(No Model.)

W. WALLACE.

MACHINE FOR DRAWING WIRE.

No. 367,733. Patented Aug. 2, 1887.

Fig. 1

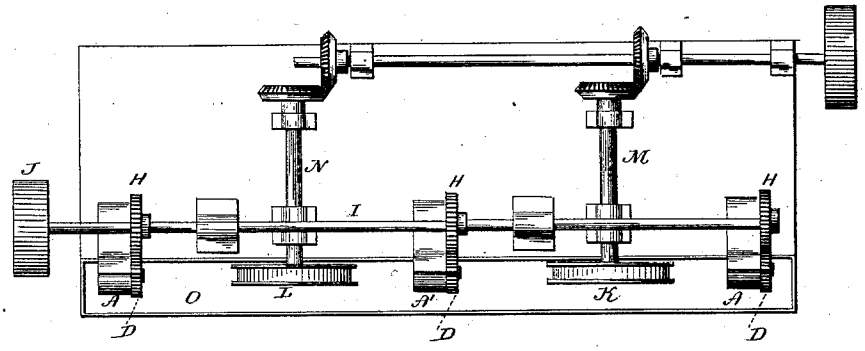


Fig. 2

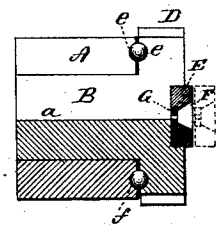


Fig. 3

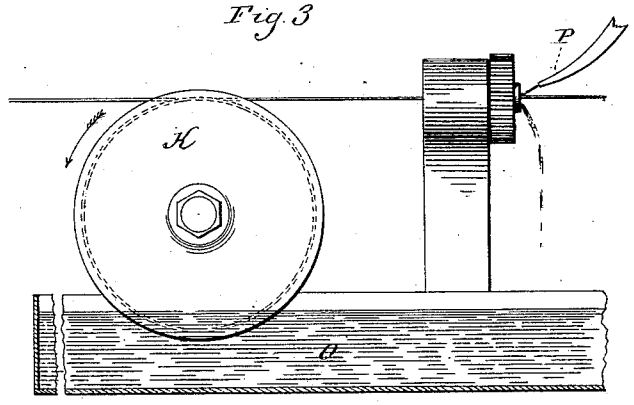


Fig 4

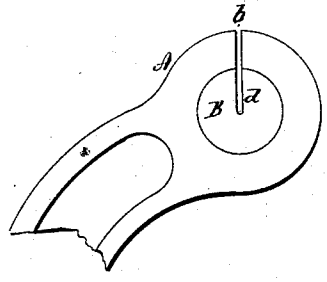
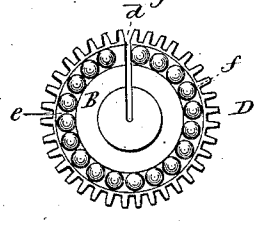


Fig 5



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UNITED STATES PATENT OFFICE.

WILLIAM WALLACE, OF ANSONIA, CONNECTICUT, ASSIGNOR TO WALLACE & SONS, OF SAME PLACE.

MACHINE FOR DRAWING WIRE.

SPECIFICATION forming part of Letters Patent No. 367,733, dated August 2, 1887.

Application filed January 24, 1887. Serial No. 225,264. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WALLACE, of Ansonia, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Drawing Wire; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a top or plan view of the machine; Fig. 2, a longitudinal section through one of the bearings, revolving head, and die, the section cutting through the longitudinal slot in the head and bearing enlarged; Fig. 3, a front view showing a single bearing and head, with one of the drums and the bath in section; Fig. 4, an end view of the bearing and head opposite the die; Fig. 5 an end view of the bearing detached, looking toward the series of anti-friction balls.

This invention relates to an improvement in machinery for drawing wire, and particularly to that class in which the die through which the wire is drawn is caused to revolve, the wire passing through the die in its axis of revolution, and with special reference to that class of wire-drawing machines in which several such revolving drawing-dies are employed, distant from each other, and of gradually-diminishing diameters, so that the wire passing through one revolving die is reduced one step, then passing through the second die is further reduced, thence passing through the third revolving die is still further reduced, and so on until the wire is reduced to any desired or practical extent.

In the usual construction of this class of wire-drawing machines the hole through the die is jeweled—that is to say, a jewel pierced to the required diameter is set in a die-block, so that the jewel presents a reducing-surface to the wire. The die-block is set in a revolving head, having a concentric opening through it in line with the drawing-die. Several such revolving heads are employed in each machine. The wire being received from the reel at one end is run through the several reducing-dies, which are all in line with each other, to the opposite end of the machine, where it is wound upon the wire-block.

In drawing wire with this class of machines it frequently occurs that the operator desires to remove the wire from one or more of the revolving heads to examine the heads themselves, or to permit him to carefully examine the dies. In the usual construction of the machines it is necessary to cut the wire when such removal is desirable.

The object of my invention is to construct the heads and bearings in which they revolve so that the wire may be taken from the heads without cutting.

In illustrating my invention I represent a series of three reducing-dies. A represents the bearing in which the first head is arranged, A′ the bearing in which the second head is arranged, and A^2 the bearing for the third head. In Fig. 2 one of these bearings is shown enlarged.

A represents the bearing, B the head, which is of cylindrical shape, and the bearing of corresponding shape, as seen in Fig. 4. Each head is attached to or formed as a part of a pinion, D, by means of which the head is caused to revolve.

E represents the die-block, which is arranged in a concentric cavity in the head. In the die-block the jewel F is set in the usual manner, the jewel being pierced with a hole of required diameter. The face of the die-block presents a funnel-shaped mouth, G, to the face of the jewel. Concentrically through the head B is an opening, *a*, corresponding to the hole in the die, but somewhat larger in diameter, and through which the wire will run.

The several heads are caused to revolve by gears H on a shaft, I. The said gears correspond and work into the pinions D on the heads, power being applied to the shaft I through the pulley J or otherwise, so that a constant revolution of the heads may be maintained.

K is the drum which is arranged between the first and second revolving dies, and L the drum which is arranged between the second and third revolving dies. These drums are fixed to their respective shafts M N, the axes of which are at right angles to the axes of the

dies, the drums standing so that their periphery is in line with the dies, as seen in Fig. 3, and preferably these drums run in a bath, O, below.

Longitudinally through the bearing a narrow radial slot, *b*, is cut, extending to the center, as seen in Fig. 4, and through the head a like longitudinal radial slot, *d*, is cut, as seen in Fig. 3. The slot *d* should be between the teeth of the pinion D, as seen in Fig. 5, and so that when the slot *d* in the head registers with the slot *b* in the bearing there will be an open passage through the bearing and head to the center.

The die-block sets freely into the recess in the face of the head, so that it may be readily withdrawn when occasion requires.

Whenever it is required to remove the dies or wire from the heads, the die-block is withdrawn from the head, as seen in broken lines, Fig. 2, the wire being returned or drawn backward sufficiently far to permit this withdrawal of the die-block. Now the wire, with die-block and die upon it, may be lifted or taken out through the slots, and after the examination is made, or the object accomplished for which it was removed, the wire may be returned through the same slots, and the die-block, with its dies, set to place, and this removal and replacement is accomplished without cutting the wire.

To resist the drawing strain the head is enlarged back of the bearing so as to rest against the bearing, as seen in Fig. 2. To overcome the great friction between the adjacent resisting surfaces of the head and bearing, I form in each of said surfaces an annular or concentric groove, *e*, and into these grooves I place a series of hard spheres or balls, *f*, as seen in Figs. 2 and 5. These balls correspond to the groove, and are of such diameter that the head bears entirely against the balls without positive frictional contact with the bearing, and as the heads revolve the balls roll around the annular groove and produce an anti-frictional device between the head and bearing.

To prevent the accumulation of any foreign substance in the die, or any tendency to clog, I arrange an injector-nozzle, P, near the face of each die-block, as seen in Fig. 3, and directed into the mouth of the die. Through this injector I force a stream of water or other cleansing-fluid, as indicated in Fig. 3, and under sufficient force to drive from the face of the die and the mouth of the die-block any foreign material which may be there, and thus I avoid the difficulties arising from such accumulation of foreign substances at the die.

I claim—

In a wire-drawing machine substantially such as described, the combination of a revolving head having a longitudinal concentric opening through it, a bearing in which said head is arranged to revolve, a removable drawing-die concentrically arranged in said head, the head constructed with a longitudinal slot opening into the passage through the head, and the bearing provided with a corresponding slot, substantially as described.

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