Aug. 23, 1949. J. A. G. DÉSY 2,479,912

AUTOMATIC CENTERING PUNCH

Filed March 13, 1947 2 Sheets-Sheet 1

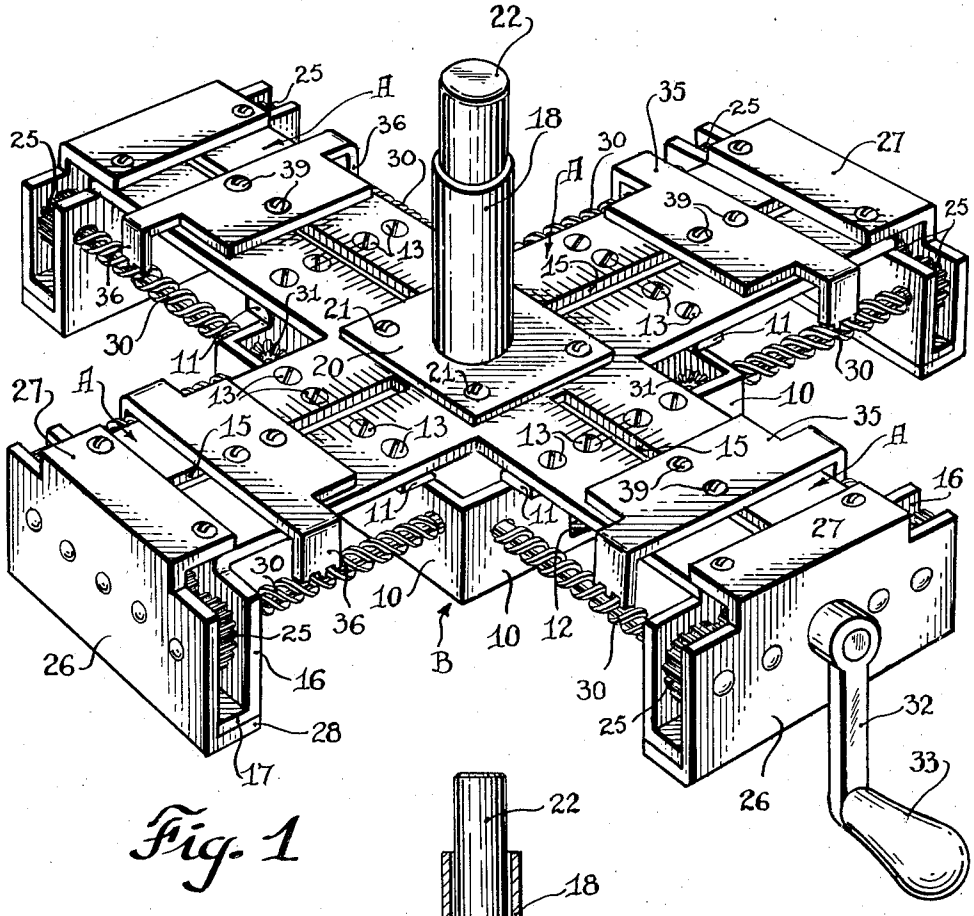


Fig. 1

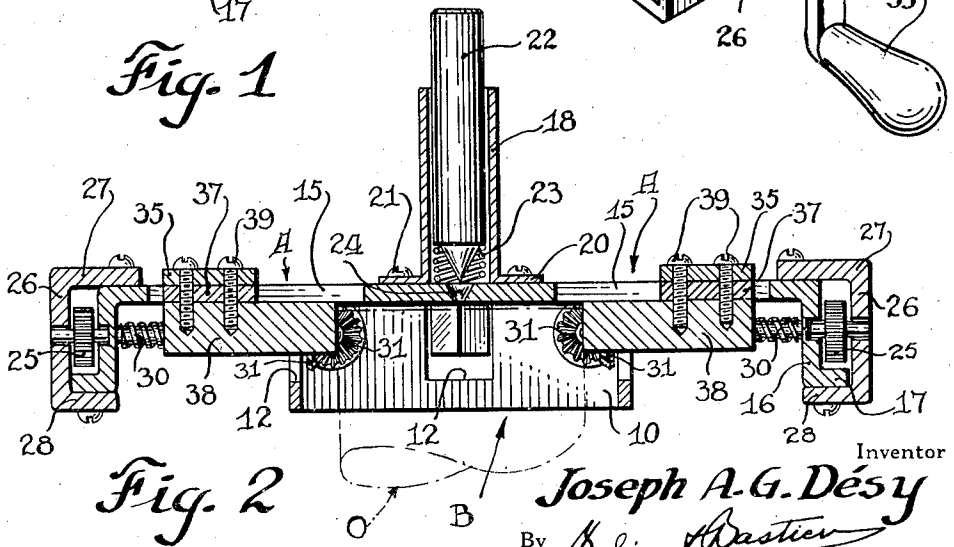


Fig. 2

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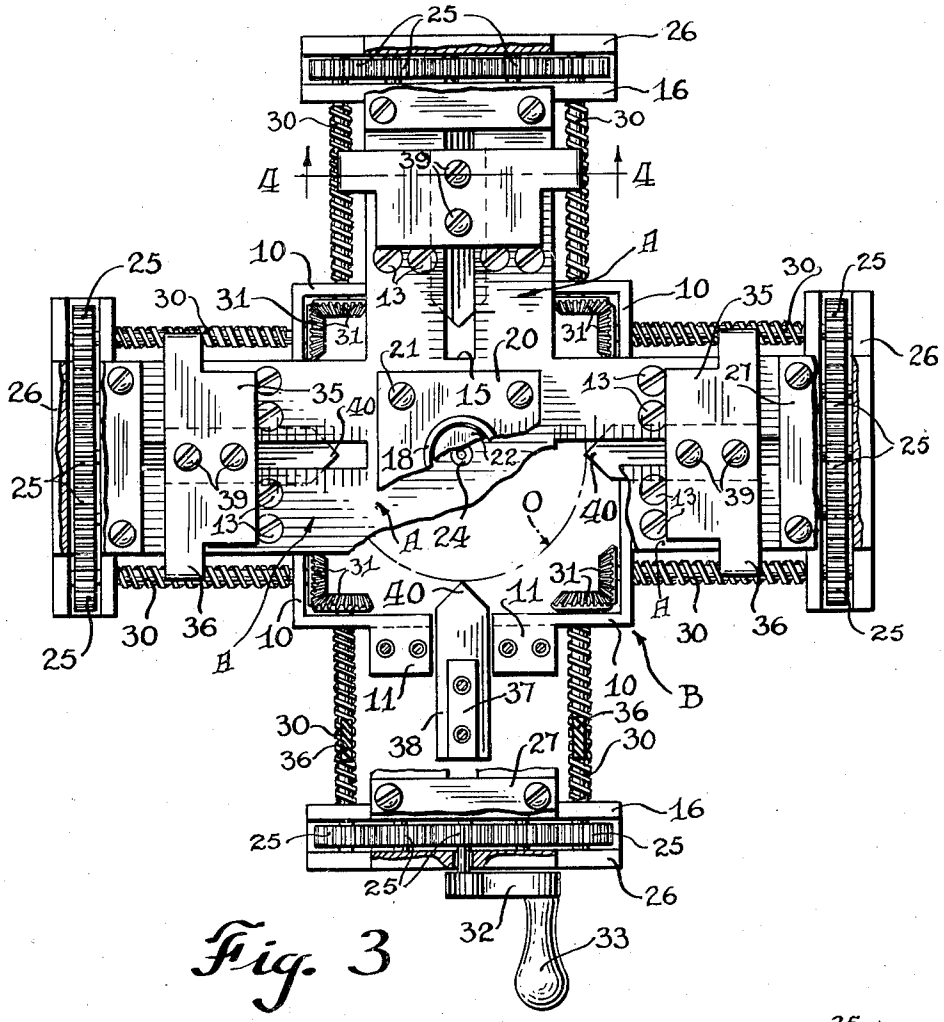


Fig. 3

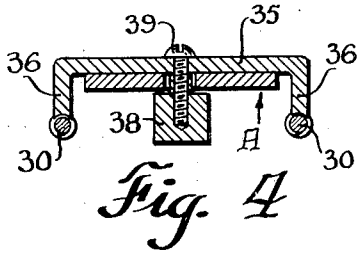


Fig. 4

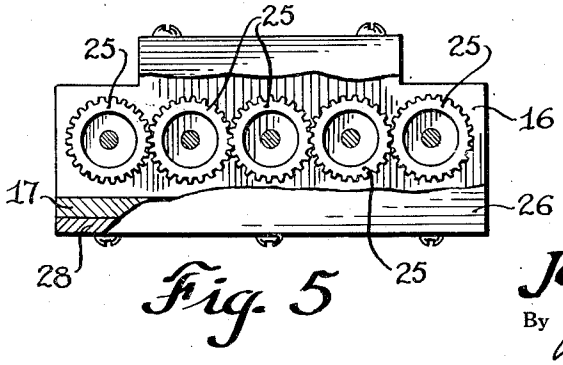


Fig. 5

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UNITED STATES PATENT OFFICE

2,479,912

AUTOMATIC CENTERING PUNCH

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Application March 13, 1947, Serial No. 734,455

2 Claims. (Cl. 33—191)

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The present invention relates to a center punch and, more particularly, such a punch in which the centering operation is automatic.

The main object of the invention resides in the provision of an automatic centering punch of improved performance.

Another object is the provision of a centering punch of the character described which is very rapid in operation.

A further object contemplates an automatic center punch which is simple, rugged and accurate.

Still another object of the invention concerns an automatic center punch which can be manufactured at relatively low cost.

Other objects and advantages of the invention will become apparent or be pointed out further during the description to follow.

As an example, and for purposes of illustration, an embodiment of the invention is shown in the annexed drawing wherein:

Figure 1 is a perspective view of the apparatus according to the invention,

Figure 2 is a transverse vertical section therethrough,

Figure 3 is a plan view of the apparatus with a part of the top removed to show the inside part,

Figure 4 is a section taken on the line 4—4 of Figure 3, and

Figure 5 is an end elevational view of one arm of the apparatus showing the inside gear train.

Referring to the drawings, wherein similar reference characters represent corresponding parts throughout, the letter B indicates generally the body of the apparatus upon which the frame and other mechanisms are primarily secured. This body is quadrangular in shape and consists of four equal vertical side walls 10 arranged in parallel right angular relation and each of which has upper perpendicular flanges 11 (see Figures 1 and 3). For a purpose to be apparent later on, there is formed between the flanges and in the upper part of the walls 10 a recess or cavity 12 which extends for a portion only of the walls height.

Disposed above the body B and secured to the flanges 11 thereof by means of screws 13, there is provided a frame consisting of diametrally aligned right angularly arranged arms A, the said frame thus effecting the general shape of a Greek cross. Each of the arms is formed with a central longitudinal narrow slot 15 and terminated, at its outer end, with a downwardly depending vertical apron 16, the lower edge of said apron

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carrying a vertical outward flange 17. The frame proper is completed by the addition, at the exact centre thereof, of an upstanding guide tube 18 which is integral with a base plate 20 secured to the frame by means of the screws 21, said tube being adapted to slidably receive a centre punch 22 held in raised position by means of a coil spring 23; the said punch is consequently normally held above a tapered aperture 24 provided, as stated before, at the exact centre of the frame and through which aperture the moistened end of the punch is adapted to protrude slightly after compressing the holding spring 23.

As shown to advantage in the figures, and more particularly in Figure 5, there are journalled on the outside of each apron a gear train consisting of five intermeshing similar pinions 25, the axes of said pinions being horizontally aligned and symmetrically disposed with respect to the centre pinion which is mounted in the centre of the apron: consequently, said centre pinion is flanked on each side with two pinions meshing therewith and with each other. For proper support of the pinion axis or shaft, an outer bearing plate 26 is spacedly mounted with respect to the apron, on the outside thereof, said plate having an upper flange 27 and a lower flange 28, both of said flanges being in parallel relation and connected respectively with the arm A and the apron flange 27 as clearly indicated in the drawings.

Each gear train of each arm is connected to the other train by means of screw shafts or worms 30, one of said worms being connected to, or forming an axial extension of, each of the outermost pinions 25 of each train. Said worms extend beyond the apron 16, towards the walls 10 of the body, wherein they are journalled in pairs in parallel arrangement with each other and with the arm thereabove. The outer worms of each pair are geared together by means of bevel pinions 31, said pinions being disposed inside the body B, at the corner thereof. Therefore, all the worms and gears are so joined together that they will revolve in unison whenever any of said gears or worms is manually or otherwise actuated: thus, any movement imparted to one of the gears, for instance, will be simultaneously transmitted all around the arms of the apparatus in perfect synchronism. This is effectuated, in practice, by means of the crank 32 suitably connected to a shaft extension of one of the centre arm pinions, said crank being provided with the handle 33 for manual rotation of the said pinion.

Each arm is provided with a slider 35 adapted

to travel over the top surface thereof and provided with end downwardly depending legs **36**, the undersurface of said legs being threaded to engage the worms **30** of the arms and to be movable along said arms by the rotary action of said worms. Each slider **35** is properly guided in a longitudinal direction by means of a guide block **37** fitted accurately in the slot **15** of each arm and held in place underneath the slider and in its slot by a locating block **38** secured under each arm, to the slider **35**, by means of screws **39**. The block 37 is somewhat wider than the slot **15** and further formed with a tapered point **40**, the edge of which is exactly in line with the centre axis of each arm and slot **15**.

The operation of the apparatus should be fairly obvious from the above description: As the crank 32 is actuated and the centre pinion attached thereto correspondingly revolved, the gear train of the other arm will be synchronously rotated and, as a result, all the worms **30** driven synchronously at a constant speed. The slider **35** engaging said worms will, therefore, have a translation movement imparted thereto, said movement being the same for all sliders. As a result, said sliders will advance, or recede, from the centre of the frame in perfect unison and, naturally, the blocks **38** attached thereto, similarly move. Consequently, a circular object O placed inside the body B, between the point of the block **38**, will be automatically centered with respect to the centre punch **22** by the mechanism just described, and be in position to receive the imprint of said punch in its upper surface upon striking said punch with a hammer or the like.

Of course, the above explanation assumes that the apparatus has been properly set and the sliders engaged with the suitable threads of the worms when said apparatus has been assembled. This setting of the apparatus must be such that the points **40** of all blocks should meet together to form a theoretical point which is exactly centered with respect to the tapered aperture **24** and immediately underneath the punch **22**, in line with its centre longitudinal axis.

From the foregoing, it should be evident that the present invention is an advance in the art of automatic centre punches in that said invention enables locating the centre of circular or cylindrical objects in a rapid and accurate manner. For fast production purposes, it represents a great saving of time in that unskilled labour can mark, in a very short time, a great number of parts to be center-marked, said marking being accomplished rapidly and accurately. Furthermore, the means above described are such as to permit periodic checking and consequent easy taking-up of looseness caused by inevitable wear: thus, the apparatus can always be maintained in purposely accurate condition.

Having thus described my invention, I claim:

1. A device of the character described, comprising a frame having pairs of diametrally aligned right-angularly disposed arms, worm screws disposed parallel to the arms on each side thereof and connected together from one arm to the next, gear trains at the ends of the arms connecting the worms of one arm together, arm sliders on each arm threadedly engaged with the worms of the corresponding arm, and blocks secured to the sliders and movable therewith.

2. In an automatic center punch, a frame having arms radially arranged as a Greek cross, a worm screw parallelly spaced on each side of each arm, means for connecting all said worms rotatively together, sliding means asociated with each arm and worms thereof, tapered blocks connected with the sliding means, and a crank for manually actuating one of the worms, whereby the blocks will be actuated to converge towards a common point.

JOSEPH A. G. DÉSY.

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