June 23, 1931. A. GASTELL 1,811,121

TRACING DEVICE

Filed March 26, 1929

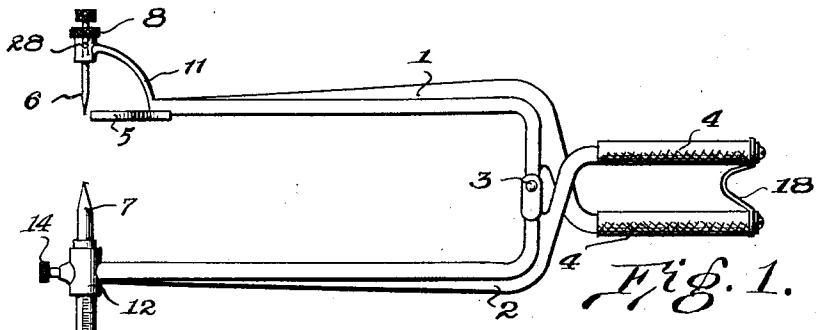


Fig. 1.

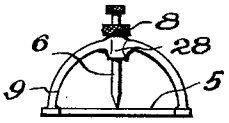


Fig. 2.

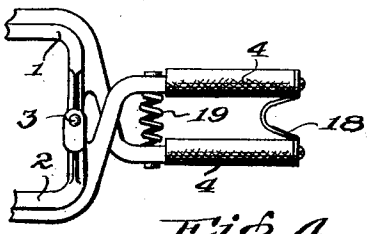


Fig. 4.

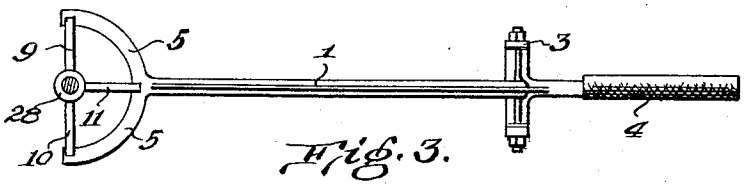


Fig. 3.

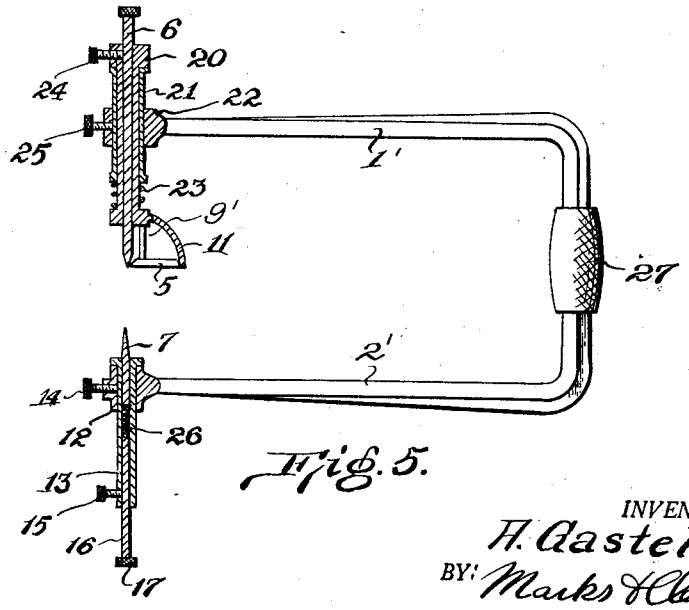


Fig. 5.

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UNITED STATES PATENT OFFICE

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TRACING DEVICE

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The subject of the present invention is a tracing device which enables points, lines or outlines from one side of work pieces, such as planks, boards and plates, to be transferred to the opposite side, and which may be particularly useful when marking the faulty places in the material on one side on the opposite side exactly in position and correct in shape, the outlines of the faulty places becoming visible on the side on which the outlines are to be drawn.

When it is desired that both sides of the piece which has been cut out are to be free from faults, for example the holes of branches or cracks which pass at an angle to the opposite side, faulty places must not only be avoided on the side on which the outlines of the piece to be cut out are drawn but also on the oppositely disposed side. In order to render this possible, the faulty places of the surface opposite the one on which the outlines of the pieces to be cut out must be indicated on the tracing surface in their correct positions.

The tracing device according to the present invention, which is adapted to be preferably manipulated freely by hand, enables this transfer to be effected in an extremely simple, convenient and accurate manner. It substantially consists of two rigid, preferably parallel arms, preferably of equal length, movably connected together at their one end at right angles to one another, or hinged movably, for example in the manner of tongs, between which arms the work piece to be treated may be fitted.

Each of these arms carries at the end, at exactly the same distance from the point of connection of the arms, at right angles to its longitudinal direction, a preferably pointed pin which is movable in its longitudinal directions. At least one of the pins is a drawing or coloured pencil, whilst the one above is preferably made of metal. Both pins are so arranged that when their points are in contact with the surfaces on both sides of the work piece, their central axles are disposed in a straight line. After the device has been fitted with its two arms on the opposite sides of the work piece, for example a wooden board, the arms are moved towards one another in such a manner that the drawing pencil with its point bears against the invisible, for example the under surface of the material, and the metal pin on the visible, for example upper surface of the material. If now the entire instrument is moved in a direction parallel to the surface of the board in such a manner that the point of the metal pin is passed along the faulty places on the visible side of the board the drawing pencil draws in an entirely accurate position on the reversed side the contours of the faulty places traversed by the metal pin.

Various examples of construction in accordance with the invention are illustrated in the accompanying drawings, wherein

Figures 1 to 4 show one form of construction in which the two arms are pivotally connected together in the manner of tongs and can be manually moved towards one another by compressing the other ends of the arms which are extended beyond the pivoted points and formed as handles. Figure 5 is an elevational view partly in section of a modification.

In the drawings 1 and 2 indicate the two arms which are pivoted together at 3 and at 4 are formed into handles which are preferably covered with coverings of soft material, for example leather or rubber. At the oppositely disposed end of the arm 1 there are formed extensions, for example in the form of a fork, of which the arms 5 are located in a plane parallel to the main arm and at right angles to the plane of connection. These engage the surface being marked to prevent tilting and to maintain the common axis of the pin 6 and the drawing pencil 7 accurately at right angles to the drawing surface of the work piece even when the device is being moved.

The pin 6 is adjustable in its longitudinal direction, for example by means of a screw thread and is adjustable in any suitable position, for example by means of the lock nut 8 or a lateral set screw in the guide bush 28, the guide bush being preferably located above the fork shaped bearing and supporting members 5, 5 and is connected thereto by

the arcuate supporting arms 9, 10 and 11 which are directed upwardly towards one another.

At the opposite end of the other main arm 2 is provided a guide bush 12. In this is slidably mounted a guide sleeve 13 which can be locked in any desired position by a set screw 14. Into the guide sleeve 13 is fitted a drawing or writing pencil 7 of which the adjustment is effected by means of a rod 16 slidably mounted in the sleeve and adapted to be locked in any suitable position by a set screw 15.

At its outer end the rod 16 is preferably provided with a head 17 and at its inner end with an enlargement in order to prevent it from falling out of the bottom of the opening in the sleeve 13. All these parts are so arranged that their central axis coincides with that of the pin 6 when the arms of the tongs have been approached towards one another to such an extent that the pins bear against the oppositely disposed surfaces of the work piece.

In order to enable the pencil to bear resiliently against the surface to be drawn upon, the drawing pencil may be subjected to the action of a spring, for example in such a manner that between it and the rod forming a lower support therefor there is located in the sleeve 13 a spiral spring 26 (see Figure 5). The sleeve 13 is preferably provided on the outside with a scale by means of which it is possible to effect a preliminary substantially accurate adjustment of the distance between the drawing pencil and the pin 6 in accordance with the known thickness of the board or the like which is to be operated upon.

Preferably means are provided whereby the pin after use, for example before moving the device to another point, is withdrawn against the action of the spring so that it no longer bears against the surface drawn upon. This for example may be effected by providing the pin above the sleeve 13 with a ring which can be drawn backwardly together with the pin against the action of the spring for example by a device actuated by lever mechanism or by pulling mechanism from the handle, or in any other suitable manner, or for example in such a manner that the sleeve, which directly carries the drawing pencil, is itself withdrawn into the guide bush by means of such a device, in which case this sleeve is slidably mounted in the sleeve 13 and is resiliently mounted in relation thereto, for example by interposing a spiral spring between the collar provided at the upper end of the inner sleeve and the upper edge of the sleeve 12.

For limiting the movement of the arms the handles 4 of the tongs are preferably connected together by connecting members 18 of pliant material, for example leather, of which the length corresponds with the maximum distance between the handles 4. By interposing a spring 18 between the two handles, it is possible, according to Figure 4, to obtain an automatic opening of the tongs when the pressure by hand of the handles is removed.

Instead of pivoting together the arms of the device they may also be connected so as to be capable of moving parallel to one another for example in such a manner that one arm is at the end provided with a bolt extending at right angles thereto which can be moved in a corresponding guide bush provided at the end of the other arm and locked in any suitable position therein. Also in this case handles may be provided on one or both of the movable parts.

It is also possible instead of connecting members 6, 9, 10 and 11, which form the supporting surface of one arm, rigidly to the arm 1 to apply these parts by means of a separate guide member movable in a guide bush secured to the arm 1 and if desired also under the action of a spring and capable of being adjusted in a definite position, and a similar assemblage may also be rigidly mounted or movably mounted in the manner described on the arm 2 of the device so that if desired both arms may bear whilst being guided or under the action of springs against the two sides of the board.

With such a spring actuated arrangement of the parts forming the supporting surfaces the arms 1 and 2 of the device may also be connected together rigidly at their point of connection according to Figure 5. In this figure 1′ and 2′ indicate the arms of the device which at their outer ends are rigidly connected together and for example at 27 are provided with an intermediate member or covering in the form of a handle. The metal pin 6′ pointed at its lower end is again movably mounted in the sleeve 20 and is capable of adjustment by means of the set screw 24. The sleeve 20 is connected at its lower end with the arcuate arms 5′, 9′, and 11′ forming the supporting surface in the manner described in connection with the previous figures and is slidably guided in a sleeve 21 which in turn is slidably mounted in the guide bush 22 secured to the arm 1′. A spiral spring 23 fitted between the lower end of the bush 21 and a collar provided at the lower end of the bush 20 tends to press the bush 20 together with the parts forming the supporting surface downwardly so that the device bears resiliently with this supporting surface on the surface of the material which is turned towards it.

The set screw 25 serves to lock the guide sleeve 21 in the desired position in the guide bush 22. Also in this case the arm 2′ of the device which supports the drawing pencil may be provided with a spring actuated supporting surface. When using the device with

spring actuated supporting surfaces the adjustable parts of one arm or of both arms are first adjusted so as to bring the ends of the pins to an interval somewhat less than the thickness of the material to be operated upon, for example a board. It is then easily possible, by reason of the resilient yielding of one or both supporting surfaces to fit the device with its two arms over the work piece and then in the manner above described, after adjusting the pointed pin 6′ almost in contact with the surface of the material, to traverse the incorrect points and to effect the tracing thereof on the other side of the board.

By the provision of longitudinal guides of known character, for example on the principle of groove and tongue, between the relatively movable parts, for example between the sleeve 20 and the sleeve 21, or these and the guide bush 22 or the sleeve 13 and the guide bush 12′ and so forth a revolving of these parts can be prevented.

In a similar manner as in connection with boards and the like of wood, the device described can also be used for plates of other suitable material.

The term extension members, by means of which supporting surfaces are formed for preventing tilting of the device, is intended to include in the specification and the claims members which as such form a supporting surface and also those, for example curved members, which only define a surface.

I claim:—

1. In a hand operated freely movable transmission device for the purpose described, including in combination, two rigid arms having their inner portions arranged in crossed formation and pivotally connected to each other, handles on said inner portions, pins mounted on the free outer ends of both of said arms and extending toward each other and arranged in alignment with each other, a tilting preventing member for engaging the surface to be operated upon mounted on one of said arms, a guide member on the arm opposite the tilting preventing member, the pin on the arm carrying the guide member being in the form of a pencil, a sleeve for receiving said pencil and longitudinally adjustable in the guide member and provided with a scale, a spring mounted in the sleeve and bearing against the inner end of the pencil, and a tension regulating member acting on the spring and the pencil.

2. In a hand operated transmission device as claimed in claim 1, wherein the tilting preventing member is resiliently urged toward the other arm.

In testimony whereof I affix my signature.

ALBERT GASTELL.