Inventor for a die shoe. The invention is particularly adapted for use in die construction work in which a die spot operation takes place. In function, it is customary to replace the upper die shoe with the lower die shoe and to mount the upper die shoe in the position of the lower die shoe. This enables the die man to operate on the upper portion of the die to considerable advantage as it renders the die easily accessible for operations thereon.

In a machine used for this purpose, the lower die shoe has guide sockets or tubes which receive guide bushings which are slidably mounted on guide posts depending from the upper die shoe. When the upper die shoe is mounted in its normal position, the guide bushings, upon a separate upward movement of the die shoe, will slide downwardly toward the top of the posts on which mounted and be retained in a position until the die is again closed. As the socket, or tube, moves on to the guide bushing, it will move the guide bushing longitudinally upwardly on the guide post on which mounted.

In operation, when the die shoes are inverted, that is, when the upper die shoe is used as a lower die shoe, the guide bushings will slide downwardly on the posts on which mounted and thus fail to function as guide bushings.

It is an object of the present invention to provide a structure whereby the guide bushing, when the upper die shoe is used as a lower die shoe, may be retained in position to project above the post on which mounted and be removable as the die is closed.

Another object of the invention is the provision of a bushing retainer so constructed and arranged that it will automatically be moved into a die retaining position upon a supporting movement of a die shoe to retain a guide bushing in position for being embraced by a tube or socket.

Another object of the invention is the provision of a device of this class which will be simple in structure, economical of manufacture, durable, compact and highly efficient.

Other objects will appear hereinafter.

It is recognized that various modifications and changes may be made in the detail of the structure illustrated without departing from the invention and it is intended that the present disclosure shall be considered to be but the preferred embodiment.

Forming a part of this application are drawings in which:

FIG. 1 is a side elevation view of the invention.
FIG. 2 is a side elevation view of the invention, in a different stage of operation,
FIG. 3 is a horizontal sectional view of the invention, taken on line 3—3 of FIG. 1,
FIG. 4 is an enlarged fragmentary elevation section view of the invention, taken on line 4—4 of FIG. 3,
FIG. 5 is an enlarged horizontal sectional view of the invention taken on line 5—5 of FIG. 1, and
FIG. 6 is an enlarged horizontal sectional view of the invention, taken on line 6—6 of FIG. 1.

In the drawings I have illustrated a die shoe 9 on which is mounted a die section 10. The die shoe 9 is the upper die shoe but is illustrated as having been transposed so as to form a lower die shoe. The lower die shoe 11 is also indicated as being transposed so as to
of the tubes 18 and the bushings 14 until they clear the bushings 14. When the retainer arms 24 clear the bushings 14, they will snap into a retaining position, engaging the lower end of the bushings 14 so as to retain them in their elevated positions.

As the die shoe is moved into a closed position, each of the bushings 14 will be retained in its elevated position until its respective tube 18 engages the adjacent arm 24 whereupon the arm 24 will swing into the dotted line position shown in FIG. 2. The tube 18 will not engage the retaining arm 24 until the guide bushing 14 is entirely enclosed by the tube 18. With this retainer arm 24 mounted in this position, the person operating the die may open and close the die as often as desired without necessitating a manual retaining of the guide bushing in its elevated position.

By mounting the plate 19 by means of the screw 21 extended through the slot 20, the device may be adapted for use on devices having different sized guide bushings 14. The plate 19 also may be swung so that the arm 24 may extend at various angles to the guide bushing 14.

What I claim is:

1. In combination with a die shoe, a guiding post projecting upwardly from one side of said shoe adapted to guide another die shoe; a bushing slidably mounted on said post; a supporting plate adjustably mounted on said first mentioned shoe; a standard mounted on and projecting upwardly from said supporting plate; a rockable engagement arm projecting outwardly from and pivotally connected to the upper end of said standard for engaging the end surface of said bushing and retaining the same in an elevated position on the post, said arm being adapted to swing downwardly for releasing said bushing for sliding movement on said post.

2. In combination with a die shoe, a guiding post projecting upwardly from one side of said shoe adapted to guide another die shoe; a bushing slidably mounted on said post; a supporting plate adjustably mounted on said first mentioned shoe; a standard mounted on and projecting upwardly from said supporting plate; a rockably mounted engagement arm projecting outwardly from and pivotally connected to the upper end of said standard for engaging the end surface of said bushing and retaining the same in an elevated position on the post, said arm being adapted to swing downwardly for releasing said bushing for sliding movement on said post.

3. In combination with a die shoe, a guiding post projecting upwardly from one side of said shoe adapted to guide another die shoe; a bushing slidably mounted on said post; a supporting plate adjustably mounted on said first mentioned shoe; a standard mounted on and projecting upwardly from said supporting plate; a rockably mounted engagement arm projecting outwardly from and pivotally connected to the upper end of said standard for engaging the end surface of said bushing and retaining the same in an elevated position on the post, said arm being adapted to swing downwardly for releasing said bushing for sliding movement on said post; and a spring for resisting downward swinging movement of said arm.

4. In combination with a die shoe, a guiding post projecting upwardly from one side of said shoe adapted to guide another die shoe; a bushing slidably mounted on said post; a supporting plate adjustably mounted on said first mentioned shoe; a standard mounted on and projecting upwardly from said supporting plate; a rockably mounted engagement arm projecting outwardly from and pivotally connected to the upper end of said standard for engaging the end surface of said bushing and retaining the same in an elevated position on the post, said arm being adapted to swing downwardly for releasing said bushing for sliding movement on said post; a spring for resisting downward swinging movement of said arm; and means for limiting longitudinal movement of said bushing on its post in one direction.

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