B. CHALFANT.

Die for Cutting Wooden Pins.

No. 202,702. Patented April 23, 1878.

Fig. 4

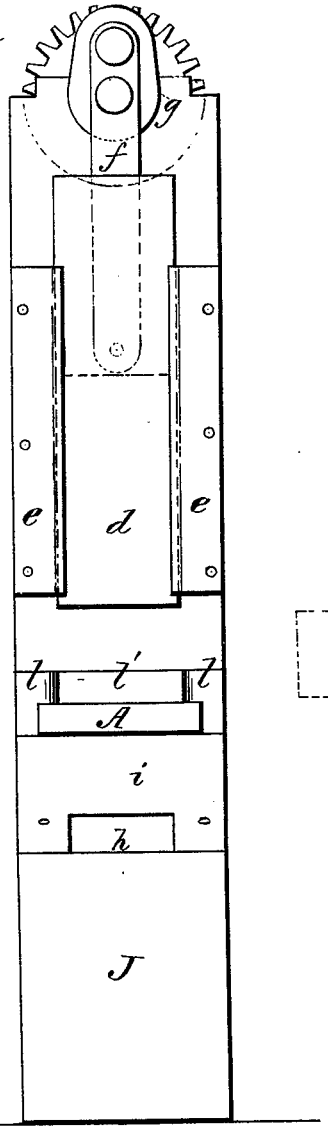

Fig. 5

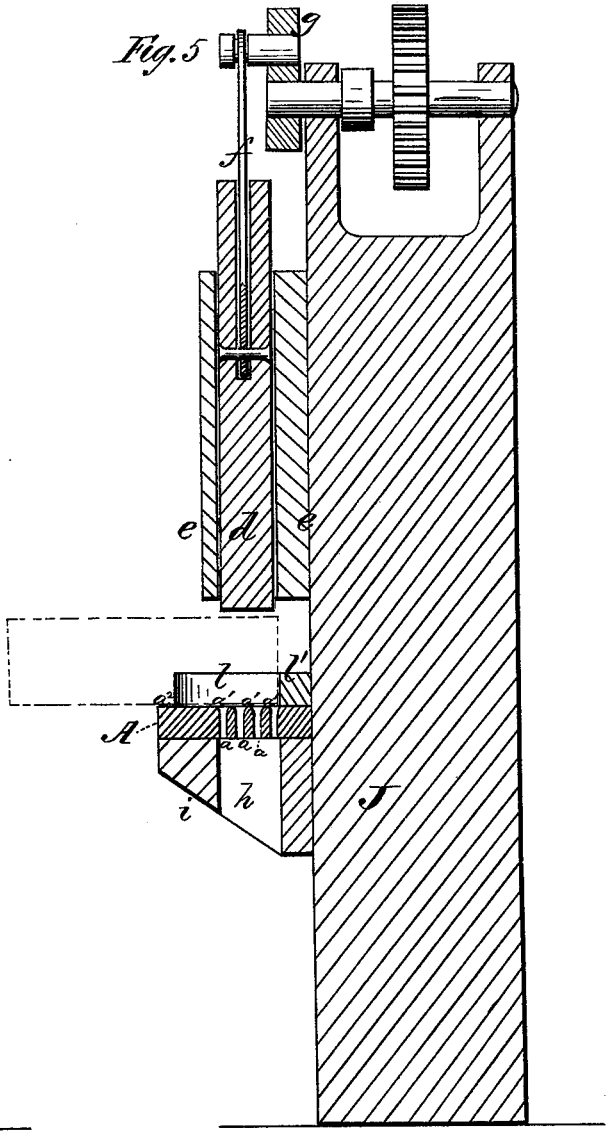

Fig. 1

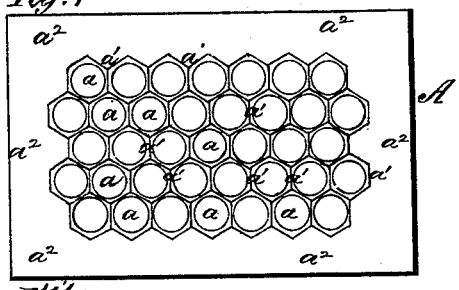

Fig. 2

Fig. 3

Witnesses.

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BRANTLY CHALFANT, OF WILLIAMSPORT, PENNSYLVANIA.

IMPROVEMENT IN DIES FOR CUTTING WOODEN PINS.

Specification forming part of Letters Patent No. **202,702,** dated April 23, 1878; application filed October 2, 1877.

To all whom it may concern:

Be it known that I, BRANTLY CHALFANT, of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Improvement in Match-Stick and Dowel-Pin Dies, which improvement is fully set forth in the following specification and accompanying drawings.

My improvement consists, in the main, of a die having laterally-adjoined lines of holes, of hexagonal or other many-sided form, on the working-face of the die, and extending through the die-plate in any desired form, the walls or partitions of the holes being beveled to an edge on their working-face.

In Figure 1, A represents a die-plate or piece of cast-steel, which may be from two to six inches wide, and of any convenient length, and of a thickness necessary to obtain the requisite strength. Through this plate holes, as at *a*, are drilled. On the working-face of the die-plate, and extending downward a short distance, each hole is made in a hexagonal form, this form being merged into a cylindric form as the holes pass through the bottom of the die-plate. On the working-face of the die-plate the walls *a'* of each hole are sharpened, and thus form a hexagonal cutting-edge.

I have shown in Fig. 1 a succession of lines of holes, in this instance there being five lines of holes extending longitudinally of the die-plate, the holes *a* of the several lines being so arranged as to adjoin each other at their cutting-edge in the form of a hexagon or in the likeness of honey-comb.

In the manufacture of match-sticks for friction-matches the stock or block of wood is placed upon the die-plate A over the holes *a*, whereupon, power being properly applied upon the stock or block, a portion of the block is forced down through the holes *a*, each one of which acts as a die to form a match-stick. In Figs. 1, 2, and 3 the holes or dies *a* are represented of a size proper for a dowel-pin such as is commonly used in the manufacture of doors, sash, and blinds; but for the manufacture of match-sticks the holes *a* would be made of a much less diameter.

In the ordinary mode of manufacture of match-sticks the die used is so formed as to compress only a slight portion of the wood of the stock into the body of the match-stick; but by my invention the cutting-edge of each of the holes or dies *a* takes in a portion of the stock of a considerably greater diameter than the diameter of the match-stick when delivered from the die-plate A complete. This extra amount of stock compressed into the body of the match-stick greatly strengthens it against breakage in the act of striking or lighting a match, as well as supplying to the body of the match-stick more burning-material, while at the same time the size or diameter of the match-stick may be the same as those now in common use. This compression is also of great importance where the holes or dies *a* are of a size for dowel-pins, such size being that shown in Fig. 1, and adopted for convenience of illustration in drafting said figure.

The ordinary dowel-pin often shrinks after being used, and thus becomes loose; but by being compressed such shrinkage is obviated, while at the same time the compression affords an increased capacity for the pin to swell from change of temperature, thereby giving security against its becoming loose after being used.

The die may be made with the holes *a* occupying an area, say, from one to three inches wide, more or less, and any convenient length, with a margin, as at a^2, indicated in Fig. 1, or with said margin partly or wholly left off, in which event there would be a sharp edge wherever the margin was left off, as indicated at *b* in Fig. 3, and thus shave off the outside surfaces of the blocks when their edges extend beyond the die-holdes.

If the die has a sharp cutter, as at *b*, the blocks for each operation may be cut off successively from a long piece simultaneously with the forming of the dowel-pins.

The operation of this die may be explained thus: The stock of which the match-sticks are to be made is cut to the proper length for the sticks, and of a width somewhat less than the area occupied by the die-holes *a*. The stock is then placed upon the die-holes and forced bodily through the die, each succeeding block pushing the preceding one out of the die in the completed condition of match-sticks, and without wastage of stock.

If dowel-pins are to be made, the die will

have a sharp edge, as at *b*, and the blocks will be cut off simultaneously with the making of the dowel-pins. The match-sticks may be forced through the die by a driving-head working between guides, and connected by a pitman to a crank-shaft, to which power is applied, as signified in Figs. 4 and 5, or by power applied to other suitable machinery. In said figures *d* is the driving-head; *e e*, the guides; *f*, the pitman, and *g* the crank-shaft. The dotted lines in Fig. 5 indicate the stock from which either the match-sticks or the dowel-pins are made in proper position for the driving-head *d* to force a portion of it through the die beneath, the match-sticks or the dowel-pins, as the case may be, falling through the opening *h* of a bed, *i*, attached to the post J, and upon which bed the die is secured in any suitable manner. The bed *i* is provided with side guides *l* and a rear stop, *l'*, to assist the operator in properly feeding up the stock.

I would state that, instead of making the die of thick steel, which is somewhat difficult to drill straight, it can be made of thin pieces, and one laid upon the other, in order to secure the requisite strength.

It will be seen that by the honey-comb or hexagonal form of the cutting-edges of my die, each one of the cutting-edges of the die-holes *a* forms also a cutting-edge of each adjoining die-hole *a*, thus forming a cutting-edge which performs double work, as compared with the cylindric cutting-edge of the match-dies in common use.

I am aware that the common round match-stick is more or less enlarged at its cutting-face, and thus compresses the stick; but such cylindric cutting-edge will often split the stock ahead of the cutting-edge and across the match-stick, thereby spoiling it, whereas, in the hexagonal cutting-edge, the cut being composed of six right lines, instead of one circular line and circular cut, this difficulty is obviated.

Thus by my form of die I secure all the advantage of the circular cutting-edge as to compression, while at the same time I secure the additional advantage of a more perfect cut; and besides this I can form a greater number of dies in a given area of die-plate A, by reason of having each one of the cutting-edges of a single die, *a*, form a cutting-edge of an adjoining die, *a*, and so avoid the wastage of stock incident to the use of a die having a circular cutting-edge which forms no part of the circular cutting-edge of an adjoining die; and this advantage would appertain whether the die-holes *a* on their cutting-edge be made triangular, quadrilateral, or polygonal.

Of course, I do not confine myself to any particular figure or outline formed by the whole number of die-holes in a die-plate, A, or to a given area embraced by such whole number of die-holes.

Having now described my invention, what I claim is—

A die for the manufacture of match-sticks and dowel-pins having a cutting-edge of hexagonal or many-sided form on its working-face, and of cylindric or other form beneath said face, the die-holes being constructed to adjoin each other, substantially as described.

Witness my hand in the matter of my application for a patent for an improved match-stick and dowel-pin die this 29th day of September, A. D. 1877.

BRANTLY CHALFANT.

Witnesses:
L. L. STEARNS,
J. A. STEARNS.