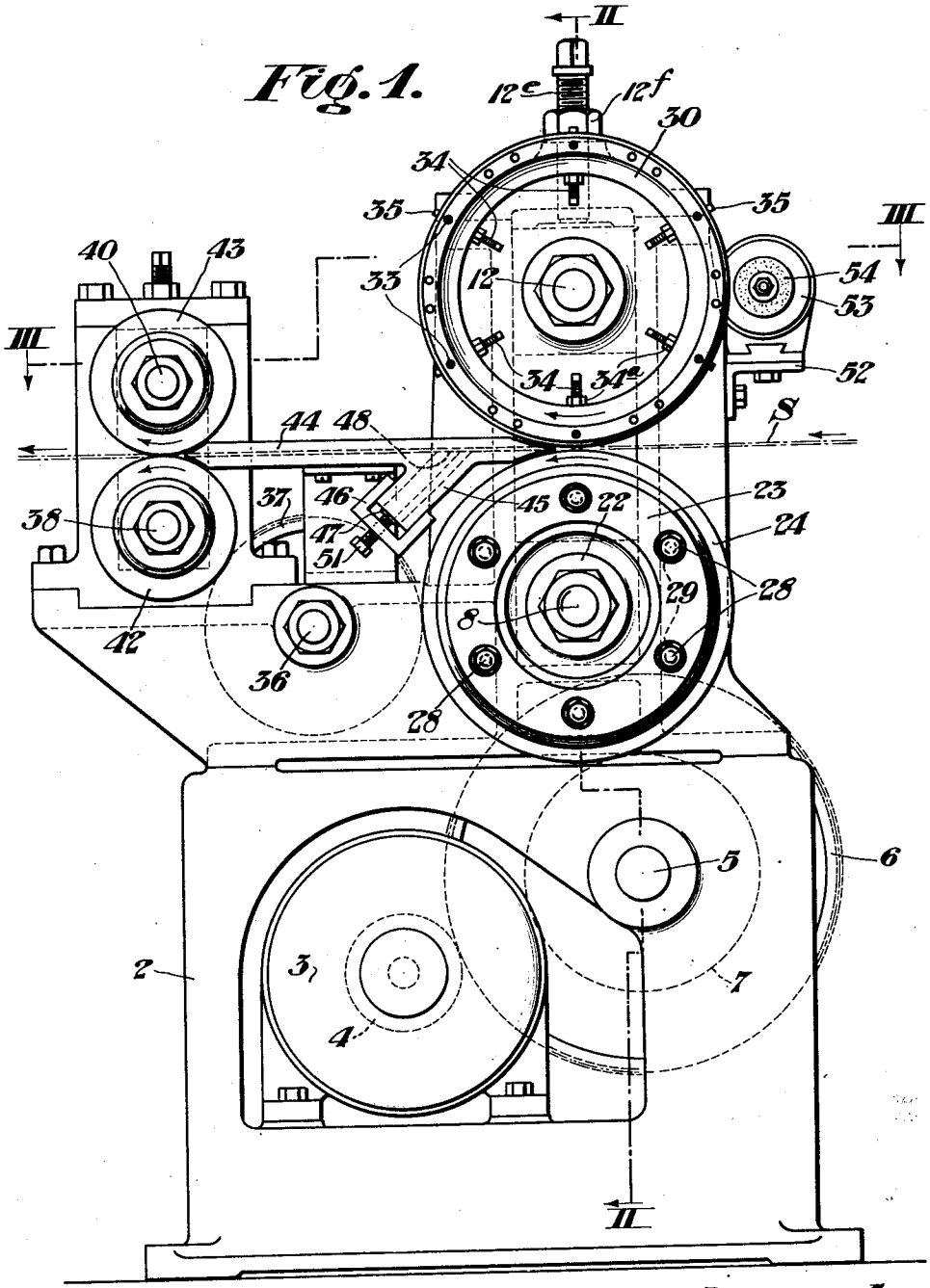
Dec. 18, 1934. W. V. GERSTER 1,984,737

DIE MACHINE

Filed Nov. 13, 1933 4 Sheets-Sheet 1

Fig. 1.



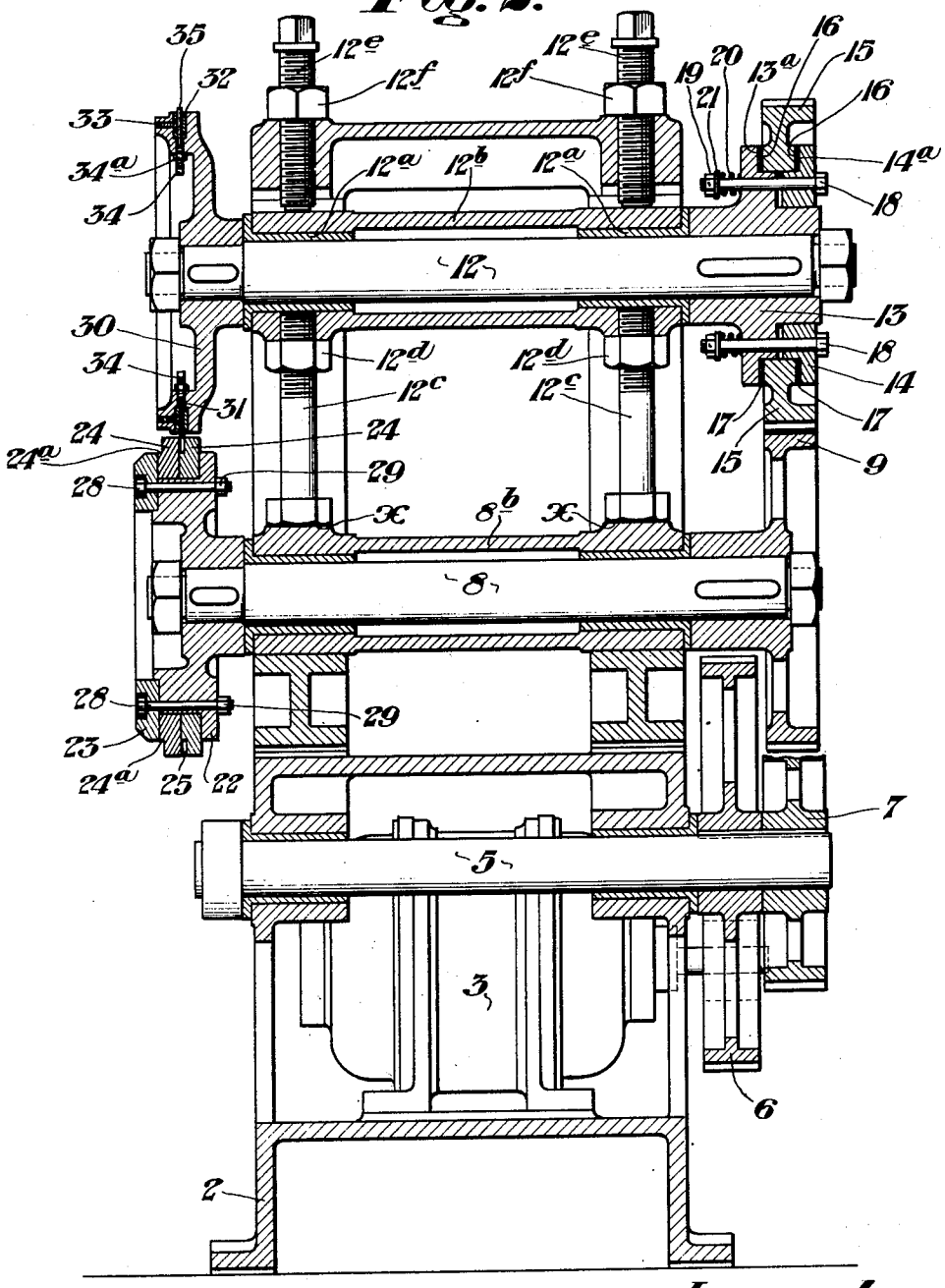
Inventor:
WILLIAM V. GERSTER,
by: Ussina & Rauber
his Attorneys.

Dec. 18, 1934. W. V. GERSTER 1,984,737

DIE MACHINE

Filed Nov. 13, 1933 4 Sheets-Sheet 2

Fig. 2.



Inventor:
WILLIAM V. GERSTER,
by: Usina & Rauber
his Attorneys.

Dec. 18, 1934. W. V. GERSTER 1,984,737

DIE MACHINE

Filed Nov. 13, 1933 4 Sheets-Sheet 3

Fig. 3.

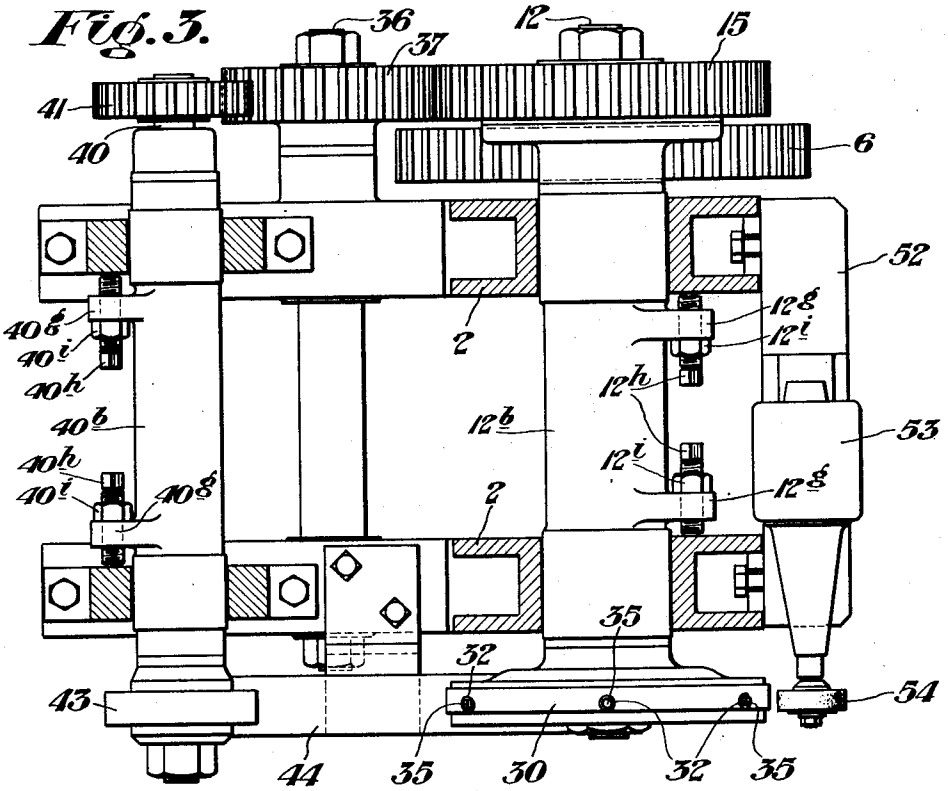


Fig. 4.

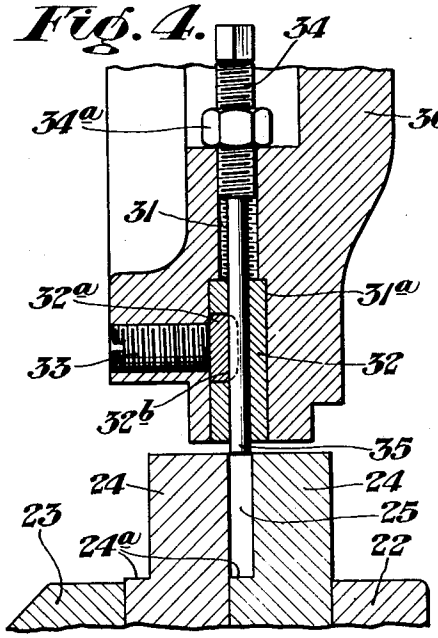
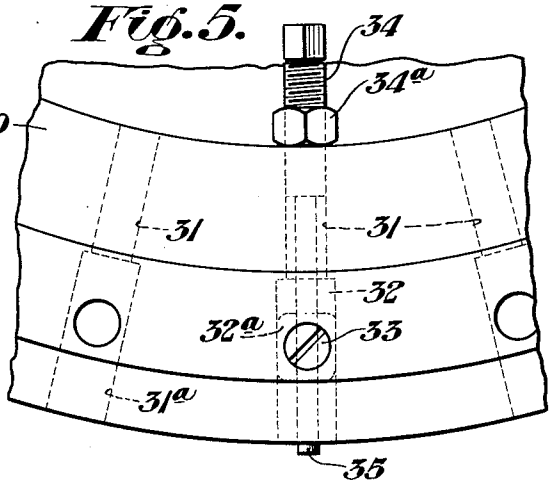


Fig. 5.



Inventor:
WILLIAM V. GERSTER,
by: Young & Quigg
his Attorneys.

Dec. 18, 1934. W. V. GERSTER 1,984,737

DIE MACHINE

Filed Nov. 13, 1933 4 Sheets-Sheet 4

Fig. 6.

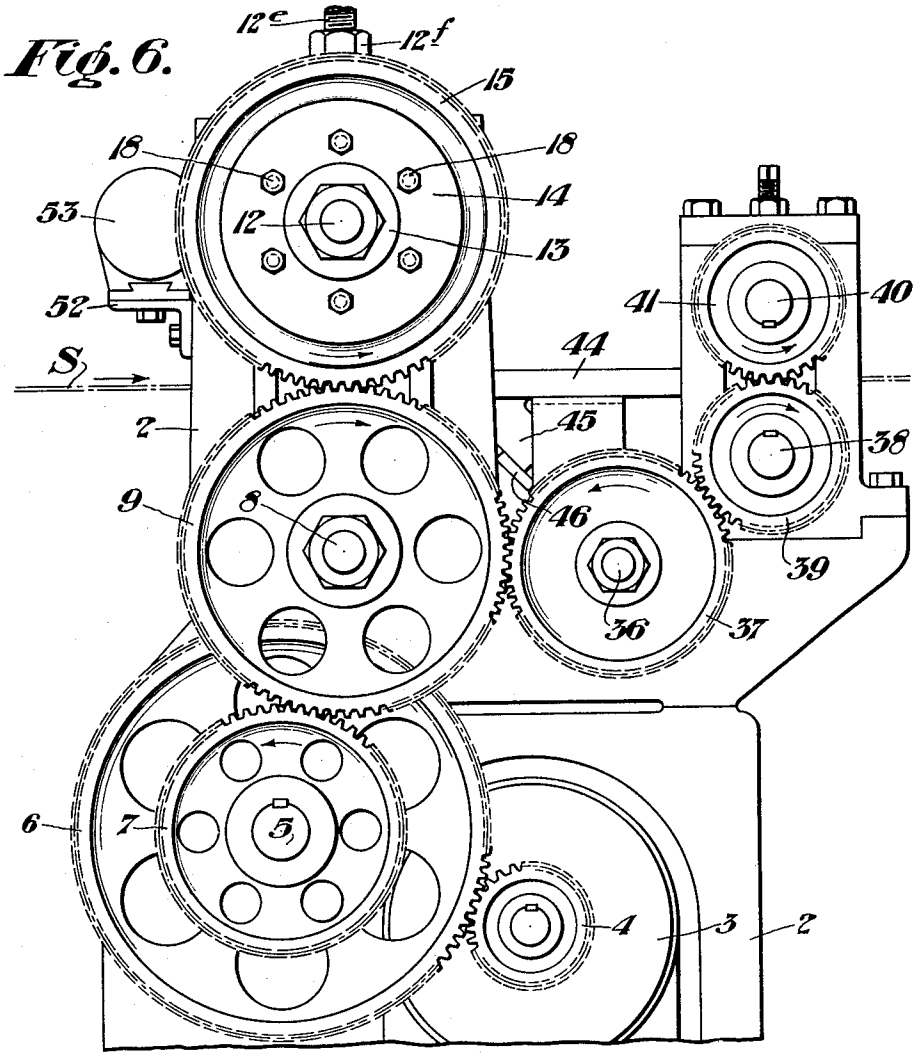


Fig. 7.

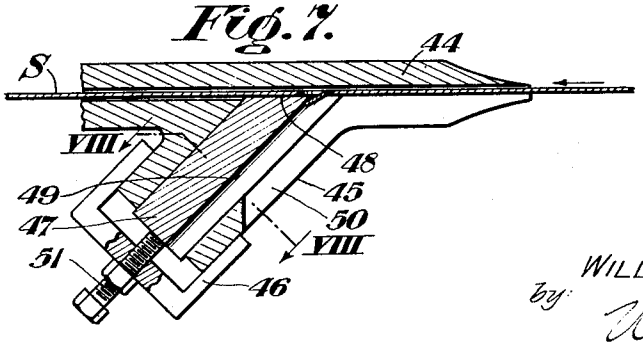
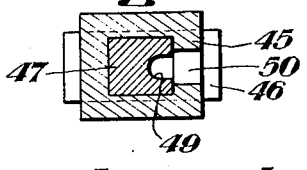


Fig. 8.



Inventor:
WILLIAM V. GERSTER,
by Ussing & Kaiser
his Attorneys.

Patented Dec. 18, 1934 1,984,737

UNITED STATES PATENT OFFICE

1,984,737

DIE MACHINE

William V. Gerster, McDonald, Ohio

Application November 13, 1933, Serial No. 697,829

5 Claims. (Cl. 164—99)

This invention relates to die machines, and more particularly to such devices used for punching nail or screw holes in barrel hoop strip material which has previously been "beaded", although not limited thereto.

One object of the present invention is the provision of a novel die machine for enabling the regulating of the cutting or punching of the material in predetermined spaced relationship.

Another object is to provide novel means for adjusting the position of the cutting or punching elements with respect to the cooperating die member.

A further object is to provide a novel rotary die head for machines of the class described which is frictionally driven with respect to the remainder of the machine.

A still further object is to provide a novel machine of the class described which may be easily and inexpensively manufactured, require but little adjustment, and prove very durable in service.

These and further objects will be apparent after referring to the drawings, in which:

Figure 1 is a side elevation of the apparatus of the invention.

Figure 2 is a sectional end view on the line II—II of Figure 1.

Figure 3 is a sectional plan on the line III—III of Figure 1.

Figure 4 is an enlarged sectional fragmentary detail of the novel rotary die head of the apparatus.

Figure 5 is an enlarged fragmentary elevation of the novel rotary die head.

Figure 6 is an elevation similar to Figure 1 but showing the other side of the machine.

Figure 7 is an enlarged sectional elevation of the novel shear knife for removing cut or punched portions from the material being processed.

Figure 8 is a sectional view on the line VIII—VIII of Figure 7.

Referring more particularly to the drawings, the numeral 2 designates a frame for the apparatus of the invention. A motor 3 is secured to the frame 2 and provided with the usual pinion 4. A shaft 5 is journaled on the machine 2 adjacent the motor 3 and carries a gear 6 which is in mesh with the pinion 4. A smaller gear 7 is also secured to the shaft 5. A shaft 8 is journaled on the frame 2 above the gear 5 and carries a gear 9 which meshes with the gear 7 on the shaft 5.

A shaft 12 is similarly journaled above the shaft 8 and carries on one of its ends a collar 13 which is annularly recessed, as at 13^a. A clamping ring 14 is slidably mounted on the collar 13 and annularly recessed, as at 14^a, in a manner similar to the recess 13^a. A gear 15 is provided with side faces 16 adjacent its inner diameter which are adapted to contact with a pair of friction facings 17, one of which is mounted on the side wall of the recess 13^a and the other similarly mounted in the recess 14^a. The collar 14 is adapted to be resiliently urged against the collar 13 by means of bolts 18, nuts 19, springs 20 and washers 21, in such manner as to enable the gear 15 to drive the shaft 12 through the friction facings 17.

A hub 22 is secured to the end of the shaft 8 opposite the gear 9 and is provided with a clamping ring 23. A pair of clamping rings 24 are recessed as at 24^a and disposed between the hub 22 and the clamping rings 23 in such manner as to provide a continuous groove 25, and are held together by means of bolts 28 and nuts 29.

A rotary head, or hub, 30 is secured to the end of the shaft 12 adjacent the hub 22 and provided with a plurality of radially disposed partially threaded apertures 31 in mathematically spaced relationship. The apertures 31 are enlarged adjacent the periphery of the rotary head 30 in such manner as to receive a guide 32 which is provided with a lateral opening 32^a. A wedge-block 32^b is seated in the lateral opening 32^a and is adjusted with respect to the guide 32 by means of a screw 33. A screw 34 is adapted to be threaded in the threaded portion of each of the apertures 31 and carries on one of its ends an extension 35 of reduced diameter which is adapted to cut or punch the material being processed. The position of the extensions 35 with respect to the guides 32 is adjusted through the screws 34 and each maintained in position by means of a lock-nut 34^a.

A shaft 36 is journaled on the frame 2 relatively adjacent the shaft 8, and carries a gear 37 which is adapted to mesh with the gear 9. A shaft 38 is journaled adjacent the shaft 36 and carries a gear 39 which is also adapted to mesh with the gear 37, while a similar shaft 40 is journaled on the frame 2 directly above the shaft 38 and carries a gear 41 which meshes with the gear 39. The shafts 38 and 40 carry on their opposite ends a pair of feed-out rolls 42 and 43, respectively.

A material guide 44 is mounted on the frame 2 and provides a feed-out for the material as it emerges from between the hub 22 and the rotary head 30. The material guide 44 carries on its lower side a small housing 45 having a bracket 46 on its lower end. A sliding block 47 is mount-

ed on the housing 45 and is provided mith a cutting edge 48 on its end. As the material being processed moves through the material guide 44 in the direction of the arrow of Figure 7, the cut or punched portions of the material are sheared therefrom by means of the knife edge 48, dropped through apertures 49 or 50 in the end and bottom of the housing 45, and thus from the machine. The position of the knife edge 48 is satisfactorily adjusted by means of a screw 51 which contacts with the sliding block 47.

A bracket 52 is secured to the frame 2 adjacent the shaft 12 and has secured thereto a motor 53 having an emery wheel 54 on its shaft for sharpening the dies or ends 35 of the extended portions of the screws 34 in the rotary head 30.

In order to effect the satisfactory adjustment of the extensions 35 with respect to the continuous groove 25, the shaft 12 which, as before stated, is journaled on the frame 2 is adapted to rotate in bushings 12^a which are, in turn, disposed in a sleeve 12^b. The sleeve 12^b is supported by bolts 12^c, the threaded portions of which are screwed into the former. The heads of the bolts 12^c rest on the sleeve 8^b for the shaft 8, as indicated at X, and a lock-nut 12^d is provided for maintaining each of the bolts in adjusted position. The sleeves 12^b are restrained from moving upwardly by means of screws 12^e which are adjustable with respect to the frame 2 and are locked in position by means of nuts 12^f.

The sleeve 12^b is provided with a lug 12^g adjacent each of its ends and in which there are mounted screws 12^h which are threaded therethrough and adapted to contact on their ends with the sides of the frame. The screws 12^h are locked in position by means of nuts 12^i.

In effecting the adjustment of the rotary die head 30 with respect to the width of the strip, it is only necessary to withdraw the lock-nuts 12^f, retract the screws 12^e, effect various adjustments with the screws 12^h which cause the heads of the bolts 12^c to slide for a very short distance on the sleeve 8^b at X. After adjustment, the various elements are locked into position by means of the lock-nuts 12^f and 12^i, for the screws 12^e and 12^h, respectively. Lugs 40^g are provided on the sleeve 40^b for the shaft 40, in order that a similar adjustment may be effected through screws 40^h which are held in adjusted position by means of lock-nuts 40^i. This is for the purpose of properly positioning the roll 43 with respect to the roll 42.

By utilizing only those apertures 31 in the rotary head 30 for obtaining suitable spaced relationship of the die elements, or extensions, 35, the cut or punched portions may be made to appear at certain regular intervals, such as, for example, 3, 4 and 6 inches, to accord with current barrel hoop specifications.

While I have shown and described one specific embodiment of my invention, it will be understood that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of my invention, as defined in the following claims.

I claim:

1. A die machine comprising, in combination, a rotary head having a plurality of radial apertures in spaced mathematical relationship, a die element in at least one of said apertures and protruding beyond the perimeter of said head, means for adjusting the radial disposition of said die element, a second rotary head mounted adjacent said first named head and having a continuous groove in which said die element is adapted to successively register, a knife adapted to shear the cut-out portions from the material being processed, and feed-out rolls for guiding the material from said machine.

2. A die machine comprising, in combination, a rotary head having a plurality of radial apertures in spaced mathematical relationship, a die element in at least one of said apertures and protruding beyond the perimeter of said head, means for adjusting the radial disposition of said die element, a second rotary head mounted adjacent said first named head and having a continuous groove in which said die element is adapted to successively register, a knife adapted to shear the cut-out portions from the material being processed, feed-out rolls for guiding the material from said machine, a friction drive for said first named rotary head, and positive driving means for said second named rotary head and said feed-out rolls.

3. A die machine comprising, in combination, a rotary head having a plurality of radial apertures in spaced mathematical relationship, a die element in at least one of said apertures and protruding beyond the perimeter of said head, means for adjusting the radial disposition of said die element, a second rotary head mounted adjacent said first named head and having a continuous groove in which said die element is adapted to successively register, a knife adapted to shear the cut-out portions from the material being processed, and feed-out rolls for guiding the material from said machine, said knife being adjustably disposed in a housing and said housing having at least one aperture through which the portions being sheared may drop from said machine.

4. In a die machine, a rotary head having a plurality of radial apertures arranged in mathematically spaced relationship, the inner portion of each of said radially arranged apertures being threaded and the outer portions thereof being enlarged, a guide in the enlarged outer portions of each of said radially arranged apertures and having lateral openings, a screw adapted for movement in the threaded portions of said apertures and each having an extended die element adapted to extend through said guide, a pressure block disposed in the lateral opening in each of said guides, means for adjusting the position of said pressure block and means for maintaining said last named means in adjusted position.

5. In a die machine, a rotary head having at least one die arranged on its periphery, a cooperating rotary head having a continuous groove in which said die is adapted to successively register, a knife for shearing the cut-out portions from the work-piece being processed, a pair of feed-out rolls for guiding the material from said machine, a gear train for positively driving said second named rotary head and said feed-out rolls, a collar associated with said first named rotary head, a clamping ring adapted to cooperate with said collar, friction facings on said collar and said clamping ring, a gear having side faces and being adapted to receive rotation for the means for driving said second named rotary head and said feed-out rolls, and means for resiliently clamping the side faces of said gear between the friction facings on said collar and said clamping ring.

WILLIAM V. GERSTER.