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L. C. KAHL.

CARRIER MECHANISM.

APPLICATION FILED APR. 26, 1904.

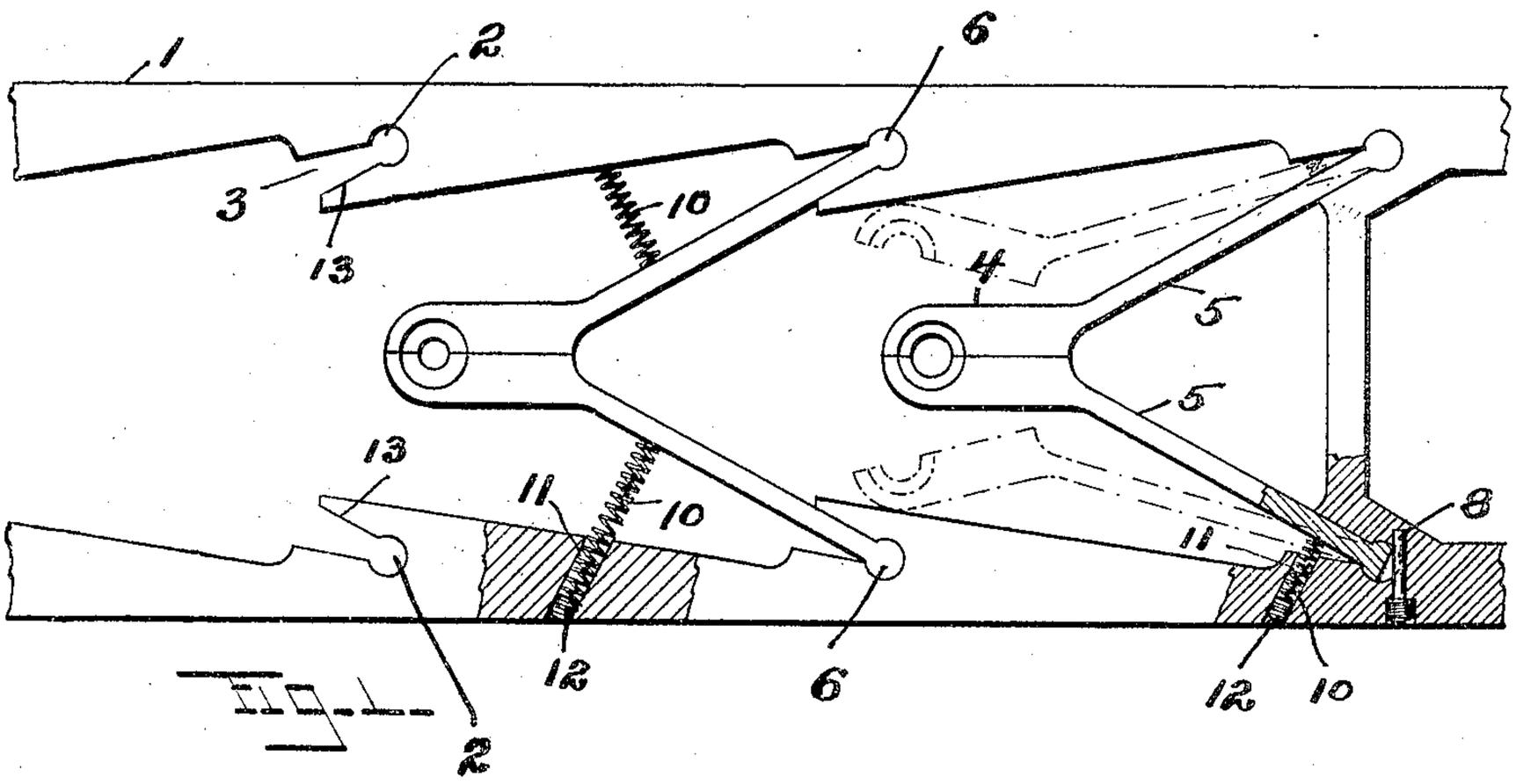

Fig. 1.

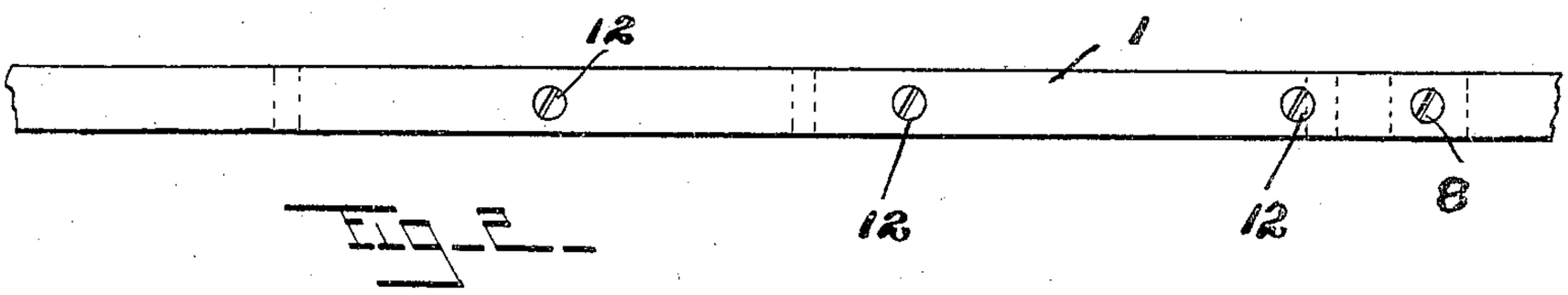

Fig. 2.

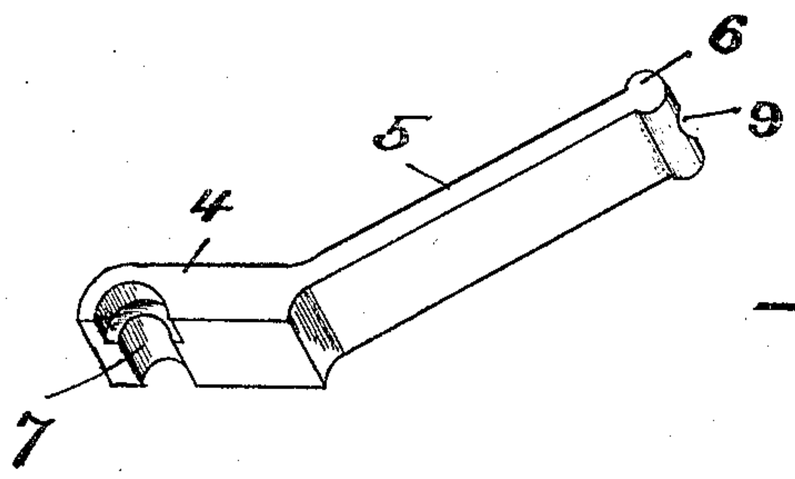

Fig. 3.

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UNITED STATES PATENT OFFICE.

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CARRIER MECHANISM.

No. 808,758. Specification of Letters Patent. Patented Jan. 2, 1906.

Application filed April 26, 1904. Serial No. 205,037.

To all whom it may concern:

Be it known that I, LOUIS C. KAHL, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Carrier Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to new and useful improvements in carrier mechanisms, and refers more particularly to mechanisms wherein movable fingers are arranged so as to grasp the unfinished article and carry it from one set of tools to another between the successive operations necessary to complete it.

It is the object of my invention, among other things, to construct a carrier mechanism of this general character which will be positive in its operation, the fingers untempered and sufficiently rigid to insure their continued uniform and predetermined movements and at the same time be engaged by spring mechanism, so as to be sufficiently yielding, and thereby obtain all the advantages of tempered spring-fingers; to provide means whereby a fixed stop will limit the movement of the fingers in one direction, and, further, to make the same of the fewest possible parts so designed as to be economically constructed, readily assembled, and, if necessary, applied to the present type of carrier-slides.

To these and other ends my invention consists in the carrier mechanism having certain details of construction and combination of parts, as will be hereinafter described, and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures, Figure 1 is a fragmentary plan view of a carrier-slide. Fig. 2 is a side elevation thereof, and Fig. 3 is a perspective view of one of the carrier-fingers.

Heretofore the carrier-fingers have been made of tempered tool-steel with that portion between the head and the die end made thin enough to form a flat spring. They are fastened rigidly in the slide at the die ends and obtain a lateral movement entirely through the flexibility of the said spring portion. This type of finger, an illustration of which is shown in Letters Patent No. 768,876, dated August 30, 1904, has proved objectionable, among other things, because the fingers are of tool-steel and expensive to make. They are either warped out of shape or broken during the tempering operation, thus completely destroying the finger, and the spring portions in time become crystalized and set, and thereby fail to operate effectually. Again, as the fingers operate in pairs, it is a very difficult and practically impossible thing to get two springs of equal tension. The varying tensions of the spring portions either throw the die ends of the fingers too far under the punch, in which case either the punch or finger is broken, or not far enough, in which case the work is imperfect. In either case the work is improperly placed beneath the operating mechanism, and, further, as that portion of the fingers engaging the slide had to be fitted exactly or substantially a driving fit the fingers were not interchangeable. I have overcome all of the above and other objections to the prior art by constructing a finger which is pivotally secured to the slide, does not require tempering, engages a fixed stop near its head, and by means of independent spring mechanisms has all of the advantages of the spring features of the old type of spring-fingers with none of its disadvantages.

In the drawings the numeral 1 designates the carrier-slide, which is of a type well known to the art, having a reciprocating movement and carrying the incompleted article from one set of tools to the other, so that successive operations may be performed thereon. Upon either side of said slide are a plurality of semicircular holes 2 at the inner ends of the outwardly-flaring slots 3.

The fingers are constructed with the die portion 4 and a shank portion 5, which terminates at its outer end in the head or knuckle 6 of greater diameter than the width of the shank 5 and of the same diameter as the hole 2. The die portion 4 is provided with recesses 7, of such form and shape as is desired for the particular class of work upon which the mechanism is used. The fingers are secured to the slide by inserting the knuckle 6 into the hole 2, the slot 3 being of sufficient width to permit the lateral movement of said fingers. After said fingers are placed in the slide movement thereof in the direction of the length of the knuckle 6 is pre-

vented by means of the stud 8, which is threaded into the side of the slide, with its shank crossing the holes 2 and passing through a recess 9 in the knuckle 6. These fingers when carrying their work are in the position shown by full lines in Fig. 1,wherein the inner faces of the die portions 4 are in engagement with each other, and are thus held by the springs 10, which bear against one side of the shank 5 and press the fingers inwardly toward each other. These springs are preferably inserted within holes 11 in the side of the slide and are held against outward movement by means of the screw-plugs 12. They may be located, as desired, either adjacent to the knuckle 6 or nearer the die portion 4, two different positions being shown in Fig. 1, but both being within my invention. When the fingers are in the position just described, the inner faces of the shank 5 engage the inner faces 13 of the slots 3, which thereby form a rigid stop for said fingers and limit the movement thereof in one direction. During the return movement of the slide the fingers are opened, so that they assume the position shown by broken lines in Fig. 1, and after they have passed the opening mechanism the springs 10 throw the fingers inwardly again until the inner face of the shanks 5 and the faces 13 engage, in which position they are held against further movement.

It will be noted that in my construction it is not necessary to temper the fingers or to have the shank 5 in the form of a spring, as they may be made as thick and heavy as desired, and that the movement of the fingers must be positive, as the engagement of the shank 5 with the shoulder 13 limits the inward movement of the fingers, forming a fixed stop and preventing overthrow.

If, perchance, after the fingers are completed they do not aline exactly with the punches, the shank can be bent slightly, so as to bring the die portions into their proper positions and without destroying or injuring the fingers.

I am aware that it is old to mount fingers on a slide for pushing or pulling parts during the successive operations required to produce a finished article; but my invention is not of that class, it referring more especially to a slide having fingers connected therewith, which fingers grasp, support, carry,and transfer the unfinished parts from one set of tools to another during the process of manufacture.

There are many minor changes and alterations that can be made within my invention aside from those herein suggested, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but claim all that falls fairly within the spirit and scope of my invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character described, the combination with a slide; of fingers pivotally mounted therein and movable between opposing stop-faces.

2. In a device of the character described, the combination with a slide; of fingers pivotally mounted therein and movable between stop-faces; and spring mechanism for moving said fingers in one direction.

3. In a device of the character described, the combination with a slide; of fingers rigid throughout their length pivotally mounted therein and movable between opposing stop-faces; and spring mechanism engaging said slide and fingers for moving said fingers in one direction.

4. In a device of the character described, the combination with a slide; of fingers movable between stop-faces and having a die portion at one end and a knuckle at the other end, said knuckle having a movable engagement with said slide.

5. In a device of the character described, the combination with a slide; of fingers movable between stop-faces and having a die portion at one end and a knuckle at the other end, said knuckle having a movable engagement with said slide; and spring mechanism connected with said slide and engaging said fingers between said die portion and knuckle.

6. In a device of the character described, the combination with a slide; of fingers pivotally mounted therein and movable between opposing stop-faces; and coil-springs engaging said slide at one end and said fingers at the other end for moving said fingers in one direction.

7. In a device of the character described, the combination with a slide; of fingers pivotally mounted therein and movable between opposing stop-faces; and means for preventing the endwise movement of said fingers in said slide.

8. In a device of the character described, the combination with a slide; of fingers pivotally mounted therein; and a pin in said slide for preventing the endwise movement of said fingers in said slide.

9. In a device of the character described, the combination with a slide; of fingers pivotally mounted therein and having a recess in the pivot ends thereof; and a pin in said slide passing through said recess to prevent the endwise movement of said fingers.

10. In a device of the character described, the combination with a slide having semicircular holes therein; outwardly-flaring slots leading into said holes; and fingers pivotally mounted in said holes.

11. In a device of the character described, the combination with a slide having semicircular holes therein; outwardly-flaring slots

leading into said holes, the inner faces thereof forming stops; fingers pivotally mounted in said holes; and means for moving said fingers against said stop-faces.

12. In a device of the character described, the combination with a slide having the holes 2 therein at the inner ends of the outwardly-flaring slots 3; studs 8 in said slide and crossing said holes; fingers having a knuckle 6 upon one end thereof rotatably mounted in said holes; and springs 10 engaging said slide and fingers.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS C. KAHL.

Witnesses:

HENRY T. CROSS,

ROGER S. WOTKYNS.