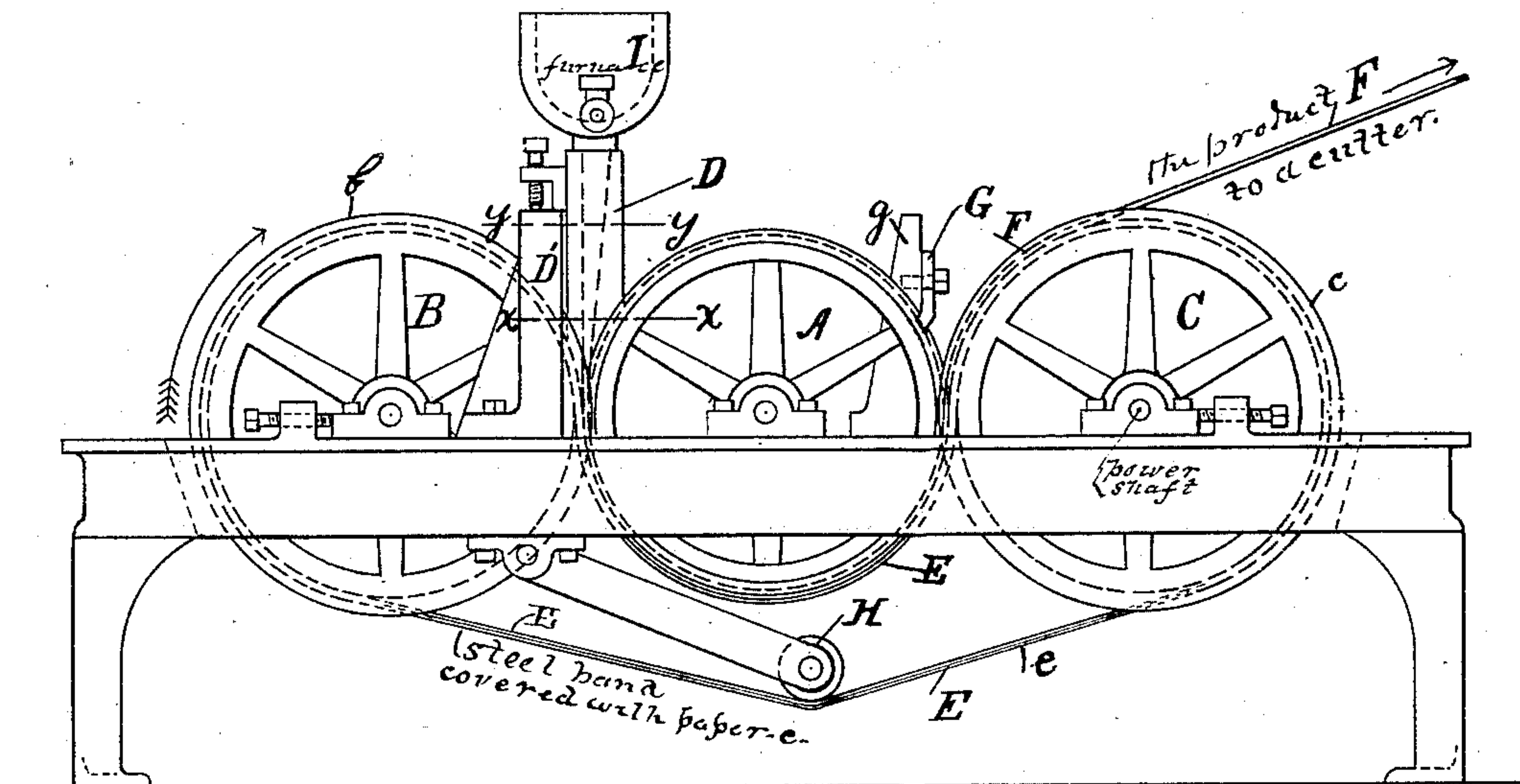


Fig. 2.

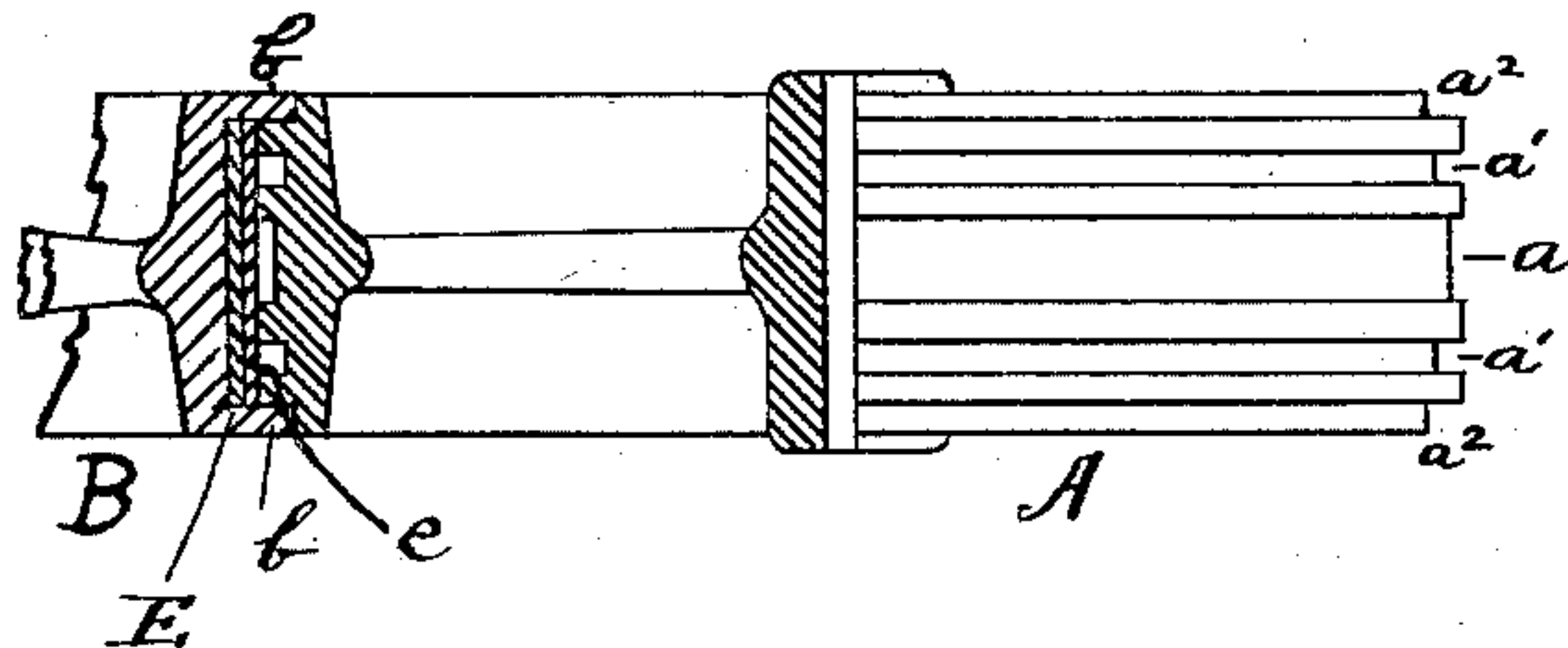


Fig. 3.

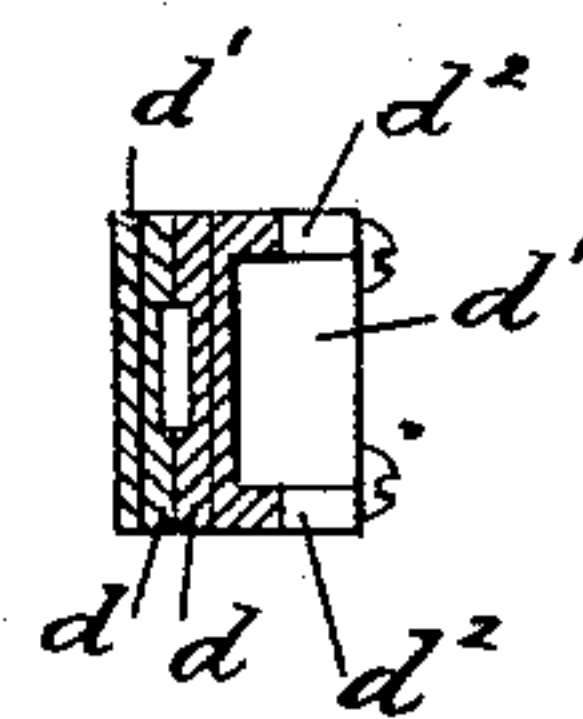
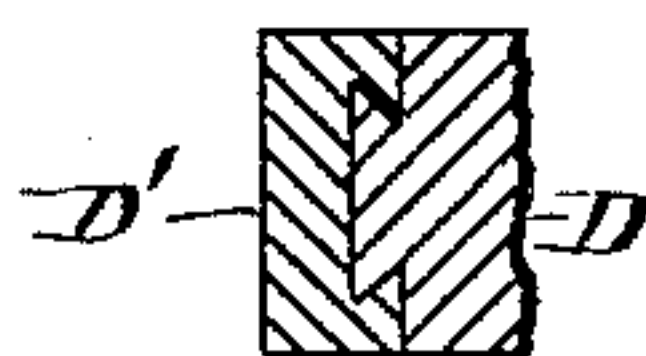


Fig. 4



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# UNITED STATES PATENT OFFICE.

NATHAN R. LYMAN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
JOSEPH P. ELLACOTT, OF SAME PLACE.

## MACHINE FOR MAKING PRINTERS' LEADS.

SPECIFICATION forming part of Letters Patent No. 315,045, dated April 7, 1885.

Application filed December 18, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, NATHAN R. LYMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Making Printers' Leads, which are set forth in the following specification, reference being made to the accompanying drawings, in which—

Figure 1 is a front view of a machine embodying my improvements. Fig. 2 shows on an enlarged scale the mold-roller and the roller coacting therewith, the former roller being shown in edge view as to its right-hand half and in axial section as to its left-hand half, and the latter roller being in similar section and broken away beyond the points of nearest juxtaposition of the two rollers. Fig. 3 shows a plan section of the funnel, taken on the line  $x x$ , Fig. 1, looking upward; and Fig. 4 is a plan section on the line  $y y$ , Fig. 1, broken away, showing the dovetail slide which holds the funnel against lateral displacement, and at the same time allows of its vertical adjustment.

My invention relates to a machine by means of which lead is formed by the aid of a roller and a band.

The object of my invention is to provide means whereby a continuous strip or ribbon of lead may be made.

In the drawings, which illustrate one way in which my invention may be carried out, A represents a roller provided with a central groove,  $a$ , in the face thereof, between which groove and a band, E, hereinafter described, covering at this point the face of a roller, B, the fused metal is formed into a ribbon. On each side of the central groove,  $a$ , a smaller groove,  $a'$ , is turned, and outside of these grooves  $a'$ , on the face of the roller A, are turned rabbets  $a^2$ .

C is a pulley. This pulley has a plain face, except near each edge, where it has a narrow annular flange,  $c$ , which corresponds with the annular rabbet  $a^2$ . The roller B has a plain face, except for the presence of the similar flanges,  $b$ , the pulley C and roller B being counterparts throughout. These flanges  $c$  and

$b$ , in conjunction with the rabbets  $a^2$ , serve to interlock the rollers A and B and pulley C and keep them in perfect alignment.

D is a funnel, made of wood,  $d$ , inside, and of metal,  $d'$ , outside, this metal, however, forming the sole material of the extreme tip of the funnel, to insure durability. This funnel slides up and down when occasion requires on a vertical standard, D, being dovetailed thereto, as shown in Fig. 4, for the purpose of permitting vertical adjustment without lateral displacement. The object of thus adapting the funnel to be vertically adjustable is to admit of the substitution for the roller A of another roller having a groove,  $a$ , of different depth, thus providing for the making of leads of different thicknesses. The metal,  $d'$ , forming the outside of the funnel is provided with flanges  $d^2$ , which fit into the grooves  $a'$ , and thus secure a more perfect relative alignment of the funnel D and the mold-roller A than would be attainable simply by the use of the dovetail slide shown in Fig. 4, the object of this nice adjustment being to deliver the molten metal from the funnel directly and wholly into the groove  $a$ , and not to either side thereof, where it would not only be itself wasted, but would also clog the machine.

A steel band, E, passing around the roller B and pulley C and wholly under the roller A, serves to transmit power from the pulley C to the roller B, and said pulley C may be revolved by any suitable appliance or power. But this band E is more especially intended for the purpose of confining the fused metal in the groove  $a$  after it has been rolled between the rollers A and B until such metal shall have cooled, the combination of the band and grooved or mold roller A forming a continuous mold. By the time the lead reaches the points of nearest juxtaposition of the roller A and pulley C it has cooled to a solid mass, and is discharged as a continuous strip or ribbon, F. After the ribbon F leaves the machine it is conducted to a suitable cutting attachment, (not shown,) where the lead is cut to the requisite lengths. The stripper G, against which the bottom of the groove  $a$  scrapes, is mounted on a standard,  $g$ , and



erves to strip the ribbon from the grooved mold-roller should that operation at any time become necessary—as, for example, when starting the machine, and before any ribbon has approached the cutting apparatus. By making the band E of steel it possesses the strength necessary to endure the requisite tension.

H is a band-tightener, of ordinary construction, for maintaining the proper tension in the band E. I is the furnace which fuses the metal and delivers it to the funnel through a suitable valve and spout. This furnace may be supported in part, as shown, by the standard D' through the funnel D. Motion is communicated to the machine by any suitable driving mechanism connected with the shaft of the pulley C. The outer face of the band E and the bottom of the groove *a* are covered with cloth, paper, or other non-conducting material, *e*, to prevent the too rapid chilling of the fused metal, such as would result from immediate contact with the metallic surfaces of the roller A and band E. The object of making the inside of the funnel of wood is also to prevent chilling of the lead prematurely.

The operation of the above-described embodiment of my invention may be summarized as follows: Fused lead alloy—such as is in common use for making printers' leads—runs in a continuous stream from the furnace into the funnel; thence between the roller A and band-covered roller B and wholly within the groove *a*, which groove regulates at this point the thickness as well as width of the ribbon in process of formation; thence under the roller A to the points of the roller A and pulley C which are in nearest juxtaposition, during which period the band E retains the gradually-cooling metal in the shape it acquired by its passage between the rollers A and B at their points of nearest juxtaposition; thence the lead, which by this time has solidified, is discharged from the machine in a continuous ribbon. Throughout its whole passage—from its entrance into the funnel to its discharge from the machine—the lead is protected from too rapid chilling by the non-conducting properties of the surfaces with which it comes in contact.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, as a mold, of a band and a roller having a groove, *a*, substantially as set forth.
2. The combination of a band and a roller provided with a groove, *a*, and a non-conducting surface, substantially as set forth.
3. A band and a roller having a groove, *a*, when arranged to form a mold, in combination with a roller, B, substantially as set forth.
4. The combination of a band, a roller provided with a groove, *a*, and a non-conducting surface, and a roller, B, substantially as set forth.
5. A band and a roller provided with a groove, *a*, in combination with a funnel hav-

ing a passage communicating with the passage formed by the grooved roller and band, substantially as set forth.

6. The combination of a band, a roller provided with a groove, *a*, and a non-conducting surface, and a funnel, substantially as set forth. 70

7. A band and a roller provided with a groove, *a*, in combination with a roller, B, and a funnel having a passage communicating with the passage formed by the grooved roller and band, substantially as set forth. 75

8. The combination of a band, a roller provided with a groove, *a*, and a non-conducting surface, a roller, B, and a funnel, substantially as set forth. 80

9. The combination of a band provided with a non-conducting surface and a roller provided with a groove, *a*, substantially as set forth. 85

10. The combination of a band provided with a non-conducting surface and a roller provided with a groove, *a*, and a non-conducting surface, substantially as set forth. 90

11. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, and a roller, B, substantially as set forth.

12. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, and a non-conducting surface, and a roller, B, substantially as set forth. 95

13. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, and a funnel, substantially as set forth. 100

14. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, and a non-conducting surface, and a funnel, substantially as set forth. 105

15. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, a roller, B, and a funnel, substantially as set forth. 110

16. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, and a non-conducting surface, a roller, B, and a funnel, substantially as set forth. 115

17. The combination of a band, a roller provided with a groove, *a*, and a funnel provided with a non-conducting surface, substantially as set forth. 120

18. The combination of a band, a roller provided with a groove, *a*, and a non-conducting surface, and a funnel provided with a non-conducting surface, substantially as set forth. 125

19. The combination of a band, a roller provided with a groove, *a*, a roller, B, and a funnel provided with a non-conducting surface, substantially as set forth.

20. The combination of a band, a roller provided with a groove, *a*, and a non-conducting surface, a roller, B, and a funnel provided 130



with a non-conducting surface, substantially as set forth.

21. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, and a funnel provided with a non-conducting surface, substantially as set forth.

22. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, and a non-conducting surface, and a funnel provided with a non-conducting surface, substantially as set forth.

23. The combination of a band provided with a non-conducting surface, a roller pro-

vided with a groove, *a*, a roller, B, and a funnel provided with a non-conducting surface, substantially as set forth.

24. The combination of a band provided with a non-conducting surface, a roller provided with a groove, *a*, and a non-conducting surface, a roller, B, and a funnel provided with a non-conducting surface, substantially as set forth.

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Witnesses:

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