United States Patent [19]

Florian

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[54] **ROTARY SHEAR WITH PICKUP FINGER AND PRESSURE RELEASE**

[76] Inventor: **Berkeley J. Florian,** 1500 Florian Dr., Dania, Fla. 33004

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[21] Appl. No.: **295,193**

[52] **U.S. Cl.** **30/178,** 30/273
[51] **Int. Cl.** **B26b 17/04**
[58] **Field of Search** 30/178, 179, 230

[56] **References Cited**

UNITED STATES PATENTS

2,578,346	12/1951	Florian	30/178
3,621,572	11/1971	Kruger	30/178

Primary Examiner—Al Lawrence Smith
Assistant Examiner—Marc R. Davidson
Attorney, Agent, or Firm—Clarence A. O'Brien; Harvey B. Jacobson

[57] **ABSTRACT**

An elongated handle having first and second spaced jaws at one end and rotary anvil structure and rotary cutting disk structure journaled from the first and second jaws. The rotary cutting disk structure is disposed closely adjacent but slightly spaced from the rotary anvil structure for rolling engagement with the latter upon the spaced jaws being urged toward each other. The jaws comprise integral portions of the handle which is constructed of metal and the metal is at least slightly bendable and resilient so as to enable the jaws to be biased toward each other. One of the jaws has a smooth bore formed therethrough and the other jaw has a threaded blind bore formed therein in registry with the smooth bore. A headed shank-type fastener is journaled through the smooth bore and threadedly engaged in the threaded blind bore whereby tightening of the fastener will cause the one jaw through which the fastener is journaled to be biased toward the other jaw. An elongated radially extending pickup finger is fixed to the head of the fastener and extends along the one jaw and outwardly beyond the free end thereof and may be used not only as a wedge to lift cloth to be cut between the rotary anvil means and the cutting disk means but also as a lever to angularly displace the head of the fastener from which it is supported.

5 Claims, 9 Drawing Figures

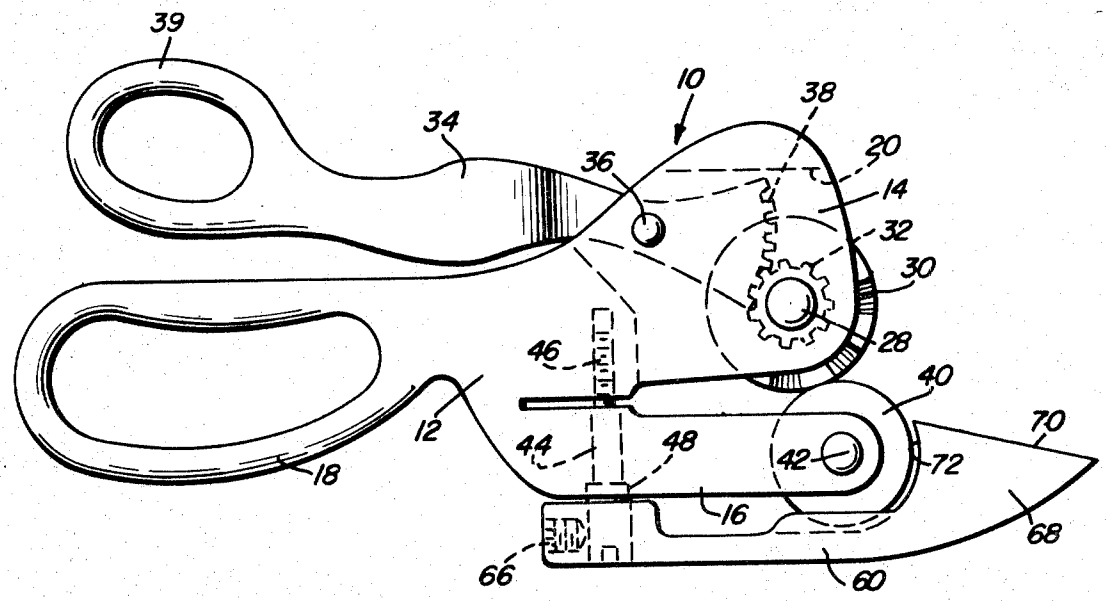


FIG. 1

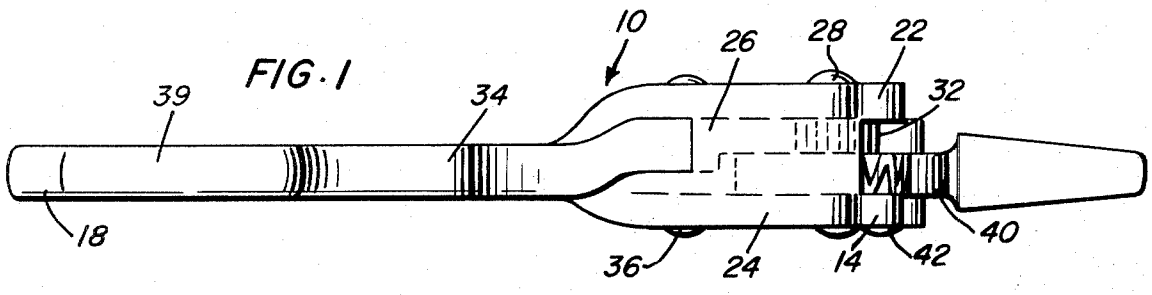


FIG. 2

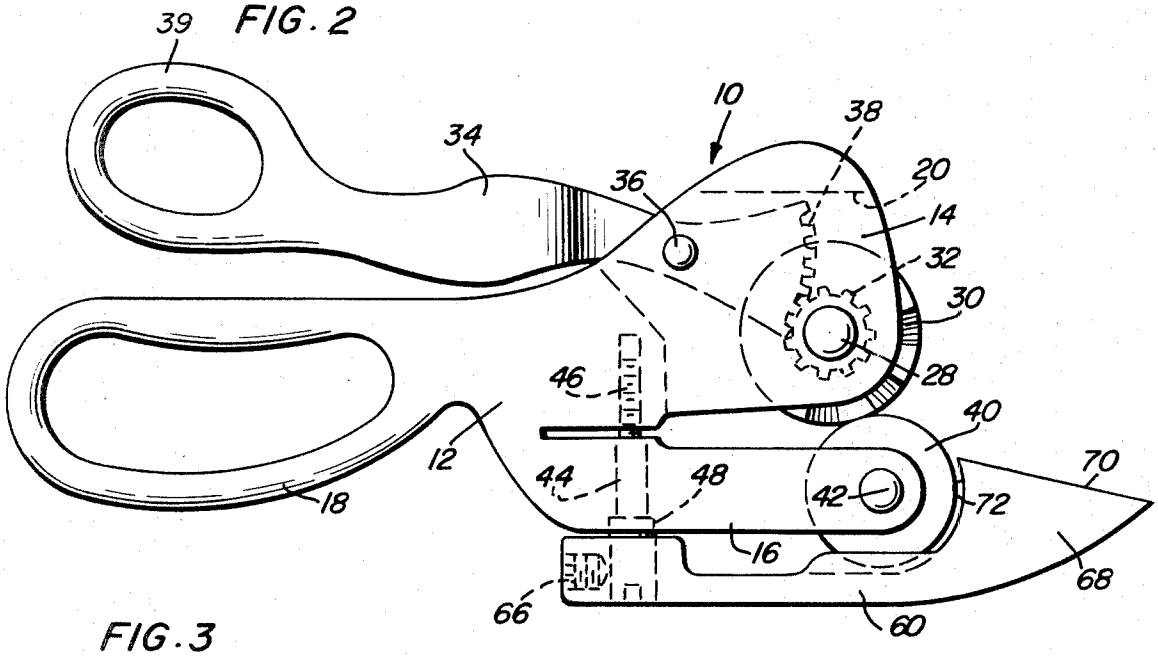


FIG. 3

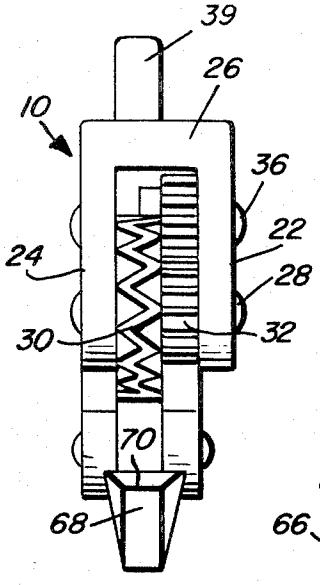


FIG. 4

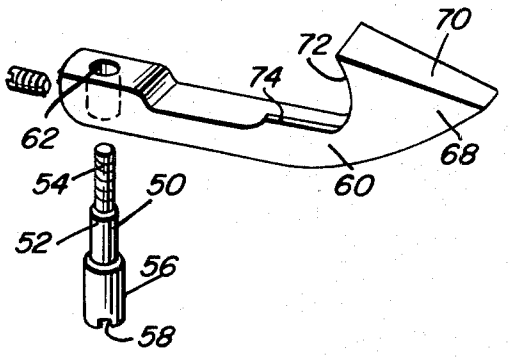


FIG. 5

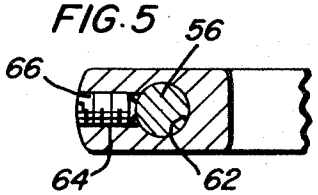


FIG. 6

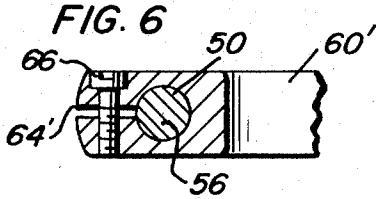


FIG. 7

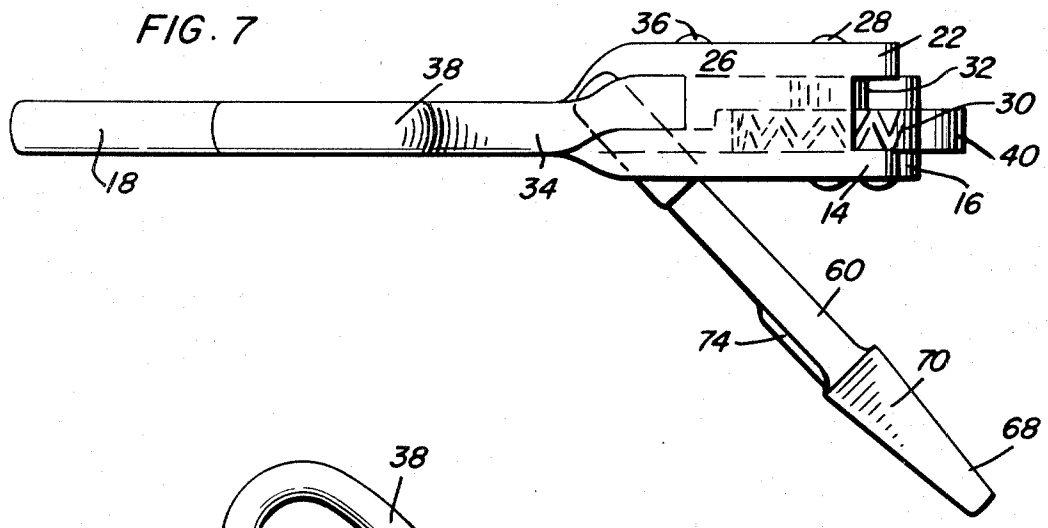


FIG. 8

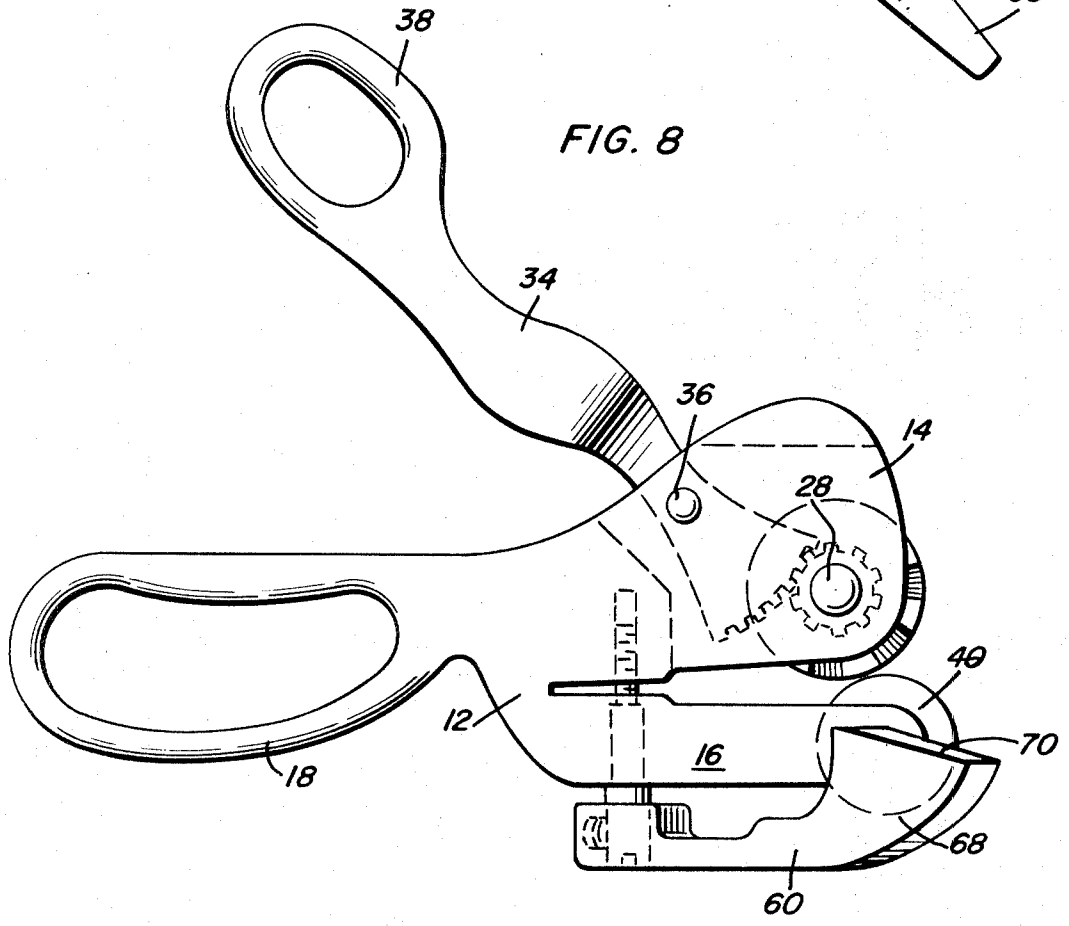
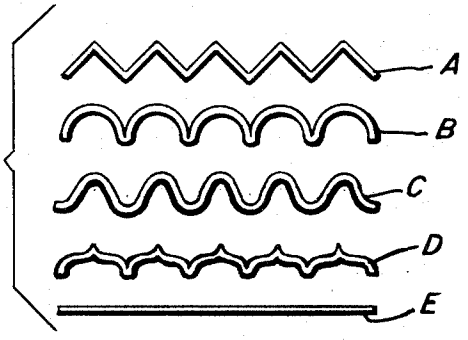


FIG. 9



ROTARY SHEAR WITH PICKUP FINGER AND PRESSURE RELEASE

The rotary shear of the instant invention comprises an improvement over the rotary shear disclosed in my prior U.S. Pat. No. 2,578,346, dated Dec. 11, 1951.

Heretofore rotary shears such as the rotary shear disclosed in my above-mentioned prior patent have been provided with means whereby the jaw members supporting the rotary anvil structure and the rotary cutting disk structure may be biased together. However, these prior rotary shears have been constructed in a manner whereby only semi-permanent adjustment of the spacing of the jaws could be effectively carried out. Rotary shears of this type are maintained in a state of adjustment whereby the rotary cutting disk means is just barely rollingly engaged with the rotary anvil structure and after initial adjustment has been obtained, further adjustment of the special relationship of the jaws of the shears is not carried out until such time as it is necessary to change the rotary disk means or sharpen the latter. However, with rotary shears adjusted in this manner, it is sometimes difficult to start the material to be cut between the rotary disk means and the rotary anvil means.

Accordingly, the main object of this invention is to provide rotary shears constructed in a manner whereby each time a piece of material to be cut is placed between the rotary cutting disk means and the rotary anvil means, the placement of the material to be cut may be accomplished while the rotary anvil means and the rotary cutting disk means are sufficiently spaced from each other to receive the material to be cut therebetween.

Another object of this invention, in accordance with the immediately preceding object, is to provide rotary shears including an oscillatable forwardly projecting pickup finger swingable between a laterally offset inoperative position and a straight forwardly projecting operative position with the pickup finger operatively associated with the jaws of the shears in a manner so as to enable the jaws to separate upon displacement of the pickup finger to its inoperative position and the jaws to be automatically drawn together to the predetermined desired adjusted positions thereof upon displacement of the pickup finger from the inoperative position to the straight forwardly projecting operative position.

A still further object of this invention is to provide a rotary shear in accordance with the preceding objects and including means by which relative displacement of the jaws of the shears toward and away from each other may be adjusted according to a given angularly displaced position of the pickup finger.

A final object of this invention to be specifically enumerated herein is to provide a rotary shear in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and easy to use, so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a top plan view of the rotary shear of the instant invention;

FIG. 2 is a side elevational view of the rotary shear of the instant invention with the pickup finger thereof illustrated as positioned in FIG. 1 and in the operative position;

FIG. 3 is a front elevational view of the rotary shear;

FIG. 4 is an exploded perspective view of the pickup finger and threaded shank-type fastener by which the rotary finger is supported from one of the jaws of the rotary shear and utilized to urge the other jaw of the shear toward the one jaw from which the shank-type fastener is supported;

FIG. 5 is a fragmentary enlarged horizontal sectional view taken substantially upon a plane passing through the center of the pickup finger;

FIG. 6 is a fragmentary horizontal sectional view similar to FIG. 5 but illustrating a modified form of pickup finger;

FIG. 7 is a top plan view similar to FIG. 1 but with the pickup finger in a laterally displaced inoperative position;

FIG. 8 is a side elevational view of the assembly illustrated in FIG. 7; and

FIG. 9 is a schematic view illustrating five exemplary cuts which may be made with the rotary shear of the instant invention by utilizing five rotary cutting disks of different configurations.

Referring now more specifically to the drawings, the numeral **10** generally designates the rotary shear of the instant invention. The shear **10** includes an elongated handle **12** having a pair of generally parallel and laterally spaced integral jaws **14** and **16** on one end and defining a finger receiving frame **18** at its other end. The jaw **14** has a longitudinally extending passage **20** formed therethrough which divides the jaw **14** into opposite side plates **22** and **24** joined by an upper integral transversely extending portion **26.**

A pivot fastener **28** extends between and is secured through the side plates **22** and **24** and has a wave-type cutting disk **30** journaled thereon. A spur gear **32** is also journaled on the fastener **28** alongside the cutting disk **30** and is drivingly coupled to the latter by means of a one-way clutch (not shown) of any conventional design.

A lever **34** includes a first end oscillatably supported in the passage **20** by means of a pivot fastener **36** extending and secured between the side plates **22** and **24.** The first end of the lever **34** disposed between the side plates **22** and **24** includes sector gear teeth **38** meshed with the spur gear **32** and the second or opposite end of the lever **34** defines a thumb-receiving frame **39.**

The jaw **16** has a drum-type rotary anvil **40** journaled therefrom by means of a pivot fastener **42** and the jaw **16** includes a smooth upstanding bore **44** formed therethrough and registered with a blind threaded bore **46** formed in the jaw **14.** The smooth bore **44** includes a lower end counterbore **48** and a headed shank-type fastener **50** has its smooth shank portion **52** rotatably received in the smooth bore **44,** its threaded shank portion **54** threadedly engaged with the threaded bore **46** and its diametrically enlarged head **56** seated in the counterbore **48,** the outer end of the head **56** being provided with a diametric kerf **58.**

The fastener **50,** of course, serves to bias the jaw **16** toward the jaw **14** when the fastener **50** is tightened. However, when the fastener **50** is not tightened, the

cutting disk **30** is at least slightly spaced from the drum-type anvil **40** and thus in order to cut material disposed between the cutting disk **30** and the drum-type anvil **40,** the fastener **50** must be tightened sufficiently to bias the jaw **16** toward the jaw **14** in order to swing the drum-type anvil **40** into rolling contact with the cutting disk **30.**

The above description comprises a description of a rotary shear substantially equivalent to the rotary shear disclosed in my above-mentioned prior patent.

However, the rotary shear **10** includes an elongated lever arm **60** defining a pickup finger **68.** The arm **60** includes an upstanding smooth bore **62** formed through one end and a short horizontal threaded bore **64** formed in and extending longitudinally of the corresponding end of the lever arm **60.** The inner end of the threaded bore **64** opens into the bore **62** and is provided with a setscrew **66.** The head **56** is firmly received in the bore **62** and releasably secured in position therein by means of the setscrew **66** when the latter is tightened against the head **56.** The lever arm **60** extends forwardly from the head **56** of the fastener **50** and terminates at its forward end in a smoothly upwardly curving pickup finger portion **68** whose upper surface **70** is inclined rearwardly and upwardly and terminates a spaced distance forward of the rotary anvil **40** at an elevation spaced above the horizontal center of the anvil **40.** The pickup finger **68** is disposed immediately forwardly of the anvil **40** and includes a rear face **72** which is contoured so as to be partially cylindrical in configuration and to closely embrace the forward and lower peripheral portions of the anvil **40.** One side of the lever arm **60** includes an upstanding longitudinally extending flange **74** which is abuttingly engageable with the right end of the rotary anvil **40** when looking along the shear **10** in a forward direction.

With the shear **10** held in one hand in the conventional manner, the forward end of the shear **10** may be moved laterally to the left over a worktable with the forward or under marginal portion of the pickup finger **68** engaged with the top of the worktable or bench. In this manner, the pickup finger **68** will be angularly displaced from the straightforward position thereof illustrated in FIG. **1** of the drawings to the inoperative position thereof illustrated in FIG. **7** of the drawings. As a result of the pickup finger **68** being angularly displaced from the operative position of FIG. **1** to the inoperative position of FIG. **7,** the fastener **50** is loosened so as to enable the resiliency of the material of which the handle **12** is constructed to allow the jaw **16** to swing at least slightly away from the jaw **14.** This, of course, will cause the cutting disk **30** and anvil **40** to be disposed in spaced apart relation whereby material to be cut between the cutting disk **30** and the anvil **40** may be readily introduced between these two components. Thereafter, the underside of the forward end of the pickup finger **68** is displaced to the left over the top of the worktable so that the lever arm **60** will be swung back to the operative position illustrated in FIG. **1** as defined by engagement of the limit stop flange **74** with the adjacent side of the drum-type anvil **40,** and such movement of the lever arm **60** from the inoperative position of FIG. **7** to the operative position of FIG. **1** will cause the fastener **50** to again be tightened and the jaw **16** to be urged toward the jaw **14** so as to again position the anvil **40** in rolling contact with the cutting disk **30.** Thereafter, the lever **34** may be oscillated relative to the handle **12** in the conventional manner in order to advance the rotary shear along the material being cut between the cutting disk **30** and the anvil **40.**

As can be seen from FIG. **8** of the drawings, when the lever arm **60** is in the inoperative position, the jaw **16** drops slightly relative to the jaw **14** and thereby swings the rotary anvil **40** away from the cutting disk **30.**

In as much as the cutting disk **30** is removably journaled on the fastener **28,** cutting disks of various types may be utilized on the shear so as to enable the latter to make cuts of various configurations, such as the cuts A, B, C, D and E illustrated in FIG. **9,** the cut A being made by the cutting disk **30.** Of course, cutting disks of still further configurations may be utilized to form cuts of any repeating configuration.

With attention now invited more specifically to FIG. **6** of the drawings, there may be seen a modified form of lever arm **60'** which, in lieu of the threaded bore **64** and setscrew **66,** is provided with a vertical slot **64'** formed in the rear end of the lever arm **60'** and with a clamp-type fastener **66'** being operatively associated with the slotted portion of the lever arm **60'** so as to allow the slotted portion to be clamped tightly about the head **56** of the fastener **50.**

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A rotary shear, comprising a handle having first and second vertically spaced forwardly projecting spaced jaws at one end relatively shiftable toward and away from each other, rotary anvil means and rotary cutting disk means journaled from said first and second jaws for rotation about horizontal transverse axes, thrust means connected between said jaws for selectively shifting the portions of said jaws from which said anvil means and said disk means are supported relative to each other to decrease the spacing therebetween and thereby bring said rotary anvil and rotary cutting disk means into rolling contact with each other, said thrust means including an actuator therefor comprising an elongated lever having one base end portion oscillatably supported from said handle for angular displacement of said lever about an upstanding axis and a free end portion underlying the lower jaw and projecting forwardly of the axis of rotation of the corresponding rotary means and disposed for frictional engagement with a surface upon which material to be cut by said shear is supported.

2. The combination of claim **1** wherein said free end portion of said lever arm is provided with an upwardly facing ramp surface inclined rearwardly and upwardly toward the other rotary means.

3. The combination of claim **1** wherein an intermediate portion of said lever arm includes a laterally outstanding abutment member engageable with one axial end of said one rotary means to establish a limit of angular displacement of said lever arm in one direction.

4. The combination of claim **3** wherein said thrust means comprises a rotary thrust member extending between and threadedly engaged with at least one of said jaws, said lever arm being carried by said rotary thrust

member and projecting generally radially outwardly therefrom.

5. A rotary shear, comprising a handle having first and second vertically spaced forwardly projecting spaced jaws at one end relatively shiftable toward and away from each other, rotary anvil means and rotary cutting disk means journaled from said first and second jaws for rotation about horizontal transverse axes, thrust means connected between said jaws for selectively shifting the portions of said jaws from which said anvil means and said disk means are supported relative to each other to decrease the spacing therebetween and thereby bring said rotary anvil and rotary cutting disk means into rolling contact with each other, said thrust means including an actuator therefor comprising an elongated lever having one base end portion oscillatably supported from said handle for angular displacement of said lever about an upstanding axis and a free forward end portion underlying the lower jaw and the rotary means carried thereby and disposed for frictional engagement with a surface upon which material to be cut by said shear is supported, said forward end portion including an upwardly projecting portion positioned for abutting engagement with one axial face of the lower jaw rotary means to establish a limit of swinging movement of the forward end portion of said lever in one direction.

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