Nov. 17, 1953

A. KREIDLER

2,659,480

DRAWBENCH

Filed Aug. 10, 1951

2 Sheets-Sheet 1

FIG. 1

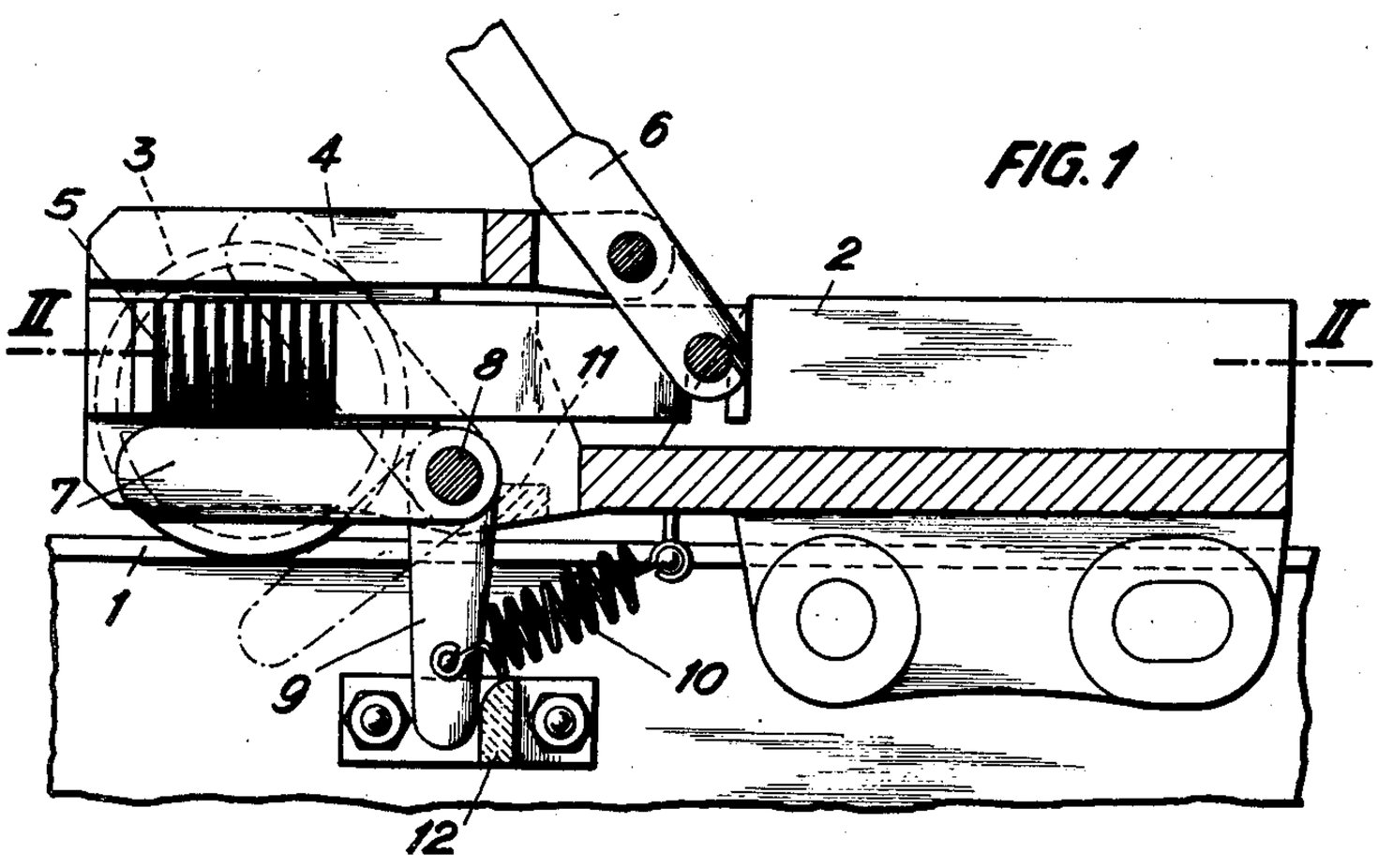

FIG. 2

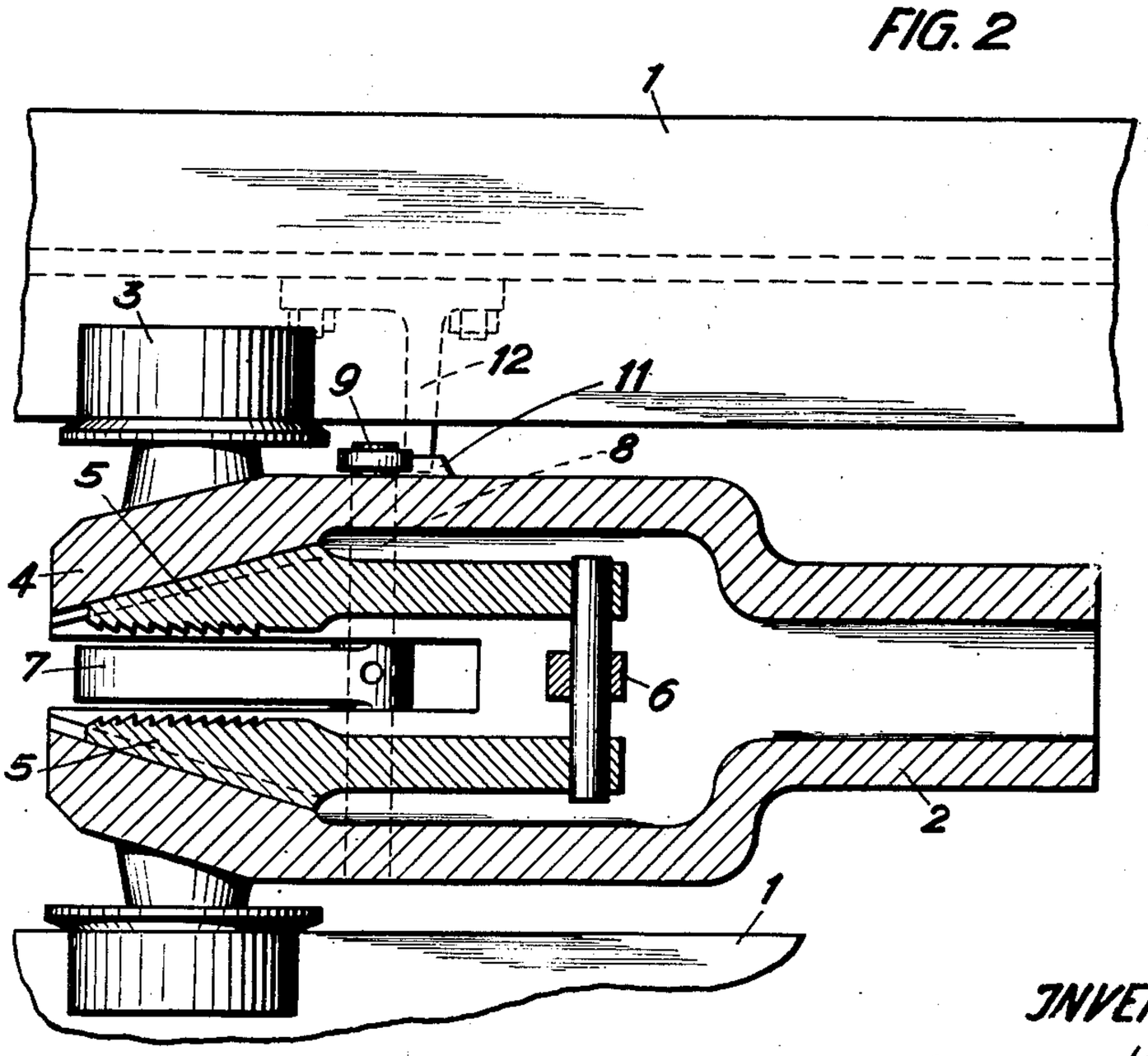

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FIG. 3

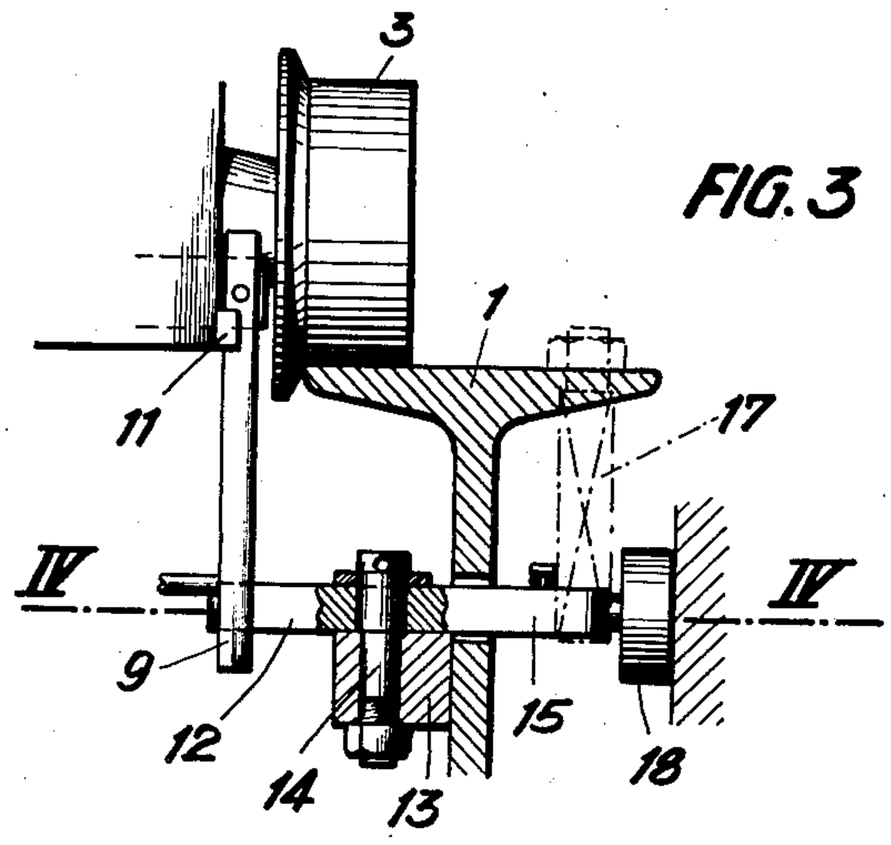
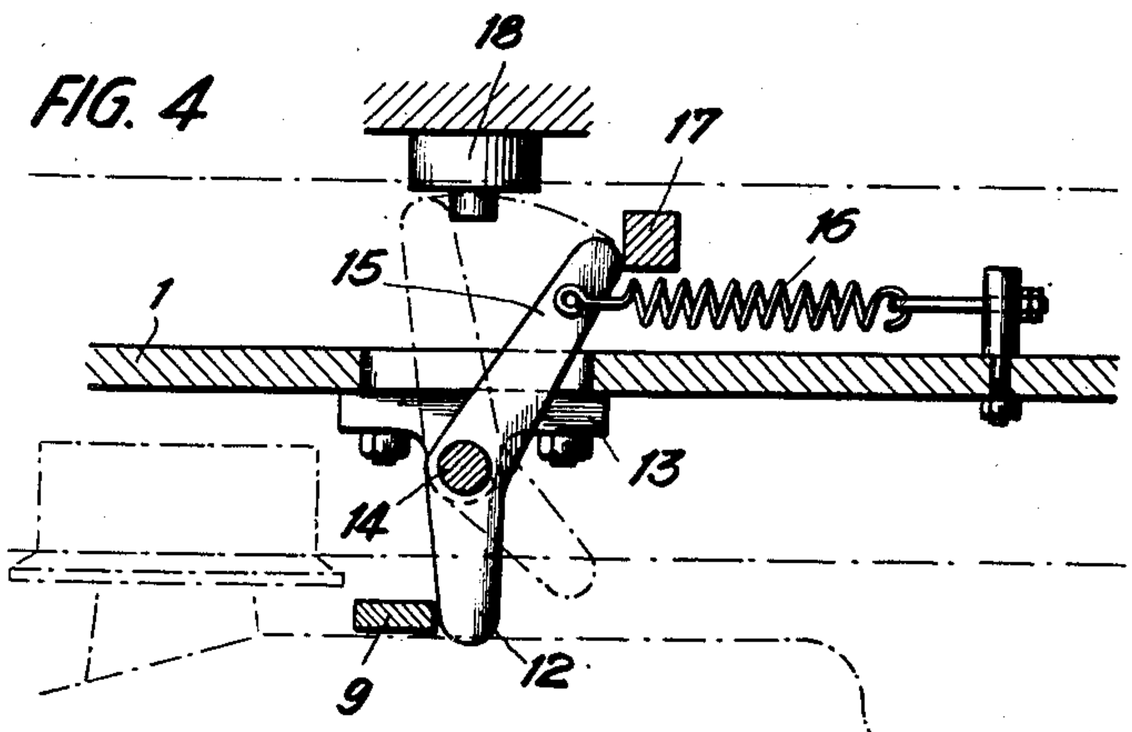


FIG. 4



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DRAWBENCH

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Claims priority, application Germany
August 16, 1950

6 Claims. (Cl. 205—22)

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This invention concerns draw-benches used during drawing operations on rods and tubes.

A fault that often occurs in the operation of draw-benches is that during the drawing operation the teeth on the jaws of the drawing tongs bite so deeply into the rod or tube being drawn that it is not immediately released when the tongs are opened. The effort then required to withdraw the rod or tube from the tongs involves excessive expenditure of time and energy. In those draw-benches wherein, on conclusion of the drawing operation, the carriage deviates from the line of pull during its return to the starting position, the danger arises that the rod or tube will be bent and the draw-bench damaged.

The present invention avoids these disadvantages by the provision of an ejector for the drawn rod or tube, mounted on the longitudinally moving tongs, and a stop or similar device located on a fixed part of the draw-bench and designed to move the ejector into its operative position at the end of the drawing operation. For this purpose the ejector is mounted on the tongs in such a manner that it can enter between the opened jaws and eject the rod or tube. An especially suitable ejector for this purpose comprises a bell-crank lever, one arm of which (the ejector arm) passes between the jaws of the tongs when the other (the operating arm) strikes the stop.

It is advantageous to combine a safety device with the ejector stop. The stop may be spring loaded, so as to be displaceable by the operating arm of the ejector in case of excessive resistance from the rod or tube, should the latter become jammed on the tongs. The stop then serves to interrupt or disconnect the drive from the draw-bench and so bring it to a standstill. This may be effected, for example, by means of an electric switch which is turned to the "off" position by the movement of the stop, so that the machine is brought to a halt whenever the ejector fails to eject the rod or tube from the tongs, and consequently no damage can be caused.

The invention will be described further, by way of example with reference to the accompanying drawings in which:

Figs. 1 and 2 depict in sectional elevation, and in sectional plan view on the line II—II of Fig. 1 respectively, one embodiment of the invention; and

Figs. 3 and 4 show an alternative ejector mechanism and an emergency stop in more detail, Fig. 3 being in sectional end view and Fig. 4 being a plan view on the line IV—IV of Fig. 3.

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On the upper longitudinal girders 1 of the draw-bench, the carriage 2 runs on rollers 3. For the sake of clarity, the draw-chain is not shown. Firmly secured to the carriage are the tongs 4 which are open top and bottom and within which are inserted obliquely the jaws 5. An operating lever 6 pivoted on the tongs 4 serves in known manner to open and close the tongs by longitudinal displacement of the jaws 5. An ejector lever 7, which is rigidly mounted on the shaft 8, is free to move within the space between the tongs. The shaft 8 is pivoted between the lower part of the tongs, and rigidly mounted upon it, outside the tongs, is the operating lever 9 which abuts against a lateral projection 11 on the tongs, under the force of a tension spring 10, so that the operating lever 9 is downwardly directed whilst the ejector lever 7 lies in a horizontal position beneath the lower edge of the jaws of the tongs. The stop 12, which is secured laterally on to one of the girders of the draw-bench, projects into the path of the operating lever 9. (Figs. 1 and 2.)

At the conclusion of a drawing operation, angular displacement of the lever 6 causes the tongs 4 to be opened by withdrawal of the jaws 5. As the carriage 2 advances further, the lever 9 strikes the stop 12 and is displaced into the position indicated by chain-dotted lines in Fig. 1, thus causing the ejector lever 7 (the other arm of the virtual bell-crank lever 7, 9) to be displaced in an upward direction between the open jaws 5 and to strike against the rod or tube, if this has not already automatically released itself from the tongs, thus forcing it upward and out of the tongs.

In the arrangement illustrated in Figs. 3 and 4, the stop 12 constitutes one arm of a lever pivoted at 14 in a bearing 13 attached to the girder 1, the other arm of which lever 15 abuts, under the force of a comparatively strong tension spring 16, against a square-headed bolt 17. The actuating member of the driving-motor switch 18 is located within the orbit of the arm 15 of the lever 12, 15.

If the jaws 5 have bitten so deeply into the rod or tube as to prevent its being ejected by the ejector 7, the lever 9 causes the lever 12, 15 to be displaced into the position indicated by chain-dotted lines in Figure 4, whereupon the arm 15 actuates the switch 18, with the result that the driving motor is switched off and the machine stops, and no damage is caused to its components.

It is of course understood that the lever 15, may

be replaced by other suitable means, such as, for example, a longitudinally displaceable slide-bar, and also could be arranged to stop the machine by disconnecting a mechanical coupling.

I claim:

1. A draw bench comprising in combination a fixed base, a carriage adapted to be moved longitudinally along the said base, the said carriage including tongs adapted to hold material to be drawn, an ejector, means for mounting the said ejector on the said carriage for movement of said ejector through the said tongs, and a stop mounted on the said fixed base, operating means for said ejector, the said stop being disposed in the path of the said operating means which engage the said stop and upon continued movement of the said carriage causes said ejector to move through the said tongs and, thereby, to remove the drawn material from the said tongs upon abutting against the said stop.

2. A draw bench comprising in combination a fixed base, a carriage adapted to be moved longitudinally along the said base, the said carriage including tongs adapted to hold material to be drawn, jaws disposed in the said tongs, an ejector, means for mounting the said ejector on the said carriage for movement of said ejector through the said jaws, and a stop mounted on the said fixed base, operating means for said ejector, the said stop being disposed in the path of the said operating means which engage the said stop and upon continued movement of the said carriage causes the said ejector to move through the said jaws and, thereby, to remove the drawn material from the said jaws upon abutting against the said stop.

3. A draw bench comprising in combination a fixed base, a carriage adapted to be moved longitudinally along the said base, the said carriage including tongs adapted to hold material to be drawn, jaws disposed in the said tongs, a two-armed lever pivotally mounted on the said carriage for movement of one arm of the said lever through the said jaws in order to act as an ejector, and a stop mounted on the said base, the said stop being disposed in the path of the other arm of the said two-armed lever which engages the said stop and upon continued movement of the said carriage causes said one arm to move through the said jaws and, thereby, to remove the drawn material from the said jaws upon abutting the said other arm against the said stop.

4. A draw bench comprising in combination a fixed base, a carriage adapted to be moved longitudinally along the said base, the said carriage including tongs adapted to hold material to be drawn, jaws disposed in the said tongs, an ejector, means for mounting the said ejector on the said carriage for movement of said ejector through the said jaws, and a spring-loaded stop movably mounted on the said base, operating means for said ejector, the said stop being disposed in the path of the said operating means which engage said stop and upon continued movement of the said carriage causes said ejector to move through the said jaws and, thereby, to remove the drawn material from the said jaws upon abutting against the said stop, means for

movement of the said stop from its normal position upon the said material becoming jammed, and the said stop including means for stopping the movement of the said carriage upon movement of the said stop.

5. A draw bench comprising in combination a fixed base, a carriage adapted to be moved longitudinally along the said base, the said carriage including tongs adapted to hold material to be drawn, jaws disposed in the said tongs, a two-armed lever pivotally mounted on the said carriage for movement of one arm of the said lever through the said jaws in order to act as an ejector, and a spring-loaded stop movably mounted on the said base, the said stop being disposed in the path of the other arm of the said two-armed lever which engages said stop and upon continued movement of the said carriage causes said one arm to move through said jaws and, thereby, to remove the drawn material from the said jaws upon abutting of the said other arm against the said stop, means for movement of the said stop from its normal position upon the said material becoming jammed, and the said stop including means for stopping the movement of the said carriage upon movement of the said stop.

6. A draw bench comprising in combination a fixed base, a carriage adapted to be moved longitudinally along the said base, the said carriage including tongs adapted to hold material to be drawn, jaws disposed in the said tongs, a two-armed lever pivotally mounted on the said carriage for movement of one arm of the said lever through the said jaws in order to act as an ejector, and a spring-loaded stop removably mounted on the said base, the said stop being disposed in the path of the other arm of the said two-armed lever and upon continued movement of the said carriage causes said one arm to move through the said jaws and, thereby, to remove the drawn material from the said jaws upon abutting of the said other arm against the said stop, means for movement of the said stop from its normal position upon the said material becoming jammed, an electric motor for driving the said carriage on the said base, an electric switch member for said electric motor disposed on the said carriage within the path of the movement of the said stop which engages said switch member upon movement of the said stop, the said switch member being operated and the said electric motor being stopped by the movement of the said stop.

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