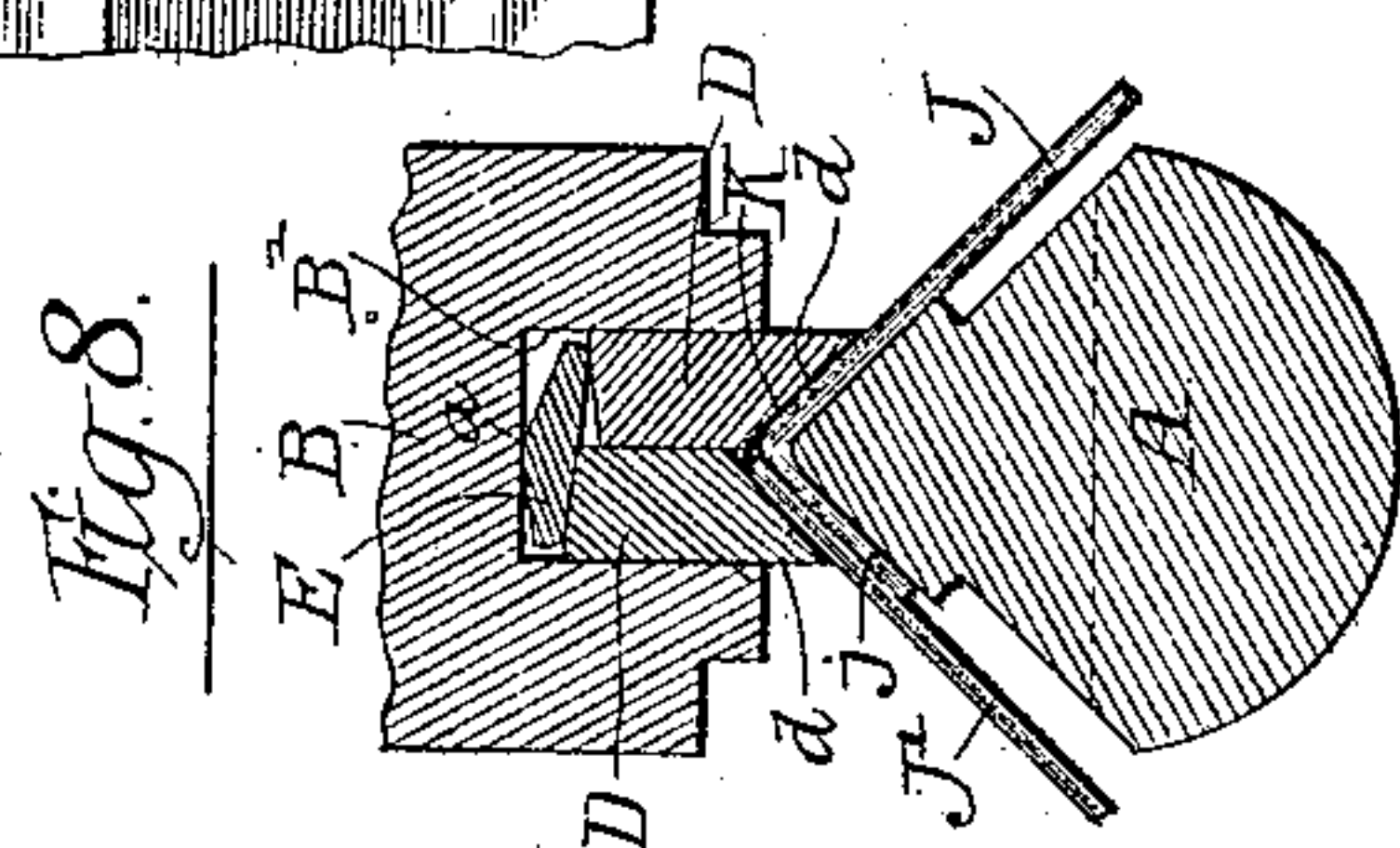
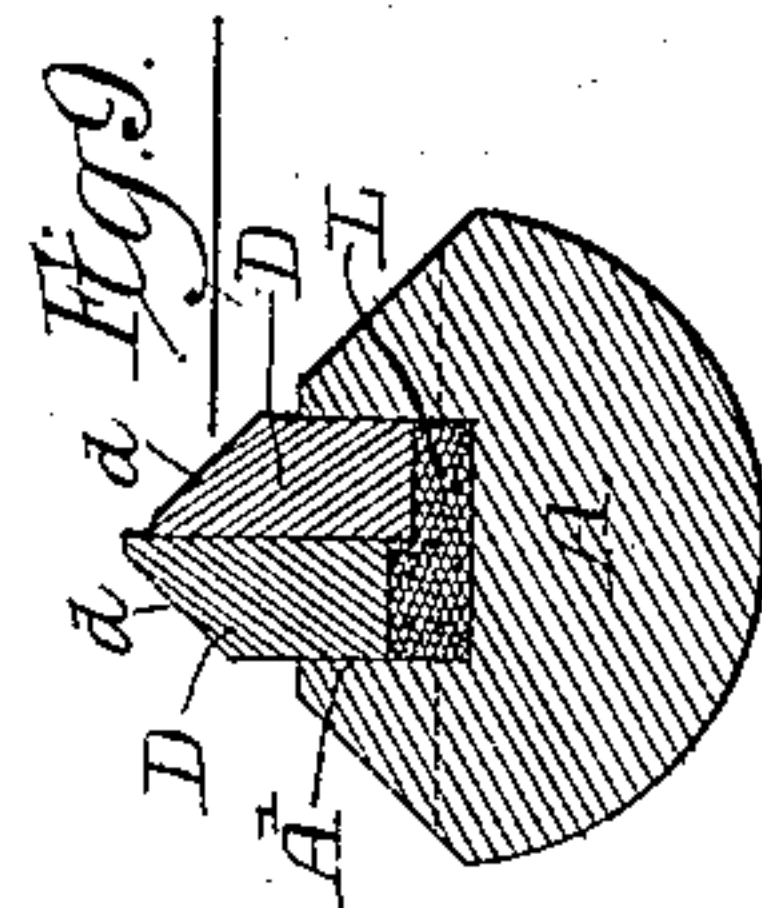
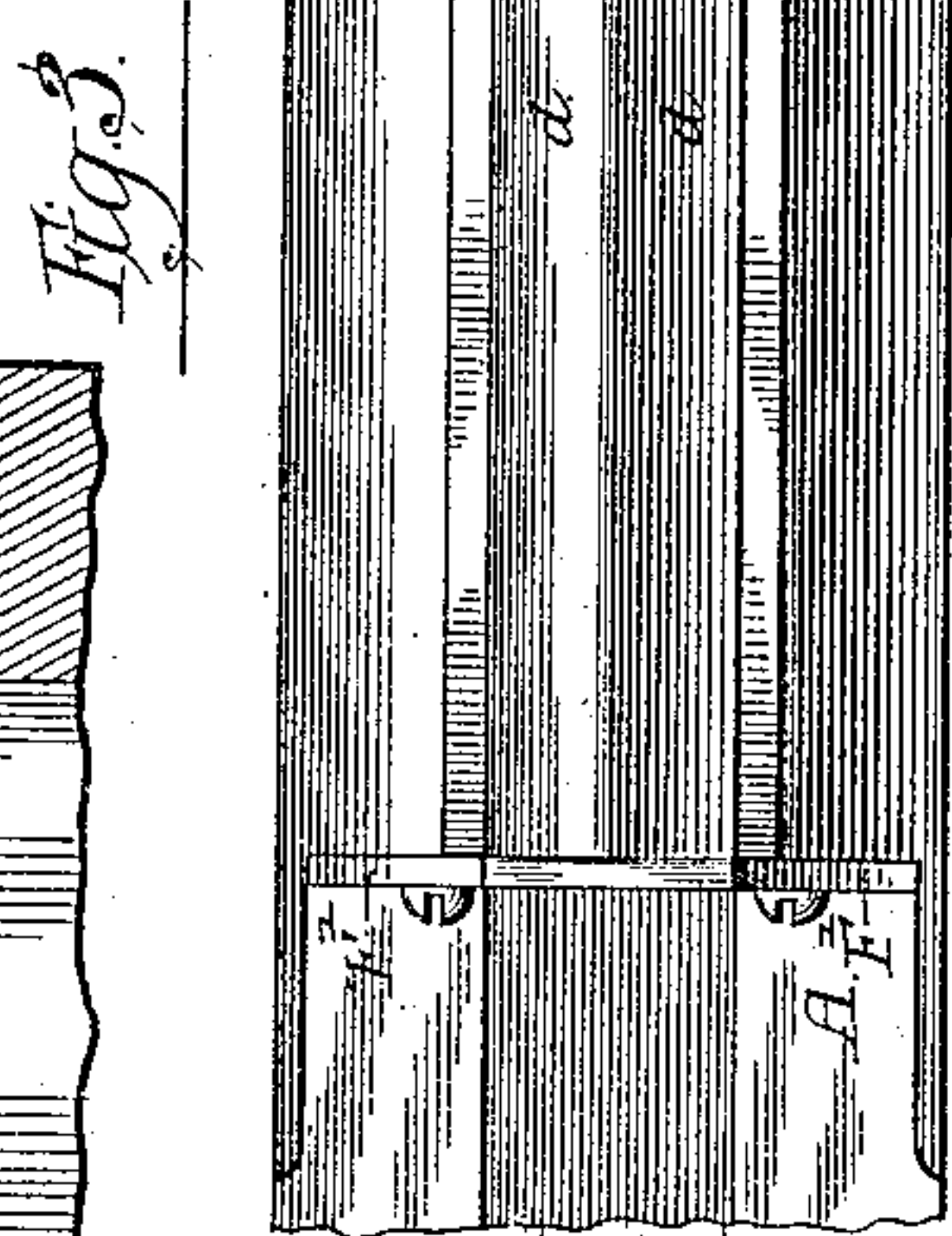
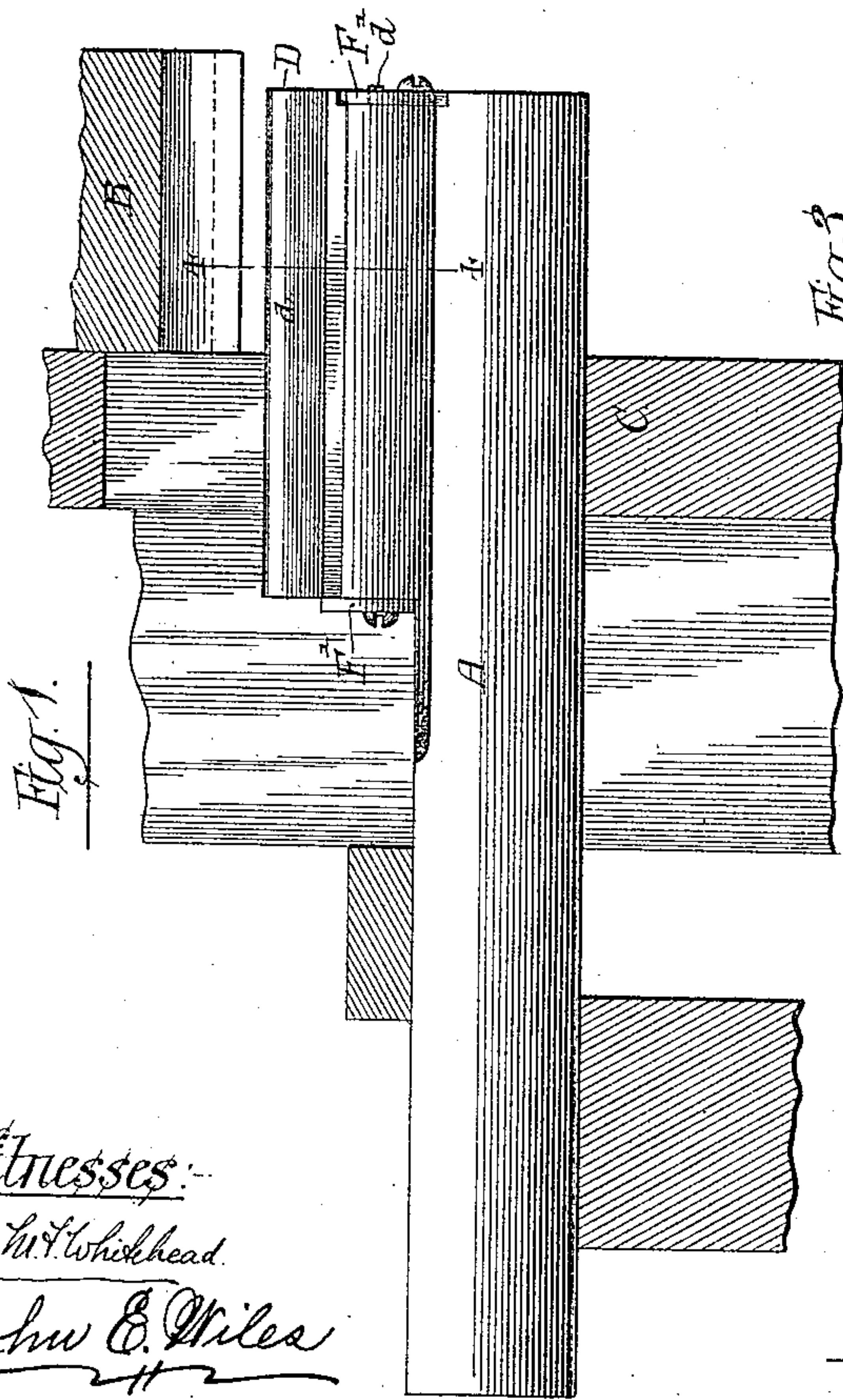
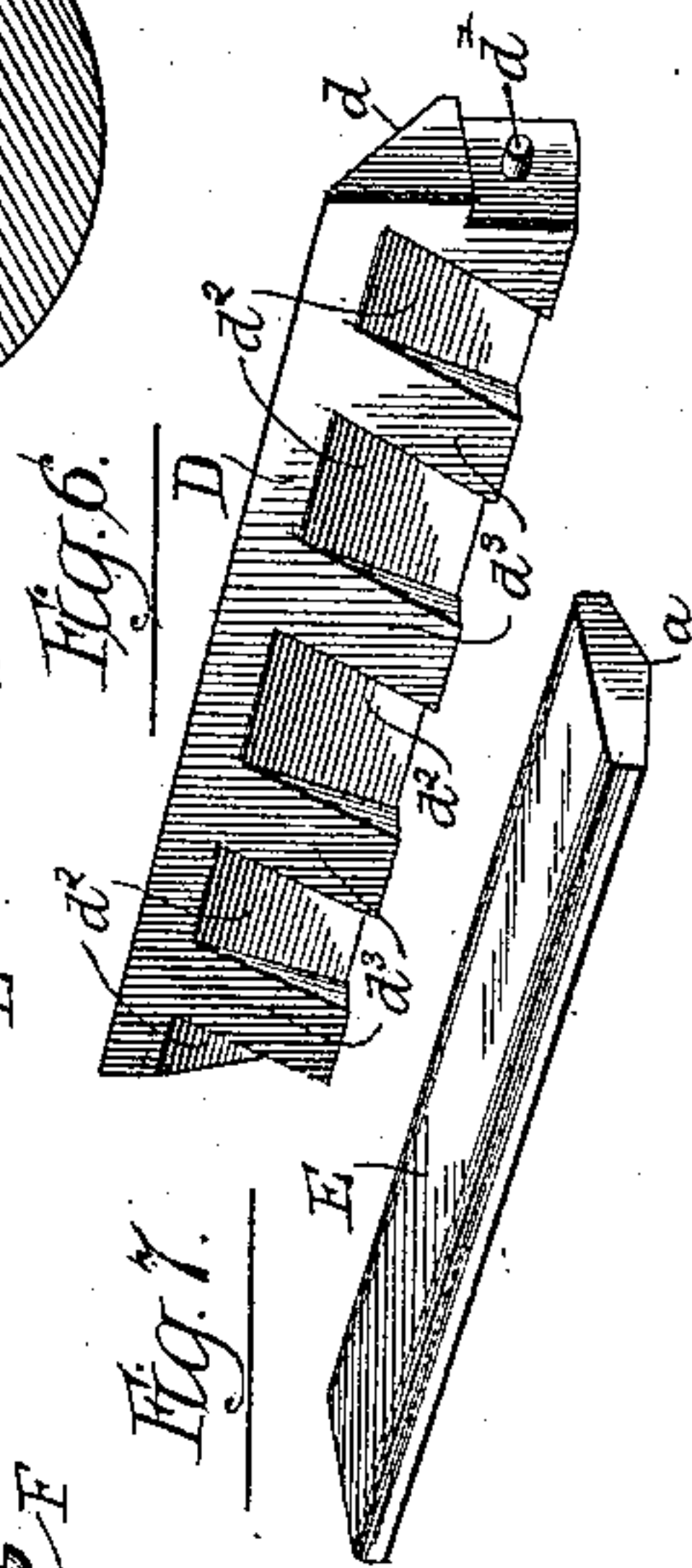
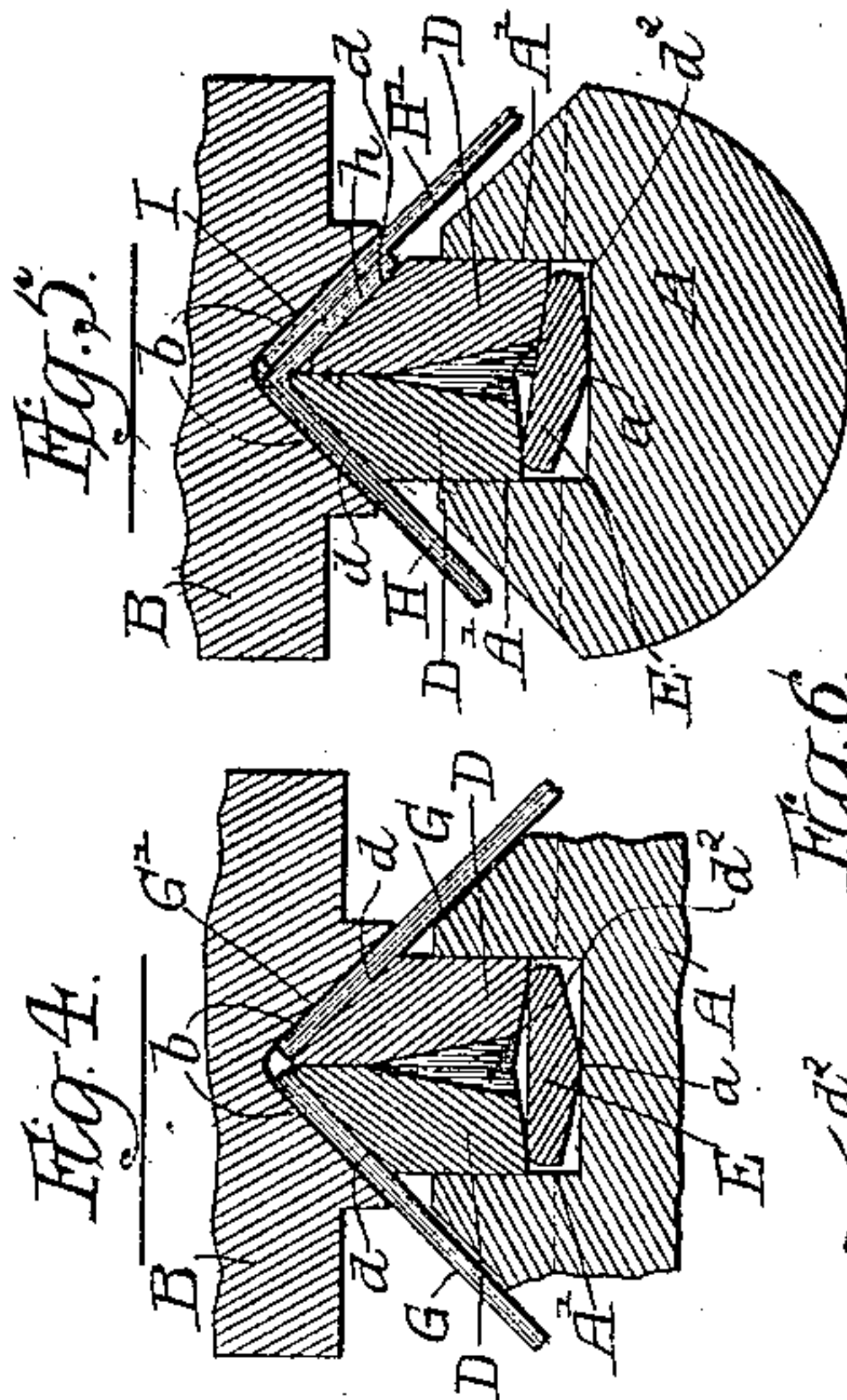
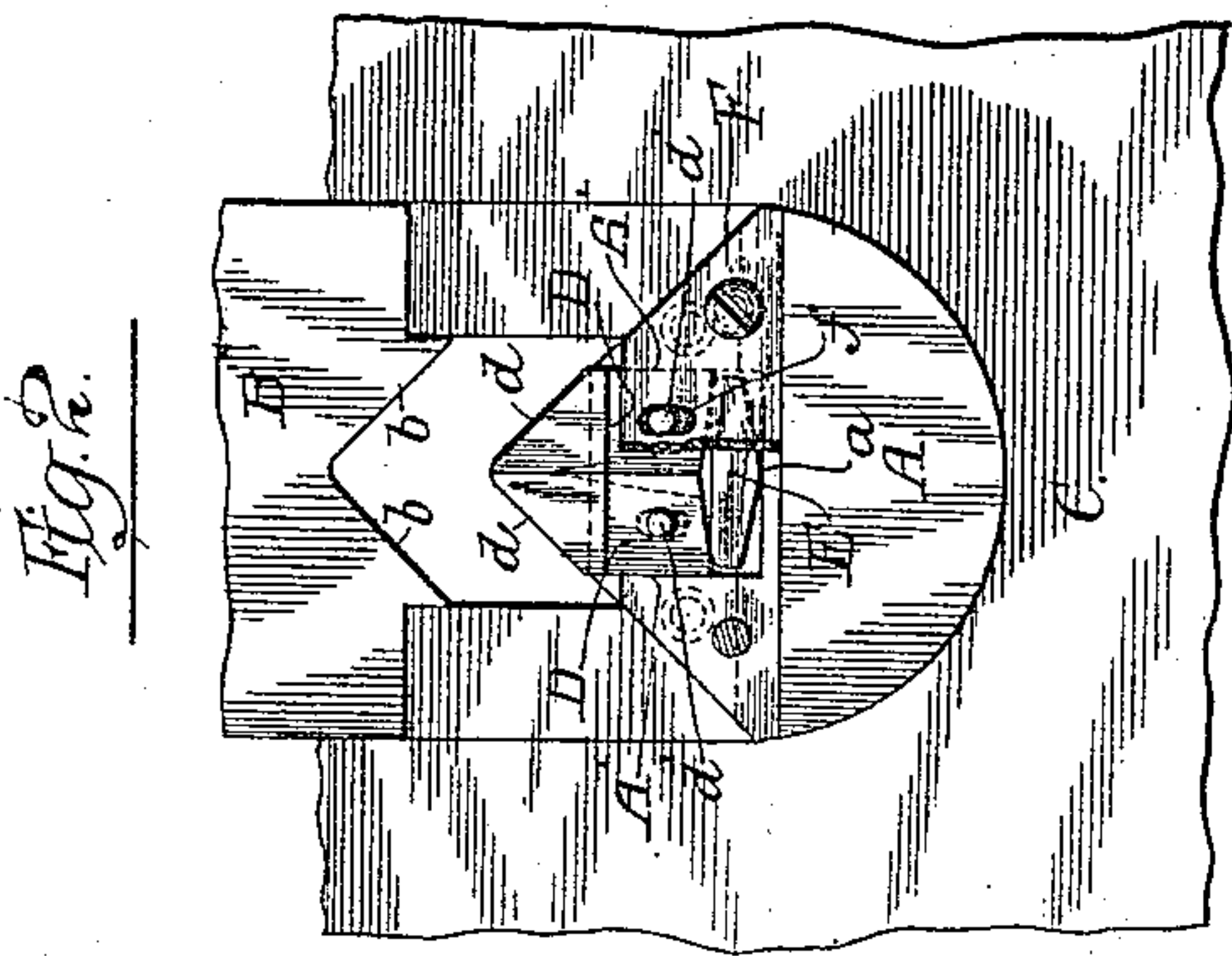


(No Model.)

F. H. BEACH.
DIE FOR BOX STAYING MACHINES.

No. 442,792.

Patented Dec. 16. 1890.



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UNITED STATES PATENT OFFICE.

FRED H. BEACH, OF ROCHESTER, NEW YORK.

DIE FOR BOX-STAYING MACHINES.

SPECIFICATION forming part of Letters Patent No. 442,792, dated December 16, 1890.

Application filed August 22, 1890. Serial No. 362,721. (No model.)

To all whom it may concern:

Be it known that I, FRED H. BEACH, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Dies for Box-Staying Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in box-staying machines or machines for applying stay-strips or jointing strips of paper, cloth, or other flexible material to paper or straw-board boxes by means of paste or glue, and more especially to the opposing dies, by means of which the stay is pressed against a box or cover interposed between the said dies. In a machine of the character referred to, the said dies are each made with two oblique faces arranged at right angles with each other, and the dies act upon the parts of the side walls of an interposed box adjacent to the corner thereof, so as to press a jointing or staying strip against both of said side walls. When the parts of the side walls of the box adjacent to the corner are of equal thickness, the stay-strips may be satisfactorily applied by means of opposing dies having rigid or unyielding faces, and one of which is moved in a straight line toward and from the other. When, however, there is any difference in the thickness of the sides of the box arising from inequality in the box itself or in the stay-strip, the latter is pressed unequally against the box, and in case the difference in thickness is considerable the pressure on the thinner part will be insufficient to insure the proper adherence of the strip. In some straw-board boxes, for instance, the side walls are provided with flaps, which are bent at right angles and lapped over the end walls at the corners, so that the box-wall is of double thickness where the board is lapped at one side of each corner, and in working upon boxes of this kind it is obviously necessary to provide some means for changing the relative positions of the working-faces of one or both of the dies, so that the opposing surface of the dies may come closer together at one side of the corner than at the other.

The object of this invention is to provide an improved construction in the opposing dies of machines of the character referred to by which the latter will be automatically adjusted to compensate for difference in thickness of the sides of the box, so as to give a practically uniform pressure upon all parts of the stay-strip; and the invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 shows in sectional elevation the opposing dies of a corner-staying machine. Fig. 2 is an end view of the parts shown in Fig. 1. Fig. 3 is a detail plan view of the lower die or anvil block. Fig. 4 is a detail section taken upon line 4 4 of Fig. 1. Fig. 5 is a similar section showing the changed position of the parts. Fig. 6 is a perspective view of one of the movable die-sections detached from its support. Fig. 7 is a perspective view of the rocking support for the said die-sections. Fig. 8 is a sectional view illustrating a construction in which the movable die-sections are located in the upper or movable die. Fig. 9 is a sectional view illustrating a construction in which the movable die-sections are sustained by springs.

As illustrated in said drawings, A indicates the lower die or anvil block, which is in this instance stationary, and B the upper die, which is constructed to reciprocate vertically, and will be herein called the "presser." The lower die or anvil block is, as herein shown, adapted to enter the interior of the box, and its upper surface is provided with oblique flat working-faces arranged with their meeting edges upward, while the movable die or presser B is made of recessed form to receive the projecting angle of the anvil-block. Said anvil-block, as shown, is sustained in the frame C of the machine in such manner that it may be moved in or out to correspond with boxes or covers of different depths, as in machines heretofore made.

The body portion of the anvil-block A is herein shown as made of semicircular shape in cross-section; but this particular form is not essential. In the upper surface of said anvil-block is formed a longitudinal groove or recess A', having parallel vertical sidewalls, and within said groove are located two longi-

tudinally-arranged parallel bars or die-sections D D, having inner vertical faces in contact with each other and outer vertical faces bearing against the side walls of the groove A'. Said bars or die-sections D D are provided with oblique upper surfaces $d d$, arranged at right angles with each other and parallel with the opposing flat faces $b b$ of the movable die or presser B. Said surfaces $d d$ form the working-faces of the lower die or anvil, by means of which pressure is applied to the box-walls in attaching the stay-strips thereto.

Within the groove or recess A', beneath the bars or die-sections D D, is located a rocking support E, which has bearing at its middle part upon the anvil-block A and at its ends against the said anvil-sections D D, said rocking support being constructed to rock or swing about or upon a central pivot or point of support, so that when one of the die-sections D D is depressed by force applied to its upper part the other die-section will be lifted, and vice versa. Said rocking support is so arranged, furthermore, that when it stands in a horizontal position it will sustain both of the die-sections D D at equal heights and with the working-surfaces $d d$ thereof at equal distances from the opposing faces $b b$ of the presser. The said rocking support may be connected or engaged with the anvil-block and the die-sections in any manner suitable for allowing a rocking movement of said support; but in the particular construction illustrated said rocking support is provided on its under surface with a central rib a , bearing on the anvil-block A, while the upper surfaces of the said support near the side margin of the same bear against the under surfaces of the die-sections D D. Said die-sections are preferably beveled on their under surfaces, as shown, so that when depressed to the limit of their downward movement they will come to a solid bearing against the support E.

The parts D D and E above described may be held from endwise movement in any suitable manner; but, as herein shown, plates F F are secured against the outer and inner end faces of the anvil-block A, so as to cover the ends of the recess or groove A', and thus hold the said anvil-sections and rocking support from endwise movement. In order to avoid the possibility of the die-sections being lifted out of the groove, I preferably provide the same at their opposite ends with pins or studs $d' d'$, which pins or studs enter short vertical slots or recesses $f f$ in the plates F F, which slots are made of such length as to permit the necessary vertical movement in the die-sections while preventing the same from being lifted out of place.

In order to prevent undue friction between the movable die-sections, the adjacent faces of the latter are preferably provided with transversely-arranged inclined grooves or recesses $d^2 d^2$, forming intermediate ribs $d^3 d^3$,

which come in contact with each other when the sections are in working position, said recesses or grooves terminating at their upper ends below the upper edges of the die-sections, so that the said edges are made continuous in the manner illustrated. The recesses described not only lessen the area of the parts in frictional contact, but they also afford spaces or openings through which any dust or dirt making its way between the upper edges of the die-sections may make its escape downwardly to the space beneath the same. Similar grooves or recesses may be made in the outer faces of the die-sections.

The operation of the movable or yielding die-sections described may be more readily understood from Figs. 4 and 5.

In Fig. 4 the parts are shown in position when acting on a paper or straw-board box the side walls of which are of uniform thickness. In this figure G G indicate the side walls of the box, the edges of which are brought together and placed against the die-sections in the manner illustrated. G' indicates a stay-strip which is being pressed into contact with the side walls G G by the action of the presser B against the die-sections. In this case, the side walls being practically uniform in thickness, the die-sections stand in line with or opposite each other, and the rocking support E is practically horizontal. It is of course understood that if there is any slight inequality in the thickness of the two walls G G the rocking support will be slightly shifted, so as to afford a uniform or equal pressure on both of said walls.

In Fig. 5 is shown the operation of the parts when working on a box composed of two sides H H', one of which sides is provided with a flap h , which is bent at right angles to the side H, to which it is attached and extends past or overlaps the other side wall H'. I is a stay-strip, which is pressed against the side walls H H' by the action of the presser B. In a box of this character the presence of the flap h obviously makes the side wall H' twice as thick as the side wall H in the part thereof acted upon by the clamping-dies, and by reason of this inequality in thickness the movable and yielding die-sections D D will be shifted into the position illustrated in said figure, one of the die-sections being depressed and the other elevated, while both are equally supported by the rocking support E, so that equal pressure is maintained by both die-sections for pressing the stay-strip against the box.

In the case of the movable die-sections D illustrated the adjacent edges of said sections at their salient or acute angles are cut away or blunted in the manner shown, so that when the sections are shifted into position with one somewhat in advance of the other the salient edge of the advanced section may not extend past a straight line drawn through the flat working-surface d of the other section so as to prevent the advance section from

pressing into the box-wall at the corner of the same.

It is obvious that the yielding blocks or die-sections constructed and operating as above described may be located in the movable part or presser, as well as in the stationary part or anvil, and, furthermore, that said die-sections may be made to form the working-surface of the concave or recessed die, as well as that of the convex or projecting die. The construction in which the said yielding blocks or sections are in the movable part or presser or constitute the recessed working-face thereof is shown in Fig. 8. In this instance the anvil-block A is made solid or in one piece, and the presser B is provided with a recess B', within which are located movable die-sections D D, behind which is placed a rocking support E, constructed and operating in the same manner as hereinbefore described. In this instance the working-faces $d d$ of the die-sections D D are made at an obtuse angle to the inner or adjacent faces of the die-sections and act upon the outer surface of the box. In said Fig. 8, J J' indicate side walls of a box, one of which J is provided with a flap j , and K is a stay-strip, which is pressed against the outside of the box-corner by the action of the dies. It will be observed that in this construction when the die-sections are out of line with each other a small triangular space or opening is formed at the inner angle of the working-face; but this is of no importance, because it is unnecessary to apply to the extreme corner of the box the pressure for securing the strip thereto.

In Fig. 9 I have shown a construction in which two separately-movable die-sections are employed to form the working-face of one of the dies, but in which said die-sections are sustained yieldingly by springs instead of being supported by means of a rocking support. In this instance the anvil-block A is provided with a groove or recess A', and within said recess are placed two die-sections D D, constructed in the same manner as hereinbefore described. Between the bottom of the groove and the said die-sections D D is placed a block L of rubber, which forms a spring operating to afford a yielding support for both of the die-sections. When one of the die-sections is subjected to a greater pressure than the other by inequality in the thickness of the side walls of the box, the die-section subject to such greater pressure yields downwardly by a compression of the spring, so as to allow the other section to operate with the requisite pressure upon the work. When a spring-support is used, any kind of a spring may be employed; but the employment of a mass of rubber inclosed in a recess beneath the die-sections in the manner illustrated is preferred, inasmuch as when the pressure is transmitted through one die-section to one part of said mass the other part thereof will tend to rise or expand and lift the other die-section, so that when one die-section is

pressed inwardly the other will be forced outwardly by the rubber, which at this time, being confined beneath the die-sections, acts in the manner of an incompressible fluid to transmit the pressure from one die-section to the other, and thus maintain an equilibrium of pressure against the sides of the box.

While the construction illustrated in Fig. 9 is a useful and valuable one in many cases, yet for machines having a long die-block which may be adjusted in or out to correspond with boxes of different depth the construction illustrated in Figs. 1 to 8 is preferred, inasmuch as the rocking support therein illustrated affords a parallel movement to the die-sections, it being obvious that if the die-sections are supported solely by a spring or springs and are made of considerable length they are liable to be thrown into an oblique position when pressure is applied to one end of the same, as would be the case in applying stay-strips to very shallow boxes or covers. The construction shown in Fig. 9 is, however, a useful and valuable one where the machine is so constructed that the pressure comes upon the entire length of the movable die-sections in pressing the stay-strip upon the box.

It is obvious that both of the devices for supporting the die-sections hereinbefore described afford a yielding support for each of the said die-sections and that the general result obtained in both cases is the same—to wit, that of enabling the movable die-sections to be thrown out of line so as to give sufficient pressure against both adjacent side walls of the box. Other devices than the particular ones described may be employed to yieldingly support the die-sections so as to enable the same to be thrown out of line while sustaining them in such manner as to give sufficient pressure on the work without departure from my invention.

By reason of the special advantages obtained by the construction herein illustrated in Figs. 1 to 8, however, the rocking support for the die-sections and other features herein illustrated are claimed as a part of my invention.

I claim as my invention—

1. The combination of two opposing dies having working-faces arranged at an angle with each other, one of which dies embraces two separate movable yielding die-sections forming the working-faces thereof, substantially as described.

2. Two opposing dies having working-faces arranged at an angle with each other, one of which dies embraces two separate movable die-sections forming the working-faces thereof, combined with a rocking support sustaining said die-sections, substantially as described.

3. Two opposing dies having working-faces arranged at an angle with each other, one of said dies consisting of a main part or body provided with a groove or recess, two movable die-sections located in said recess, and a rock-

ing support engaging said die-sections, substantially as described.

4. Two opposing dies having working-faces arranged at an angle with each other, one of
5 said dies consisting of a main part or body provided with a groove or recess, two movable die-sections located in said recess, and a rocking support consisting of a bar located in the groove beneath the die-sections and provided
10 with a central rib or projecting part bearing

upon the bottom of the groove, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

FRED H. BEACH.

Witnesses:

C. CLARENCE POOLE,
MARK D. KNOWLTON.