

F. L. SIMMONS.
 ADJUSTABLE V-BLOCK AND THE LIKE FOR MAGNETIC CHUCKS.
 APPLICATION FILED MAR. 19, 1919.

1,343,751.

Patented June 15, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

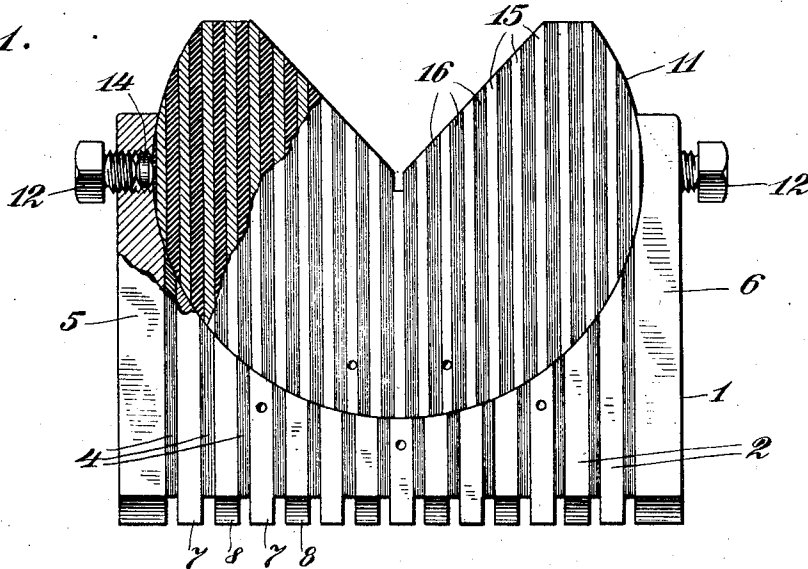
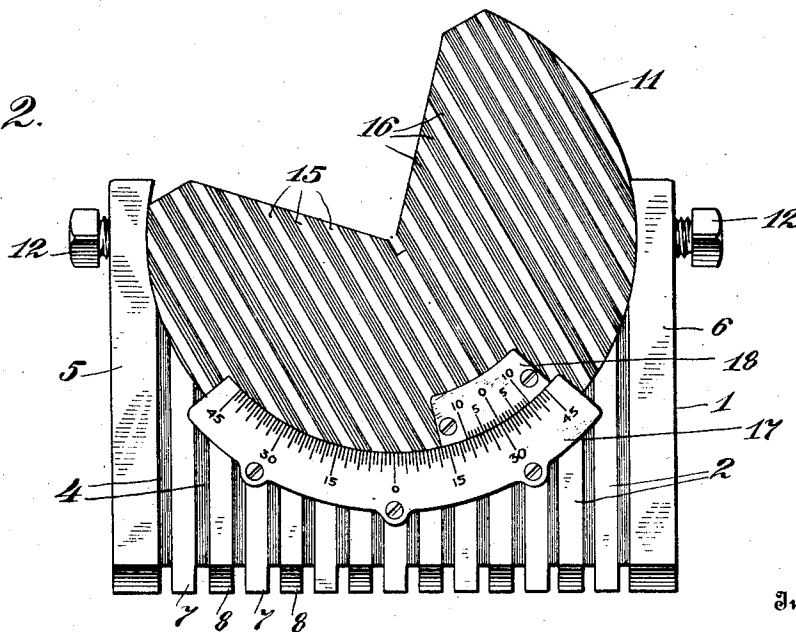


Fig. 2.



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Fig. 3.

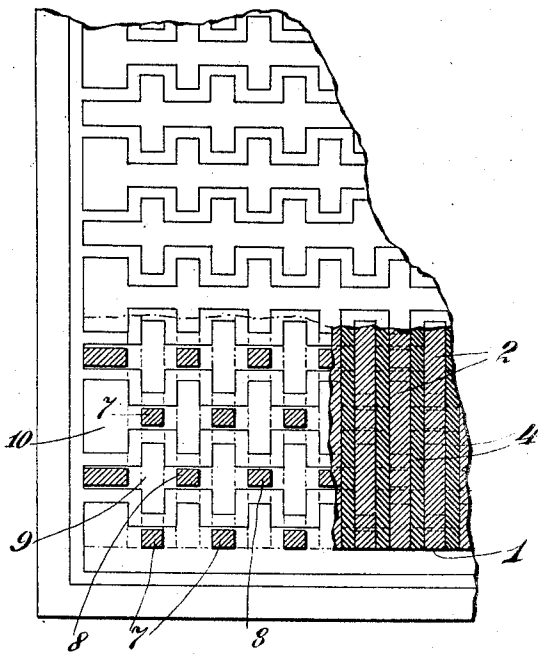


Fig. 4.

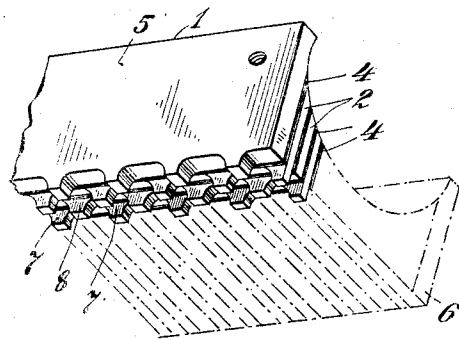


Fig. 5.

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ADJUSTABLE V-BLOCK AND THE LIKE FOR MAGNETIC CHUCKS.

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To all whom it may concern:

Be it known that I, FRANK L. SIMMONS, a citizen of the United States, residing at Woonsocket, in the county of Providence, State of Rhode Island, have invented certain new and useful Improvements in Adjustable V-Blocks and the like for Magnetic Chucks, of which the following is a specification.

10 This invention relates broadly to magnetic chucks and more specifically to an attachment comprising an adjustable member adapted to be operative with a suitable magnetic chuck to adjustably hold work above the
15 face of the chuck.

The principal object of the present invention is to provide an attachment for magnetic chucks and the like comprising a base composed of a plurality of magnetizable members
20 separated by non-magnetic material and each being adapted to be energized by a suitable magnetic chuck and to carry an adjustable member comprised of laminations of magnetizable and non-magnetizable material whereby the lines of forces from the
25 base are carried into and through the adjustable member.

A further and more specific object of the present invention is to provide an attachment
30 of the character specified wherein the laminations of magnetizable material in the base member are arranged in such manner that each lamination is adapted to be energized by definite magnetic poles in a suitable magnetic chuck, and with sustaining
35 posts provided for carrying the magnetism into the said laminations.

Another and more specific object of the present invention is to provide an attachment
40 of the character specified comprising a base portion having laminations extending lengthwise thereof and having a concavity also extending lengthwise and comprising a portion of a cylinder, a work-supporting
45 movable member being adapted to fit said concavity and comprising longitudinally extending laminations of magnetizable and non-magnetizable material with the width of the magnetizable material in the adjustable
50 member less than the width of the non-magnetizable material in the base mem-

ber whereby the magnetizable laminations in the base member cannot be short-circuited by rotating the adjustable member.

Another object of the present invention is
55 to provide an attachment for magnetic chucks and the like of the character specified and wherein mechanical locking means are provided for locking the adjustable member in position within the base.
60

A still more specific object of the present invention is to provide an attachment for magnetic chucks comprising a base member made up of sheets of soft steel and brass or the like brazed or secured together to
65 comprise a unitary member with projections extending from the alternate sheets of steel and arranged in such manner that when the base member is in position on the face of a
70 suitable chuck the alternate strips of steel are energized by alternate poles in the chuck and with an adjustable member also comprising longitudinal strips of alternate
75 steel and brass or the like brazed into a unitary mass, and with the steel sheets in the adjustable member adapted to be energized through the steel sheets in the base member.

Another object of the present invention is to provide an attachment for magnetic
80 chucks and the like comprising a plurality of individualized magnetizable strips, with each strip being provided with projections to cooperate with a definite pole piece in a suitable magnetic chuck whereby each sheet
85 is energized.

Other and further objects of the present invention will in part be obvious and will in part be pointed out hereinafter in the specification following wherein I have illustrated one form of my invention and which
90 illustrations and descriptions I desire shall be considered as merely illustrative and not in a limiting sense, because my construction is capable of being embodied in constructions other than those specifically shown and described.
95

Figure 1 is an end view of a device embodying my invention and with the end scales removed.
100

Fig. 2 is a view similar to Fig. 1 and showing the end scale in position.

Fig. 3 is a detail of a portion of the side of the device illustrated in Figs. 1 and 2.

Fig. 4 illustrates the manner in which the device is adapted to cooperate with a suitable magnetic chuck.

Fig. 5 is a perspective view more clearly illustrating the projections through which the magnetizable laminations or sheets of the base are adapted to be energized.

Magnetic chucks are usually made with flat work faces. Such a surface is the most commonly used supporting surface for work adapted to be held by magnetic chucks. Frequently, however, it is desirable to have magnetic chucks with inclined or adjustable faces. To this end adjustable auxiliary devices have been designed which are intended to carry the magnetic forces, by induced magnetism, through to a suitable adjustable work surface. Such devices have been heretofore constructed by making up a series of segments arranged transversely of the length of the device and with the segments of alternate magnetizable and non-magnetizable material. Such devices are adapted to be placed on the face of a magnetic chuck and are intended to carry magnetic forces to the desired work surface. Where transverse segments or laminations are used, a considerable amount of the magnetic force is lost because the transverse sections, being less than the width of the poles, are adapted to be energized in such manner that a plurality of adjacent sections or laminations are of the same magnetic polarity, which means that between adjacent sections there is very little or substantially no holding force.

The present invention overcomes the difficulties of the known art by providing a base member and an adjustable work support made up of longitudinally extending strips of magnetizable material separated by non-magnetizable material, with each strip provided with projections adapted to cooperate with similar poles of a suitable magnetic chuck, so that when the device is in position on such a chuck, each and every lamination in the base member is definitely energized and with adjacent laminations energized with different polarities of magnetism.

The bed on the base for the adjustable member is preferably provided with a longitudinal concavity which comprises slightly more than one-half of a concave cylindrical surface. The adjustable member of the device is constructed to fit this longitudinal opening and the contacting surface of the adjustable device is greater than the surface of the opening to permit rotation of the device and at the same time maintain the opening filled with metal.

The adjustable member preferably is also formed of alternate sheets of magnetizable

and non-magnetizable material and with the width of the sheets of the magnetizable material less than the width of the non-magnetizable material in the base, so that when the device is adjusted there is no danger of short-circuiting the base plates. Preferably also the arrangement of the plates in the adjustable member relatively to the plates in the base is such that a large number of plates in the base and the adjustable member connect to form complete magnetic circuits irrespective of the adjustments. This may be provided by making the relation between the plates in the base and the plates in the adjustable member an incommensurate relation so that contact is assured at all times. The fact that the opening is greater than one-half of the diameter of the cylinder provides an interlock between the base and the top. The adjustable member may be positioned within the base by sliding the same longitudinally into the concavity, and it may be retained there by suitable plates mounted on the ends either of the base or the work-supporting member. These plates preferably are provided with scales which may comprise a main scale and a vernier scale in order to permit of an accurate adjustment of the work face of the adjustable member. The work face may be provided with angular or flat surfaces or such other forms and shapes as may be desired. It may also be desirable to provide a plurality of work-supporting members for a single base so that by merely changing the adjustable member various types of work faces may be provided.

In order to insure the stability of the adjustable work-supporting member, as when the current is broken to remove work, it is desirable in some cases to provide a mechanical locking mechanism between the base and the adjustable member. This mechanical lock may be obtained by many widely differing constructions, but preferably comprises the provision of set screws extending through the side walls of the base member and at substantially diametrically opposite points, whereby the adjusted member may be securely locked in adjusted position at all times.

Referring now to the drawings and more particularly to Fig. 1, the base member 1 comprises a plurality of sheets or laminations 2 of suitable magnet steel or other suitable magnetizable material which loses its magnetism quickly after the energizing current from the chuck is broken. These sheets or laminations are separated by non-magnetizable material such as brass or Babbitt metal 4. Where brass is used, these several sheets of steel and brass are preferably brazed together to form a unitary member, and where Babbitt metal is used it may be necessary to provide cross rivets or bolts of

non-magnetizable material such as brass to hold the parts together.

Preferably a pair of heavier sheets 5 and 6 comprise the side members for the base portion. As will be noted by referring to Figs. 1, 3, and 5, the lower portion of the brass sheets terminates above the lowermost portions of the steel sheets, and the steel or iron sheets are provided with projections 7 and 8 which are arranged in alternate series to comprise alternate rows crosswise of the device. These projections comprise bases upon which the device is adapted to rest and as is illustrated in Figs. 3 and 4. One series of projections stand on one series of pole pieces in a suitable chuck, for example, the pole pieces 9, and are adapted to be energized with one magnetic sign, and the other set or series of projections 8 stand on a different set of pole pieces 10 which are adapted to be energized by the opposite magnetic sign. By this arrangement it will be seen that adjacent laminations are adapted to be energized differently, as is indicated in Fig. 4.

The upper portion of the base member 1 is provided with a cylindrical concavity in which is mounted the adjustable work support 11. Preferably set screws 12 are provided on substantially diametrically opposite sides of the work support 4. These set screws 12 preferably bear against small shoes 14 which are in contact with the sides of the work support and are adapted to clamp this support in adjusted position, thereby comprising a mechanical lock for holding the work support in an adjusted position when the chuck is not energized.

The adjustable work support likewise is made up of longitudinally extending strips of alternate magnetizable and non-magnetizable material 15 and 16, preferably of steel and brass. These strips may be suitably secured together by screws, brazing, or otherwise as is well known in the art. Preferably the width of a combined brass and steel strip in the adjustable work support, as compared to the width of a strip of brass and steel in the base, is incommensurable. This relation insures contact between the steel strips in the adjustable work support and those in the base, irrespective of the adjustment of the work support. It is also important that the width of the steel strips in the adjustable work support shall be less than the width of the brass in the base in order to prevent a steel strip in the work support from short-circuiting the steel strips in the base when the adjustable member is rotated.

In order to indicate accurate adjustments of the work support, suitable scales 17 and 18 are provided. The scale 18 preferably comprises a vernier adapted to cooperate with the scale 17. Preferably such scales or plates are provided on each end of the de-

vice to retain the work support against longitudinal movement, and therefore from displacement from the base member.

The upper or work support face of the adjustable member may be V-shaped as is illustrated in Figs. 1 and 2, or it may be of any other desired configuration.

Having described my invention, what I claim is:

1. An attachment for magnetic chucks and the like comprising the combination of a base portion of a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material and a movable work support adjustably mounted upon said base portion and also comprising a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, with the sheets of magnetizable material in the work support of less thickness than the sheets of non-magnetizable material in the said base portion.

2. An attachment for magnetic chucks and the like comprising the combination of a base portion of a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, a movable work support adjustably mounted upon said base portion and also comprising a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, with the sheets of magnetizable material in the work support of less thickness than the sheets of non-magnetizable material in the said base portion, and locking means between the base and the work support.

3. An attachment for magnetic chucks and the like comprising the combination of a base portion of a plurality of alternate sheets of magnetizable and non-magnetizable material, a movable magnetizable work support adjustably mounted upon said base portion and adapted to transmit lines of force from the base portion to the work upon the work support, means whereby the adjacent magnetizable sheets in said base portion may be magnetized to comprise opposite magnetic poles when the said attachment is energized by a suitable magnetic chuck, and means whereby said work support is normally interlocked with the said base.

4. An attachment for magnetic chucks and the like comprising the combination of a base portion of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, a magnetizable work-supporting member slidably mounted upon a curved surface upon said base portion whereby the work face of the said supporting member may be adjustably inclined relatively to the base portion, and means comprising oppositely disposed clamping screws to lock the supporting member in position on the base.

5. An attachment for magnetic chucks

and the like comprising the combination of a base portion having a plurality of longitudinally extending magnetizable sheets magnetically insulated one from another, a movable work support adjustably mounted to be rotatable upon said base portion and comprising magnetizable members adapted to be energized through inductance from said base portion when the base portion is energized by a suitable energizing means, and means to prevent longitudinal movement of the support on the base portion.

6. An attachment for magnetic chucks and the like comprising the combination of a base member comprising a plurality of magnetizable portions insulated magnetically one from another, a movable work face also comprising a plurality of magnetizable sections magnetically insulated one from another and adapted to be slidably mounted upon said base portion, and mechanical means for locking the work support and the base together in adjusted position.

7. An attachment for magnetic chucks and the like comprising the combination of a base member comprising a plurality of magnetizable portions insulated magnetically one from another, a movable work face mounted to rotate on a horizontal axis and also comprising a plurality of magnetizable sections magnetically insulated one from another, and mechanical means for locking the work support and the base together in adjusted position.

8. An attachment for magnetic chucks and the like comprising the combination of a base portion having a concave longitudinal opening, and a movable work support adjustably mounted in the said opening in the base portion in such manner as to be interlocked therein said base portions comprising a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, and means provided on the magnetizable sheets for permitting alternate sheets to be magnetized as alternate magnetic poles by a suitable energizing means.

9. An attachment for magnetic chucks and the like comprising the combination of a base portion having a concave longitudinal opening, and a movable work support adjustably mounted in the said opening in the base portion in such manner as to be interlocked therein, said base portion comprising a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, and supporting feet provided on the magnetizable sheets with the feet alternately arranged for permitting alternate sheets to be magnetized as alternate magnetic poles by a suitable energizing means.

10. An attachment for magnetic chucks and the like comprising the combination of

a base portion of a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material and a movable work support adjustably mounted upon said base portion and also comprising a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, with the sheets of material in the work support of an incommensurate thickness relatively to the thickness of the sheets in the base portion.

11. An attachment for magnetic chucks and the like comprising the combination of a base portion of a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, and a movable work support rotatably slidable upon said base portion and also comprising a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, with the sheets of material in the work support of an incommensurate thickness relatively to the thickness of the sheets in the base portion.

12. An attachment for magnetic chucks and the like comprising the combination of a base portion of a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, a movable work support adjustably mounted upon said base portion and also comprising a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, with the sheets of magnetizable material in the work support of less thickness than the sheets of non-magnetizable material in the said base portion and of an incommensurate thickness relatively to the thickness of the magnetizable material in the base portion, and locking means between the base and the work support.

13. An attachment for magnetic chucks and the like comprising the combination of a base portion of a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, a movable work support adjustably mounted upon said base portion and also comprising a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, with the sheets of magnetizable material in the work support of less thickness than the sheets of non-magnetizable material in the said base portion and of an incommensurate thickness relatively to the thickness of the magnetizable material in the base portion.

14. An attachment for magnetic chucks and the like comprising the combination of a base portion of a plurality of alternate sheets of magnetizable and non-magnetizable material, said base being provided with a seat for a work support, a magnetizable movable work support adjustably mounted

upon the seat on the said base portion, said work support being provided with a work face adapted to be angularly disposed to said base by adjustments of said support, and supporting feet on the magnetizable sheets in said base portion and arranged to comprise two series whereby the magnetizable sheets in the base portion may be magnetized to comprise opposite magnetic poles when the said attachment is energized by a suitable magnetic chuck whereby the movable work support is magnetically held upon the base portion.

15. An attachment for magnetic chucks and the like comprising the combination of a base portion of a plurality of longitudinally extending alternate sheets of magnetizable and non-magnetizable material, a work-supporting member slidably mounted upon a curved surface upon said base portion whereby the work face of the said supporting member may be adjustably inclined relatively to the base portion, and with the work-supporting member interlocked with the base portion.

16. An attachment for magnetic chucks and the like comprising the combination of

a base of longitudinally extending alternate sheets of magnetizable and non-magnetizable material and provided with a longitudinal trough having sides comprising more than one-half a cylinder, a work-supporting member rotatably slidably mounted within the said trough in said base portion whereby the said supporting member is adjustably interlocked with the base portion, and means to lock the supporting member in position on the base.

17. An attachment for magnetic chucks and the like comprising the combination of a base portion having a plurality of longitudinally extending magnetizable sheets magnetically insulated one from another, a movable work support adjustably mounted to be rotatable upon said base portion and comprising magnetizable members adapted to be energized through inductance from said base portion when the base portion is energized by a suitable energizing means, locking means to lock the base and support in adjusted positions, and means to prevent longitudinal movement of the support on the base portion.

FRANK L. SIMMONS.