

No. 775,432.

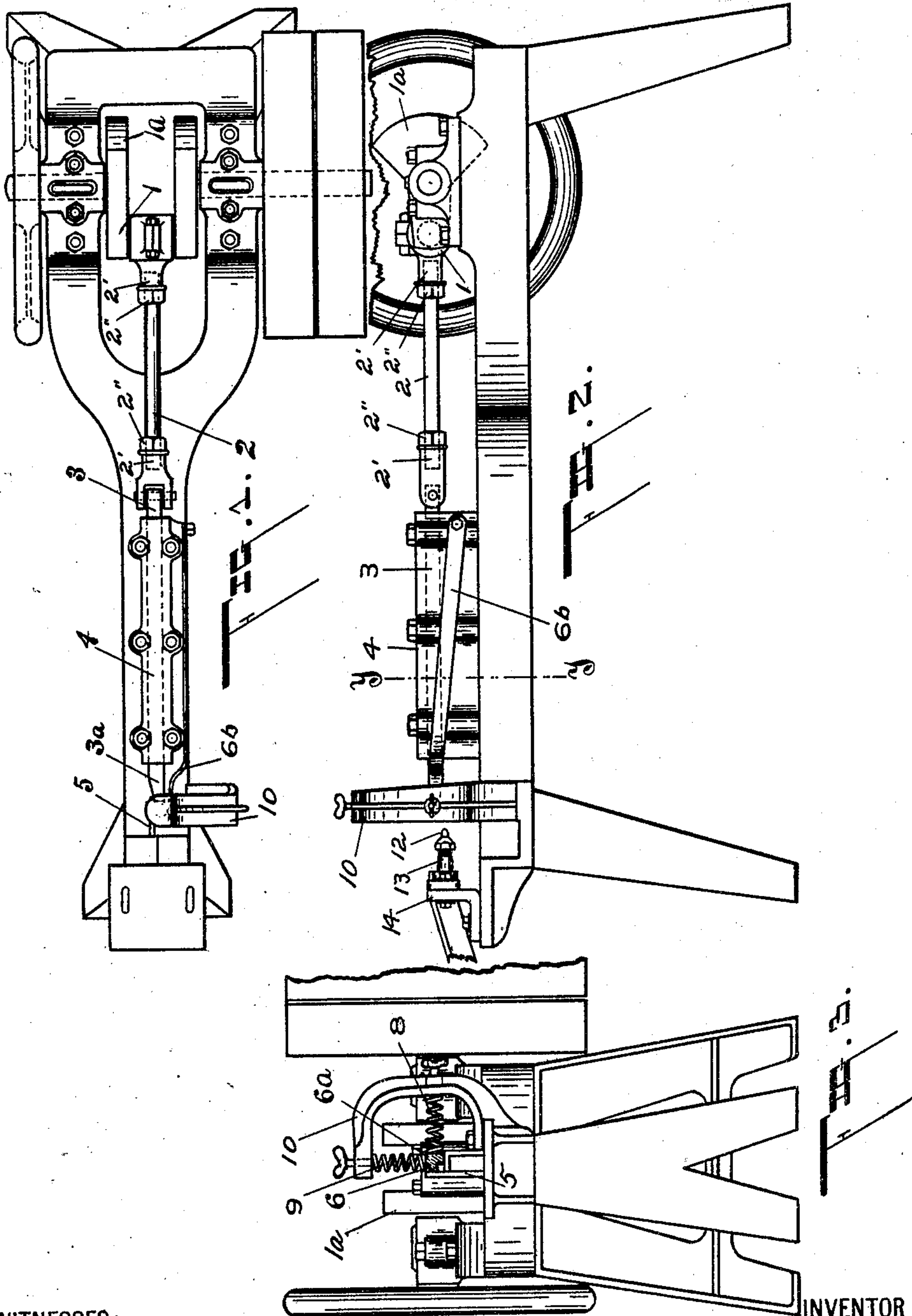
PATENTED NOV. 22, 1904.

C. F. STEWART.
MACHINE FOR MAKING DOWEL PINS.

APPLICATION FILED MAY 16, 1904.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

W. D. Cathcart.

A. A. Easterly.

Clarence F. Stewart.

BY

Geo. B. Willcox. ATTORNEY

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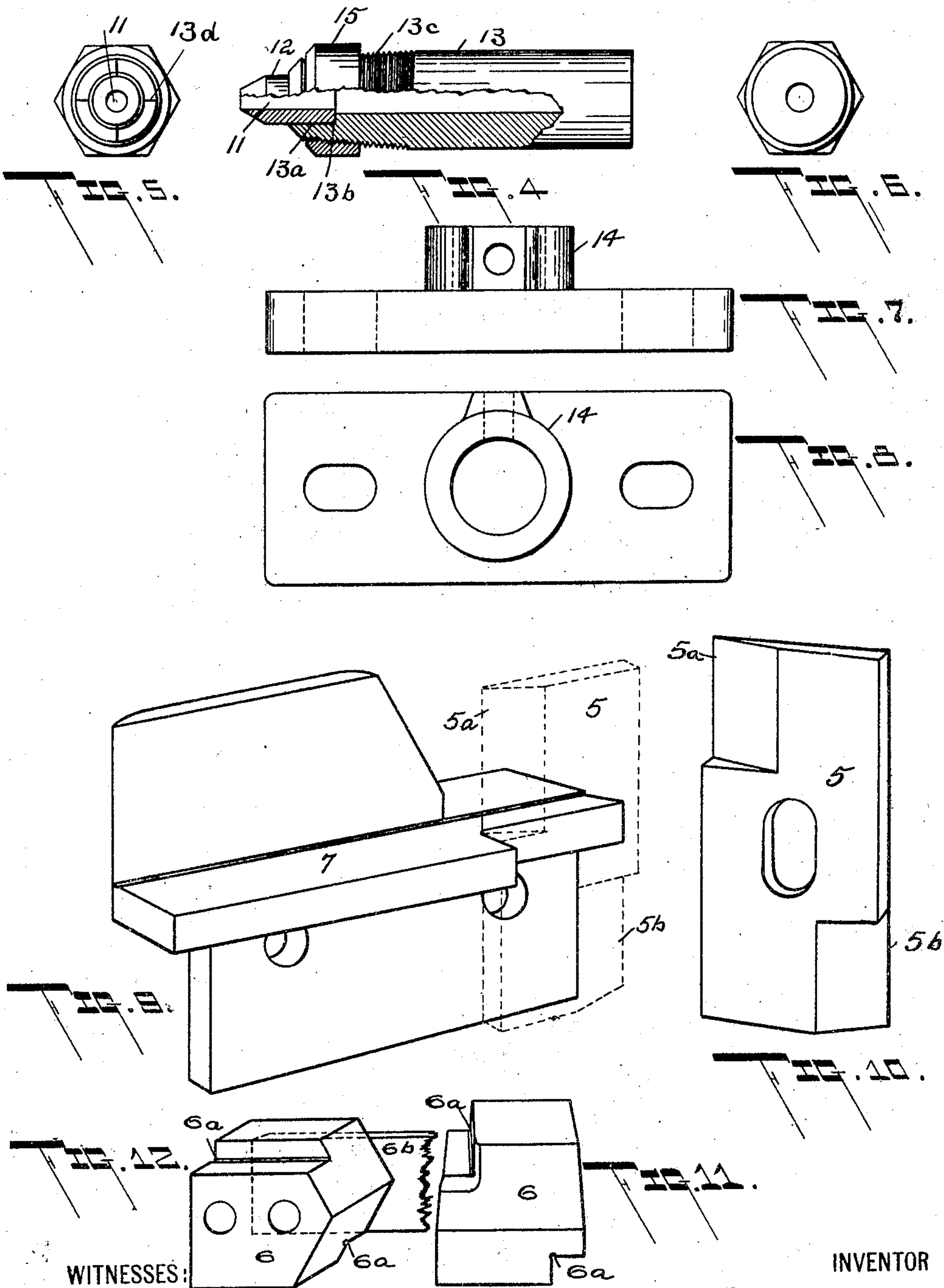
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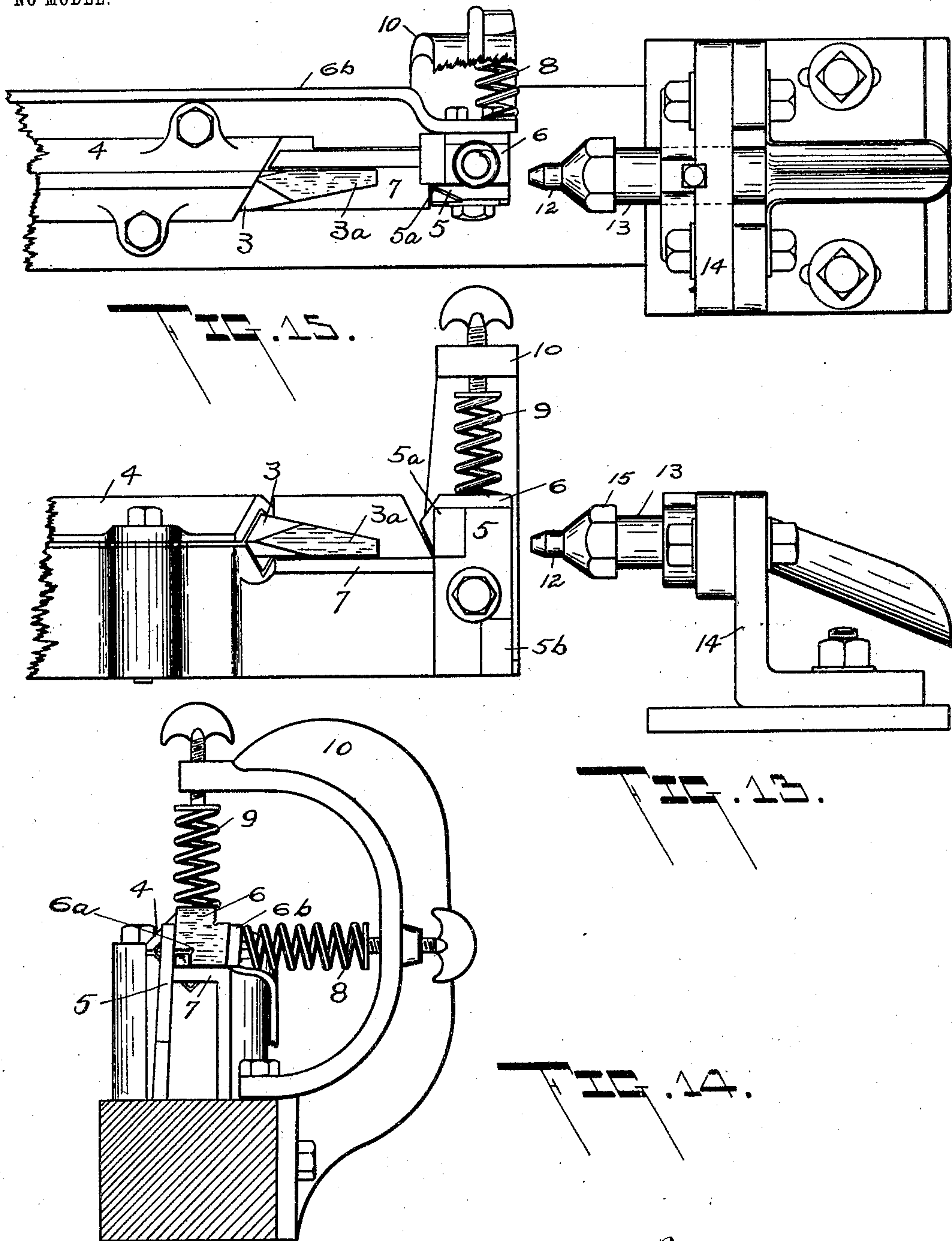
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Clarence F. Stewart. INVENTOR

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UNITED STATES PATENT OFFICE.

CLARENCE F. STEWART, OF VASSAR, MICHIGAN.

MACHINE FOR MAKING DOWEL-PINS.

SPECIFICATION forming part of Letters Patent No. 775,432, dated November 22, 1904.

Application filed May 16, 1904. Serial No. 208,252. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE F. STEWART, a citizen of the United States, residing at Vassar, in the county of Tuscola and State of Michigan, have invented certain new and useful Improvements in Machines for Making Dowel-Pins; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is a machine for making dowel-pins, and relates particularly to certain features in a dowel-pin machine of the class in which pins are formed by forcing a rectangular block endwise through the annular die.

The objects of the present improvements are to so construct the guide-block and guide-shoe by which the rectangular blank is directed into the die that friction between the guide-block and blank will be reduced to the minimum, and the machine will therefore require less power to drive it and is much easier to feed, thereby insuring a greater per cent. of good pins.

Further objects are to provide means for reducing the pressure of the blank against the block, this means consisting in the peculiar manner in which the splitting-knife is mounted, the knife being set at a slight angle from the vertical and having a tendency to draw the blank down into the shoe, thus relieving the pressure on the guide-block while the blank is being forced through the splitting-knife. Means is also provided for mounting the reciprocating plunger in its guides, so it will remain firmly supported centrally alined with reference to the hollow die and will be incapable of lateral movement even when the guides become worn.

Another improvement lies in the construction of the splitting-knife, whereby two interchangeable knives are formed in one piece, this construction being such that two knives may be made at almost the same cost as a single knife.

I have also provided a new construction of guide-block, whereby the block may be inverted when one side is worn, thus greatly increasing the life of the block. Interchange-

able springs for yieldingly holding the guide-block against the guide-shoe and knife are also employed, giving uniform pressure both on top and on the side of the guide-block. The connecting-rod is made adjustable, whereby the stroke of the plunger relatively to the splitting-knife may be regulated.

A further improvement lies in the construction of the annular die and the device by which it is held in place, whereby the cost of the die is greatly reduced.

With these objects and certain others which will appear further in the specification my invention consists in the device illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of the machine with the hollow die removed. Fig. 2 is a side view, broken away in part, showing the hollow die in place. Fig. 3 is a rear view of the machine, the die being removed. Fig. 4 is a part-sectional detail showing the construction of the spring-chuck for holding the hollow die. Fig. 5 is a front view, and Fig. 6 is a rear view, of the parts shown in Fig. 4. Fig. 7 is a top view of the bracket that supports the die-chuck, and Fig. 8 is a rear view. Fig. 9 is a perspective of the guide-shoe, the position of the knife being shown in dotted lines. Fig. 10 is a perspective of the knife. Fig. 11 is a front perspective of the guide-block. Fig. 12 is a side perspective of the same, showing part of the presser-spring. Fig. 13 is a detail in side elevation, showing the relative arrangement of the plunger, knife, guide-block, and guide-shoe. Fig. 14 is an end view showing the relation of the knife to the guide-block. Fig. 15 is a top plan view of the parts shown in Fig. 13.

As is shown in the drawings, the device consists in a power-operated crank 1, having rearwardly-extending counterbalances 1^a to reduce vibration and an extensible connecting-rod 2, journaled at its forward end to the reciprocating plunger 3, carried by horizontal guides 4. As the plunger moves back and forth its forward end 3^a advances toward and recedes from the splitting-knife 5 and the guide-block 6, which is yieldingly pressed toward the splitting-knife by means of the spring 6^b.

As is well known, in this class of machines wooden blanks having the grain extending lengthwise the machine are fed in front of the plunger 3^a and pushed forward against the splitting edge of the knife, thereby splitting from the blank a rectangular strip, which is forced through an annular die, and thereby converted into a dowel-pin at the next stroke of the machine. It is found in practice that machines of this type require considerable pressure on the top and side of the guide-block, and I have devised a guide-block and guide-shoe construction that eliminates a large part of the resistance. This guide-block construction is shown in Fig. 11, where 6^a is a longitudinal groove formed in the inner corner of the rabbet that extends along the lower corner of the front side of the guide-block. This groove forms a clearance for the corner of the blank and insures that the only rubbing contact will be that of the faces of the rabbet against the faces of the blank.

In order to keep the reciprocating plunger 3 central in its guides, I have adopted the construction shown in Figs. 13 and 14. The plunger is formed from a rectangular bar with its diagonal vertical, and thus the bar rests in the V-shaped groove of the guide 4. When the groove wears, the bar by its shape is prevented from shifting laterally, and therefore remains always in the vertical plane of the axis of the hollow die.

By referring to Fig. 14 it will be seen that the splitting-knife 5 is not vertical, but is tilted slightly toward the guide-block. This slight tilting of the knife results in a tendency of the blank to draw close into the corner formed by the knife 5 and the guide-shoe or table 7, and thereby makes unnecessary the heavy pressure which would be required to be exerted by the yieldingly-pressed guide-block 6 if a vertical knife were used. In practice I prefer to form the splitting-knife as shown in Fig. 10, where 5^a and 5^b are cutting-blades formed in the diagonally opposite edges of a steel plate 5. This plate may be mounted in any suitable manner so that the blades 5^a and 5^b by inverting the plate may be used interchangeably.

To hold the guide-block 6 in place, I employ a pair of interchangeable coil-springs 8 and 9, mounted in any suitable yoke or bracket 10 in such a manner as to exert yielding pressure against the top and side of the guide-block 6, respectively. The advantage in making the springs interchangeable is that the same amount of pressure will always be exerted upon the side of the blank as it passes through the knife as will be exerted upon the top and the necessity of employing two sizes of springs is avoided.

To compensate for any slight lengthening or shortening of the travel of the reciprocating plunger due to wear in the journals or

receding of the cutting edge 5^a of the knife by wear, I provide the adjustable connecting-rod 2. This rod is constructed by providing threaded recesses 2' in the journals at its ends and forming right and left hand threads on the respective ends of the rod to engage the journals. Set-nuts 2'' are threaded on the rod to preserve its adjustment.

Tapered annular dies heretofore used to form the pins are expensive, and to produce a simple die that can be more cheaply manufactured and to provide suitable means to rigidly clamp it in position I provide the device illustrated in Figs. 4, 5, and 6, in which 11 is an annular die of the usual form, except that its outer surface 12 is cylindrical instead of tapered. I clamp this die 11 rigidly in a chuck 13, which can be held in the bracket 14 by any suitable means. The chuck is in the form of a hollow spindle having a recess 13^a to receive the die 12, said recess being formed with a shoulder 13^b to receive the thrust of the die. The forward end of the chuck 13 is tapered slightly and threaded, as at 13^c, to receive the internally tapered and threaded nut 15. Radial slits 13^d are formed in the threaded end of the chuck, as shown in Fig. 5. When the nut 15 is screwed up, the slitted ends of the chuck 13 are drawn together, so as to firmly grip the die 12 and hold it in proper alinement.

By the means above described I have produced a dowel-pin machine that is simple in construction, requires small power to drive, and is not liable to get out of order.

What I claim as my invention, and desire to secure by Letters Patent, is as follows:

1. In a machine of the class described the combination with the reciprocating plunger and the annular die, of a rabbeted guide-block having a clearance-groove formed in the corner of the rabbet, for the purposes set forth.

2. In a machine of the class described, the combination with the reciprocating plunger, the counterbalance-crank, and the extensible connecting-rod; of a spring-pressed rabbeted guide-block having a clearance-groove formed in the corner of the rabbet, together with a tilted splitting-knife, and a cylindrical annular die, substantially as described.

3. In a machine of the class described, the combination with the reciprocating plunger, the spring-pressed guide-block and fixed guide-shoe; of a splitting-knife arranged opposite said guide-block, the top of said knife being inclined toward the guide-block, for the purposes set forth.

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

CLARENCE F. STEWART.

Witnesses:

W. I. CATHCART,
A. A. EASTERLY.