A. H. LYON.

WORK SUPPORT.

APPLICATION FILED MAY 23, 1921.

1,438,250. Patented Dec. 12, 1922.

Fig 1.

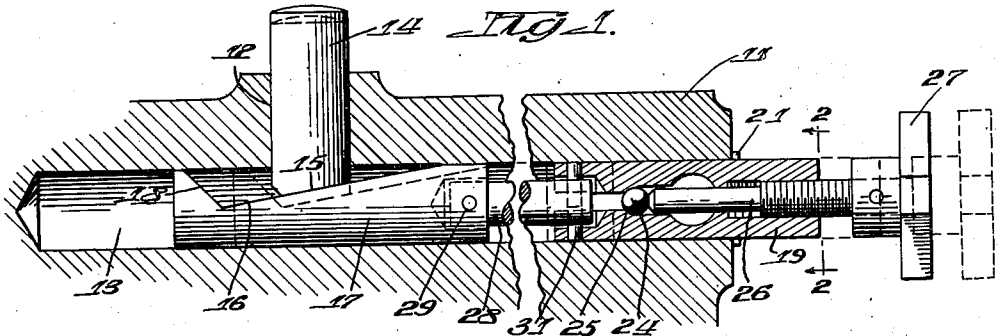


Fig 2.

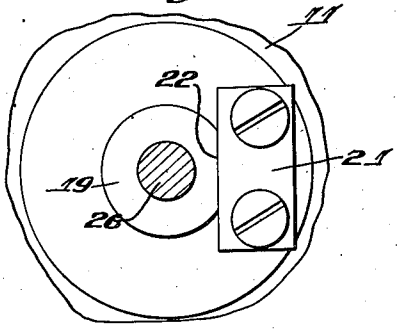


Fig 3

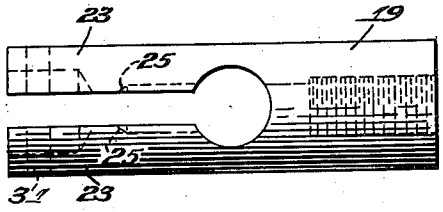


Fig 4.

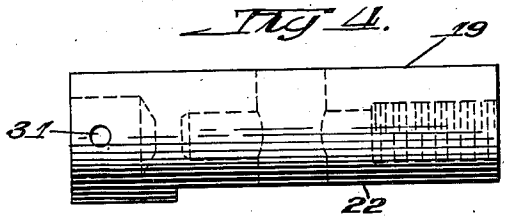


Fig 7.

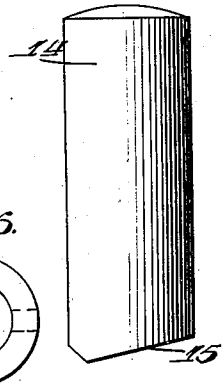


Fig 5.

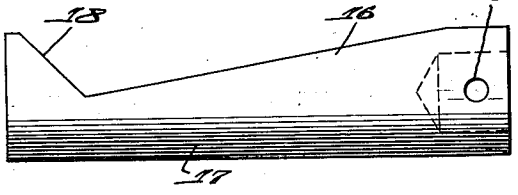


Fig 6.

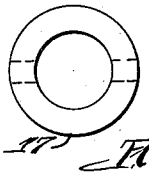
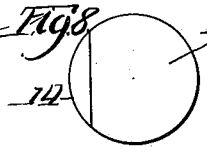


Fig 8



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UNITED STATES PATENT OFFICE.

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WORK SUPPORT.

Application filed May 23, 1921. Serial No. 471,825.

To all whom it may concern:

Be it known that I, ARTHUR H. LYON, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Work Supports, of which the following is a specification.

This invention relates in general to work supports and fixtures especially adapted for for use with metal working machines, but more particularly it has reference to that class in which a work piece is supported at fixed points and in which adjustable intermediate supporting means, such for example as one or more movable plungers are provided for holding the medial portion of the work-piece against distortion and vibration. My invention, however, is not limited to this particular use but is generally applicable as a work-supporting device, as will be apparent from the following.

The primary object of my invention is to provide a simple and novel work-supporting device of the character described, especially adapted for use with so-called quick loading fixtures and which will accurately and effectually support the work-piece in proper condition for service requirements.

Another object is to provide a plunger work-support embodying such novel characteristics as to make it especially desirable for use at any position within the borders of a work-piece, and which will function with equal rapidity and accuracy whether remote from or close to the loading side of the work-piece.

A further object resides in the provision of a work support of the character described so constructed that it will be thoroughly practical and durable for all conditions and requirements for which it is intended.

Still another object is to provide a work supporting and locking device of such design as to allow quantity production of most of the parts for use under varying conditions peculiar to the needs of fixtures for different work-pieces.

Other objects and attendant advantages will be appreciated by those familiar with this art as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawings, in which;—

Figure 1 is a vertical sectional view through a work-support embodying my invention;

Fig. 2, a sectional view taken on the line 2—2 of Fig. 1;

Figs. 3 and 4, side and top views, respectively, of the locking member;

Figs. 5 and 6, side and end views, respectively, of the wedge block; and

Figs. 7 and 8, side and end views, respectively, of the work-supporting plunger.

Although my invention is particularly adapted for use in a work fixture as an intermediate work support, that is, for supporting the work-piece at a point intermediate the fixed points, I have in the drawing deemed it unnecessary to show such an arrangement as it is well known in the art. On the other hand, it should be understood that my improvements are in no way limited to such an arrangement.

In the present instance, 11 represents the body of the fixture in which are formed vertical and horizontal intersecting bores 12 and 13 respectively. A suitable work engaging or supporting means such as a plunger 14 axially movable in the bore 12, has a beveled lower edge 15 resting on the inclined face 16 of a wedge block 17 disposed in the bore 13. The incline 16 is at a low angle, giving a relatively broad flat bearing surface which will carry heavy loads with but little wear or distortion. By axial movement of the wedge block 17, the plunger will be moved vertically into and out of operative engagement with the work-piece, as will be explained more fully hereinafter. The plunger by contact with the abutment 18 prevents withdrawal of the wedge block.

A novel locking device is now provided, whereby the wedge block may be quickly adjusted for bringing the plunger into the proper work-supporting position and then locked for holding the plunger in such position. It is desired to reduce the setting and locking movements to the fewest in order to promote speed in loading, without however, sacrificing accuracy in setting the plunger. With this in view, I have devised a locking

member designated generally by character 19 slidably fitting in the bore 13 and retained against rotation by a stop plate 21 which engages the flat side 22 of said member. This member is slotted, providing separable end portions 23 adapted to be separated by the wedging action of a ball 24 between the bevel surfaces 25. The ball is adapted to be pressed between said surfaces by a screw rod 26 threadingly engaged in the locking member and equipped beyond the outer end thereof with a hand knob 27. A link 28 pivotally connected at 29 and 31 to the wedge block and locking member respectively on axes intersecting at right angles, establishes a fixed distance connection between said parts but which permits of relative flexibility, the connection being in effect a universal joint.

From the foregoing, it will be manifest that when the screw rod 26 is loosened, the operator by grasping the knob 27 may slide the locking device and wedge blocks axially for vertically adjusting or setting the plunger with respect to the work and that by simply turning the knob with the same hand the member 19, and consequently the wedge block will be locked in the bore. This setting and locking operation may be very quickly performed; and in practice when the plunger is employed as an intermediate support the knob will be pushed in, thus bringing the plunger into contact with the work with sufficient pressure, and by turning the knob the plunger will be effectually locked against rotation. It will be particularly noted that this setting of the plunger is very sensitive and permits of a high degree of accuracy, that is, the only multiplication of force is through the lower incline 16 which permits of instant movement of the plunger into contact with the work, and by direct hand pressure the plunger will be pressed against the work with the proper force under the circumstances to hold the work against vibration without distortion. No screw threads or other slow acting and power increasing means is used, but instead the present construction produces rapidity in action of loading and unloading the work without sacrificing other desiderata. It will be further noted that the plunger may be located in any position within the borders of a work-piece; and through the agency of an efficient link connection of proper length between the wedge block and locking member the parts may be operated with equal facility and without danger of binding in the bore by reason of irregularities invariably present in long bores. In adapting my improvements to different work fixtures practically the only changes necessary for the different sizes and conditions are in the dimensions of the link 28 and plunger 14 or their equivalents. Consequently in production the wedge block and locking device may be standard. By the use of the term screw knob in the claims, I mean any rotatable member adapted to be manipulated for adjusting or moving the plunger to set position and for locking it in such position.

It is believed that the foregoing conveys a clear understanding of the objects prefaced above, and while I have illustrated but a single working embodiment of my invention it should be understood that it is capable of wide application in this art and of considerable change in details of construction without departing from the spirit and scope of the invention as expressed in the appended claims, in which—

I claim:

1. A work supporting and locking device for quick loading work fixtures comprising a plunger, a screw knob, and means operated by said screw knob for axially sliding the plunger to and for locking it in set position.

2. A combination of a work-supporting body, a work-engaging plunger movable upon said body, a screw knob at the exterior of said body on an axis angular with respect to the plunger axis, and means operable by said knob for axially moving the plunger to and for locking it in said position.

3. A work supporting and locking device for quick loading work fixtures comprising a plunger, a screw knob, and means operable between the plunger and screw knob whereby through axial movement of said knob the plunger will be moved into operative engagement with the work and by rotative movement of the knob the plunger will be locked in operative position.

4. A work support comprising a body having intersecting bores, a work-engaging plunger in one of said bores, a wedge block in the other bore and adapted by axial movement therein to move the plunger axially, a locking member in the second mentioned bore, a flexible connection between the wedge block and locking member, and means at the exterior of the body for axially moving the wedge block and locking member and for locking the latter in fixed position.

5. A work support comprising a body having intersecting bores, a work-engaging plunger in one of said bores, a wedge block in the other bore and adapted for axial movement therein to move the plunger axially, a locking device slidable in the second mentioned bore and connected to the wedge block, and a screw knob on the locking device for sliding and locking it.

6. A work support and locking device comprising a work-engaging plunger, a wedge block having a low angle incline engaged by the plunger, a locking device connected to the wedge block, and a screw knob on the locking device operable for shifting

said device and the wedge block to adjust the plunger and for locking the plunger in adjusted position.

7. A work support and locking device comprising a work-engaging plunger, a wedge block having a low angle incline engaged by the plunger, a screw knob, and means operable between the wedge block and screw knob whereby through manipulation of the latter the plunger will be adjusted to set position and locked in such position.

8. The combination of a work-engaging plunger, a wedge block having a low angle incline for axially moving the plunger, a locking device, a flexible connection between the locking device and wedge block, and a screw knob for moving the plunger through the agency of said locking device, flexible connection and wedge block, and for locking said device to hold the plunger in set position.

9. The combination with a work-supporting body having intersecting bores therein, of a wedge block in one of said bores, cut-away on one side to provide a low angle incline, a work-engaging plunger in the other bore engaging said incline, a wedge-locking device in the first mentioned bore connected with the wedge block, and means at the exterior of the body for moving said locking device and consequently the wedge block axially to adjust the plunger and for locking said device in wedging engagment with its bore for holding the wedge block in said position.

10. The combination with a body having intersecting bores, of a plunger axially movable in one of said bores, a wedge block in the other bore adapted by axial movement to correspondingly move the plunger, a locking member in the second mentioned bore, a universal connection between said locking member and said block, said locking member having separable end portions, a wedging element disposed between said end portions, and a screw member threadingly engaging the locking member and adapted to bring said wedging element against said separable end portions.

11. The combination of a work-engaging plunger, a wedge block engaging said plunger, a shiftable locking device having a manually operable locking member, and a flexible connection between said wedge block and locking device whereby the wedge block may be moved to a plunger-setting position and locked therein by operation of said manually operable member.

12. A work supporting and locking device for quick-loading work fixtures comprising a work-engaging plunger, a manually operable member, and means operated by said member for sliding the plunger to work-supporting position and for locking it against retracting from said position.

ARTHUR H. LYON.