Oct. 3, 1950 J. A. YERKES 2,524,583

PAPER PUNCH

Filed Jan. 14, 1947 3 Sheets-Sheet 1

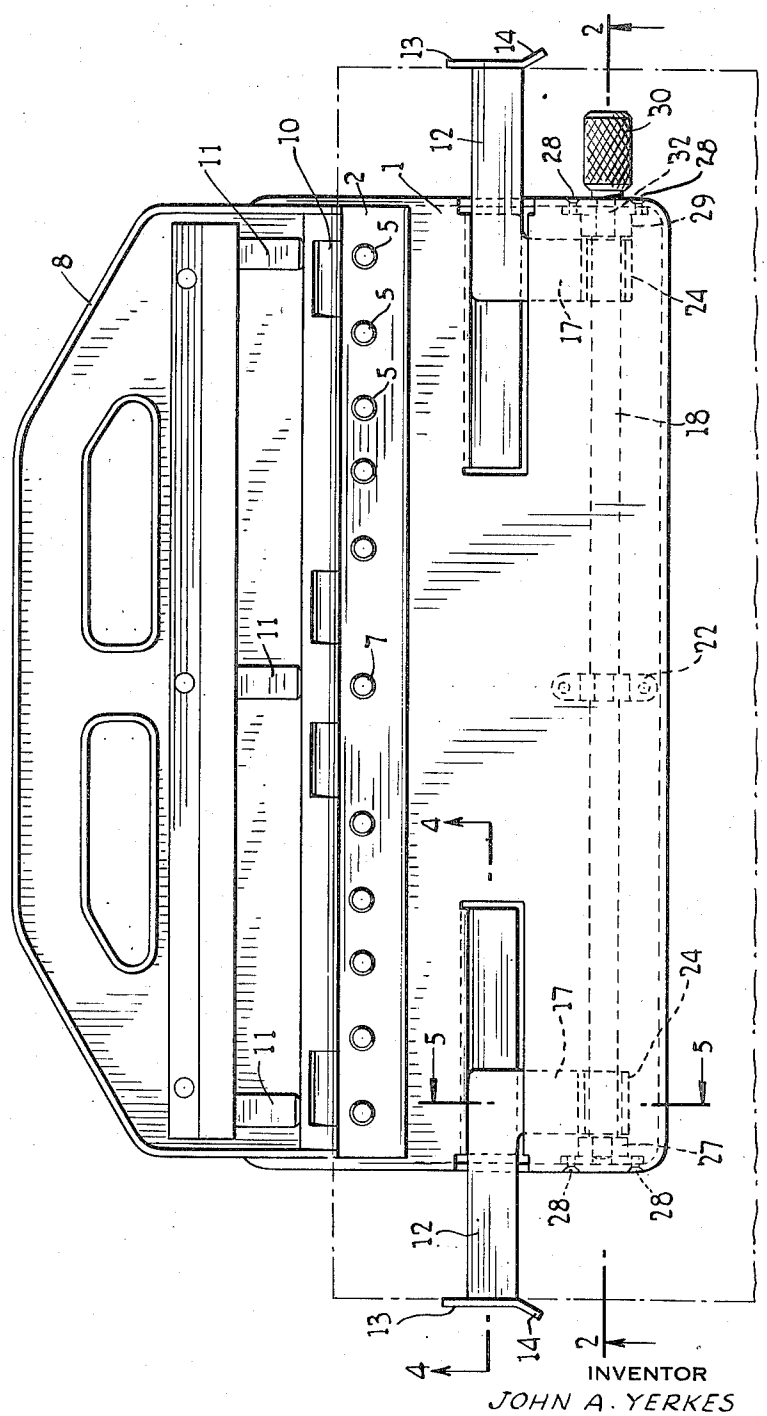


Fig. 1.

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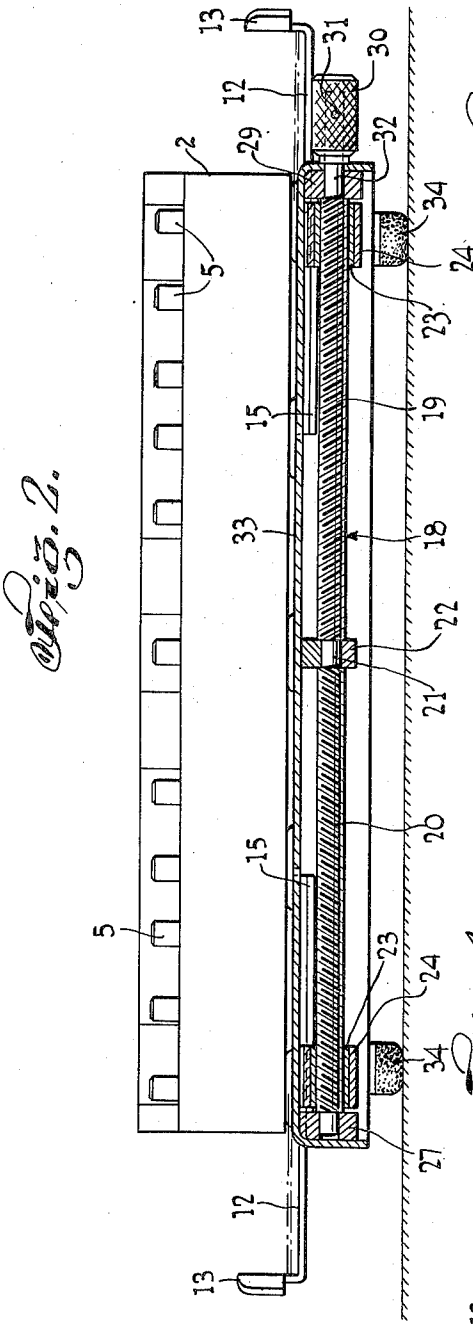


Fig. 2.

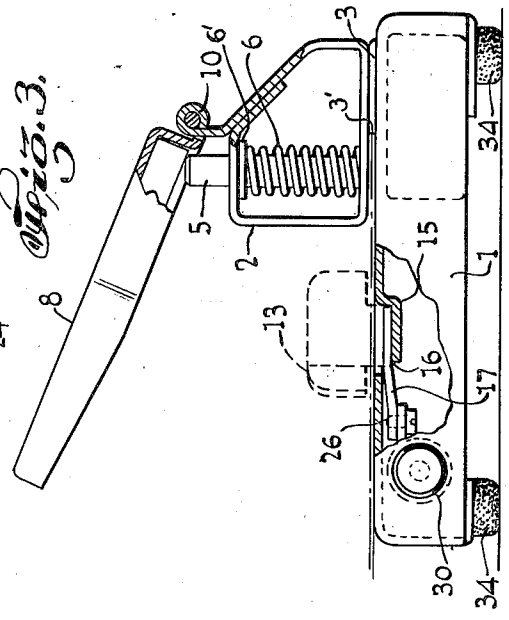


Fig. 3.

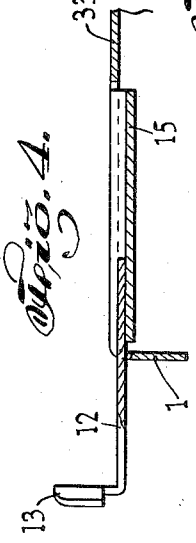


Fig. 4.

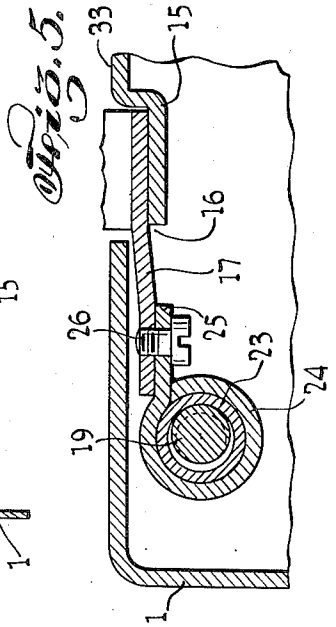


Fig. 5.

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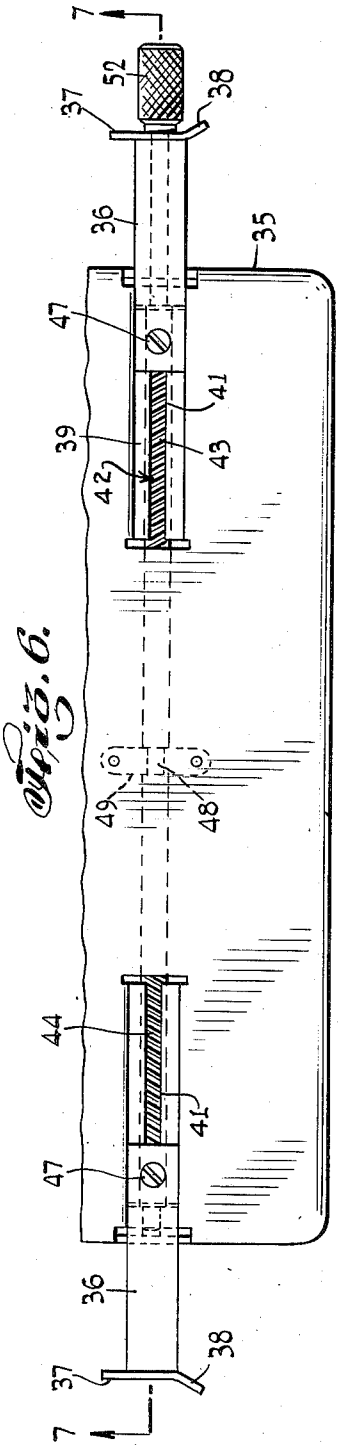


Fig. 6.

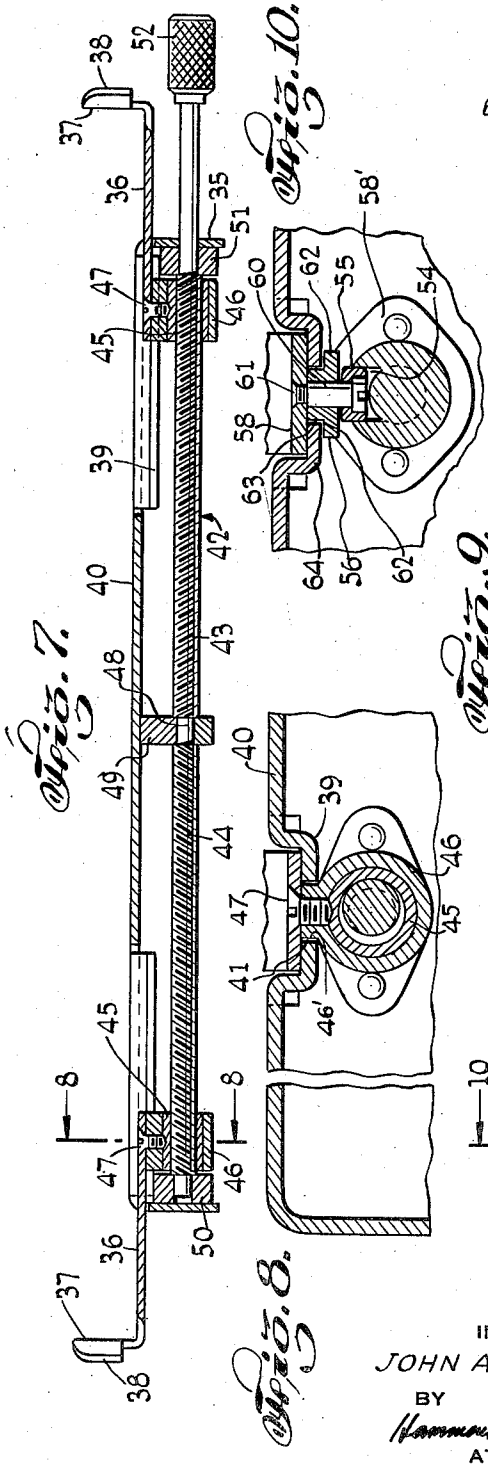


Fig. 7.

Fig. 8.

Fig. 10.

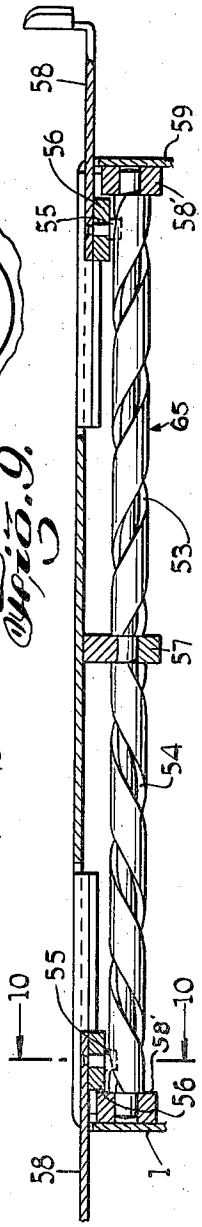


Fig. 9.

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2,524,583

UNITED STATES PATENT OFFICE

2,524,583

PAPER PUNCH

John A. Yerkes, New York, N. Y.

Application January 14, 1947, Serial No. 722,025

10 Claims. (Cl. 164—96)

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This invention relates to a perforating device and especially to an apparatus for punching holes in sheets of paper, cardboard, or similar material, such as is suitable for desk or office use.

When it is desired to punch holes in paper for various purposes, such as filing, frequently it is necessary to center accurately the hole or holes punched in the paper relative to the center of the paper, so as to have an orderly arrangement of the papers in a file. In order to center the holes, it is necessary to provide guide or gauge means for holding the paper or stack of papers centrally of the punch arrangement. Papers frequently are of various widths so that a fixed guide arrangement is not satisfactory and means must be provided for easily, quickly, and accurately changing the width between the paper guides and still maintain the paper centered relative to the punches.

One of the objects of the present invention is to provide an improved punch construction for locating paper accurately relative to a punch of the desk or office variety, the punch having a base of convenient size.

Another object of the invention is to provide a desk type punch which can be constructed economically and having parts which can be supported on a standard size base, yet be adaptable for use with papers considerably wider than the base.

One of the features of the invention is the use of two gauge bars slidable on the punch base and movable so that gauging portions thereof will extend outside of the confines of the base. By being projectible from a position wholly within the confines or outline of the base to positions outside thereof, it is possible to use a smaller base than otherwise would be feasible. The gauge bars are interconnected for simultaneous movements in opposite directions by means of a rotatable connector. To effectuate such a movement, each of the gauge bars can have an oppositely directed helical connection with the rotatable connector, so that the gauge bars will move in opposite directions relative to each other as the connector is rotated in one direction. The helical connection can be in the form of right and left-hand threads. The gauge bars can be supported in depressed saddles or seats formed in the base, there being suitable connecting means between the gauge bars and the threaded connector member, said connecting means extending through slots or openings in the base.

Still another feature of the invention in one

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of its modifications is the provision of coarse pitch threads on the connector between the gauge bars so that the connector will turn when pressure simultaneously is exerted on both of the gauge bars, thus permitting simultaneous movement of the bars in opposite directions. The pitch of the threads in such a modification is made sufficiently great or coarse so that movement of the bars is not effectuated by rotation of the connector.

These and other objects, features, and advantages of the invention will become apparent from the following description and drawings which are merely exemplary.

Fig. 1 is a plan view with the handle in open position and the gauge members in an extended or open position.

Fig. 2 is a fragmentary elevation taken along the line 2—2 of Figure 1.

Fig. 3 is a side elevation with part of the handle and bracket broken away, the handle being shown in a position just before a punch is depressed thereby.

Fig. 4 is an enlarged fragmentary section taken along the line 4—4 of Figure 1.

Fig. 5 is an enlarged detailed view of the connector screw and gauge bar taken along the line 5—5 of Figure 1.

Fig. 6 is a fragmentary plan view of a modified form of arrangement of the screw threaded connector rod.

Fig. 7 is a sectional view taken along the line 7—7 of Figure 6.

Fig. 8 is an enlarged broken section taken along the line 8—8 of Figure 7.

Fig. 9 is a sectional view of still another modification wherein a connector having a coarse pitch threads is employed.

Fig. 10 is an enlarged sectional view taken along the line 10—10 of Figure 9.

In a preferred form of the invention, base 1 can be formed by stamping from a suitable piece of sheet metal, although it is to be understood that a casting, die casting, or other material shaped in various manners may be employed, as distinguished from a base built up or fabricated from a plurality of pieces of material held together by suitable means. Bracket 2 (Figs. 1, 2, 3) may be made from a flat piece of metal formed to the shape shown, one type of arrangement and configuration of these parts being described, in detail, in my copending application Serial No. 653,343 filed March 9, 1946.

Bracket 2 may be carried on suitable pads 3 (Fig. 3) formed or mounted on base 1, said pads

spacing the lower face of the bracket above the upper face of base 1, so that the paper may be inserted under the punch and between the bracket and base, the forward edge 3' of pad 3 serving as a stop for the forward edge of the paper. In this manner, the forward edge of the paper can be located relative to the punch. The punches 5 can be urged upwardly into their retracted position by spring 6 acting on washer 6', washer 6' being carried by the punch shank. A plurality of punches may be provided as shown in Figs. 1 and 2, said punches being spaced either side of the central punch 7 at predetermined distances so that preselected patterns of holes may be punched in the paper.

Handle 8 is hinged at 10 to bracket 2, and said handle may have a plurality of slidable selectors 11 which may be slid along the handle so as to be positioned to depress desired punches or groups of punches as the handle is operated. The arrangement of the punches and the selectors is described in said aforementioned copending application Serial No. 653,343.

The gauges are extendible beyond the base so as to take care of paper wider than the base and still have a convenient base size. The gauges also are arranged so that they may be brought together inside of the base outline so as to center paper narrower than the base. Merely by way of example and illustration, the gauges can be arranged to accommodate standard widths of paper between 4½ inches and 12½ inches, and the base in such an instance can be about 8 or 9 inches.

The gauge bars 12, 12 may be stamped from flat strips of metal with bent-up flanges 13, 13, said flanges preferably being outwardly flared as at 14, 14 (Fig. 1). The base 1 has depressed ways 15, said ways preferably being formed by bending the same inwardly from the strip of metal from which the base is made. Slot 16 provides an opening wherein extensions 17 of the gauge bars can pass and wherein said extensions are guided as the gauge bars are moved relative to the base.

Connector rod 18 has oppositely threaded portions 19 and 20, and in the form shown in Fig. 2, the threads extend to the reduced center portion 21 of the rod which is carried in bearing 22. Threaded bushings or nuts 23 (Figs. 2, 5) are non-rotatably engaged by the circular bushing holder 24, the bushing holder having an extension 25 which may be connected to the gauge extension 17 by means of a screw or other fastening 26. Bushing holder extension 25 may be made separate from the extension 17 of the gauge bar so as to facilitate assembly of the device. Threaded rod 18 is journalled at the left end (Fig. 2) in bearing 27 which is suitably fastened, such as by riveting or screws 28 (Fig. 1), to base 1 of the punch, and the right-hand end is journalled in bearing 29 similarly secured to the base 1 of the punch. Knob 30 may be pinned at 31 or otherwise fastened to the reduced shank 32 of the threaded rod. Gauge bar shanks 12 are slidable on the depressed ways 15, the inner edges of the gauge bars sliding underneath the upper surface 33 of base 1 as the gauges are moved toward the center of base 1. Base 1 of the punch may be supported on suitable feet 34 which should be sufficiently high so that the fingers can easily grasp the knob 30.

When it is desired to move the gauge bars closer together, knob 30 may be turned in such a direction as to rotate the rod to cause both of the gauge bars 12 to slide inwardly toward each other. Thus, the gauges are oppositely movable toward each other as the threaded rod is rotated. When the gauge bars are in their innermost position, it will be apparent that the gauge bar extension 17 and the bushing holder 24 with its extension 25 will be located closely adjacent the central bearing 22 underneath the upper face 33 of the punch base.

A modification of the invention is seen in Fig. 6, wherein threaded rod 42 is located directly beneath the gauge bars. Base 35, in this modification, may have a bracket and punches mounted thereon with gauge bars 36 having flanges 37 and outwardly flaring portions 38, in a manner similar to Figs. 1 to 5. Depressed ways 39 may be formed by being bent downwardly from top surface 40 of the base, said ways having a longitudinal slot or aperture 41 centrally thereof.

Threaded rod 42 may have oppositely directed threads 43 and 44 thereon, one being right-hand and the other, left-hand. Cooperating with each of the gauge bars are suitably threaded bushings 45 engaging the threads of the respective portions of the threaded rod, said bushings being carried by bushing holders 46. The bushing holders, in turn, are held by means of a screw 47, or other suitable fastening means, to their respective gauge bars. The reduced central portion 48 of the threaded rod is supported in the central bearing 49 mounted on the base of the punch. Bearings 50 and 51 are mounted on opposite ends of the base to support the threaded rod 42, said rod having a knob 52 suitably fastened thereon for the purpose of turning the rod when it is desired to adjust the gauges.

The knob is located for convenience so as to be to the right of one of the gauge bars when said gauge bar is in a fully extended position. The threaded bushings and inner ends of the gauge bars will slide underneath the upper surface 40 of the base as the gauges are brought together. The reduced portion 46' of the bushing holder 46 is slidable in the central slot 41 of the depressed ways 39. As is evident, the slot is not necessarily exactly in the center of the way.

Rotation of knob 52 and threaded rod 42 thereby will cause the gauge bars to move inwardly or outwardly relative to each other in opposite directions, so that the distance between the flanges 37 thereof can be suitably adjusted to appropriately center the paper relative to the punches.

Still another form of the threaded rod is seen in Figs. 9 and 10, wherein the rod 65 has coarse pitch threads 53 and 54 therein, said threads engaging the rollers 55 mounted on slidable guide blocks 56, which, in turn, are fastened to the gauge bars 58. The threaded rod 65 is journalled in bearings 57 and 58', said bearings being fastened to the base 59 of the punch in a manner similar to that described for the previous modification. Roller 55 may be mounted on stud 60 which is screw threadedly engaged at 61 with the gauge bar 58. The slidable guide blocks 56 are formed with shoulders 62 straddling the aperture 63 in the depressed ways 64. The threads of rod 65 have a pitch sufficiently coarse so that if only one roller 55 is in engagement with the rod, rectilineal movement of the roller by pressure on its gauge bar would cause rotation of the rod. At the same time, rotation of the rod would not drive the roller rectilinearly because of the slope of the threads on the rod. This means that in order to move the gauge bars in the form shown in Fig. 9, each gauge bar must have an oppositely directed force exerted thereon in order to cause

rotation of the threaded rod to permit simultaneous movement of the gauge bars.

When it is desired to move the gauge bars inwardly and outwardly relative to each other, both of the bars are grasped, for example, and moved inwardly together. The inward pressure on the bars will cause pressure to be exerted on the rollers and thence on the coarse pitch threads so as to rotate rod 65. If only one of the gauge bars is pushed, there will be a locking action between the roller of the opposite gauge bar and the threads of the rod so that it is not possible to accidentally move one bar without the other.

It is to be understood that details of construction herein may be varied without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. In a desk-type paper punch, a base having a pair of slideways thereon located below the upper face of said base, a pivoted lever mounted on said base, a punch operable by said lever, a pair of oppositely movable cooperating gauge members slidably mounted in said slideways and projectible beyond said base, a gauge interconnecting member rotatably mounted on said base having oppositely directed screw threads thereon, one gauge member being connected with the screw threads turning in one direction and the other gauge member being connected with the screw threads turning in an opposite direction, whereby said gauge members are movable simultaneously in opposite directions as said interconnecting member rotates so as to center paper relative to said punch.

2. In a desk-type paper punch, a formed unitary metal base having depressed slideways formed from the metal of the base, said slideways being slotted, a pivoted lever mounted on said base, a punch mounted on said base and operable by said lever, a pair of oppositely movable cooperating gauge members, said gauge members being slidable on said slideways and projectible beyond said base, a connector rod rotatably mounted on said base and having oppositely directed threads on each end portion thereof, a threaded connection between one gauge member and one end of said rod and an oppositely directed threaded connection between the other gauge member and the other end of said rod, a portion of said connections between the gauge members and the connector rod being slidable in said slots along said slideways, whereby said gauge members are movable simultaneously in opposite directions upon rotation of said connector rod.

3. In a desk-type paper punch, a base having a pair of depressed slideways with slots extending along said slideways, a pivoted lever mounted on said base, a punch mounted on said base and operable by said lever, a pair of oppositely movable cooperating gauge members slidable on said slideways, said slidable gauge members being movable from positions wholly within the outlines of said base to positions with the gauging portions of said members projecting beyond said base, a gauge connector rod rotatably mounted on said base and having oppositely directed threads on each end portion thereof, a threaded connection between one gauge member and one threaded portion of said rod and an oppositely directed threaded connection between the other gauge member and the other end of the rod, a portion of said connections being slidable in said slots, whereby said gauge members are moved simultaneously in opposite directions upon rotation of said connector rod.

4. In a desk-type paper punch, a base having a pair of depressed slideways with slots extending along said slideways and along the ends of said slideways, a pivoted lever mounted on said base, a punch carried by said base and operable by said lever, a pair of oppositely movable cooperating gauge members slidable on said slideways, said gauge members being movable from positions wholly within the outlines of said base to positions with the gauging portions of said members projecting beyond said base, a connector rod rotatably mounted on said base and having oppositely directed threaded portions on the ends thereof, a threaded connection between one gauge member and one threaded portion of said rod and an oppositely directed threaded connection between the other gauge member and the other end of said rod, a portion of said connections between the gauge members and the connector rod being slidable in said slots along said slideways, said gauge members being slidable through said slots at the end of said slideways, whereby said gauge members are moved simultaneously in opposite directions upon rotation of said connector rod to center paper relative to said punch.

5. In a desk-type paper punch, a base having a pair of depressed slideways with slots extending along said slideways, a pivoted lever mounted on said base, a punch carried by said base and operable by said lever, a pair of oppositely movable cooperating gauge members slidable on said slideways, said gauge members being movable from positions wholly within the outlines of said base to positions with the gauging portions of said members projecting beyond opposite sides of said base, a connector member rotatably mounted on said base, said connector member having oppositely directed threads on each end portion thereof, said connector being offset relative to the line of movement of the gauge members, and threaded members mounted on each end portion of said connector member and joined with the respective gauge member by extensions, said extensions being slidable in said slots.

6. In a desk-type paper punch, a base having a pair of depressed slideways with slots therealong, a pivoted lever mounted on said base, a punch carried by said base and operable by said lever, a pair of oppositely movable cooperating gauge members slidable on said slideways, said gauge members being movable from positions wholly within the outlines of said base to positions with the gauging portions of said members projecting beyond each side of said base, a connector rod rotatably mounted on said base directly under said gauge members, a threaded member on each end portion of said connector rod connected to the inner end of the respective gauge member, the connection between said threaded member and the gauge member being slidable in said slots, and a knob on said connector rod for turning the same.

7. In a desk-type paper punch, a base, a pivoted lever mounted on said base, a punch operable by said lever, a pair of oppositely movable cooperating gauge members, said gauge members being slidable on and projectible outwardly beyond said base, a rotatable connector rod having oppositely directed coarse pitch threads, and a connecting member between each of said gauge members and the corresponding threads on the end portions of said threaded connector, whereby simultaneous pressure inwardly or outwardly on the gauge

members will cause rotation of the coarse pitch threaded connector member so that simultaneous movement of the gauge members can take place.

8. In a desk-type paper punch, a base, a pivoted lever mounted on said base, a punch operable by said lever, a pair of oppositely movable cooperating gauge members, said gauge members being slidable on and projectible outwardly beyond said base, a rotatable connector rod having oppositely directed coarse pitch threads on the end portions thereof, a roller carried on each of said gauge members engageable with the corresponding oppositely directed threads, the pitch of said threads being such that simultaneous pressure oppositely directed on said gauge members will cause rotation of the coarse pitch threaded connector rod so that simultaneous movement of the gauge members can take place when substantially simultaneous pressure is exerted on each of said gauge members.

9. In a desk-type paper punch, a formed unitary metal base having slideways on said base, said slideways being slotted, a pivoted lever mounted on said base, a punch mounted on said base and operable by said lever, a pair of oppositely movable cooperating gauge members, said gauge members being slidable on said slideways, a connector rod rotatably mounted on said base and having oppositely directed threads on each end portion thereof, a threaded connection between one gauge member and one end of said rod and an oppositely directed threaded connection between the other gauge member and

the other end of said rod, a portion of said connections between the gauge members and the connector rod being slidable in said slots along said slideways, whereby said gauge members are movable simultaneously in opposite directions upon rotation of said connector rod.

10. In a desk-type paper punch, a base, a pivoted lever mounted on said base, a punch operable by said lever, a air of oppositely movable cooperating threaded gauge members, and a rotatable threaded connector having oppositely directed pitch threads engaging corresponding threads of said threaded connector, the pitch of said threads being such that pressure inwardly or outwardly respectively, on at least one of the gauge members, will cause simultaneous movement of said gauge members inwardly or outwardly relative to each other.

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