

F. R. FULLER.
CLICKING DIE.
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1,368,330.

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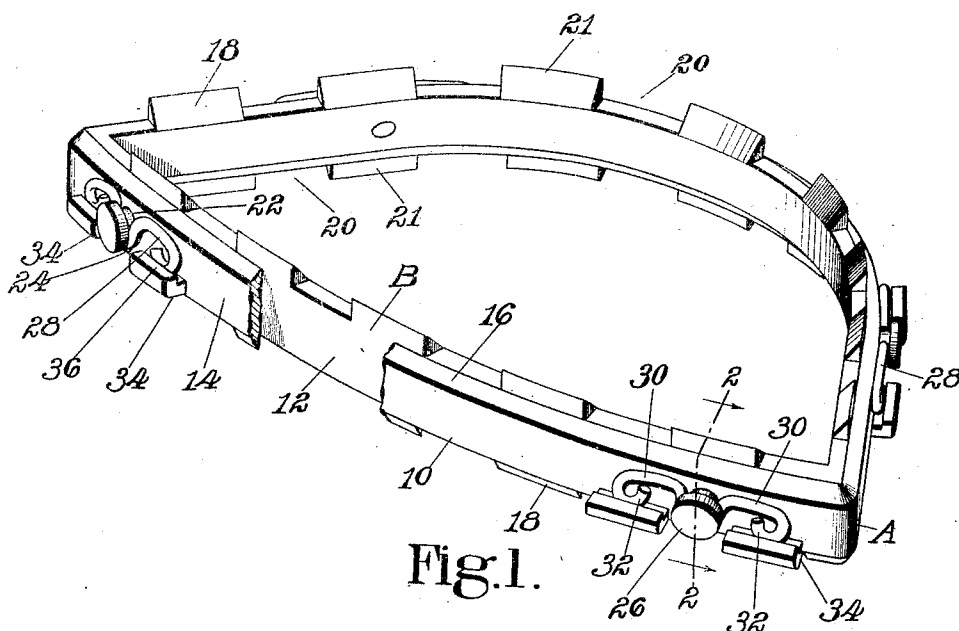


Fig. 1.

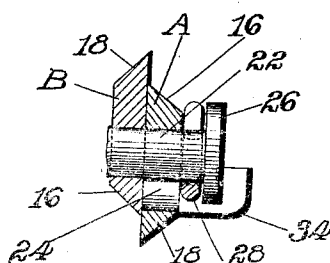


Fig. 2.

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CLICKING-DIE.

1,368,330.

Specification of Letters Patent.

Patented Feb. 15, 1921.

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To all whom it may concern:

Be it known that I, FREDERICK R. FULLER, a citizen of the United States, residing at Marlboro, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Clicking-Dies, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to dies and more particularly is shown as embodied in a die for cutting sheet material which die is of the type commonly termed a clicking die.

When clicking dies have cutting edges of considerable length, and especially when they are used for operating upon material which strongly resists their action, it may require an unduly heavy single blow to force the entire edge of a die through the material operated upon.

An object of my invention is to provide a die which, whatever the extent of its cut or the resistive character of the stock, will operate easily and effectively. Such results are obtained by dividing the effect of the cutting blow between means which sever the material along a portion of the line of division and other means acting to complete the operation.

In accordance with features of the invention, the illustrated die is a sectional die comprising a plurality of members movable relatively to one another in their cutting action and constructed and arranged to operate successively along different parts of a common line.

The illustrated dies members are concentric and have differently formed cooperating cutting edges, one of the cutting edges being continuous and another being discontinuous to cause the cutting edges to operate upon the common line. As herein illustrated, two die members are arranged with flat faces movable over one another, the opposite faces of the members being beveled to form cutting edges acting along different portions of the common line. To retard the action of one of the cutting members relatively to the other, yieldable connections may be provided between the members operating to hold one of them out of normal

engagement with the material to be cut, yet permitting it to come later into action to complete the work partly performed by its companion.

Another object of the invention is to provide a die so constructed as to increase the time which the die may be used before being re-sharpened. To this end, the die members have cutting edges disposed in opposite pairs, either of which may be employed for independent action upon the work, the cutting edges of the illustrated die members being similar in form. To enable either pair of cutting edges to operate over successive portions of the same line the adjacent cooperating edges of the members are of different character while those at the opposite edges of the respective members are of the same character.

A particular embodiment of the invention appears in the annexed drawing,

Figure 1 being a perspective view of the improved clicking die, and

Fig. 2 a transverse section on the line 2-2 of Fig. 1.

As illustrated, the die consists of two portions A and B, and, since the line along which the material is to be cut describes a closed figure, the portions are concentric, the portion B being within the portion A. These portions are similar in shape, differing only in their diameter and the relations of the parts. Each is formed from a bar 10 having opposite flat faces 12 and 14, the face 14 being beveled at 16 and 18 and converging throughout to the face 12 to furnish opposite cutting edges. The edge of the bevel 16 is continuous while the opposite edge is interrupted, there being spaces 20 which, as shown, are about equal in extent to the intermediate cutting projections 21. The portions A and B have their faces 12 and 14 at opposite sides with reference to one another and the faces 12 are in contact throughout their entire extent about the die and their bevels 16 and 18 oppositely placed. This arrangement causes the pairs of cutting edges, either of which pairs may be brought into cooperation with the work, to include a continuous and a discontinuous edge acting along a common line.

The cutting edges of the pairs are held so that one is normally projected beyond

the other. Consequently one edge, which is preferably the discontinuous, engages the material to be cut, while the other, or continuous edge, is out of contact therewith.

- 5 As shown, this is effected by yieldable connections, consisting of a plurality of projections 22 from the member B, four in number in the present instance, each projection passing through a transverse slot 24 in the member A and having outside the last-named member a head or enlargement 26. The contact of the projections with the ends of the slots limits the movement of the members transversely of one another, the projections thus serving as stops. Engaging each projection is a spring 28, conveniently of heavy wire having a U-shaped portion which rests against the projection and opposite arms 30, 30 the aligned ends 32, 32 of which bear against projections 34, 34 upon opposite sides of the slot 24. At the outer ends of the projections 34 are upturned angular portions 36, which, with the heads 26, serve to retain the springs in place.
- 25 In using the illustrated die, either of the pairs of cutting edges may be placed in contact with the stock, the discontinuous edge 21 resting upon it. The pressure member which is to produce the cutting effect is then brought into contact with the upturned edge of the die. This first forces the edge 21 into the material, the springs 28 resisting the movement of the member B carrying the continuous cutting edge, but as the edge 21 passes through the work and the resistance increases, the continuous edge descends and severs the material between the separated portions of the member A and also aids in completing the cuts made by said portions.
- 40 Thus, at any particular time only about half of the line of division is being acted upon, so that approximately only the same amount of pressure is required to perform the work. When one of the pairs of cutting edges becomes dull the die may be inverted to bring the other pair into action, this operating in precisely the same manner as just described, though here the discontinuous edge which acts first is upon the member B instead of upon the member A.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A die for cutting material along a line comprising means for cutting a portion of the line, and relatively movable means for thereafter cutting another portion of the line.
2. A die for cutting material along a line comprising means for cutting a portion of the line, and independent means for thereafter cutting along the entire line.
3. A die for cutting material along a line comprising means for cutting separated portions of the line, and independently op-

erating means for thereafter cutting intermediate portions of the line.

4. A clicking die including a plurality of portions having their cutting edges operating along a line common to all, and means for maintaining the cutting edge of one of the portions out of contact with the work when the cutting edge of another portion engages the work.

5. A clicking die including a plurality of portions having their cutting edges operating at different points along a line common to all, and means for maintaining the cutting edge of one of the portions out of contact with the work when the cutting edge of another portion engages the work, said portions acting successively in the use of the die to sever the work along the entire line of contact with the die.

6. A sectional die comprising a plurality of cutting members constructed and arranged to operate along different parts of a common line, and a yielding connection between said members to retard the action of one of said members relatively to another.

7. A clicking die including a plurality of portions having their cutting edges operating along a line common to all, and a spring for maintaining the cutting edge of one of the portions out of contact with the work when the cutting edge of another portion engages the work.

8. A clicking die consisting of a plurality of like cutting members movable over one another in their cutting action.

9. A clicking die consisting of a plurality of members, each member having opposite cutting edges and the edges of plural members being arranged in cooperating pairs for independent action upon the work.

10. A clicking die consisting of a plurality of members having opposite cutting edges arranged in cooperating pairs, said cooperating edges being differently formed.

11. A clicking die consisting of a plurality of members each having opposite cutting edges, the adjacent edges of the members being different in character while the opposite edges of the respective members are of the same character.

12. A clicking die consisting of two concentric members having cutting edges operating along a common line.

13. A clicking die consisting of two members having cutting edges operating along a common line, one of the cutting edges being continuous and another being discontinuous.

14. A clicking die consisting of two members having contacting flat faces and opposite beveled faces forming two cutting edges operating along a common line.

15. A clicking die consisting of two members having cutting edges operating along a

common line, one of said members being provided with a transverse slot and the other member having a projection extending through the slot.

5 16. A clicking die consisting of two members having cutting edges operating along a common line, one of said members being provided with a transverse slot and the other member having a projection extending
10 through the slot, and a spring connecting the projection and slotted member.

17. A clicking die comprising members each having a flat face and an opposite beveled face, the flat faces contacting with and
15 being movable over one another.

18. A clicking die comprising members each having a flat face and an opposite beveled face, the flat faces contacting with and

being movable over one another, and yieldable connections between the members. 20

19. A clicking die comprising members each having a flat face and an opposite beveled face, the flat faces contacting with and being movable over one another, and a stop carried by one member and engaging the
25 other.

20. A clicking die comprising members each having a flat face and an opposite beveled face, the flat faces contacting with and being movable over one another, a stop carried
30 by one member and engaging the other, and a spring cooperating with the stop and with said other member.

In testimony whereof I have signed my name to this specification.

FREDERICK R. FULLER.