

Aug. 1, 1961

L. C. HAUER
MARKING APPARATUS

2,994,264

Filed May 31, 1957

3 Sheets-Sheet 1

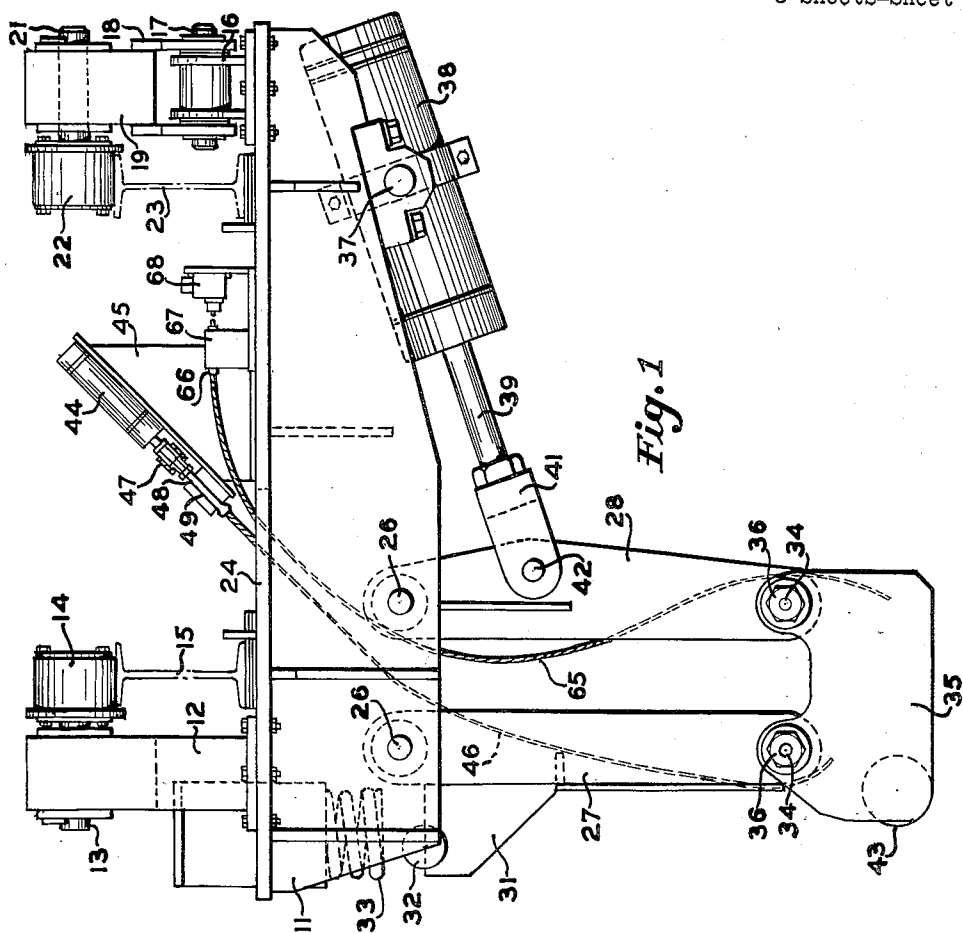


Fig. 1

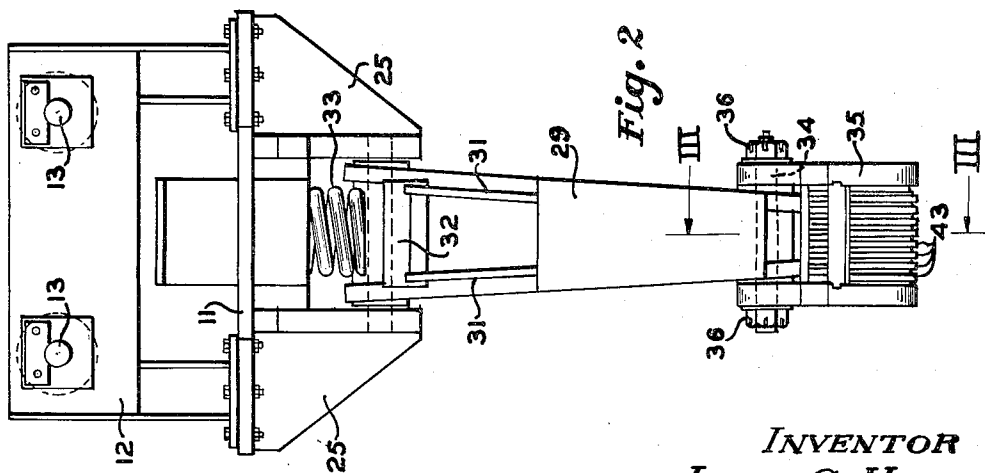


Fig. 2

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3 Sheets-Sheet 2

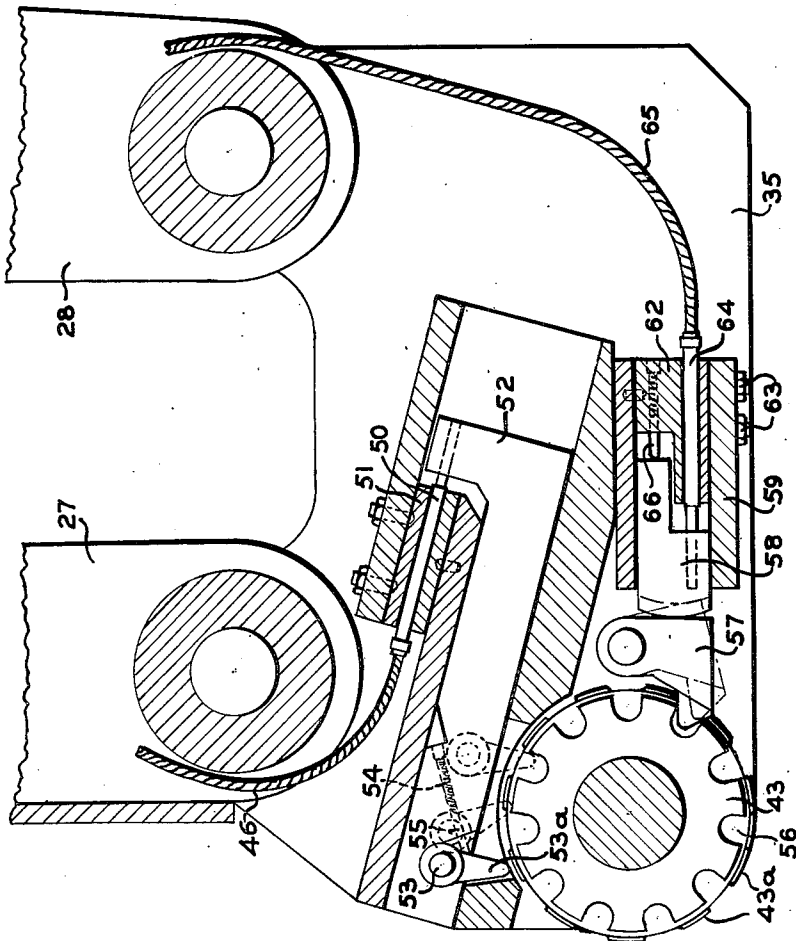


Fig. 3

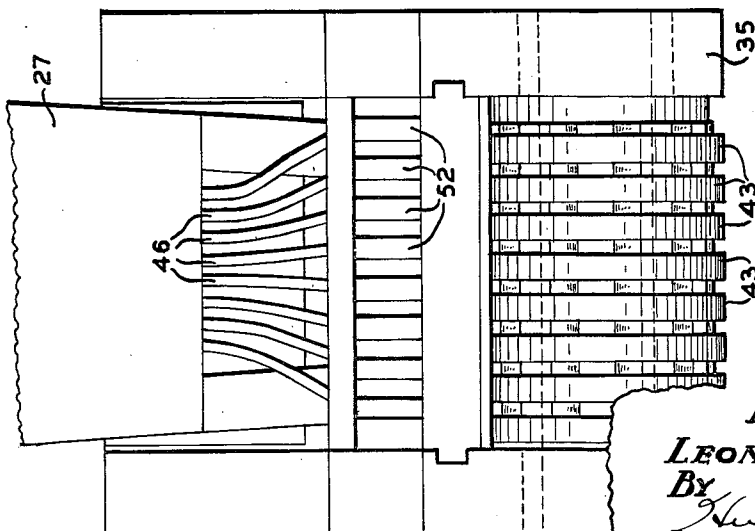


Fig. 4

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3 Sheets-Sheet 3

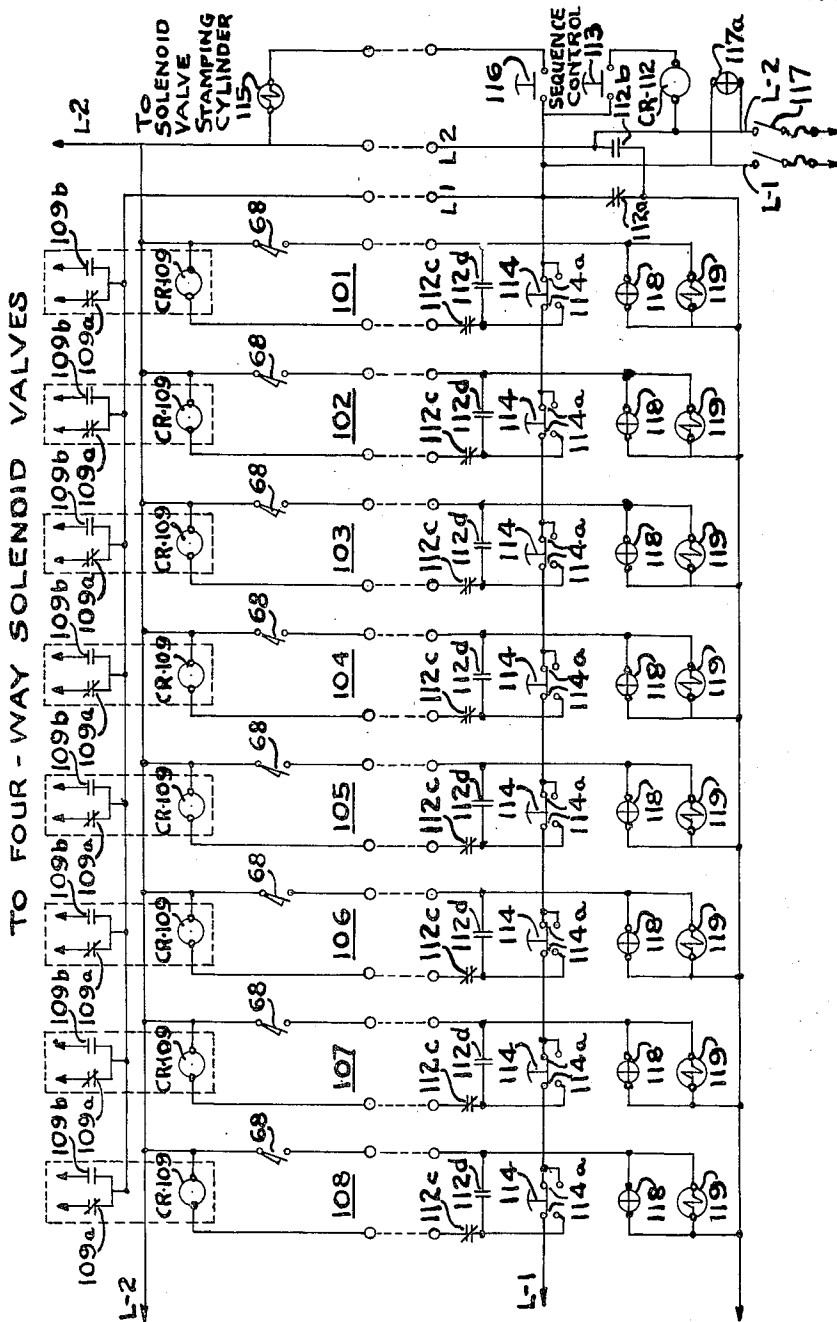


Fig. 5

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2,994,264

MARKING APPARATUS

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2 Claims. (Cl. 101-95)

This invention relates to apparatus for marking workpieces and in particular, to apparatus for impressing upon billets, slabs or the like, marks by which the heat as well as the total number of workpieces coming from a particular heat may be readily identified.

Heretofore, various types of marking devices have been employed ranging from dies which are positioned in a holder which are struck by a manually operated hammer to marking devices employing a holder, in which the dies are inserted manually, which is secured to a pendulum adapted to be swung into contact with the workpiece for impressing the identifying mark thereon. With such devices, it is readily understood the difficulty which is encountered when consecutive numbering is to be provided. Each time a number, for example, is to be advanced, the apparatus must be withdrawn from operation long enough to permit the necessary changes to be made, thus interfering with the continuity of production of workpieces and hence with the economy of the operation.

One of the objects of the invention herein disclosed is to provide an improved device by which the same or consecutive identifying marks may be readily applied to a group of workpieces.

Another object of this invention is to provide in a marking device a novel means for retaining and advancing the marking elements contained therein.

Still another object of this invention is to provide in a marking device means for assuring to the operator that the dies thereof are in their proper striking position.

A further object of this invention is to provide an apparatus which is both economical to manufacture and maintain and which will apply uniform accurate legible markings to the workpiece to be identified.

These objects as well as the novel other features and advantages of this invention will be apparent from the following description and accompanying drawings, of which:

FIG. 1 is a side elevation of a billet marking device embodying the features of the invention herein disclosed;

FIG. 2 is an end view of the device of FIG. 1;

FIG. 3 is an enlarged sectional view taken at III-III of FIG. 2;

FIG. 4 is an enlarged end view of the stamping head shown in FIG. 1; and

FIG. 5 is an electrical diagram of the control circuit for effecting operation of the stamping device.

With reference to FIGS. 1 and 2, the billet stamping device comprising my invention as shown in the preferred form, comprises a frame 11 to the upper surface of which there are secured at one end a pedestal bearing 12 within which there are supported elongated shafts 13 having secured to their outer ends flanged trolley wheels 14 which are adapted to ride along a suitable track 15. To the other end of the frame there is secured a bracket 16 to which a pin 17 is affixed. Pivotaly secured to the pin at its outer ends there is a yoke 18 to the upper portion of which there is affixed a bearing 19 within which a shaft 21 is supported. To the free end of the shaft there is keyed a flanged trolley wheel 22 which also rides along a track 23 that is parallel to and on the same level as track 15.

The frame 11 consists of a base 24 to the under side of which there are secured two symmetrical brackets 25.

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Through suitable openings near one end of the two brackets 25 there are passed two pins 26 to which there are pivotally secured a pair of arms 27 and 28. To the forward arm 27 there is welded a face plate 29 to which there is secured at the upper edge thereof and to the outer surface of the arm 27 a pair of upright members 31 having affixed to the upper portion thereof a cylindrical bar 32. To the under side of the base 24 and above the bar 32 there is secured a bumper spring 33.

Through openings provided at the lower ends of the two arms 27 and 28 there are passed similar pins 34 threaded for a portion of their lengths at the ends thereof. Depending from the lower ends of the arms 27 and 28 and pivotally secured to the pins 34 there is a marking head generally designated by the numeral 35 which is firmly secured in place by nuts 36 locked upon the threaded pins 34.

To the under side of the frame 11 and pivotally secured thereto by trunnions 37 there is a cylinder 38 having extending from one end thereof a piston rod 39 which is provided with a clevis nut 41 with openings therein and in the arm 28 through which is passed a pin 42 for pivotally securing the piston rod to the arm 28. The marking head 35 has supported therein a plurality of individually rotatable marking wheels 43 each of which carries a plurality of marking dies around the circumference thereof. For advancing each wheel in order to present the next character in the stamping position, there is a piston cylinder assembly 44, to which there is connected a suitable four-way solenoid valve, affixed to the bracket 45 at the upper surface of the frame 11 having a sheathed cable 46 secured at one end by means of a coupling 47 to a rod 48 slidably supported in a guide 49. To the opposite end of the cable 46, FIGURE 3, there is secured a tube 50 having the end of the cable slidably supported therein, the tube extending through a guide 51, with the end of the cable secured to a slide 52 having a cut-out portion within which a pawl 53 is pivotally supported. It is to be noted that though the opening in the slide coincides at the circular portion with that of the pivotal end of the pawl, the opening occupied by the pick portion 53a of the pawl is rather extended so that the pawl 53 can be swung through a substantial angle before its movement is arrested. A compression spring 54 is secured within a suitable opening in the slide 52 and engages with the end of a plunger pin 55 to force the plunger pin into contact with the pick 53a of pawl 53 thereby causing the pawl to assume its normal position as shown in FIGURE 3.

All of the marking wheels 43 are somewhat the same, except for the die characters carried thereby, as that shown in FIGURE 3, each wheel having its own individual actuating means. As noted in FIGURE 3, the wheel 43 is provided with eleven cut-out portions or indentations 56 into each of which the pick 53a of pawl 53 is successively positioned as the wheel 43 is advanced each time the slide 52 is actuated. Each wheel carries, for example, a plurality of dies 43a numbered from 0 to 9 with one blank space remaining. By reason of the fact that the depth of the indentations 56 is a little greater than the thickness of each pick 53a, adequate clearance is assured for permitting the pick 53a to drop down into successive indentations in readiness for further advancing the wheels.

Adjacent to each of the wheels 43 there is a locking pawl 57 which normally is retained in frictional locking engagement with the wheel by the action of a slide 58 which is confined within a guide 59 and urged to the left, as shown in FIGURE 3, by a spring pressed pin 61 confined within a suitable opening provided in a member 62 which is secured within the guide 59 by bolts 63. Also extending through an opening in the member 62 there is

a tube 64 threadably secured at one end to the slide 58 and at its opposite end secured to the sheathed cable 65. One end of the cable 65, FIGURE 1, extends up through an opening in the frame 11 and is secured within a hollow tube 66, similar to the tube 64, and the cable end is adapted to extend through and beyond the opposite side of a bracket 67. Adjacent to the free end of the cable 65 there is a micro-limit safety switch 68 with which the cable end makes contact each time the marking wheel 43, with which the particular locking pawl is associated, is advanced. As the wheel is advanced, the locking pawl 57 is forced out of its locking position thus to cause the sheathed cable 65 to be displaced to the right within the sheath so that the end projects outward and against the safety switch 68 thereby to illuminate a safety pilot light and engage a control solenoid as will be described in connection with the electrical circuit of FIGURE 5. However, should the wheel fail to be turned completely to its next marking position, thereby preventing the locking pawl 57 from dropping down into its locking position, the operator will be warned of the condition since the safety light will remain illuminated inasmuch as the locking pawl will be out of registry with the next indentation 56 thereby preventing the end of the cable 65 from being retracted within its sheath to break contact with the switch 68. Should such a condition arise, then the operator will not attempt to stamp the next billet until the condition is corrected for, otherwise, the billet may not be properly marked and, further, possible damage to the stamping dies may result.

As shown on the electrical diagram FIGURE 5, the general electrical control circuit includes a plurality of separate similar independent circuits identified by the numerals 101 through 108, there being one separate circuit for each of the eight die stamping wheels 43. Each circuit comprises a relay CR109 consisting of a solenoid and a normally closed contact 109a and a normally open contact 109b which relay is connected to a terminal strip to which there is also connected the micro-limit safety switch 68, operated by operation of the locking mechanism of the marking wheels 43, and a second control relay CR112 consisting of a solenoid, a normally closed contact 112a, a normally open contact 112b, a series of normally closed contacts 112c and a series of normally open contacts 112d. Also connected in the circuit there is a push button switch 113. A push button switch 114 is shown in its normal position bridging two contacts 114a to complete the circuit across line L₁, which line continues across each of the remaining circuits 102 through 108 with similar push button switches 114 spaced therealong. A second line L₂ is connected at intermediate points to the various control relays CR109 as is shown in the upper portion of FIGURE 5.

With reference to control relay CR112, contacts 112a and 112b are so arranged with respect to lines L₁ and L₂ that when push button 113 is depressed and during the time the button is held in the depressed position, lines L₁ and L₂ are reversed so far as the circuits are concerned and the upper portions of the circuits containing the relays CR109 disconnected from the power lines.

Also provided in the circuit there is a four-way solenoid valve 115 connected to and for admitting fluid under pressure to the stamping cylinder 38 and operably connected to a push button switch 116.

A main switch 117 is provided for connecting and disconnecting lines L₁ and L₂ to a source of power, a pilot light 117a being provided in the circuit to indicate the "power on" condition.

Although not shown, indicators for each billet marking wheel 43 are mounted on a suitable panel for indicating to the operator that a particular die stamping wheel 43 has been advanced, the indicator portions shown comprising a safety pilot lamp 118 and a solenoid 119. When the micro switch 68 is closed at the time the locking pawl 57 moves outward from its locked position, the

cable 65 is pushed into contact with the micro switch 68 thereby closing the switch and lighting the safety pilot lamp 118 and energizing the solenoid 119 which controls the mechanism for moving one of a series of indicator wheels, which wheels are similar to the billet marking wheels 43.

Operation of the marking apparatus thus described may be briefly summarized as follows:

Power is applied to the circuits by closing the main switch 117. Let it be assumed that the various billet marking wheels are in their proper positions for marking a billet with the identification numerals and letters desired and that a billet is in position to be marked thereby. The operator simply closes the push button switch 116 which causes the four-way valve 115 to open to admit fluid under pressure to the cylinder 38 thereby swinging the marking head 35 from its uppermost position downward to cause the die marking wheels 43 to strike the billet. If the next billet, for example, is to be marked with the next number in sequence, then the operator depresses the push button 114 of the particular circuit controlling the marking wheel to be advanced, which will actuate the proper control relays CR109 so as to open the normally closed contact 109a and to close the normally open contact 109b which causes a four-way solenoid valve, not shown, to admit fluid under pressure to the proper piston cylinder assembly 44 to which it is connected. Fluid is thereby introduced into the cylinder and movement of the piston of assembly 44 causes the cable 46 to move downward within its sheath to push the slide 52 forward, as shown in FIGURE 3, so that the pawl 53 engages with the next adjacent notch of the wheel 43 to advance the wheel to present the next character in its stamping position. Rotation of the wheel 43 causes the locking pawl 57 to swing to the right so that the slide 58 and the sheathed cable 65 move in the same direction, thereby extending the cable end beyond the bracket 67 which makes contact with and closes the micro-limit switch 68 thereby to illuminate the safety pilot lamp 118 and to energize the solenoid 119 which advances the wheel of the indicator corresponding to the particular die marking wheel 43 which is also being advanced.

If for some reason during the advancement of a die stamping wheel 43 the wheel should not properly be registered at its next die stamping position, then the operator is warned of the condition since the pilot lamp 118 will remain illuminated. In such a case, the operator will not swing the billet marking apparatus to strike the work-piece but will correct the condition and thereby prevent improper or illegible marking of a billet and also possible damage to the dies.

Should the operator find that the sequence of numbers presented by the die stamping wheels is for some reason not the same as that shown on the indicator panel, then the operator merely depresses the sequence control push button 113 thereby to energize the control relay CR112 reversing lines L₁ and L₂ and normally closed contacts 112a opened and normally open contacts 112b closed.

As is apparent from FIGURE 5, this disconnects the upper portion of the circuit containing the control relays CR109 so that all the operator need do is to press the push button 114 of the particular indicator circuits involved a sufficient number of times in order to advance the indicator wheels to bring them into agreement with the characters presented by the die marking wheels 43. Any number of additional marking wheel circuits may be added by connecting them to extensions of the lines as shown in FIGURE 5.

In accordance with the provisions of the patent statutes, I have explained the principle and operation of my invention and have illustrated and described what I consider to represent the best embodiment thereof. However, I desire to have it understood that within the scope of the appended claims, the invention may be practiced

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otherwise than as specifically illustrated and described.

I claim:

1. Apparatus for marking work-pieces comprising a support, a head pivotally connected to said support for movement to and from work engaging position, a wheel 5 rotatably connected to said head having a series of alternately spaced marking dies carried on the periphery thereof and separated by alternate indentations, a first slide carried on said head adjacent to said wheel, a driving pawl pivotally secured to said slide and adapted to be 10 engaged with one of the series of indentations of said wheel, a first cable means extending from a power source to said slide to actuate said slide and therethrough to cause said driving pawl to engage and advance said wheel 15 into the next succeeding die marking position, a second slide mounted on said head including means to actuate a locking pawl pivotally secured to said head, said means comprising a second cable means normally urging said second slide into contact with said locking pawl and 20 extending to an indicator means to indicate retraction

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of said locking pawl from one of said indentations, said second cable means upon operation of said driving pawl responsive to the actuation of the first cable means being thereby retracted to release the locking pawl and cause movement of the said indicator and arranged to signify retraction of the locking pawl.

2. Apparatus for marking work-pieces according to claim 1, wherein a compression spring on said first slide normally urges said driving pawl out of contact with said indentations.

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