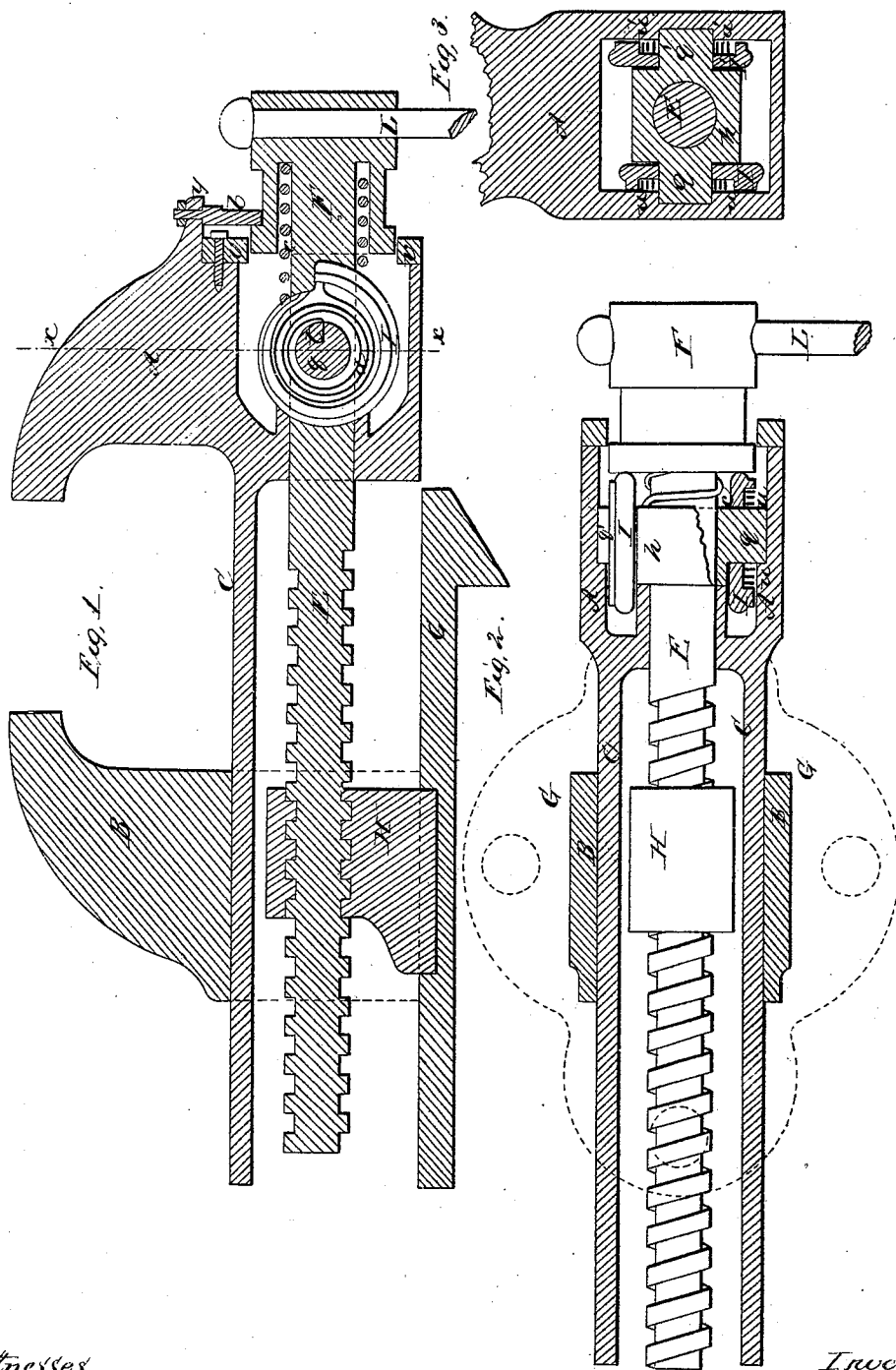


Crawley & Baylies.

Vise.

N^o 98,040.

Patented Dec. 21, 1869.



Witnesses,
Martin Follen
Wm. J. Brown

Inventor,
Edwin Crawley
Thomas L. Baylies.

United States Patent Office.

EDWIN CRAWLEY AND THOMAS L. BAYLIES, OF RICHMOND, INDIANA.

Letters Patent No. 98,040, dated December 21, 1869.

IMPROVED VISE.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern :

Be it known that we, EDWIN CRAWLEY and THOMAS L. BAYLIES, of Richmond, in the county of Wayne, and State of Indiana, have invented new and useful Improvements in Automatic Vises; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a longitudinal vertical section, the parts being shown in the positions they assume when the jaws are not gripping an article.

Figure 2 is a horizontal section, through the middle of the vise, the parts being shown in the positions they assume when the jaws are gripping an article.

Figure 3 is a transverse vertical section, through the dotted line *x x*.

The same letters in the different figures refer to corresponding parts of the invention.

Our invention relates to an improvement in automatic vises, or that class of vises, the moving jaw of which has a rapid motion when being adjusted, with reference to the article to be secured therein, but which motion is automatically changed to a slower one, giving increased force, when said jaw comes in contact with the thing to be held.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

With reference to the drawings—

G is a bed-plate, and *A* and *B* are jaws, the former being movable, and the latter stationary, on bed-plate *G*.

C represents a box-slide, passing through a corresponding rectangular opening in jaw *B*, to which box-slide, jaw *A* is connected, and by which it is maintained in its proper position with reference to jaw *B*.

E represents a shaft, which is provided with screw-threads on a part of its length, which threads engage with corresponding threads in nut *H*. Said threads have a coarser or more rapid pitch than those ordinarily used in vises.

Nut *H* is secured to bed-plate *G* by screws, or by means of dovetailed projections formed upon said bed-plate.

The end of shaft *E*, which projects beyond the front face of jaw *A*, is provided with a boss, *F*, through an orifice in which, a lever, *L*, is inserted, by means of which shaft *E* is operated.

I I represent two cam-wheels, placed in a recess formed in jaw *A*, said wheels being opposite to each other, with shaft *E* passing between them.

q q represent axles or shafts, on which cam-wheels *I I* revolve. The outer ends of said axles rest in slots formed in the sides of jaw *A*, the inner ends being se-

cured to collar *h*, which collar embraces shaft *E*, but permits said shaft to move freely therein.

Each of the cam-wheels *I I* is so formed that the distance from the centre to the circumference of the same increases from a given point on the periphery thereof throughout the entire circumference. The inclination or pitch thus given to the peripheries of said cam-wheels is less than the pitch of the threads on shaft *E*, when said wheels and shaft are revolved conjointly.

u u are coiled springs, enclosed in annular recesses formed in the outer faces of the webs of wheels *I I*. One end of each of said springs is connected to its respective wheel at a point near the periphery thereof, the opposite end of said spring being secured to the shaft on which said wheel revolves.

t represents a pin secured in the recess of cam-wheel *I*, at such a point as will cause said pin to come in contact, at certain times, as will be hereinafter explained, with the stem of spring *u*, by which means said cam-wheel is prevented from revolving beyond a certain point. The same arrangement of parts explained above is used in cam-wheel *I*.

c is a spiral spring, embracing shaft *E*. One end of said spring extends into an annular recess formed in boss *F*; the opposite end of said spring bears against the front face of collar *h*.

v is a plate, secured to the front face of jaw *A* by means of screws, and covers the recess formed in said jaw. Said plate is provided with an orifice, into which boss *F* extends.

b is a plate, secured to projection *y*, on jaw *A*. The lower portion of said plate extends into a depression formed around the periphery of boss *F*.

The operation of the mechanism is as follows:

The parts being in the position shown in fig. 1, the vise is ready for the reception of the article to be held. The shaft *E* is turned in the proper direction, by means of lever *L*. When no greater resistance is offered to the closing jaw than occurs in adjusting said jaw, the tension of spring *c* is sufficient to prevent boss *F* from coming in contact with the peripheries of cam-wheels *I I*; consequently no rotary movement of the latter takes place, and jaw *A* moves with a speed corresponding to the pitch of the threads on shaft *E*.

In the operation of clamping the article, the pressure is produced by continuing to rotate shaft *E* to the right. The first resistance offered to the closing jaw overcomes the tension of spring *c*; consequently the inner face of boss *F* is brought in contact with the peripheries of the cam-wheels at the point where the diameter of said wheels is greatest. As the rotary motion of shaft *E* is continued, the tension of the coiled springs *u u* is overcome, and the said cam-

wheels revolve on the axes $q\ q'$. The result of this joint action of the screw and cam-wheels is to cause jaw A to move with a speed corresponding to the difference between the pitch of the threads on shaft E and the inclination or pitch of the peripheries of said wheels; hence, it follows that a greater amount of gripping force is obtained, than would be produced by the action of the screw alone.

When the lever L is turned to the left, for the purpose of releasing the article the action of boss F on the peripheries of the cam-wheels causes said wheels to revolve in a direction opposite to that in which they move during the operation of compressing the article, until the pressure is so far removed as to permit the tension of spring c to force boss F away from the peripheries of the cam-wheels, when the action of the coiled springs $u\ u'$ continues the rotary motion of said wheels until the pins t come in contact with the stems of said springs, and thus prevent any further rotary motion of said wheels during the operation of adjusting the jaw.

The relative positions of pins t , and the stems of springs $u\ u'$, are such as to bring the cam-wheels to a state of rest, when the highest point on the periphery of each of said wheels is opposite the shoulder or inner face of boss F.

Plate b causes jaw A to follow the longitudinal movement of shaft E, when said shaft is turned to the left.

The length of the depression in the periphery of boss F is sufficient to receive plate b , and to permit all necessary longitudinal motion of shaft E, independently of jaw A, which motion is equal to the distance between the highest and the lowest points on the peripheries of the cam-wheels, and also the amount of "lost motion" between the inner face of boss F and the peripheries of said cam-wheels.

Having thus described our invention,

What we claim, and desire to secure by Letters Patent, is—

1. The combination of boss F, spring c , and cam-wheels I I', with the jaws, screw, and nut of a vise, substantially as set forth.

2. The combination of the cam-wheels I I', collar h , springs $u\ u'$ and c , and boss F, with the jaws, screw, and nut of a vise, substantially as described.

3. The combination of the cam-wheels I I', springs $u\ u'$ and c , collar h , plate b , and boss F, with the screw and movable jaw of a vise, substantially as herein described.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

EDWIN CRAWLEY.
THOMAS L. BAYLIES.

Witnesses:

MARTIN FOLLEN,
WM. T. BROWN.