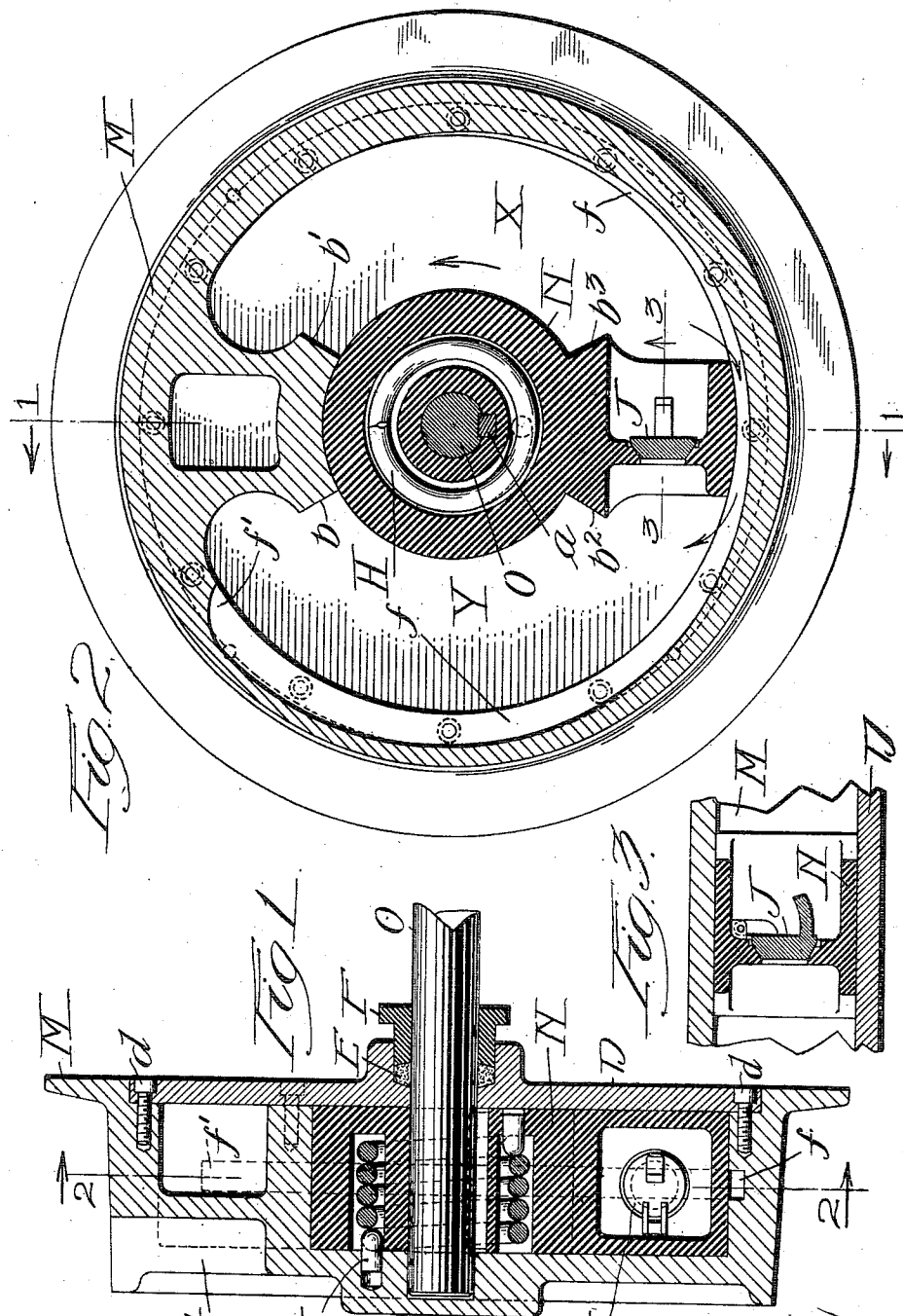


P. P. MONFILS.
 WIRE DRAWING BLOCK.
 APPLICATION FILED OCT. 17, 1910.

995,548.

Patented June 20, 1911.



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WIRE-DRAWING BLOCK.

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Specification of Letters Patent. Patented June 20, 1911.

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To all whom it may concern:

Be it known that I, PHILIAS P. MONFILS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Wire-Drawing Block, of which the following is a specification.

This invention relates to a wire drawing block. Many devices have been invented for the purpose of avoiding the shock to which wire drawing blocks as ordinarily made are subjected at the beginning of the wire drawing operation, and to permit the block to gradually come up to speed. The desirability of such an invention is well understood, but heretofore so far as I am aware it has not been attained in a practical manner.

The principal objects of this invention are to provide a construction in which the block cannot be started suddenly at the full speed of the spindle, but will necessarily start very slowly and gradually, increase or accelerate until it has attained the full speed of the spindle, and will then continue to run absolutely at full speed until the end of the wire being drawn has passed through the die or until the block is brought to a stop for some other reason; to provide practical and efficient means whereby the block will of itself return to its starting position ready to start gradually as above specified; to provide a construction which will be simple and mechanical and will be always in condition to repeat the above mentioned operation as often as it is stopped and started; to provide simple and practical means whereby the breaking of the wire caused by the shock of starting the block at full speed of the spindle, as is now the common practice, will be entirely avoided, thus saving much wire and time during the wire drawing operation; and to provide means whereby the speed of the wire drawing operation can be greatly increased thereby materially increasing the out-put of each block, a condition now prevented by the fact that the speed at which the wire drawing blocks can be run is limited by the sudden shock a given sized wire can stand at starting without breaking.

The invention also involves improvements in details of construction as will appear hereinafter.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a central, vertical, sectional

view of a wire drawing block constructed in accordance with this invention; Fig. 2 is a vertical, sectional view thereof on the line 2—2 of Fig. 1, and Fig. 3 is a sectional view on the line 3—3 of Fig. 2.

The invention is illustrated in a form in which the block M is exteriorly of the same shape as is now used in common practice. It is provided at G with a seat or shelf having means, not herein illustrated, for attaching the wire to the block. It is mounted to rotate on the spindle O and the device is provided with a chamber for containing the mechanism described. In the form shown this chamber is inside the hollow block, but it might be located below it at any point along the spindle. The block is provided with a plate D secured in position by screws or the like d. This plate is intended to fully seal the chamber so as to be perfectly tight. To assist in this a stuffing box E and gland F are illustrated for preventing leakage around the spindle.

One or more abutments b and b' are provided and located adjacent to the seat G. Otherwise the chamber is of substantially circular shape with the center of the spindle as an axis. Outside this circular chamber, but communicating with it all around, is a groove f which gradually increases in size from one side of this chamber near b to the other near b'. This groove ends at f' at the extreme side of the chamber. This chamber is filled with oil or other suitable fluid and is divided into two parts X and Y by means of an interior arm or member N. This is hung concentrically on the spindle O and keyed thereto by a key a so that it moves positively with the spindle. The arm extends out radially and fills the chamber radially all except the eccentric passage f. It is provided with two abutments b² and b³ adapted to engage the abutments b and b' respectively in its extreme positions. It is also provided with a port closed by a clap valve J pivoted at the top and operating in an obvious manner. The block proper M and the internal member N are connected only by a spring H which is contained in a recess in the latter and is connected at each end with one of these members.

In operation, the spring H brings the block around so that the abutments b and b² are in contact, and the chamber X now constitutes almost the entire area of the hollow portion of the block. The end of the wire

to be drawn, after being pointed and passed through the die in the usual manner, is fastened to the block and held securely by any usual clamping device at G (not shown). The spindle O is then started at full speed. The member or arm N being keyed upon said spindle as stated, immediately starts at full speed in the direction of the arrow in Fig. 2. The pressure of the liquid of course closes the valve J and as the arm starts from the position just indicated, it will be seen that a large flow of fluid is allowed to pass the end of the arm through the passage *f* which at this point is very large. However, even at first, the amount of fluid passing through is limited, so pressure is transmitted from the arm N through the body of fluid in the chamber X to the block. This starts the block gradually and as the arm is attempting to rotate faster than the block it of course will gradually catch up with the block, and as it does so, the flow of fluid through the passage *f* will be gradually decreased as the arm passes along the gradually decreasing passage *f*. When the relative positions of the arm N and block M are such that the two abutments *b'* and *b³* are nearly in contact the passage *f* is decreased to nothing, and there is no further escape of fluid except what may leak by, and from that time on the two parts rotate together as one piece, although as long as there is any escape of liquid by the arm N the abutments *b³* and *b'* will continue gradually to approach. It will be immaterial, however, whether they actually ever touch each other or not, but ordinarily they will. In any event the parts gradually approach a relatively fixed position so that there is absolutely no shock. This results in bringing the block M up to the full speed of the spindle without subjecting the wire to any shock whatever. During this operation the spring H is put under tension.

When the end of the wire being drawn has passed through the die, thereby releasing the pressure, the spring H will begin to act to return the parts to their normal original position and the abutments *b'* and *b³* will be drawn apart and the abutments *b* and *b²* together. This spring, of course, is so arranged that when the parts are brought around to their normal working position the spring is brought into tension and thereby causes a backward pull to be exerted between the two members, not sufficient however to prevent their operation as just described, but assisting in some degree the prevention of a shock. However, the main function of this spring is to bring the parts back to their stopping position as just specified. The operation of bringing the parts back to their normal position is facilitated by the valve J which, when the liquid flows back through it, automatically opens to per-

mit a rapid flow into the chamber Y. It will be seen therefore that by this invention, the spring H being used almost entirely for the purpose of bringing the parts back to their starting position, the objects hereinbefore described have been arrived at without the use of the ordinary springs employed for relieving shock, and in a very positive and efficient manner, and yet with very little mechanism or other complications.

While I have illustrated and described a preferred embodiment of the invention I am aware that many modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction herein shown and described, but

What I do claim is:—

1. As an article of manufacture, a wire drawing device comprising two relatively rotatable elements and having a chamber adapted to contain liquid and divided into two parts by one of said elements, whereby each of said parts will be contracted by the relative rotation of the elements in one direction and expanded by the opposite rotation, said two parts of the chamber having a port connecting them for permitting liquid contained in one to flow into the other, and a self-closing valve for controlling said port adapted to be closed by the flow of the liquid in one direction, and to be opened by the flow of liquid in the other, said device also having a passage connecting the two parts of the chamber, whereby the liquid flowing through said port may return, said passage extending around a portion of the interior circumference of the chamber and gradually increasing in cross sectional area from one side to the other.

2. As an article of manufacture, a wire drawing device comprising a hollow member and an interior member relatively rotatable therein and dividing the interior of the hollow member into two chambers having a passage between them for permitting liquid contained in one of said chambers to flow into the other when said inside member rotates in the hollow member, said passage extending around a portion of the interior circumference of the chamber and gradually increasing in cross sectional area from one side to the other, whereby as the inner member rotates toward the smaller end of said passage the flow of liquid will be gradually cut off.

3. As an article of manufacture, a wire drawing device comprising a hollow block and an interior member relatively rotatable therein and dividing the interior of the hollow member into two chambers having a passage between them for permitting liquid

contained in one of said chambers to flow into the other when said inside member rotates in the outer member, said passage extending around a portion of the interior circumference of the chamber in the outer member and gradually increasing in cross-sectional area from one side to the other, said inner member having a passage therethrough, and a valve for said passage adapted to freely open toward the smaller side of the first named passage, and to automatically close in the opposite direction.

4. In a wire drawing device, the combination with a rotatable shaft, of a member fixed thereon, an exterior hollow member rotatably mounted on said shaft having a chamber for receiving the first named member concentric with said shaft but having an eccentric passage for the liquid beyond the end of the inner member, said inner member fitting the chamber radially except for said passage.

5. In a wire drawing device, the combination with a rotatable shaft, of a member fixed thereon, an exterior hollow member rotatably mounted on said shaft adapted to receive the wire to be drawn and having a chamber for receiving the first named member, concentric with said shaft but having an eccentric passage for the liquid beyond the end of the inner member, said inner member fitting the chamber radially except for said passage, and having a free passage therethrough larger in cross section than the cross section of the first named passage, and a valve for said passage in the inner member constructed and adapted to close automatically when the liquid in the chamber attempts to flow toward the larger end of the first named passage, and to open automatically when the liquid attempts to flow in the opposite direction.

6. In a wire drawing device, the combination with a rotatable shaft, of a member fixed thereon, an exterior hollow member rotatably mounted on said shaft and having a chamber for receiving the first named member, said outer member having means on the outside thereof for attaching the wire to be drawn, the chamber in the outer member being concentric with said shaft but having an eccentric passage for the liquid beyond the end of the inner member, said inner member fitting the chamber radially except for said passage, and yielding means for normally bringing the inner and outer members to starting position when pressure is removed from the outer member.

7. In a wire drawing device, the combination of an operating shaft, an arm fixed thereon, a hollow block for the attachment of the wire rotatably mounted on said shaft, a spring connecting said block and arm, said block having a chamber therein, said arm being located in and filling said chamber radially and rotatable therein, said block having a passage therein beyond the arm for permitting liquid to flow from one side of the arm to the other in the chamber in the block.

8. In a wire drawing device, the combination of an operating shaft, an arm fixed therein, a hollow block for the attachment of the wire rotatably mounted on said shaft, a spring connecting said block and arm, said block having a chamber therein provided with two abutments, said arm being located in and filling said chamber radially and rotatable therein, and having two abutments adapted to engage the abutments on the block in the two extreme positions of the block with respect to the arm, said block having a passage therein beyond the arm for permitting liquid to flow from one side of the arm to the other in the chamber in the block, said passage gradually widening from a point near one of the abutments on the block to a point on the opposite side near the other abutment.

9. In a wire drawing device, the combination of an operating shaft, an arm fixed thereon, a hollow block for the attachment of the wire rotatably mounted on said shaft, a spring connecting said block and arm, said block having a chamber therein provided with an abutment, said arm being located in and filling said chamber radially and rotatable therein, and having an abutment adapted to engage the abutment on the block in the extreme position of the block with respect to the arm, said block having a passage therein beyond the arm for permitting liquid to flow from one side of the arm to the other in the chamber in the block, said arm having a passage or port therethrough, and a freely opening valve for said port adapted to automatically close when the block moves in one direction, and to open when it moves in the other.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

PHILIAS P. MONFILS.

Witnesses:

ALBERT E. FAY,
C. FORREST WESSON.