

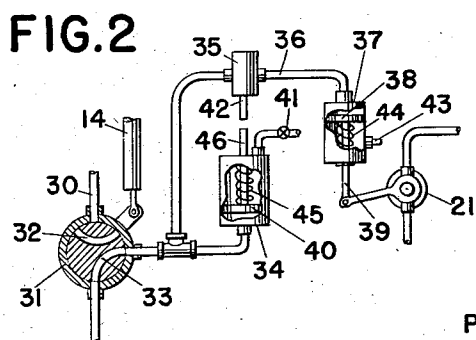
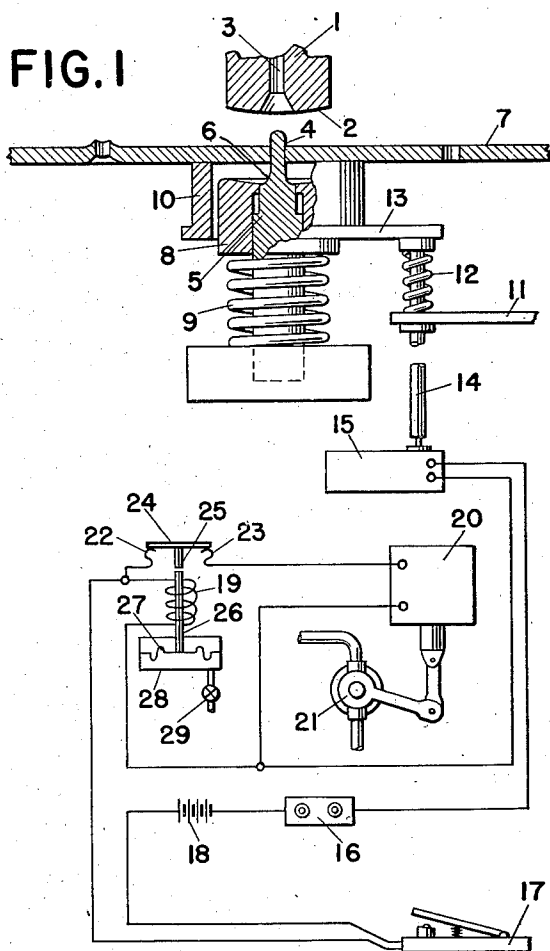
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P. H. MERRIMAN

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ELECTRICALLY OPERATED DIMPLING ATTACHMENT

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INVENTOR.
PAUL HOMER MERRIMAN
BY *George Douglas Jones*
ATTORNEY

UNITED STATES PATENT OFFICE

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ELECTRICALLY OPERATED DIMPLING
ATTACHMENT

Paul Homer Merriman, Riderwood, Md., assignor
to The Glenn L. Martin Company, Middle River,
Md., a corporation of Maryland

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5 Claims. (Cl. 153—21)

This invention relates to a dimpling machine, more particularly to a control for a dimpling machine whereby the operation of the machine is effected without additional effort on the part of the operator, other than placing the sheet of material in the machine.

The dimpling operation, on a sheet of metal, places a dimple or depression around a rivet hole for the reception of the head of the rivet so that the heads of the rivets will be flush with the surface of the sheet.

A tool whereby this dimpling operation may be performed is disclosed in the patent to Veit, No. 2,288,378.

In using this tool, it is necessary to place the sheet over the pilot pin and then operate the air valve of the squeezer which actuates the dimpling tool. Where large sheets are to be dimpled, it requires both hands of the operator to manipulate the sheet in the machine.

By the invention herein disclosed, the dimpling operation takes place at the proper time without extra effort on the part of the operator.

The invention makes it possible for the dimpling machine operator to handle large sheets and dimple rows of holes, easily and quickly, as the system is fully automatic.

Since the dimpling tool will be actuated only when the hole in the sheet is over the pin of the dimpling tool, it is impossible to damage the sheet by the inadvertent operation of the machine.

No pedals other than a safety foot pedal are required, which lessens fatigue of the operator.

Further and other objects will become apparent from the description of the accompanying drawing which forms a part of this disclosure and in which like numerals refer to like parts.

In the drawing:

Fig. 1 shows a dimpling tool partly in section and a schematic representation of the control therefor.

Fig. 2 illustrates a pneumatic control for the dimpling tool.

The dimpling tool consists of an anvil 1, having a convex surface 2, a bore 3 for the reception of pilot pin 4. The pilot pin is formed integrally with peen 5 and extends through the rivet hole of the material. Surface 6 on peen 5 cooperates with a mating surface on the anvil 1 to form the dimple in sheet 7. Bushing 8 is urged upwardly by spring 9 to prevent distortion of the sheeted material as described in the above mentioned patent.

Ring 10 extends around the dimpling tool in such a position that the pilot pin of the dimpling

tool extends beyond the ring. The ring is supported on bracket 11 by spring 12 and arm 13, rod 14 transmits the motion of the ring to the button of micro-switch 15.

Switch 15 is connected in series with a master switch 16, a foot pedal safety switch 17, a source of power 18, and time delay switch solenoid 19. Solenoid 20 which operates the air valve 21 of the pneumatic control of the dimpling tool is connected across the solenoid 19 in the above described circuit. The contacts 22 and 23 are made and broken by connector 24. This connector is moved by member 25 which, in turn, is moved upwardly by the core 26 of the solenoid 19. Core 26 is governed in its motion by its attachment to the diaphragm 27 of the airtight box 28. Valve 29 may be adjusted to control the timing of the motion of member 26 and the parts actuated thereby.

In the operation of the device, the master switch 16 is closed and the foot of the operator is placed on switch 17. When the sheet to be dimpled is placed in the machine, it is slid along on the pilot pin 4 to a hole in the sheet, around which it is desired to form a dimple. When the hole and pin register, the sheet drops over the pin and the weight of the sheet presses down on ring 10 causing push rod 14 to close switch 15. This energizes solenoid 19 and since connector 24 normally closes the circuit to solenoid 20, the air valve is immediately opened to operate the dimpling tool. After a brief interval, determined by the diaphragm 27 and the adjustment of bleed valve 29, the motion of core 26 opens the circuit to solenoid 20 which shuts off the air valve 21. Lifting a sheet 7 from the ring 10 opens the circuit on solenoid 19 and the time delay switch resets for the next operation. It should be apparent that the time delay switch is timed to open by the adjustment of valve 29. The dimpling tool will not be operated until a sheet again slides over the pilot pin and presses on ring 10.

Fig. 2 illustrates a pneumatic system for operating a dimpling tool for the purpose and in the manner described above.

Air under pressure is conducted by pipe 30 to valve 31. Push rod 14 from ring 10, moves the valve so that when passage 32 is opened, a passage 33 is closed. When passage 32 is opened, air pressure is transmitted to cylinder 34 and valve 35 which is normally open, thus permitting the pressure to be transmitted through pipe 36 to cylinder 37 and piston 38 which moves linkage 39 to operate valve 21. Piston 40 in cylinder 34

moves upwardly with a speed determined by bleed valve 41. After a predetermined time, rod 46 contacts member 42 on valve 35 to shut off the supply of air to pipe 36. The air in cylinder 37 escapes through vent 43 when the piston has moved to uncover this vent. Springs 44 and 45 are provided for the return of pistons 38 and 40 when the pressure is relieved.

The electrical control is very sensitive and is preferred with sheet aluminum where only small pressures are involved.

While this automatic control is illustrated for use with a dimpling tool, it is intended for use with any similar tool. From this disclosure, it should be apparent that the automatic control is adaptable to many other tools and operations.

It is to be understood that certain changes, alterations, modifications and substitutions can be made without departing from the spirit and scope of the appended claims.

I claim as my invention:

1. The combination with a power operated tool for forming material, of a trigger adjacent the forming portion of said tool adapted to control the power applied to said tool, said trigger being so positioned as to be actuated by the weight of said material only when properly positioned to be formed.

2. An actuating mechanism for the power circuit of a sheet metal working tool comprising an electric switch positioned to be actuated by the weight of the material in place in the tool, a time delayed switch having a solenoid in series with a source of electric power and the switch, said switch being normally closed and timed to open, and a second solenoid which operates the said

power circuit, controlled by the time delayed switch whereby the positioning of a sheet of metal causes the actuation of the power tool and the subsequent deenergization of its power circuit.

3. A control mechanism for the power circuit of a sheet metal working tool comprising, an air valve actuated by the weight of the metal sheet in place in the tool, and time controlled pneumatic means actuated by the air valve to control the power for a single timed full cycle operation of the tool.

4. The combination with a dimpling tool for dimpling sheet metal around holes formed therein, said dimpling tool having an upwardly extending pilot pin over which the sheet of metal drops when the hole and pin register, of trigger means actuated by the weight of the sheet metal and a power relay actuated by said trigger to cause the operation of the tool, said trigger means lying sufficiently below the tip of the said pin to be protected against actuation until the sheet drops after the pin enters the hole.

5. The combination with a dimpling tool for dimpling sheet metal around holes formed therein, said dimpling tool having an upwardly extending pilot pin over which the sheet of metal drops when the hole and pin register, of trigger means below the level of the top of the pin actuated by the weight of the sheet metal, a power relay actuated by said trigger to cause the operation of the tool, time delay means associated with said power relay to cause a single operation of the power tool, and means to reset the power relay mechanism for the next dimpling operation.

PAUL HOMER MERRIMAN.