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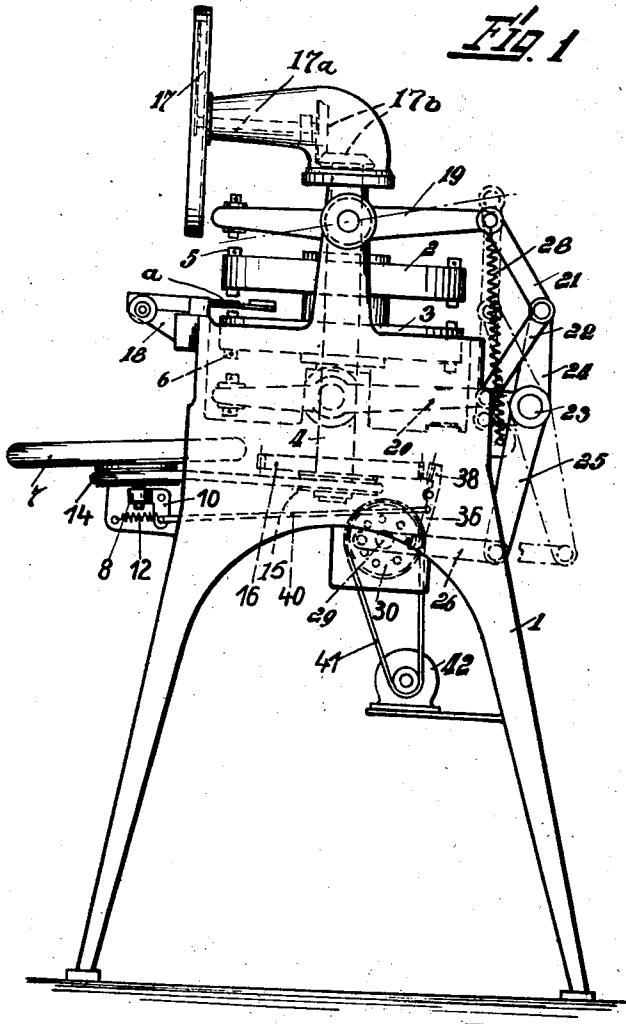
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2,133,201

MACHINE FOR EMBOSSING SHEET METAL PRINTING PLATES

Filed Nov. 30, 1937

2 Sheets-Sheet 1



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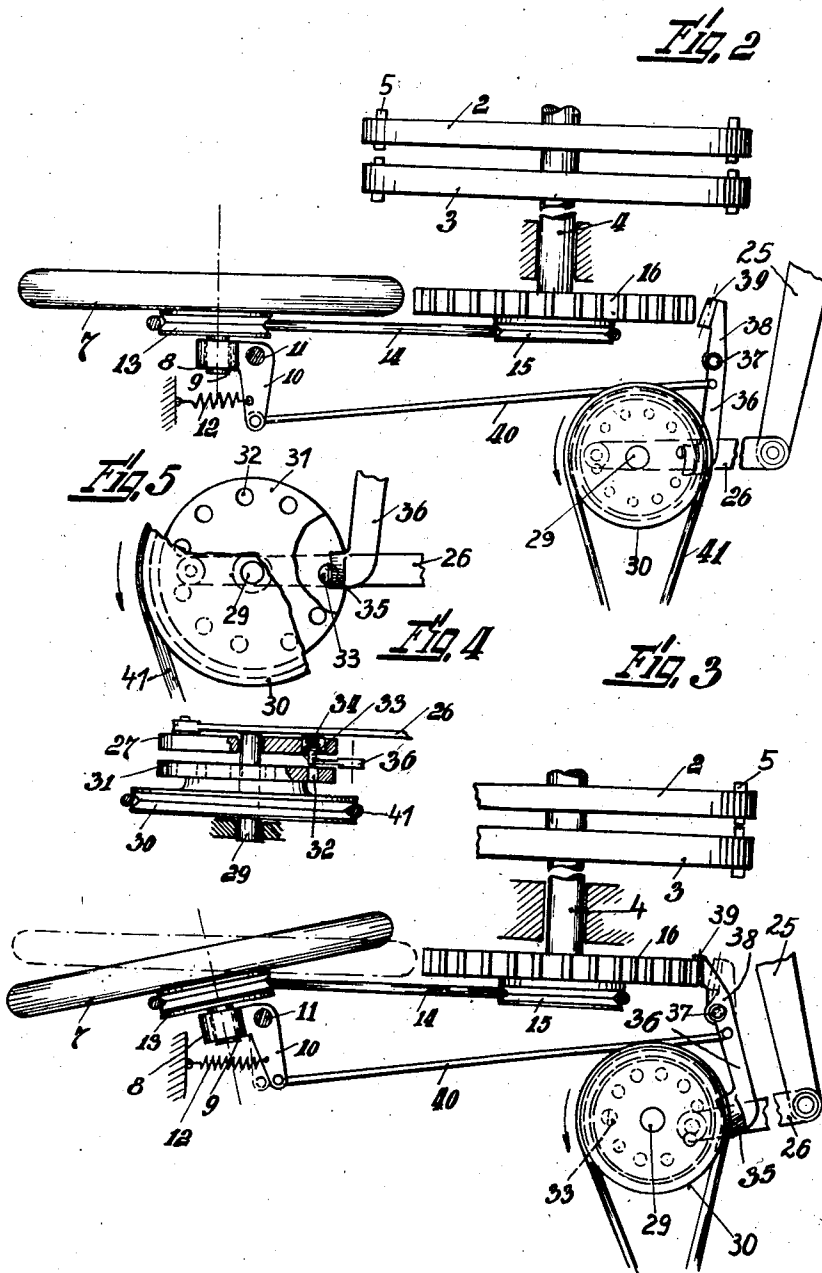
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UNITED STATES PATENT OFFICE

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MACHINE FOR EMBOSSING SHEET-METAL
PRINTING PLATES

Joseph Krell, Berlin-Zehlendorf, Germany

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6 Claims. (CL 197-6.7)

My invention relates to a machine for embossing sheet-metal printing plates. Such plates can be made of sheet metal of any kind which is comparatively thin, and can be used for printing addresses, or for any other printing operation.

A machine of this type generally is equipped with a pair of type wheels, one with punch, and the other with matrix members, and the sheet metal plate to be embossed is held between the members. The means for adjusting the type wheels is a hand wheel.

In machines as designed heretofore, extra means such as a pedal is required for throwing in the clutch, so that the operator has to perform the two operations of adjusting the type wheels and of depressing the clutch pedal.

It is an object of my invention to improve a machine of the type described, with a view to eliminating the extra operation of throwing in the clutch.

To this end, I provide a locking mechanism for the type wheels which includes a gear wheel on the shaft of the type wheels, and a pawl for co-operation with the gear wheel. Part of this mechanism which is operatively connected to the type-adjusting handwheel, is a member which controls the clutch.

Not only is the operation of the embossing machine much facilitated by this novel arrangement, but it is also possible to adjust the operator's seat to such a level that her stature is considered, and she can operate in the most convenient position without being restricted by the necessity of reaching the pedal with her foot.

In the accompanying drawings an embossing machine embodying my invention is illustrated by way of example.

In the drawings

Fig. 1 is a side elevation of the machine, showing its parts before the clutch is thrown in,

Fig. 2 shows certain parts of the machine, drawn to a larger scale,

Fig. 3 shows the same parts as in Fig. 2 after the clutch has been thrown in,

Fig. 4 is a partly sectional plan view, and

Fig. 5 is an elevation, of the clutch.

Referring now to the drawings, 1, Fig. 1, is the frame of the machine in which is mounted to rotate a vertical type-wheel shaft 4. 2 and 3 are an upper and a lower type wheel on the shaft, 5 are punch members in the upper, and 6 are matrix members in the lower type wheel. A printing plate α is placed between the members on a suitable holder 18.

The means for adjusting the type wheels by rotating the shaft 4 is a hand wheel 7 marked with types. The shaft 8 of the hand wheel is mounted to rotate in the shorter arm 9 of a bell-crank fulcrumed at 11 in the frame 1. A spring 12 tends to pull the longer arm 10 of the bell-crank to the left, and to place the hand wheel 7 in horizontal position. A pulley 13 is keyed on the hand-wheel shaft 8, and a similar pulley 15 is keyed on the lower end of the type-wheel shaft 4. The two pulleys are preferably of the wedge-section type, and connected by a cord 14, also of wedge section, and preferably made of elastic material such as rubber. This connection of the two pulleys permits of tilting the hand wheel about the fulcrum 11 without interference on the part of pulley 15, and has the additional advantage of noiseless operation.

A gear wheel 16 is keyed on the type-wheel shaft 4 above the pulley 15, and the shaft is connected to the shaft 17a of a type indicator 17 by bevel gearing 17b, so that the indicator rotates in synchronism with the type wheels 2, 3.

A double-armed lever 19 is fulcrumed on the frame 1 for operating the punch members 5, and a similar lever 20 is provided for operating the matrix members 6. A pair of toggle links 21 and 22 are pivoted to the respective double-armed levers at their outer, and to each other at their inner ends. Fulcrumed on the frame 1 at 23 is a double-armed operating lever for the toggle-links mechanism whose upper arm 24 engages the pivot by which the links 21 and 22 are connected. A spring 28 is connected to the pivot connecting the lever 19 and the link 21, and the lower end of the spring is anchored on the frame.

29 is the driving shaft of the machine. A pulley 30 is keyed on the shaft and driven from a motor 42 through a belt 41. It is understood that the driving shaft can be operated by any suitable means, and from any source of power. A clutch disk 27 is free to turn on the driving shaft 29, and is connected to the lower arm 25 of the operating lever by a rod 26. 31 is the mating clutch disk which is secured to, or integral with, the pulley 30 and has a circular row of holes 32. A clutch pin 33 whose free end is partly cut away to form a step or shoulder, as best seen in Fig. 5, is inserted in the clutch disk 27 and urged toward the mating disk 31 by a spring 34. Normally, however, i. e., while the parts are in the position according to Figs. 1 and 2, the pin is retained by the knife-like lower end of a pawl which is fulcrumed on the frame 1 at 37. The knife 35 is

formed on the free end of the lower arm 36 of the pawl and its upper arm 38 is equipped with a lug 39 for engaging between the teeth of the gear wheel 16. The pawl and a rod 40 connecting its lower arm 36 to the longer arm 10 of the hand-wheel supporting bell-crank, make up the locking mechanism referred to, and the lower arm 36 of the pawl, with its knife 35, is the part of the locking mechanism which controls the clutch 27, 31, 33.

The operation of the machine is as follows:

Normally, the spring 12 holds the hand wheel 7 in horizontal position, and, through rod 40, the pawl 36, 38 away from the teeth of the spur gear 16. The hand wheel is rotated to adjust the type wheels 2, 3 for the type required which is indicated by the indicator 17. After the type has been selected, the hand wheel 7 is tilted about its pivot 11 through a small angle from the horizontal position, and moved into the position shown in Fig. 3. Rod 40 moves the pawl into the teeth of the spur gear 16 with its lug 39 and, at the same time, moves the knife 35 at the lower end of the pawl away from the stepped end of pin 33. The type disks are now locked, and the clutch is thrown in, the pin 33 engaging the first hole 32 in disk 31 that comes along as the disk rotates with the shaft 29. The disk 27 now rotates with the shaft 29 in anti-clockwise direction through 180 degrees from the position in Fig. 2 into the position in Fig. 3, shifting the rod 26 to the right and turning the operating lever 24, 25 anti-clockwise so that its arm 24 straightens the links 21 and 22 and, through the double-armed levers 19 and 20, forces the adjusted punch and matrix members 5, 6 into the printing plate *a*. Upon continued rotation of the disk 27 with the driving shaft 29, the operating lever 24, 25 is returned into its initial position, Fig. 1, and retracts the links 21 and 22 with the assistance of spring 28, so that the double-armed levers 19 and 20 are moved into inactive position with respect to the punch and matrix members.

Before the driving shaft 29, and the disk 27 connected to it by the pin 33, have performed a complete revolution, the adjusting wheel 7 is returned into its horizontal position, Fig. 2, and the lug 39 of the pawl 36, 38 is disengaged from the gear wheel 16 by means of rod 40. At the same time, the knife-like member 35 at the lower end of the pawl is moved into the path of the pin 33 so that, as the pin comes round, after the disk 27 has performed a complete revolution, its stepped end is pushed back by the knife in the manner of a wedge, and the clutch is thrown out, Fig. 4.

The machine is now ready for the embossing of the next type which is performed exactly as described.

I claim:

1. In a machine for embossing sheet-metal printing plates, a driving shaft, a pair of rotary type wheels, punch members in one, and matrix members in the other wheel, means for holding a printing plate between the members, mechanism for operating the members, a clutch for connecting the driving shaft to the mechanism, a hand wheel for adjusting the type wheels, a tiltable bearing for the hand wheel, a gear wheel connected to the type wheels, a pawl adapted to engage in the gear wheel and operatively connected to the tilting bearing, and a member on the pawl for controlling the clutch.

2. In a machine for embossing sheet-metal printing plates, a driving shaft, a pair of rotary

type wheels, punch members in one, and matrix members in the other wheel, means for holding a printing plate between the members, mechanism for operating the members, a clutch for connecting the driving shaft to the mechanism, a hand wheel for adjusting the type wheels, a tiltable bearing for the hand wheel, a gear wheel connected to the type wheels, a pawl adapted to engage in the gear wheel and operatively connected to the tilting bearing, and a member on the pawl arranged to throw out the clutch when the pawl is disengaged from the gear wheel, and to throw in the clutch when the pawl is engaged in the gear wheel.

3. In a machine for embossing sheet-metal printing plates, a frame, a driving shaft mounted to rotate on the frame, a pair of type wheels mounted to rotate in the frame, punch members in one, and matrix members in the other wheel, means for holding a printing plate between the members, a clutch for connecting the driving shaft to the mechanism, a bellcrank fulcrumed on the frame, a hand wheel mounted to rotate on the bellcrank, a pulley on the hand wheel, a pulley connected to the type wheels, and a flexible member connecting the pulleys, for adjusting the type wheels; a type-wheel locking mechanism operatively connected to the bellcrank, and a member forming part of the locking mechanism for controlling the clutch.

4. In a machine for embossing sheet-metal printing plates, a frame, a driving shaft mounted to rotate on the frame, a pair of type wheels mounted to rotate in the frame, punch members in one, and matrix members in the other wheel, means for holding a printing plate between the members, a clutch for connecting the driving shaft to the mechanism, a bellcrank fulcrumed on the frame, a hand wheel mounted to rotate on the bellcrank, a pulley on the hand wheel, a pulley connected to the type wheels, and a flexible elastic member connecting the pulleys, for adjusting the type wheels; a type-wheel locking mechanism operatively connected to the bellcrank, and a member forming part of the locking mechanism for controlling the clutch.

5. In a machine for embossing sheet-metal printing plates, a frame, a driven shaft mounted to rotate on the frame, a pair of type wheels mounted to rotate in the frame, punch members in one, and matrix members in the other wheel, means for holding a printing plate between the members, a clutch for connecting the driving shaft to the mechanism, a bellcrank fulcrumed on the frame, a hand wheel mounted to rotate on the bellcrank, a pulley on the hand wheel, a pulley connected to the type wheels, and a wedge-section belt connecting the pulleys, for adjusting the type wheels; a type-wheel locking mechanism operatively connected to the bellcrank, and a member forming part of the locking mechanism for controlling the clutch.

6. In a machine for embossing sheet-metal printing plates, a frame, a driving shaft mounted to rotate on the frame, a pair of type wheels mounted to rotate in the frame, punch members in one, and matrix members in the other wheel, means for holding a printing plate between the members, a clutch for connecting the driving shaft to the mechanism, a spring-controlled bolt for connecting the clutch parts, a bellcrank fulcrumed on the frame and having arms of different lengths, a hand wheel mounted to rotate on the shorter arm of the bellcrank for adjusting the type wheels, a double-armed pawl fulcrumed

on the frame and having arms of different lengths, a lug on the shorter arm of the pawl for locking the type wheels, a rod connecting the shorter arm of the pawl to the longer arm of the
5 belicrank, and a knife-like member on the longer arm of the pawl for holding the clutch bolt in

inactive position while the lug on the pawl is disengaged from the type wheels, and for releasing the bolt to move into clutching position under the action of its spring when the lug is engaged with the type wheels.

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