F. V. PEPPER & E. A. BRANDENBURG.

PAPER FASTENING DEVICE.

APPLICATION FILED DEC. 19, 1911.

1,173,119. Patented Feb. 22, 1916.

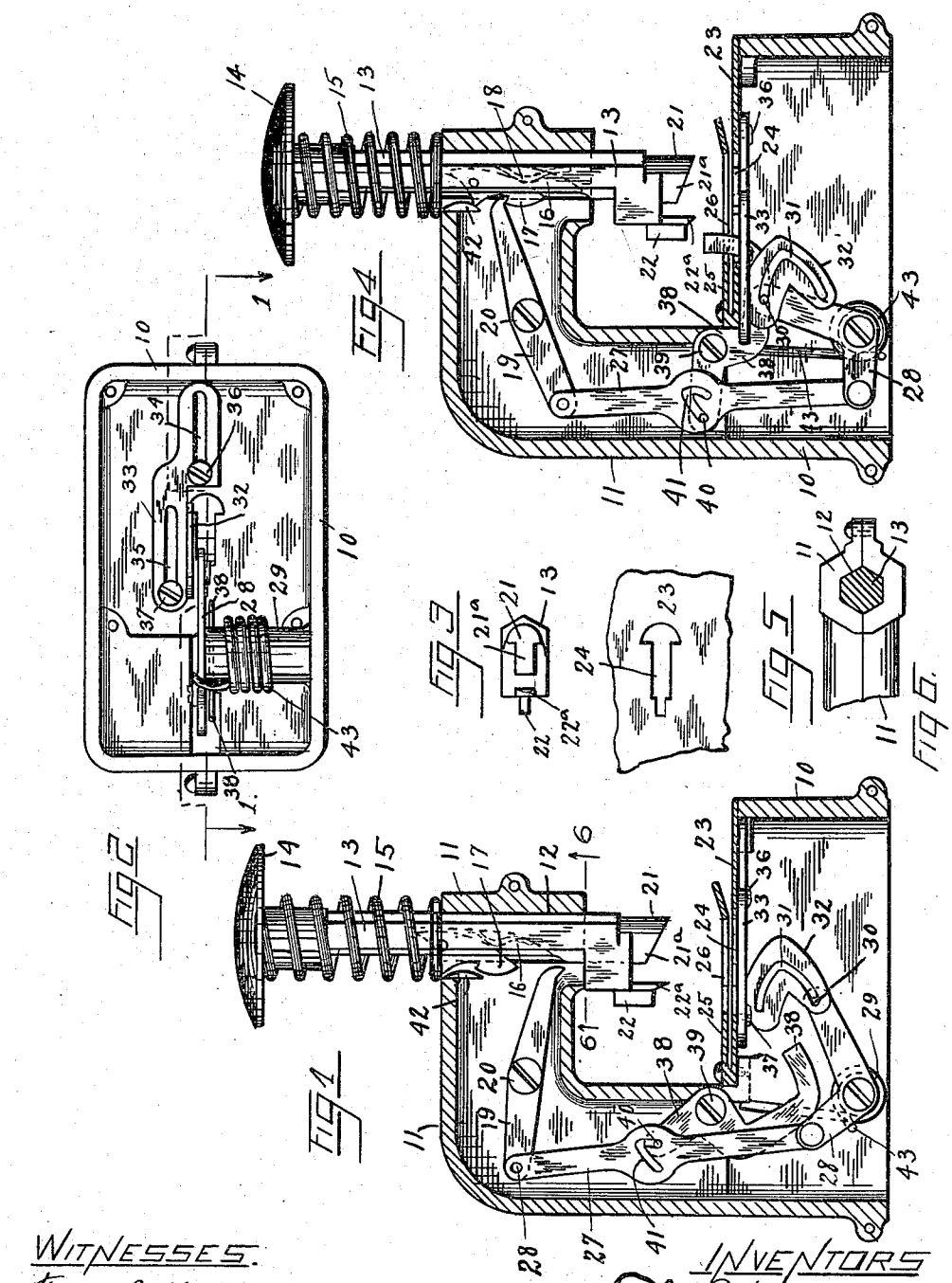


FIG 4

FIG 2

FIG 3

FIG 5

FIG 6.

FIG 1

WITNESSES.

Frank Waterfield.

Edward A. Gibbs

INVENTORS

F. V. Pepper.

E. A. Brandenburg.

By E. Farnham.

Attorney.

UNITED STATES PATENT OFFICE.

FREDERICK V. PEPPER AND EDWARD A. BRANDENBURG, OF LOS ANGELES, CALIFORNIA.

PAPER-FASTENING DEVICE.

1,173,119. Specification of Letters Patent. Patented Feb. 22, 1916.

Application filed December 19, 1911. Serial No. 666,674.

To all whom it may concern:

Be it known that we, FREDERICK V. PEPPER and EDWARD A. BRANDENBURG, both citizens of the United States, residing at the city of Los Angeles, county of Los Angeles, and State of California, have invented new and useful Improvements in Paper-Fastening Devices, of which the following is a specification.

Our invention relates to that class of fastening devices used for securing two or more sheets of paper together, which consists in using a part of the sheets as the fastening means, and the object thereof is to provide cheap, simple and efficient means for quickly securing a number of sheets of paper together so that they will not become separated in handling. We accomplish this object by means of the device described herein and illustrated in the accompanying drawings forming a part hereof in which:

Figure 1 is a vertical section on the line 1—1 of Fig. 2. Fig. 2 is a bottom plan of our device. Fig. 3 is a bottom plan of the lower end of the plunger and the cutters. Fig. 4 is a view on the same line as Fig. 1 with the operating parts in different positions. Fig. 5 is a fragmentary plan view of the plate or die. Fig. 6 is a section of the plunger on the line 6—6 of Fig. 1 and a fragment of the top frame.

In the drawings 10 is a box shaped base frame preferably open at the bottom from which and at one end thereof extends the tubular L-shaped top frame 11 which is preferably cast integral with the base frame. In the outer end of the top frame is a vertical guide way 12 in which the plunger 13 reciprocates. On the top of the plunger is a head 14. Surrounding the plunger between the head and the frame is coiled a spring 15 which retracts the plunger to its inoperative position after the sheets of paper have been fastened together as hereafter explained. In the inner edge of the plunger is a recess 16 in which is pivotally mounted a dog 17 the head of which is held spring pressed outwardly by a leaf spring 18. This spring allows the head of the dog to move into the recess as the plunger moves downwardly and to slip past the end of lever 19 which is pivoted at 20 in the upper portion of the top frame.

After the head of the dog has passed below the end of lever 19 spring 18 throws the head of the dog out of the recess so that it engages the end of the lever 19 on the upward movement of the plunger. On the lower end of the plunger are the cutters. The front cutter consists of a semi-circular head 21 from which extends rearwardly a shank or body 21^a. The rear cutter consists of a T-shaped body 22 having a downwardly projecting tapered point 22^a whose front face is straight. These cutters are made of tempered steel and are set into the lower end of the plunger which is enlarged to receive them. The front cutter cuts out of the sheets of paper the locking tongue, not shown, and the rear cutter cuts a T-shaped slot in the paper through which the head of the locking tongue is passed as hereafter explained. On the top of the base frame is a die plate 23 having an aperture 24 therein. The front part of the aperture is of a configuration to fit the front cutter and the rear portion is of a configuration to fit the rear cutter. The shape of this aperture is best shown in Fig. 5. Above the die plate and at a distance above the same equal to the maximum thickness of the sheets of paper to be fastened together is a holding plate 25 having an aperture 26 therein which is a little larger than the aperture in the die plate and may be of the same shape if desired. The die plate and holding plate may be formed of a single plate of metal if desired or of two different plates and are suitably fastened to the base frame. A link bar 27 is pivotally connected to lever 19. The other end of link bar 27 is pivotally connected to the shorter arm of a bell crank lever 28, which lever is pivotally mounted on stud 29 extending from the side of the base to near the center thereof and is cast integral therewith.

The longer arm of bell crank lever 28 carries a pin 30 which enters a cam shaped slot 31 in arm 32 of the tongue turning plate 33, which plate has guide slots 34 and 35 therein. Flat head screws 36 and 37 pass through these slots into the die plate and hold and guide the tongue turning plate as hereafter explained.

A tongue placing lever 38 is pivotally mounted by screw 39 to the side of the bottom of the top frame. The lower or longer end of this lever is U-shaped and will be called the head of the lever. The other end or shank of this lever carries a pin 40 which

enters a cam slot 41 in link bar 27. For convenience in assembling the parts the frame is preferably cast in two parts which are separated on a vertical central longitudinal plane and are united by screws.

In the operation of our device two or more sheets of paper that are to be fastened together are passed under the holding plate. The operator then drives the plunger down until the cutters have passed through the sheets of paper and the lower end of the plunger contacts with the sheets of paper. This movement of the plunger and cutters cuts a tongue of the shape and size of the front cutter from the paper except that the tongue is not cut by the edge of the cutter opposite the head. These tongues remain attached to the sheets of paper and extend downwardly. The rear cutter cuts a T-shaped aperture out of the sheets of paper commencing at a distance from the tongue equal to the distance between the cutters. The operator then releases the plunger when spring 15 retracts the plunger to its inoperative position as shown in Fig. 1. In the upward movement of the plunger dog 17 engages lever 19 and carries the outer end thereof upwardly thereby depressing the rear end of lever 19. The depressing of the rear end of lever 19 causes link bar 27 to operate bell crank lever 28 to reciprocate the tongue turning plate and drive it rearwardly until the rear edge of the part thereof which contains slot 34 reaches the front edge of the aperture cut in the sheets of the paper by the rear cutter when the movement of the plate rearwardly ceases. It will be understood that the plunger moves upwardly a sufficient distance to remove the cutters from the die plate before dog 17 engages lever 19. The rearward movement of the tongue turning plate carries the free ends of the tongues of paper rearwardly so the heads thereof lie beneath the aperture cut by the rear cutter. At this point link bar 27 causes tongue placing lever to turn on its pivot thereby causing the head thereof to engage the tongues and force the heads thereof through the aperture cut in the sheets by the rear cutter. At this point the operating parts are in the position in Fig. 4. The further upward movement of the plunger brings the shank of dog 17 into engagement with stop lug 42 thereby disengaging the dog from lever 19. As soon as lever 19 is disengaged from dog 17 spring 43, which is coiled around stud 29 and has one end bearing against a part of the frame and the other bearing on lever 28, returns the connected parts to their inoperative position as shown in Fig. 1. The withdrawal of the sheets of paper from beneath the holding plate flattens the heads of the tongues upon the top sheet and thereby locks the tongues in the sheets. It will be observed that the head of the rear cutter cuts an aperture of the same width as the body of the tongue and that the aperture cut by the shank of the rear cutter is much narrower so that when the tongues are pushed through this aperture the resiliency of the paper causes the heads of the tongues to spread and thereby lock the tongues.

Having described our invention what we claim is:—

1. A paper fastening device comprising a frame; a spring retracted reciprocating plunger mounted in said frame; a tongue cutter and a slot cutter on the lower end of said plunger; a spring actuated dog carried by said plunger; a die plate and a holding plate secured to said frame, said plates having apertures therein; a tongue turning plate slidably mounted on the underside of the die plate; a tongue placing lever pivoted to said frame; and means to first operate the tongue turning plate and then the tongue placing lever and then to return the parts to their inoperative position.

2. In a paper fastening device, mechanism to form a tongue having a head thereon from the paper, and to cut a single aperture in the paper at the rear of the tongue, said aperture being narrower than the width of the head of the tongue; and mechanism to pass the head of the tongue through the aperture at the rear of the tongue.

3. A paper fastening punch having a pair of punch knives one of which is substantially U-shaped in cross section and has its bent portion wider than its other portion so as to cut a tongue with an enlarged free end from the paper and the other of the punch knives being narrower than the bent portion of the first mentioned punch knife and adapted to cut an opening in the paper adjacent to the tongue and narrower than the width of the enlarged free end of the tongue, and a locking finger operated by the movement of the punch knives for forcing the enlarged end of the tongue cut by the first mentioned punch knife through the narrower opening cut by the other punch knife.

In witness that we claim the foregoing we have hereunto subscribed our names December 1911.

FREDERICK V. PEPPER.
EDWARD A. BRANDENBURG.

Witnesses:
MYRTLE I. PEPPER,
FRANCES B. BURKE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."