The invention relates generally to the manufacture of metal stamps or stencils having a numeral or designation embossed in reverse on one end and adapted, when struck with a hammer on the opposite end, to impress the designation in a surface to be marked.

Ordinarily, such stamps are made from bars of tool steel and the like, and the embossed designation is laboriously cut by hand on one end of each bar, the bar being subsequently hardened. When such stamps become dulled and worn, new stamps are made by the same slow hand method.

Certain prior machines for making stamps have included a die-block oscillatable with respect to a fixed stamp blank, there being means for moving one end of the blank axially into abutment with the die block whereby the end of the stamp is pressure swaged into the die block impression to emboss the end of the stamp. In such prior machines the oscillating movement of the die block must be very slight to avoid damaging the metal walls of the die impression, and it is very difficult, if not impossible, to form a sharp-edged embossing which is not convexly rounded. Thus, very little variation is possible in the size of the blanks or the embossings thereon, and excessive pressure is required to force the end of the stamp into the die impression.

It is an object of the present invention to provide novel and improved apparatus for embossing the ends of metal stamp blanks.

Another object is to provide improved apparatus which is adapted to form designations on the ends of stamps over a wide range of sizes.

A further object is to provide improved apparatus which makes it possible to emboss a large number of stamps from a single die block.

Another object is to provide improved apparatus for forming a sharp-edge embossing on the ends of stamp blanks.

A further object is to provide a novel and improved apparatus having means for oscillating both a die and stamp blank simultaneously to roller swage the end of the blank into the die impression.

These and other objects are accomplished by the constructions, arrangements, and combinations which comprise the present invention, the nature of which is set forth in the following general statements, preferred embodiments of which are set forth in the following description and illustrated in the drawings and which is particularly and distinctly pointed out and set forth in the appended claims forming part hereof.

In general terms, the present invention may be defined as including a stamp blank holder and a die block mounted in opposing relation thereto with power means for oscillating both holders simultaneously in the same direction, one of the handles being movable axially toward the other to bring the blank and die block into abutment for roller swaging the end of the blank into the die impression to form a sharp-edged embossing in reverse on the end of said blank.

Referring to the drawings forming part hereof in which preferred embodiments of the invention are shown by way of example;

Figure 1 is a plan elevational view of one embodiment of a machine comprising the invention;

Fig. 2 is a side elevation thereof, parts being broken away and in section;

Fig. 3 is a plan elevation of another embodiment of the invention;

Fig. 4 is a side elevation thereof, parts being broken away and in section;

Fig. 5 is a fragmentary view similar to Fig. 4, showing the method of separating the die blocks for replacing a stamp blank; and

Fig. 6 is a series of fragmentary sectional views showing different positions of the stamp blank and die during the oscillating movement thereof.

Similar numerals refer to similar parts throughout the several views of the drawings.

Referring first to Figs. 1 and 2, the embodiment of the invention shown therein comprises a machine having a metal frame including four flanged legs 10 for supporting the machine on the floor, the bottom ends of the legs preferably having turned flanges 11 which are anchored to the floor by bolts or screws 12. At their upper ends, the legs 10 are connected in pairs by longitudinal side frame members 13, and the side frame members 13 are connected at one end by a cross member 14 preferably having outturned flanges 15 secured to the side frame members by bolts 16. The opposite ends of the side frame members 13 are preferably connected by a plate 17 which is secured by bolts 18 to the outturned flanges on the legs 10.

A stamp blank holder indicated generally at 20 is oscillatably mounted on the side frame members 13 by means of pivot shaft 21 journaled in bearings 22 formed on the interiors of the side frame members 13. The blank holder 20 preferably includes a sleeve portion 23 mounted on the pivot shaft 21 and having a forwardly projecting arm 24 provided with screw threads 25 on its front end. A chucking sleeve 26 is screwed on the threads 25 and is adapted to wedgeably en-
gage jaws 27 within the sleeve for tightly grip-
plunging a stamping block 28 with its end projecting
outwardly from the jaws.

The blank holder 29 also includes flanged lever
members 29 on each side of the sleeve 23 and
mounted on the pivot shaft 21 and a bar 30 ex-
tends across and is secured to the top portions of
levers 29 for threadedly mounting an adjusting
screw 31 for adjusting the position of the arm
24 relative to the levers 29 so that the neutral
or horizontal position of the blank 28 can be ad-
justed slightly with respect to the die block
against which it is to be pressed. Normally, the
arm 28 rests on a transverse abutment bar 32
secured to the underparts of the levers 29, and
shims may be interposed between the arm 24
and the bar 32 for abutting the arm 24 in the
adjusted position of the stamp blank.

Each of the levers 29 has a depending arm 33,
and the arms 32 have sleeves 34 at their lower
ends which journal the end portions of a trans-
verse pivot pin 35 extending between the de-
pending arms 33. A reciprocating member 36
has one end which fits between the sleeves 34
and which has a slot 37 in which a bushing 38
journaled on the pin 35 is slidable mounted.
Consequently, vertical movement of the reciprocat-
ing member 36 will cause oscillating movement
of the arms 33 of the levers 29, and the adjust-
able connection between the levers 29 and the
arm 24 will cause corresponding oscillation of the
jaws 27 holding the stamp blank 28. During this
movement the movement of the pin 35 laterally of
member 36 is taken care of by the sliding
movement of the bushing 38 in the slot 37 of the
reciprocating member.

The reciprocating member 36 has a depending
arm 40 which is slidable mounted in guides 41
mounted in a shelf member 42 which has brackets 43 at
its ends secured by bolts 44 to the legs 10. The
sliding arm 40 of the reciprocating member is pivotedly connected to the upper end of the con-
necting rod 45 which is pivotedly connected to its
lower end to a crank on the crankshaft 46, the
crankshaft being journalied in suitable brackets
47 depending from the shelf 42. As shown in
Fig. 2, the crankshaft preferably has mounted
thereon a driving pulley 48 which may be op-
eratively connected to a suitable driving motor
(not shown).

The die block holder is indicated generally at
50 and is preferably of U shape, having a for-
wardly extending head 51 in which the die block
52 is held in usual fashion as by a set screw 53.
The die block is preferably hardened tool steel
having the desired die impression in its outer sur-
face for forming the embossing on the projecting
end of the stamp blank 58, the impression hav-
ing been formed prior to hardening the die block.

The die block holder 50 preferably has rear-
wardly extending arms 54 which are preferably extended above and below the forward heat 51
for counter-balancing purposes, and the inter-
mediate portions of the arms 54 are journalied on a transverse pivot shaft 59 to permit oscillat-
ing movement of the die block 52. The ends
of the pivot shaft 59 are journalied in bearings 57
which have shouldered end plates 50 slidably mounted in slots 59 formed in the side frame
members 13, so that the die block holder 50 may
be adjusted toward and away from the stamp
blank holder 20.

The means for adjusting the die block holder
50 preferably includes an adjusting shaft 60 hav-
ing a hand wheel 61 on its outer end and threaded
into a boss 62 formed on the transverse frame
member 14. The inner end of the shaft 60 is
journalied in a bearing block 63 which in turn
journals the central portion of the transverse pivot shaft 55.

The head 51 of the die block holder preferably
has two depending lever arms 65 which journal
a pivot pin 66, and the pivot pin is journalied in a
bushing 67 which is slidably mounted in a slot
68 formed in the reciprocating member 36 in the
end thereof opposite the slot 37. The slot 68 is
made longer than the slot 37, to allow for adjust-
ment of the die block holder 50 toward and away
from the stamp blank holder 20.

In the operation of the machine, the die block
holder is backed away from the stamp blank
holder by manipulating the hand wheel 61, where-
on the die block 52 may be inserted in the head
51 and the set screw 53 tightened. The chucking
sleeve 25 of the blank holder may then be turned
on the threads 25 to loosen the jaws 27 for insert-
ing a blank 28 therein and the sleeve 26 is then
tightened to grip the blank with its end projecting
from the jaws, as shown. The hand wheel 61 is
manipulated to bring the die block closely adja-
cent to the pivot pin 66, the machine is started in
moving motor is then operated to rotate the crank
shaft 45. As the crankshaft rotates, the recipro-
cating member 36 will be moved up and down in
the guides 41 to give an oscillating movement to
the die block holder 50 and the blank holder 20.
The sudden change in the oscillating movement of
the die block holder and blank holder takes place
in the same direction about the pivots 55 and 21 re-
spectively, and since the pivots are in the same
horizontal plane, the blank most closely ap-
proaches the die block in the horizontal or neu-
tral position, as shown in Fig. 2. During the
oscillating movement of the die block and blank,
the hand wheel 61 is manipulated to gradually
feed the die block toward the blank, with the re-
sult that as the end of the blank abuts the die
block impression, the metal of the blank will
gradually be roller swaged into the die impression
and form a sharp-edged embossing in relief on the
end of the blank.

Due to the fact that the blank 28 and the die
block 52 oscillate together in the same direction
about their pivots 21 and 55, the die block is gradually roller swaged into the die im-
pression rather than pressure swaged by an axial
thrust. Accordingly, the swaging of the metal
takes place without tearing or damaging the walls
and surfaces of the die impression, and the em-
bossing which is formed is substantially the exact
counterpart of the die impression. Because of
this roller swaging action, embossings may be
formed on a considerable variety of sizes of stamp
blanks, without requiring excessive axial pressure
between the blank and the die block. Moreover,
by forming the embossed designation on the ends
of stamp blanks before the blanks are hardened,
a large number of the stamps may be embossed
from a single hardened steel die block.

Referring to the embodiment of apparatus
shown in Figs. 3, 4 and 5, this machine includes
considerably heavier die block and blank holding
parts than the machine shown in Figs. 1 and 2,
in order to adapt the machine for embossing
larger and heavier stamp blanks.

The machine includes parallel spaced-apart
side plates 70 secured to a transverse plate 71 at
one end by screws 72, the side and end plates
being supported on suitable legs 73 having sup-
porting shoulders 74 at their upper ends and
flanged feet 75 at their lower ends which may be secured to the floor as by screws 76.

The blank holder is preferably a solid block indicated generally at 77 mounted on a pivot shaft 88 which is journaled in the side plates 70 of the frame. Spacer disks 89 are preferably journaled on this shaft 78 between the plates 70 and the holder block 77 for centering the block between plates. Preferably, a counterweight 80 is secured to the outer surface of the block, as by welding, to facilitate raising the block to replace the stamp blank therein.

As best shown in Fig. 6, the stamp blank 26a is held in the block 77 by means of jaws 81 which are clamped around the blank by means of a set screw 82, the inner end of the blank being adapted to abut a filler disk 83 located at the bottom of the socket 84 which receives the inner end of the blank. The die block holder indicated generally at 85 is preferably a solid block of metal mounted on a transverse pivot shaft 86, and having a set screw 87 for clamping the die block 52a in its front surface in position to be abutted by the projecting end of the blank 26a.

As shown, the die block holder 85 has a rearwardly projecting ear 88 journaled on the central shaft 86, the end portions of the pivot shaft 85 being mounted in spaced ears 89 projecting forwardly from a movable block 90. As indicated in Fig. 5, the block 90 has outwardly projecting ribs 91 on opposite sides, and the ribs are slidably supported on guides 92 formed on the side plates 70. The means for adjusting the block 90 on the guides 92 to move the die block 52a toward and away from the blank 26a preferably includes an adjustable shaft 58a having a hand wheel 61a on its outer end and threaded into a bushing 52a mounted in the end plate 71 of the frame. The inner end of the shaft has a flange 53 thereon which is rotatably held in a socket 84 in block 90 by means of an annular clamping plate 55 secured to the block by screws 95.

The side plates 70 have depending brackets 97 connected at their lower ends by a transverse bar 98, and the bar 98 supports suitable bearings 99 at spaced intervals for journaled the crankshafts 100. The crankshafts each have a crank 101 thereon to which the connecting rod is pivotally connected, and the upper end of the connecting rod is pivotally connected by a pin 103 to ears 104 depending from the block 85.

Accordingly, when the crankshaft 100 is rotated, the connecting rod 102 will impart an oscillating movement to the pin 103 and the block 85 about the pivot shaft 86. The means for rotating the crankshaft 100 may be a suitable driving motor (not shown) which is operatively connected to a drive pulley on the outer end of the shaft and indicated at 40a in dot-dash lines.

The means for oscillating the blank holder block 71 simultaneously and in the same direction as the block 85 preferably includes a pair of links 105 located at opposite sides of the blank holder block 85 and between the block and the side plates 70. The lower ends of the links 105 are journaled on the outer ends of the pivot pin 103 which connects the connecting rod 102 to the ears 104. The upper ends of the links 105 are journaled in the outer ends of spring pressed pivot pins 107 projecting upwardly from the blank 27 at opposite sides thereof. Thus, the links 105 pivotally connect the connecting rod pivot pin 103 to the ears 107 on the blank 77, so that as the connecting rod oscillates the pin 75 and die block holder 85 about the pivot shaft 86, it also simultaneously oscillates the plunger pins 106 and the block 77 about the pivot shaft 78.

Means is provided for releasing the links 105 from the connection with the plunger pins 106, for allowing the block 77 to be swung upwardly as indicated in dot-dash lines for replacing a stamp blank. Such means preferably includes a latch member 108 located on top of the block 77 and between the plunger pins 106. The latching member 108 has sockets 109 in its sides for receiving the inner ends of the pins 106, and the sockets have cam surfaces 109a for forcing the pins outwardly in the position of Figs. 3 and 4 to enter the ends of links 105. The sockets 105 allow the pins to move inwardly in the position of Fig. 5 under the pressure of the springs 110 and release themselves from engagement with the links 105.

In order to maintain the links 105 in the released position of Fig. 5, ears 111 are provided at the tops of the links, and a tie rod 112 connects the ears 111.

The means for moving the latch member 108 from the locked position of Figs. 3 and 4 to the unlocked position of Fig. 5 and vice versa, preferably includes an L-shaped lever 113 pivotally connected at 114 to an intermediate portion of a handle 115, and pivotally connected at its other end, as at 116, to a slide plate 117 having a slot 118 in which a pin 119 secured in the block 77 is slideable. Accordingly, when the handle 115 is in the position of Figs. 3 and 4 the pin 119 is at the left end of slot 118 and the latch member 108 is in position forcing the plunger pins 106 into pivotal connection with the links 105. When the handle is manipulated to the full line position of Fig. 5, the springs move the inner ends of the pivot pins 106 inwardly into the cam sockets 109a and disconnect them from the links 105, so that the blank holder block 77 may be manually swung to the opposite position such as shown in dot-dash lines in Fig. 5, for removing and replacing the stamp blank therein.

The simultaneous oscillating movement of the blocks 77 and 85 is best illustrated in Fig. 6 which shows the relation between the blocks at the neutral positions and at the extremities of movement. With the die block 52a and the blank 26a positioned in the blocks in the manner previously described, the hand wheel 61a is manipulated gradually to feed the die block holder 85 toward the blank holder 77 to bring the end of the blank into abutment with the impression in the die block while the two blocks are oscillating. As clearly shown in the neutral position of Fig. 6, if the end of the blank is fully entered into the die block impression in that position the blank and die block rotate about their pivots slightly away from each other during the oscillating movement above and below the neutral position, so as to roll the swage metal on the end of the blank into the die impression to form the embossed designation on the end of the blank. It is of course understood that the die block 52a has been hardened, while the blank 26a is not hardened until after the embossing is formed by the improved roller swaging operation.

Obviously, the oscillating movements of the die and blank holder in the embodiment of the invention shown in Figs. 1 and 2 are substantially identical to that of the die block and blank in the embodiment of Figs. 3, 4 and 5, so that the various positions illustrated in Fig. 6.
are representative of the embodiment of Figs. 1 and 2.

As set forth in connection with the embodiment of Figs. 1 and 2, the roller swaging action between the blank 28a and die block 28d gradually swages the metal of the blank into the die impression without excessive pressure, and without damaging the walls and surfaces of the die impression. It follows that the sizes of the blanks to be embossed and the sizes of the embossings themselves may be varied to a substantial extent merely by changing the impressions in the die blocks, because the simultaneous oscillating movement of both the die block and the blank provides for roller swaging of various sizes of embossings without damage to the die block impression. It is also apparent that a great many stamps may be embossed from a single die impression.

In the foregoing description, certain terms have been used for brevity, clarity and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such words are used for descriptive purposes herein and are intended to be broadly construed.

Moreover, the embodiments of the improved construction illustrated and described herein are by way of example, and the scope of the present invention is not limited to the exact details of construction.

Having now described the invention, the construction, the operation and use, and preferred embodiments thereof, and the advantages new and useful results obtained thereby; the new and useful constructions, and reasonable mechanical equivalents thereof obvious to those skilled in the art, are set forth in the appended claims.

1. Stamp forming apparatus including a frame, a stamp blank holder and a die block holder, means pivotally mounting said holders in opposed relation in said frame, one of said pivotal mountings being slidable in said frame toward and away from said other holder, power driven reciprocating means, and means operatively connecting said reciprocating means to said holders for oscillating said holders simultaneously in the same direction.

2. Stamp forming apparatus including a frame, a stamp blank holder having a pivotal mounting in said frame, a die block holder having a pivotal mounting in said frame axially parallel to the blank holder pivotal mounting, means slidably mounting one of said pivotal mountings in said frame, screw means for feeding said slidably mounted holder toward and away from said other holder, means mounting a die block with a die impression in the die block holder, means mounting a stamp blank in the stamp blank holder in opposed relation to said die block, and means for oscillating said holders simultaneously in the same direction for roller swaging the end of said blank into the impression of said die block.

3. Stamp forming apparatus including a frame, a pair of pivot shafts mounted in spaced parallel relation in said frame, one of said pivot shafts being slidable toward the other, a stamp blank holder mounted on one of said shafts, a die block holder mounted on the other shaft, means for feeding said blank holder toward and away from said other holder, means for gripping a stamp blank and a die block in opposed relation in the respective holders, means operatively connected to said holders for oscillating them simultaneously in the same direction, and screw means for feeding one holder toward the other for roller swaging the end of the stamp blank into the die block impression as the holders oscillate.

4. Stamp forming apparatus including a frame, a stamp blank holder and a die block holder, means pivotally mounting said holders in opposed relation in said frame, a lever arm depending from the inner end of each holder, a member mounted on the frame for vertical reciprocating movement, means for reciprocating said member, and means providing sliding pivotal connections between each of said depending lever arms and the reciprocating member for oscillating said holders simultaneously in the same direction.

5. Stamp forming apparatus including a frame, a stamp blank holder and a die block holder, means pivotally mounting said holders in opposed relation in said frame, one of said pivotal mountings being slidable in said frame toward and away from the other of said pivotal mountings, a lever arm depending from the inner end of each holder, a member mounted on the frame for vertical reciprocating movement, means for reciprocating said member, and means providing sliding pivotal connections between each of said depending lever arms and the reciprocating member for oscillating said holders simultaneously in the same direction.

6. Stamp forming apparatus including a frame, a pair of pivot shafts mounted in spaced parallel relation in said frame, a stamp blank holder mounted on one of said shafts, a die block holder mounted on the other shaft, means for gripping a stamp blank and a die block in opposed relation in the respective holders, a lever arm depending from the inner end of each holder, a reciprocating member slidably mounted on the frame for vertical reciprocating movement, means for driving the reciprocating member, and means providing sliding pivotal connections between the depending lever arms and the reciprocating member for oscillating said holders simultaneously in the same direction.

7. Stamp forming apparatus including a frame, a pair of pivot shafts mounted in spaced parallel relation in said frame, one of said shafts being slidable toward the other, a stamp blank holder mounted on one of said shafts, a die block holder mounted on the other shaft, means for feeding said blank holder toward and away from said other holder, means for gripping a stamp blank and a die block in opposed relation in the respective holders, a lever arm depending from the inner end of each holder, a reciprocating member slidably mounted on the frame for vertical reciprocating movement, means for driving the reciprocating member, means providing sliding pivotal connections between the depending lever arms and the reciprocating member for oscillating said holders simultaneously in the same direction, and screw means for feeding one holder toward the other for roller swaging the end of the stamp blank into the die block impression as the holders oscillate.

8. Stamp forming apparatus including a frame, a stamp blank holder and a die block holder, means pivotally mounting said holders in opposed relation in said frame, one of said pivot shafts being slidable toward the other, a stamp blank holder mounted on one of said shafts, a die block holder mounted on the other shaft, means for gripping a stamp blank and a die block in opposed relation in the respective holders, means operatively connected to said holders for oscillating them simultaneously in the same direction, and screw means for feeding one holder toward the other for roller swaging the end of the stamp blank into the die block impression as the holders oscillate.
11. Stamp forming apparatus including a frame, a stamp blank holder and a die block holder, means pivotally mounting said holders in opposed relation in said frame, an ear depending from the inner end of one of said holders, a reciprocating member operatively connected to said ear for oscillating said one holder, an ear projecting upwardly from the inner end of the other holder, a pin slideable in said upwardly projecting ear, a link for pivotally connecting said depending ear to said pin, a latch member slideable on said other holder and having a cam surface for forcing said pin into connection with said link in one position of the latch member, and having a socket for permitting disengagement of said pin from said link in another position of said latch member, and a spring normally urging said pin into disengaged position.

STANLEY DIUK.

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