(No Model.) 3 Sheets—Sheet 1.

W. EVANS.

DIE FOR FORMING RIBS ON SPRING PLATES.

No. 306,010. Patented Sept. 30, 1884.

FIG. 1

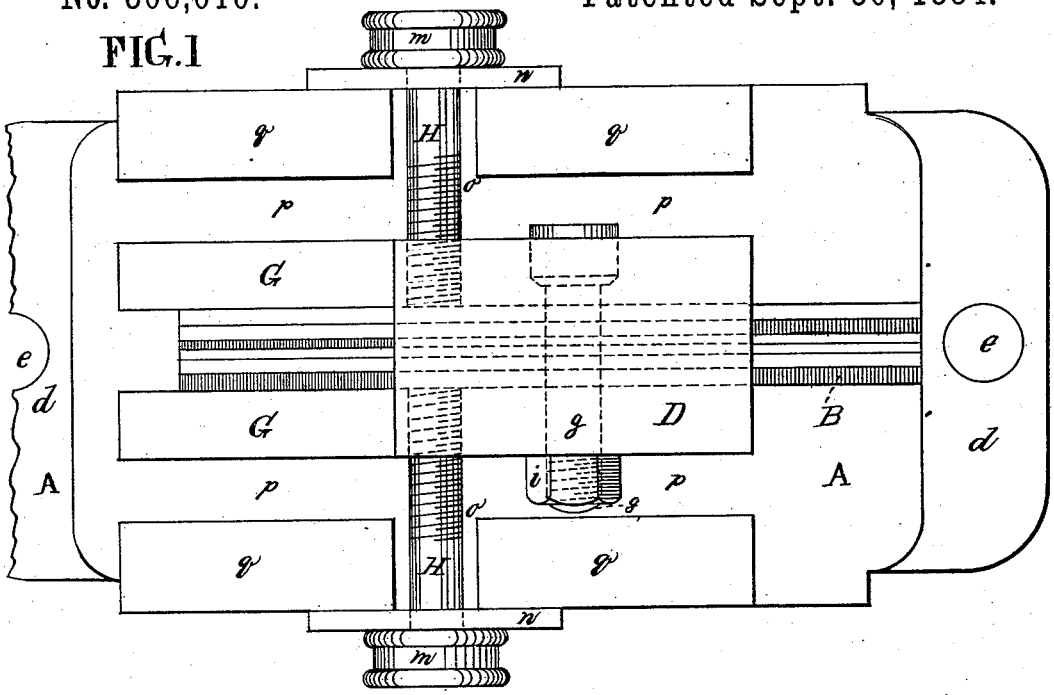
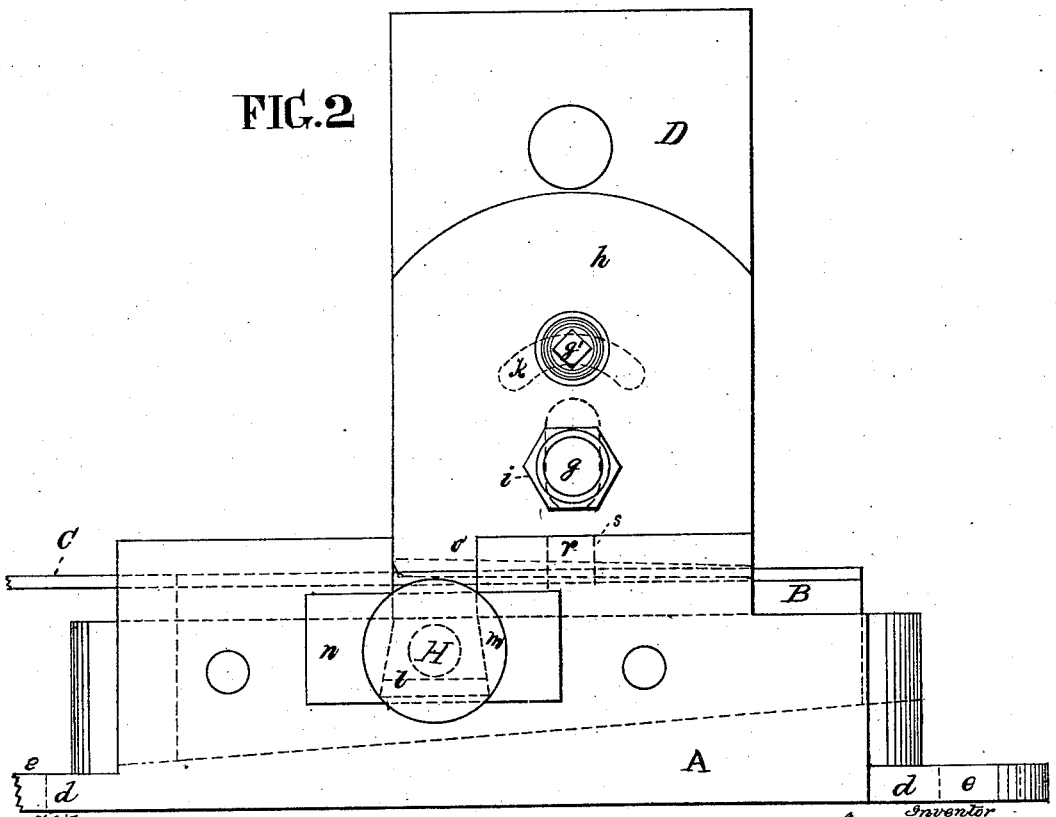


FIG. 2



Witnesses.
Thomas J. Bewley
Frank A. Roberts.

Inventor
William Evans.
per Stephen Ustick Att'y

(No Model.) 3 Sheets—Sheet 2.

W. EVANS.

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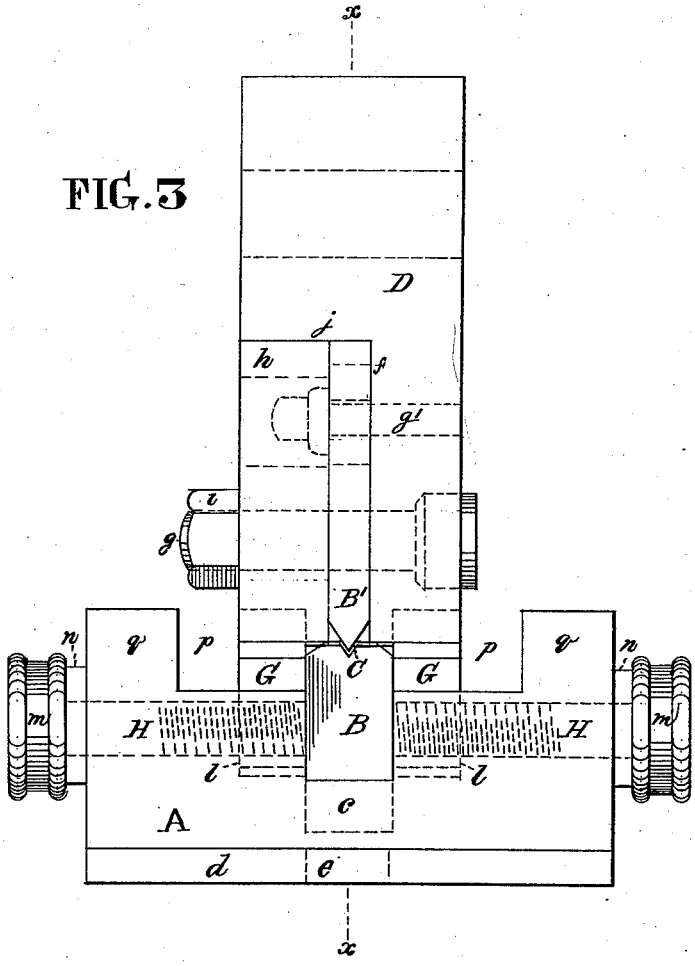
FIG. 3



Witnesses.

Thomas J. Bewley.

Francis H. Roberts.

Inventor

William Evans

per Stephen Ustick atty

(No Model.) 3 Sheets—Sheet 3.

W. EVANS.

DIE FOR FORMING RIBS ON SPRING PLATES.

No. 306,010. Patented Sept. 30, 1884.

FIG. 4

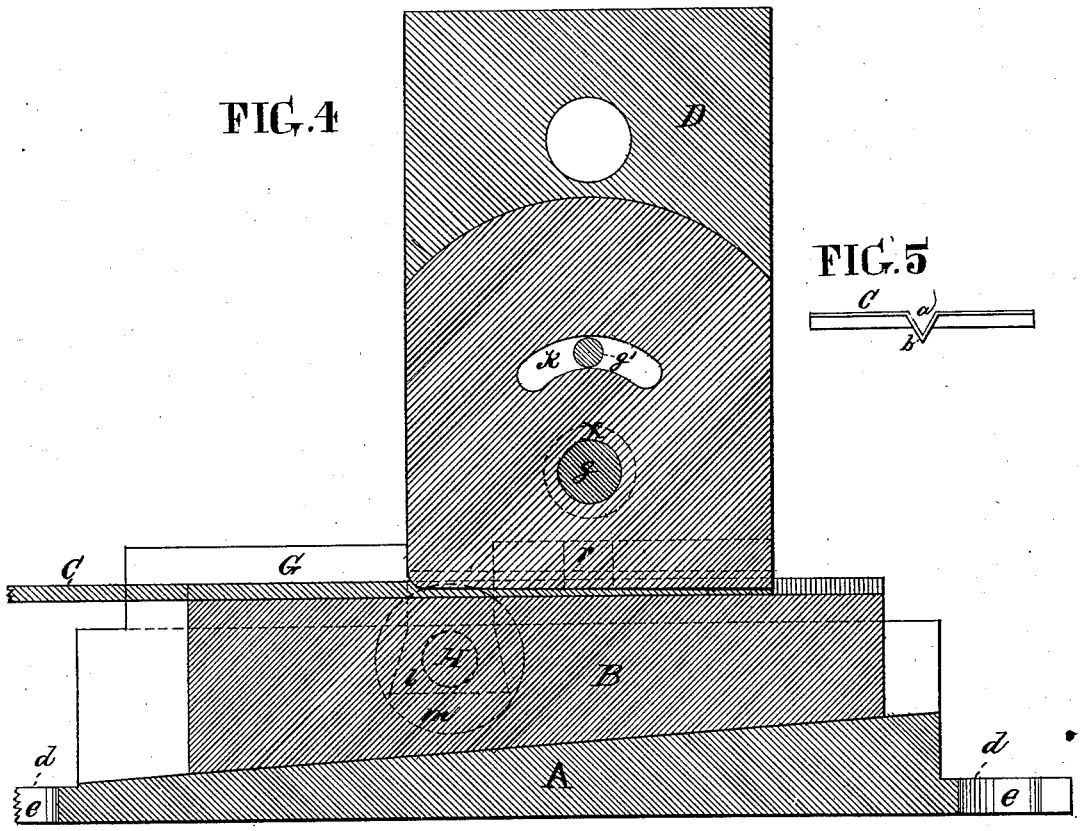


FIG. 5

Witnesses

Thomas J. Beuky

Frank H. Roberts.

Inventor

William Evans

per Stephen Ustick Atty

UNITED STATES PATENT OFFICE.

WILLIAM EVANS, OF PHILADELPHIA, PENNSYLVANIA.

DIE FOR FORMING RIBS ON SPRING-PLATES.

SPECIFICATION forming part of Letters Patent No. 306,010, dated September 30, 1884.

Application filed December 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EVANS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in the Die-Bed and Dies for Forming Grooves and Ribs of Spring-Plates, of which the following is a specification.

My invention, in the first place, consists of a bed-plate adapted to be connected with a press, and having a groove to receive detachable lower dies for the formation, in conjunction with upper dies, respectively, of grooves and ribs of different sizes.

The invention, in the second place, consists in making said groove inclined in the direction of its length, and in giving to the lower edge of the die a corresponding inclination, in order to vary the height of the upper edge of the die, so as to increase or decrease its distance from the lower edge of the upper die in accommodation to the difference in the thickness of the spring-plates.

In the third place, it consists in making the upper die separate from the stock with which it is connected, for the purpose of changing a series of dies to match the lower dies as changes may be made in them.

In the fourth place, it relates to the combination, with the die-stock, of an intermediate plate fastened between the upper edge of the upper die and a shoulder of the die-stock, the shoulder and edge of said plate being concentric, as hereinafter described.

The invention, in the fifth place, consists of adjustable slides, between which the spring-plates are placed, in combination with stationary guides and adjusting-screws for setting the slides out to their greatest width to take in the widest spring-plates, they being contracted by the adjustment of the screws for taking in suitable packing between the slides and guides.

In the accompanying drawings, which make a part of this specification, Figure 1 is a plan view of the die-bed A, dies B and B′, and parts connected therewith. Fig. 2 is a side elevation of the same. Fig. 3, Sheet No. 2, is an end elevation. Fig. 4, Sheet No. 3, is a vertical section at the broken line *x x* of Fig. 3. Fig. 5 is an end elevation of the spring-plate C.

Like letters of reference in all the figures indicate the same parts.

A represents the die-bed, which is provided with a groove, *c*, of suitable depth to hold accurately detachable lower dies. One of these dies, B, is shown in connection with the groove. The bottom of the groove is inclined in the direction of its length for the purpose of varying the height of the die by moving the latter in the direction of the arrow, the lower edge of the die having a reverse inclined edge to correspond. The height of the die is decreased by moving it in the reverse direction.

The object of such variation in the height of the die is to vary the distance between its upper edge and the lower edge of the upper die, B′, to correspond to the difference in the thickness of spring-plates C, one of which is shown in end elevation in Fig. 5, having its longitudinal groove *a* and rib *b* of V shape, formed, respectively, on its upper and lower sides by the conjoint action of the V projection of the upper die and the corresponding depression of the lower die when the upper die is caused to descend by means hereinafter described. This operation is performed by means of a press instead of by rollers in the manner heretofore practiced; and for this purpose I connect the bed-plate A firmly with the standing frame of a press by means of the flanges *d d*, which have holes *e e*, through which screw-bolts pass into permanent parts of the press, whereby the lower die, B, is held in a fixed position. The upper die, B′, has a vertical reciprocating movement for pressing the spring-plate C into the groove of the lower die to form its groove on one side and rib on the opposite side, the die being connected with the stock D, which has an up and down movement, by any suitable mechanical device.

In order to form grooves and ribs of various sizes suited to the various widths of the spring-plates, the lower and upper dies are both detachable, so as to replace them with others of suitable size V projections and depressions. The change is made in the lower dies simply by removing one from the groove *c* and placing another therein; and in the upper die provision is made for the change by means of the

rabbet *f* of the stock and confining-bolt *g*, which passes through the stock, the die, and cap-plate *h*, and has a confining-nut, *i*.

The die-plate B′ is confined by means of the screw-bolt *g′* to the stock.

For the purpose of canting the die in order to suit the taper of the spring-plate C, as may be required, the upper edge of the die-plate B′ and the shoulder *j* of the stock are concentric with the point at *x*, and the slot *k* of said die B, through which the bolt *g′* passes, is concentric with the same point.

G G are adjustable guides, between which the spring-plates C are respectively placed and held securely in position for the formation of grooves *a* and ribs *b*. They are expanded and contracted by means of the screw-bolts H H, which pass through lugs *l l* on their lower sides, the bolts having milled heads *m m*, the inner sides of which bear against the plates *n n* at the sides of the bed-plate A and cover the cross-groove *o*, which the bolts pass through. There are spaces *p p* between the slides and the projections *q q*, in which packing of suitable thickness is placed to give the proper distance between the slides G G to correspond to the width of the spring-plates, the slides being then drawn tightly against the packing by the screw-bolts H H, and held until it becomes necessary to alter the distance between them for spring-plates of another width.

In order to hold the stock D in position in the longitudinal direction of the bed-plate, the upper edge of the slides G is cut away and tongues *r r* formed, which enter the cross-slots *s s* of the stock and its cap-plate *h*.

I claim as my invention—

1. The combination of the upper die, B′, with the stock D, having a rabbet, *f*, the plate *h*, and bolt *g*, whereby the die B′ is detachable from the stock, substantially as and for the purpose set forth.

2. The combination of the upper die, B′, the cap-plate *h*, and stock D, the said die having a concentric upper edge in connection with the corresponding shoulder, *j*, of the stock, the parts being held together by means of the bolt *g* and bolt *g′*, whereby the die B′ may be varied in its position to give more or less angle to the position of its lower edge, substantially as and for the purpose set forth.

3. The combination of the slides G G, having lugs *r r* on their upper edges, with the lower edges of the stock D and cap-plate *h*, having cross-slots *s s*, for holding the stock and slides accurately together in the longitudinal direction of the latter, substantially as described.

WILLIAM EVANS.

Witnesses:
THOMAS J. BEWLEY,
STEPHEN USTICK.