July 29, 1924. 1,503,165

W. F. LAUTENSCHLAGER

MICROMETRIC CONNECTION

Filed Dec. 1, 1922

Fig. 1.

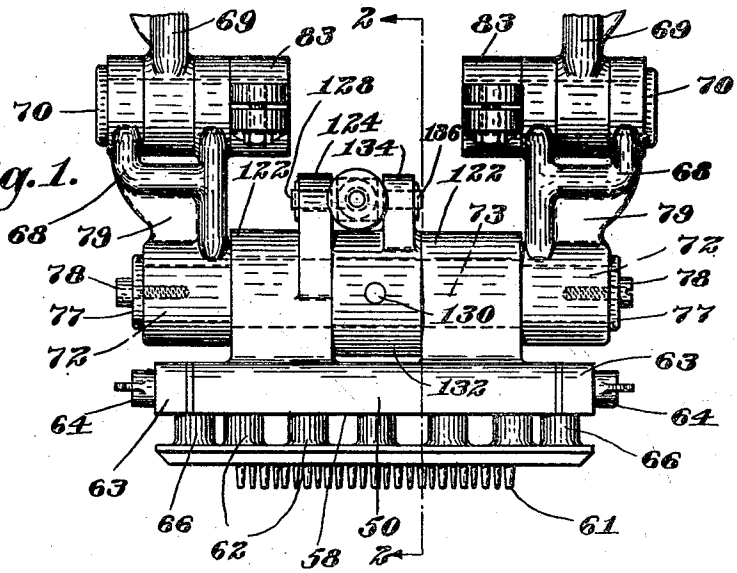
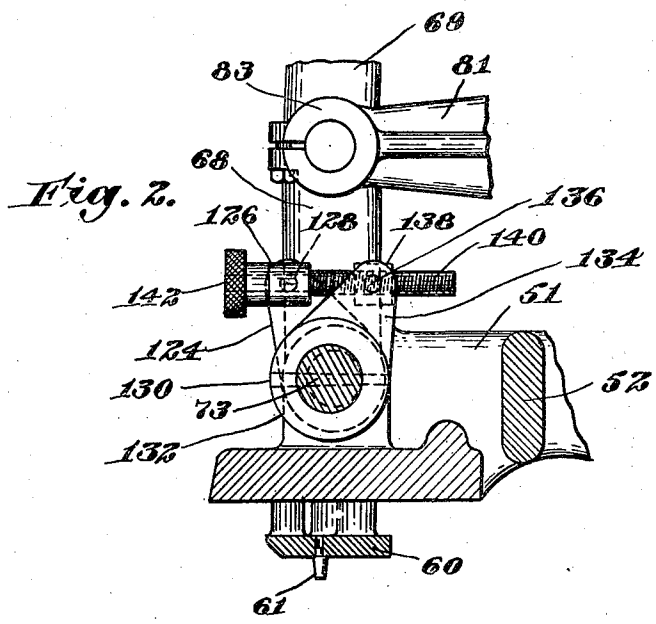


Fig. 2.



Inventor
William F. Lautenschlager

by Francis J. V. Dakin
Attorney

Patented July 29, 1924. 1,503,165

UNITED STATES PATENT OFFICE.

WILLIAM F. LAUTENSCHLAGER, OF CINCINNATI, OHIO, ASSIGNOR TO THE PEERLESS MACHINERY COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MICROMETRIC CONNECTION.

Application filed December 1, 1922. Serial No. 604,347.

To all whom it may concern:

Be it known that I, WILLIAM F. LAUTENSCHLAGER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Micrometric Connections, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a micrometric connection for minutely adjusting the relation of two parts of a machine to each other, and is designed with special reference to perforating machines of the type shown in an application filed by me in the United States Patent Office November 3, 1921, Ser. No. 512,609, (now Letters Patent No. 1,434,060 issued Oct. 31, 1922) in which it is employed for adjusting micrometrically the plunger with relation to its operating mechanism.

In perforating machines of the above character, the plunger is arranged to carry a die-plate, which is provided with a multiplicity of tube dies set therein and projecting therefrom and arranged to perforate a complete design. Tube dies of this character are comparatively delicate, easily injured or broken, and very expensive. It requires skill and experience to so adjust the machine that the dies will perforate a clean pattern and yet not be injured by too forcible contact with the work-supporting plate. As a general rule, a strip of soft brass or other suitable material is arranged upon the work-supporting plate to receive the cutting edges of the tube dies, and sometimes a backing strip of paper is interposed between the brass plate and the work to obviate injury to the dies; but even these precautions will not prevent injury, if there is an improper adjustment of the plunger with relation to the operating mechanisms, and the plunger is adjusted too far downwardly. It is desirable and necessary, therefore, in machines of this character to have as delicate and fine an adjustment as possible between the die-carrying plunger and its operating mechanism, in order to secure clean cutting and yet avoid damaging the dies.

The main object of my invention is the provision of a simple and efficient connection between the plunger and its operating means, whereby the relation of these two parts may be micrometrically adjusted.

Other objects of the invention will be more specifically described and set forth hereinafter.

My invention in its preferred form contemplates the provision of a member for connecting the two parts of the machine, said member having a main portion upon which is mounted one of the parts, and a subordinate portion upon which is mounted the other part of the machine (the subordinate portion being in eccentric relation to the main portion), and means for rotating the connecting member to vary the relation between the two parts of the machine. The amount of the eccentricity which the subordinate part bears to the main part may, of course, be varied to suit the range of adjustment desired in the machine. The rotation of the connecting member is preferably secured by a screw lying tangent to the arc of rotation.

In the drawings illustrating the preferred form of my invention, Fig. 1 is a front elevation of a portion of a perforating machine, showing a connection constructed in accordance with my invention and used for connecting the plunger of the machine with its operating mechanism; and Fig. 2 is a sectional view on line 2—2 in Fig. 1, looking from right to left.

In the drawings illustrating the application of my invention to the perforating machine shown in my application hereinbefore referred to, there is shown a portion only of the machine, comprising a part of the plunger and adjacent parts of its operating mechanism. For convenience, the parts shown herein and taken from my prior application are designated by the same reference numerals used in that prior application, to which reference may be made for a more complete description of the entire machine and its mode of operation.

Referring to the drawings, 50 designates a plunger head carried by two arms 51, connected together by a cross-piece 52. The plunger head 50 carries a die comprising a plate 60 provided with a plurality of tube dies 61 of ordinary construction, set in the plate and arranged in a design, and to permit the material cut out by the tube dies to

pass up through the dies and the plate 60 and then to escape, the latter is provided with a series of lugs 62, adapted to engage the face 58 of the plunger head when the die is arranged in position and to hold the plate 60 away from the plunger head. For holding the die in position on the plunger head, the latter is provided with two ears 63, one on each end; each ear being adapted to be forced toward the end of the plunger head by a butterfly headed screw 64 threaded therethrough and into said end in order to contract a dowel hole cut partly out of the end of the plunger head and partly out of the ear and located at the base of the ear to grip a dowel 66 formed on the back face of the die-plate 60.

Part only of the operating means is shown in the drawings, comprising the lower portions of two toggle-joints made up of lower arm 68 and upper arm 69, loosely hinged together on a shaft 70, the upper portion of the lower arm being bifurcated to receive the lower portion of the upper arm. The arms 68 and 69 may be reinforced by webs 79. The toggle-joints are shown as operated by pitmans 81, each pitman having its end in the form of a split collar 83 adapted to encircle the inner end of one of the shafts 70, the junction of the toggle-joint.

The two lower arms 68 at their lower end are suitably formed to each receive one end 72 of a shaft 73, which is rotatably mounted in bearings 122 in the upper part of the plunger head 50, the arms 68 being locked in place by washers 77 and screws 78. The ends 72 of the shaft 73 are arranged eccentrically with respect to the main body 73 of the shaft, so that by turning the shaft 73 the plunger head may be moved within certain limits, dependent upon the amount of the eccentricity, upwardly and downwardly in relation to the toggle-joints.

The novel feature of my invention resides in the means provided for rotating the shaft 73, in order to adjust the relation of the plunger to its operating mechanism. In the form of the invention shown in the drawings, one of the bearings 122, integral with the plunger head, in which the shaft 73 is mounted, is provided with an upwardly extending arm 124 carrying on its inner side a collar 126, loosely mounted on a pin 128 set in the arm 124. Between the two bearings 122 there is mounted on the shaft 73, and secured thereto by a key 130, a collar 132 provided with an upwardly extending arm 134, in which is set a pin 136 carrying loosely a threaded block 138.

The collar 126 is provided with a through and through bore in which is loosely mounted an adjusting screw 140, having a reduced portion fitting the said bore. A knurled head 142 may be secured on the finger end of the screw 140, and the screw is locked against longitudinal movement in said collar by the head 142 on one side and by the enlarged threaded portion of the screw upon the other side. The adjusting screw is threaded through the block 138.

The device is operated by merely turning the screw 140 in one direction or the other thereby moving the block 138 and arm 134 either toward or away from the fixed arm 124 and in consequence rotating the shaft 73 in one direction or the other. This rotation raises or lowers the eccentric ends 72 of the shaft 73 in relation to the center of the shaft and thereby raises or lowers the plunger head in relation to the arms 68. By providing the screw 140 with a fine thread adjustment to a microscopical degree is possible.

Although my device is designed with particular reference to perforating machines, yet it is capable of use in other environments for adjusting the relation between various mechanisms where a microscopical adjustment is necessary or desirable. The invention is not to be limited to the exact form herein shown and described since it may be embodied in other forms of construction all within the scope of the following claims.

What I claim is:—

1. In a perforating machine, the combination of a die-carrying plunger, means for operating said plunger, and means for adjusting the relation between said plunger and said operating means; said means comprising a shaft having a main portion and an eccentric portion, said plunger being mounted on one of said portions and said operating means being connected to the other of said portions, an arm fixed to the main portion of said shaft and carrying a threaded member, and an adjusting screw mounted on a fixed part of said plunger and threaded through said threaded member.

2. In a perforating machine, the combination of a die-carrying plunger, operating means therefor, and means for adjusting the relation between said plunger and said operating means; said means comprising a shaft having a main portion and an eccentric portion, said plunger being mounted on one of said portions and said operating means on the other of said portions, an arm keyed to said shaft and provided with a loose, threaded portion, and an adjusting screw loosely mounted on a fixed part of the plunger head and threaded through said loose member on said arm, said screw being normally tangent to said shaft.

3. In a perforating machine, the combination of a die-carrying plunger, operating means therefor, and means for adjusting the relation between said plunger and said operating means; said means comprising a shaft having a main portion and an eccen-

tric portion, said plunger being mounted on one of said portions and said operating means being mounted on the other of said portions, a threaded member secured to said shaft, and an adjusting screw mounted upon said plunger head and threaded through said threaded member for rotating said shaft.

4. In a perforating machine, the combination of a die-carrying plunger, operating means therefor and means for adjusting the relation between said plunger and said operating means in order to adjust the length of stroke of said plunger; said means comprising a shaft having two portions in eccentric relation to each other, said plunger being mounted on one of said portions and said operating means on the other of said portions, an arm mounted on said shaft, a threaded nut carried by said arm and mounted thereon to permit of being turned freely and an adjusting screw pivotally mounted on a fixed part of the plunger head and threaded through said nut carried on said arm whereby said adjusting screw may be turned to turn said shaft in one direction or the other and thereby to vary the effective stroke of the plunger head.

In witness whereof, I hereunto set my hand this twenty-third day of November, 1922.

WILLIAM F. LAUTENSCHLAGER.