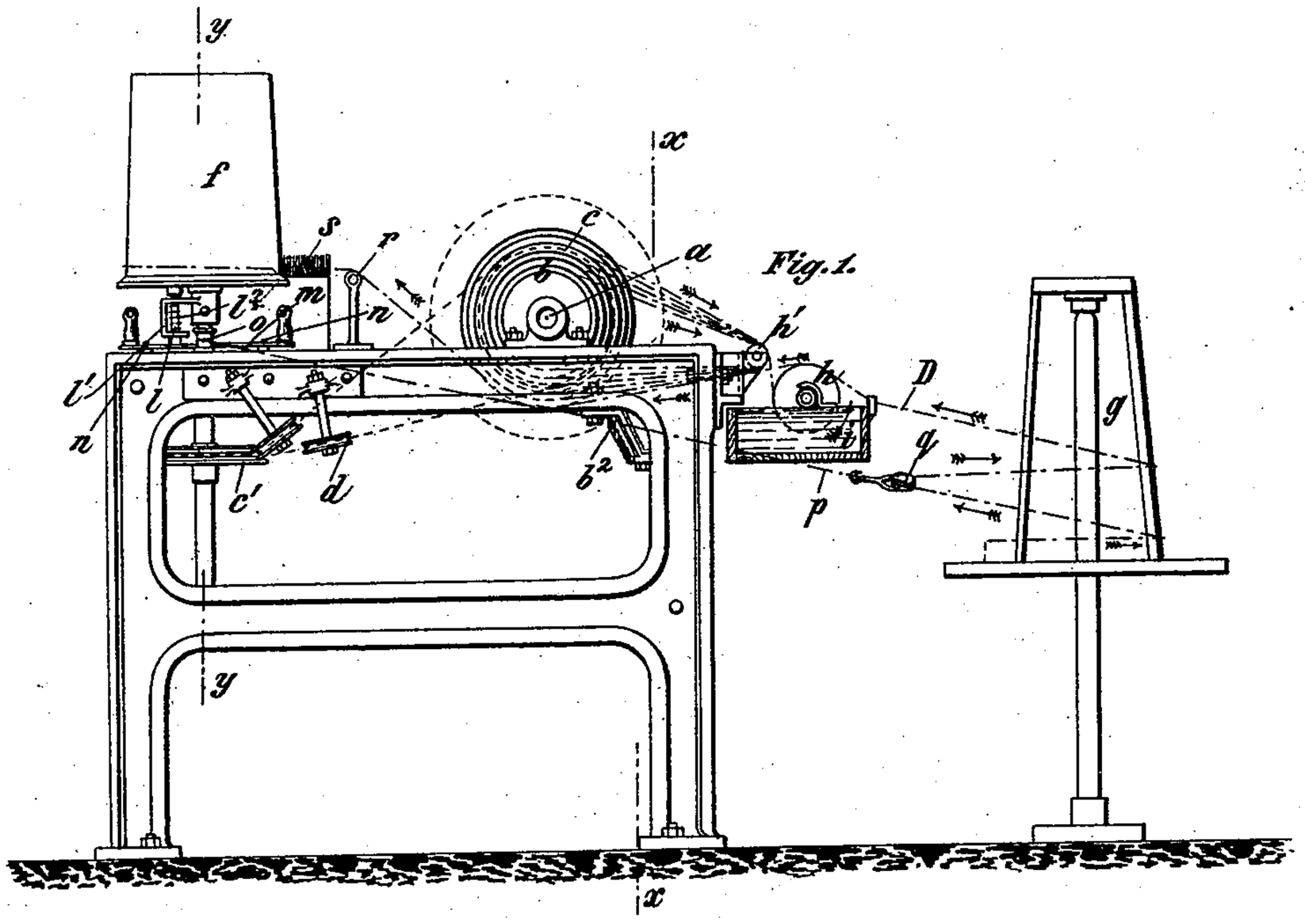
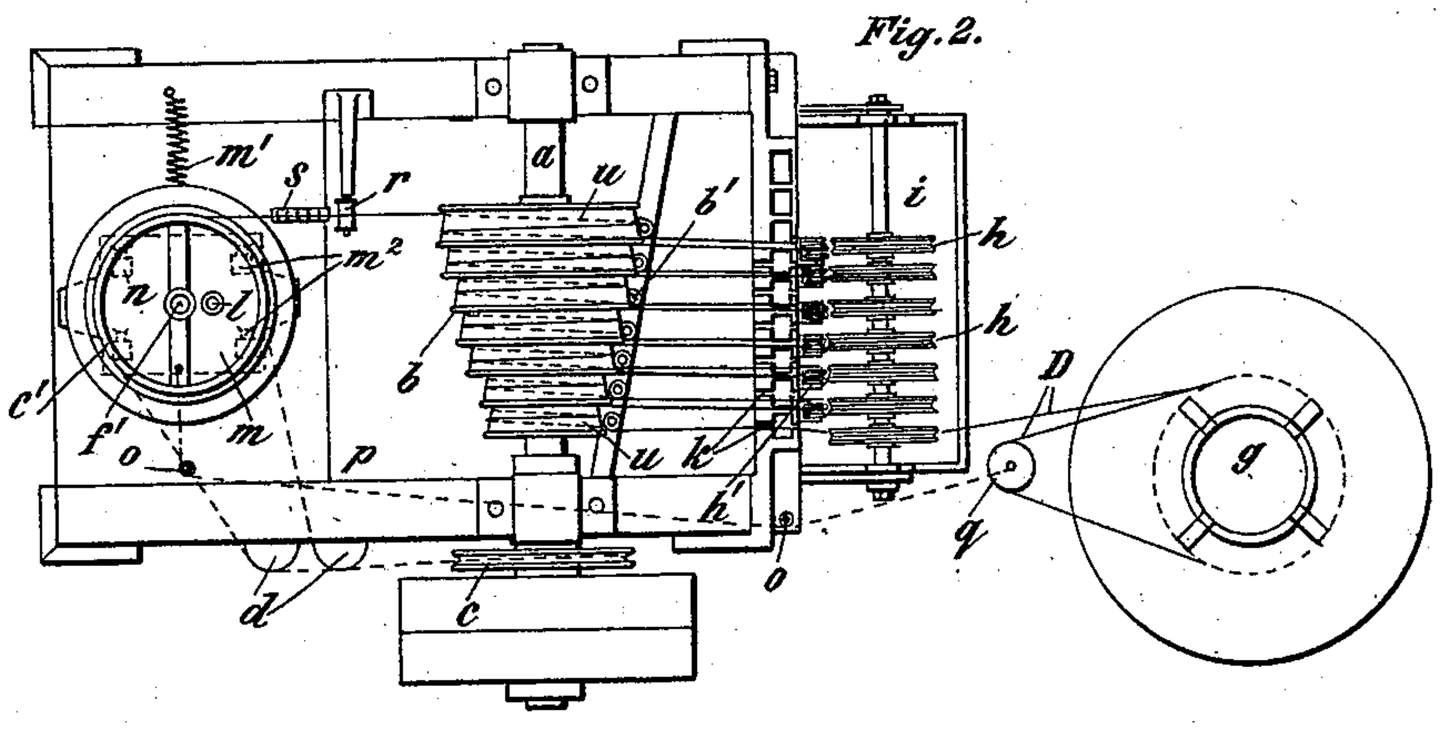
(No Model.) 2 Sheets—Sheet 1.

V. BERGMANN.

WIRE DRAWING MACHINE.

No. 549,051. Patented Oct. 29, 1895.





Witnesses:
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Richard I. Elliott

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

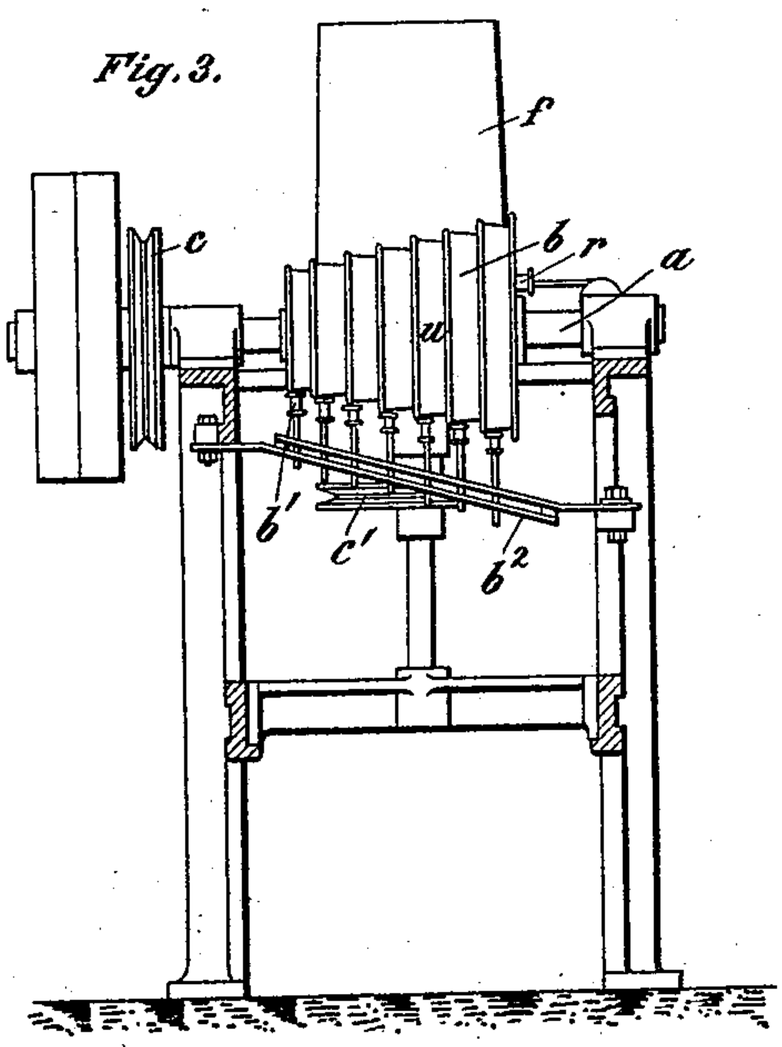


Fig. 4.

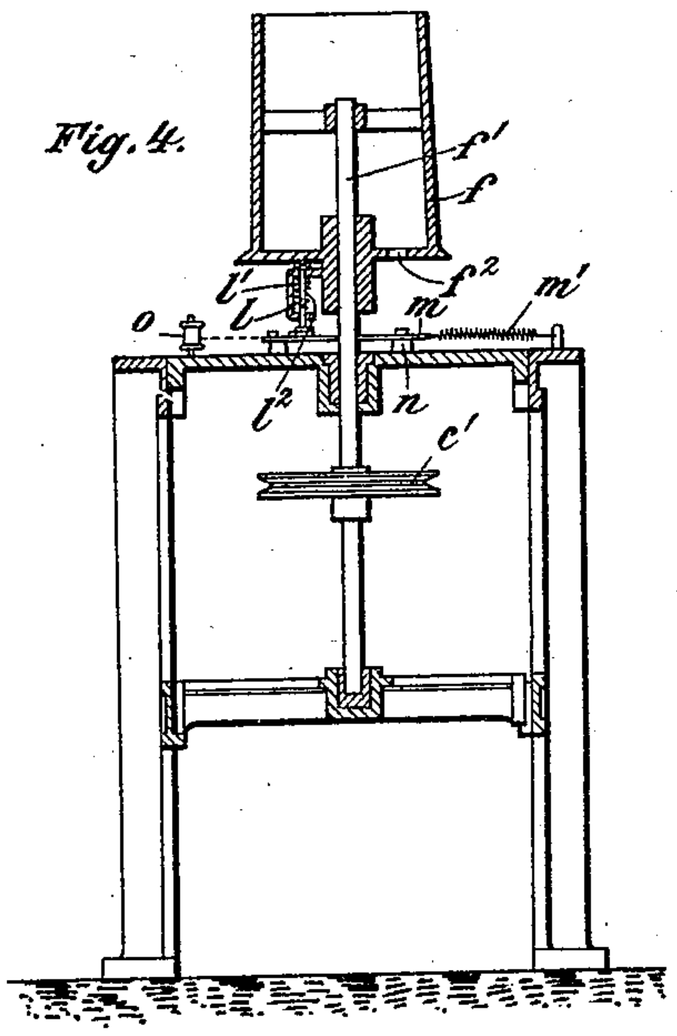
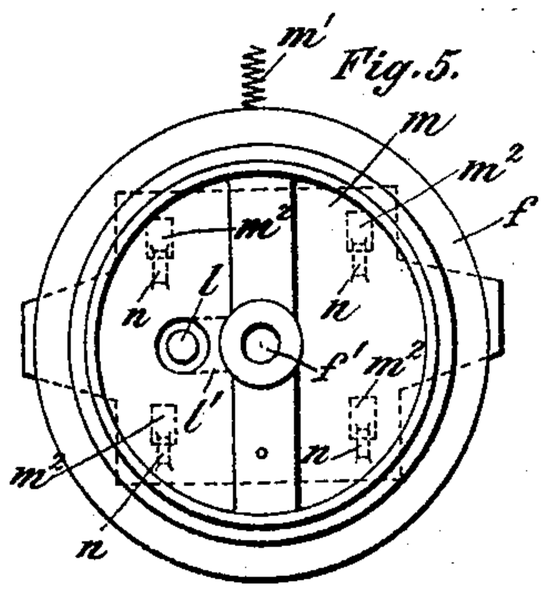


Fig. 5.



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UNITED STATES PATENT OFFICE.

VALENTIN BERGMANN, OF FEISTRITZ, AUSTRIA-HUNGARY.

WIRE-DRAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 549,051, dated October 29, 1895.

Application filed March 1, 1895. Serial No. 540,246. (No model.)

To all whom it may concern:

Be it known that I, VALENTIN BERGMANN, merchant, residing at Feistritz, in the Duchy of Kärnten, Austria-Hungary, have invented a new and useful Improved Wire-Drawing Machine, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention is an improvement in wire drawing and winding machines; and it consists in the improved stop mechanism for winding-drums and in the improved construction of the drawing or tightening rollers. Its objects are to provide an automatic stop mechanism for the winding-drums to prevent the wire breaking or snapping off, and also to prevent the drawing or tightening rollers from being cut.

In order that my invention may be clearly understood and more easily carried into practice, I have appended the accompanying sheets of drawings, which illustrate one mode of carrying the invention into practice.

Figure 1 is a side view of a complete wire-drawing machine; Fig. 2, a plan view thereof; Fig. 3, a vertical section on line $x\,x$ of Fig. 1; Fig. 4, a vertical section on line $y\,y$ of Fig. 1; Fig. 5, a detail drawn on an enlarged scale.

The stop mechanism stops the winding-drum before the wire snaps, should a knot form in the wire when it is being coiled on the reel, so that by the use of such mechanism the principal causes of the tearing or breaking of the wire are fully obviated.

f is the winding-drum; f', its supporting shaft, on which is keyed pulley c'.

a is the main shaft, on which are keyed the drawing-roll b and pulley c.

i is a bath-box, in which are a series of glass guide pulleys h, mounted on a shaft.

k are the draw-plates; g, the reel on which the wire to be drawn is placed.

Motion is imparted to the winding-drum f from the driving-shaft a by a rope passing over pulleys $c\,c'$.

The wire D as it leaves reel g passes over the first pulley h and through the first draw-plate k to a guide-roller b', to and over the drawing-roller b, and back by another guide-roller b' to and around the second pulley h in trough i, through the next draw-plate k, then over the next guide-roller b', drawing-roller b, and roller h', &c., in order to be passed again through the bath in trough i, &c. In this manner the wire is alternately passed through the bath and around the draw-roller a number of times equal to that of the draw-plates in use and finally led over roller r through reed s and wound on the winding-drum.

The winding-drum f is loosely mounted on shaft f' and is detachably coupled thereto ordinarily by a pin l, mounted in a bracket-arm l', secured to shaft f below the drum, said pin being normally pressed up into engagement with a socket f^2 in the bottom of the drum by a movable plate m, arranged below the drum and resting upon studs n on the top plates of the machine. Plate m is connected by a cord p, passing over rollers e, with a sheave q, through which the wire is passed immediately after its running off the reel g, this wire, however, being once more passed around the reel before it reaches the first glass pulley h. (See Figs. 1 and 2.) Should a knot be found in the wire or should the wire become entangled on the reel, the sheave q, and hence the cord p, are drawn toward the reel g, thereby drawing plate m as soon as this pull overcomes the tension of the spring m', which constantly draws the plate m in the position shown in Fig. 2, to one side until the studs n enter slots m^2 in the plate, whereupon the latter drops down, and the pin l, being unsupported, is thrown out of engagement with socket f^2 by the spring l^2, and the drum will be thus stopped before the tension on the wire has increased to such an extent as to cause it to break.

If desired, a piece of india-rubber can be arranged at the inner side of the trough in position to wipe the wire as it comes from the trough and brush the liquid adhering thereto back into the trough. Thus the wire will be clean and dry when it reaches the draw-plates and will appear more highly finished.

To prevent the drawing-roller b being cut by by wire, it is made of the shape shown in Figs. 2 and 3—that is, it is constructed as a stepped cone-pulley, with a number of steps u corresponding to the number of draw-plates required. Each step u, moreover, is slightly tapered, so that its diameter is less at the side

toward the largest end of the cone-pulley. The wire is led to the largest diameter of a step and slides, while running one or more times around the same, laterally over the surface of the step until it reaches the point whence it can pass to the next roller h'. In this manner the various steps are uniformly acted upon in all parts of their periphery, and thus the risk of their being cut by the wire is fully obviated. The guiding-rollers b' are so arranged that the running edge of each of the latter is in the plane of the largest diameter of the relative step u. These rollers are carried by a common frame b^2. The relative proportions of the various steps are such that the wire which is stretched an additional given length at each draw-plate is coiled on a step which has a correspondingly greater periphery.

What I claim, and desire to secure by Letters Patent, is—

1. In a wire drawing machine, the combination of wire drawing mechanism, a drum upon which the finished wire is wound, loosely, mounted on a rotating shaft, and a clutch device whereby said drum can be disengaged from the shaft; with a movable guide for the wire, and flexible connections between said guide and the clutch controlling device whereby the clutch will disengage the drum from the shaft and allow the latter to stop if the wire kinks or catches in the guide, substantially as described.

2. The combination in a wire drawing machine, of a reel, a draw-plate, a drawing roller, and a winding drum; a shaft for rotating said drum, and a clutch for engaging or disengaging it from the shaft; with a guide for the wire, and connections between said guide and clutch, whereby the clutch is disengaged if the wire catches in the guide, substantially as and for the purpose described.

3. In a wire drawing machine the combination of the reel, the draw plates, the drawing roller, the winding drum, its driving shaft, the bolt for locking the shaft to the drum, and the plate for upholding said bolt, with the guide for the wire, and the flexible connection between said guide and the plate, all substantially as described.

4. In a wire drawing machine the combination of the bath, the rollers therein, the stepped cone drawing roller, having tapered steps u, substantially as and for the purpose described, the draw-plates between said roller and bath, and the sets of wire guide rollers b' and h', all substantially as described.

5. In a wire drawing machine, a stepped-cone drawing roller b having tapered steps u substantially as and for the purpose described in combination with wire guide rollers at the side of the drawing roller whereby the wire is so guided as to be uniformly distributed in one or more coils over the whole periphery of each step u so as to work or act laterally and uniformly thereon, substantially as described.

6. In a wire drawing machine the combination of the bath, the rollers therein, the conical stepped drawing rollers, the draw-plates between said roller and bath, and the wire guide rollers b', h' substantially as described; with the drum, its winding shaft, the clutch connection between said shaft and drum; the wire guide sheave, and the connections between said sheave and the clutch devices, all substantially as and for the purpose described.

7. The herein described wire drawing machine, consisting of the reel, the bath, the guide rollers therein, the stepped drawing roller, the guide rollers and draw plates intermediate the drawing roller and bath; the winding drum, its shaft, the spring plate, the devices for locking the drum to the shaft controlled by said plate; the wire-guide roller, and the connection between said roller and plate, all constructed and arranged substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

VALENTIN BERGMANN.

Witnesses:
ANDREAS STANGL,
FRANK H. MASON.