W. J. KENT.

MACHINE FOR MAKING TOE CALKS.

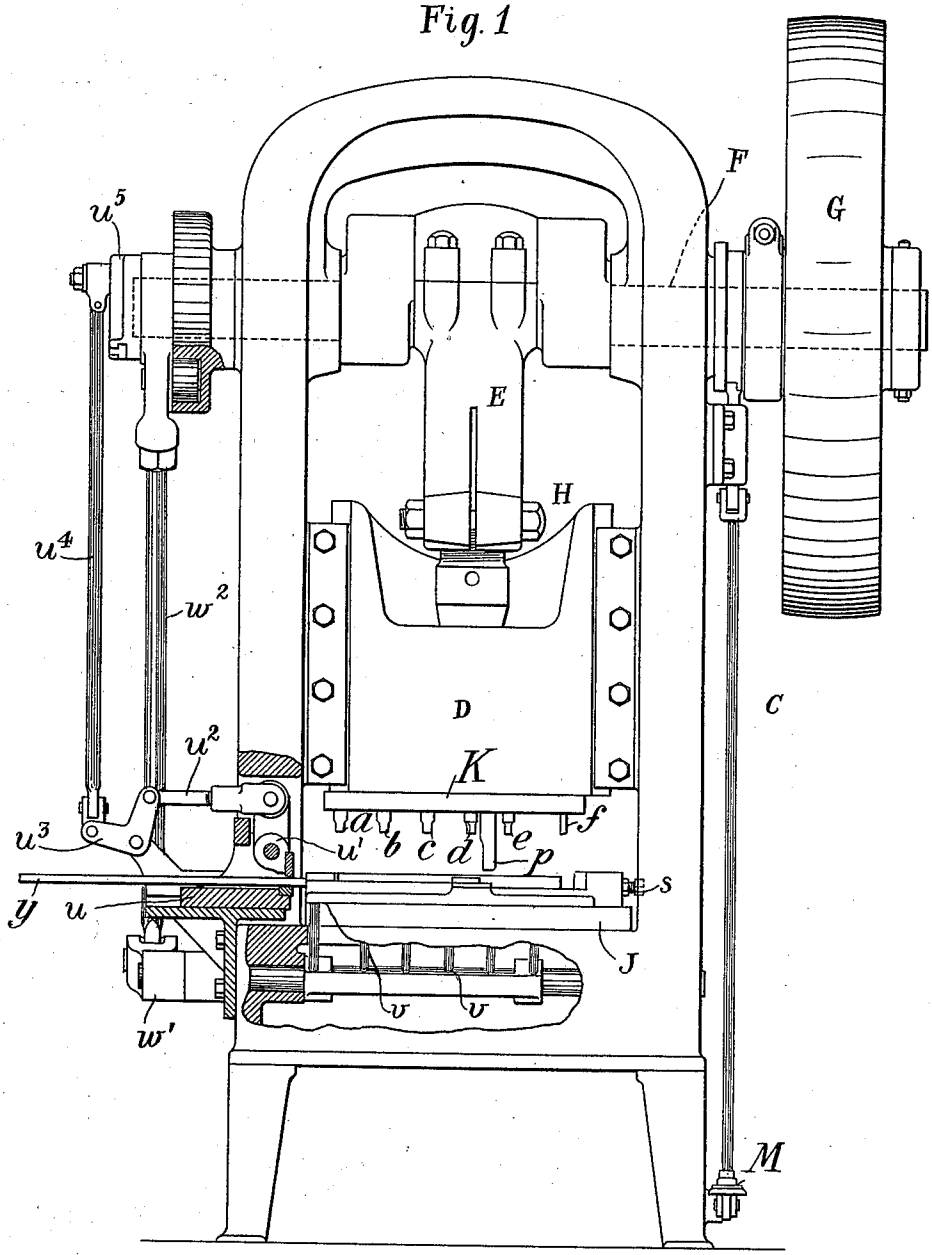
APPLICATION FILED MAR. 25, 1911.

1,001,862.

Patented Aug. 29, 1911.

4 SHEETS—SHEET 1.

Fig. 1



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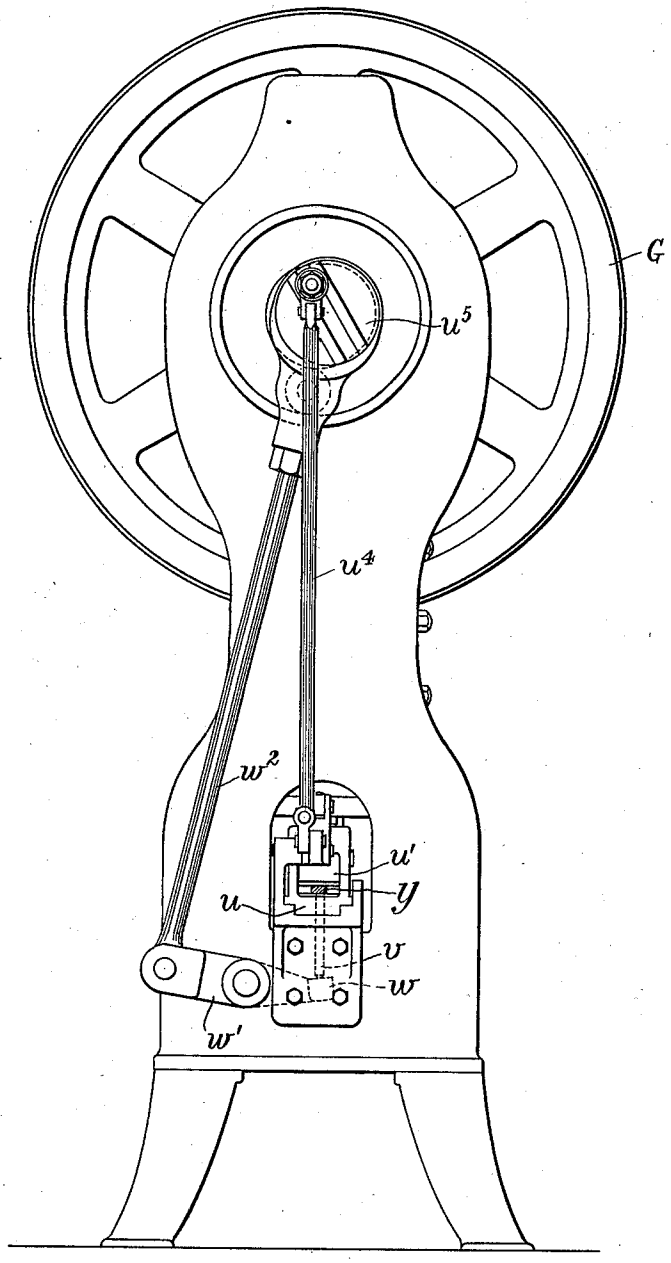
4 SHEETS—SHEET 2.

Fig.2



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4 SHEETS—SHEET 3.

Fig. 3

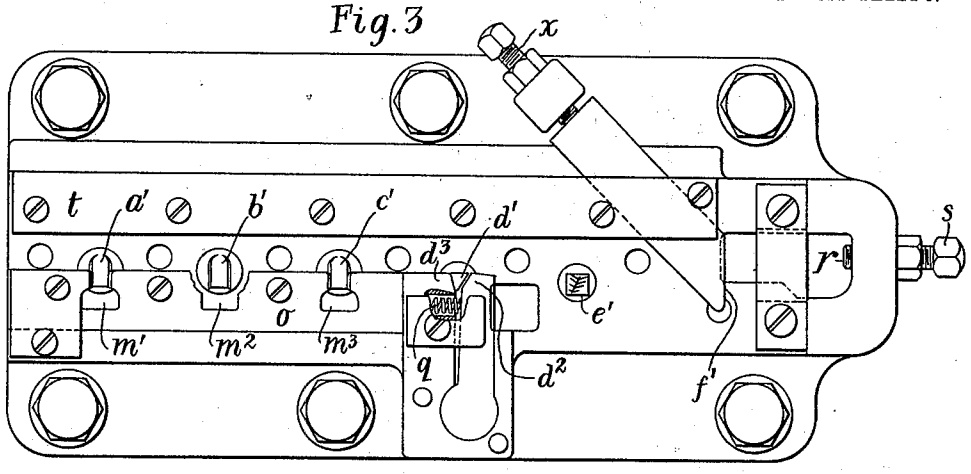
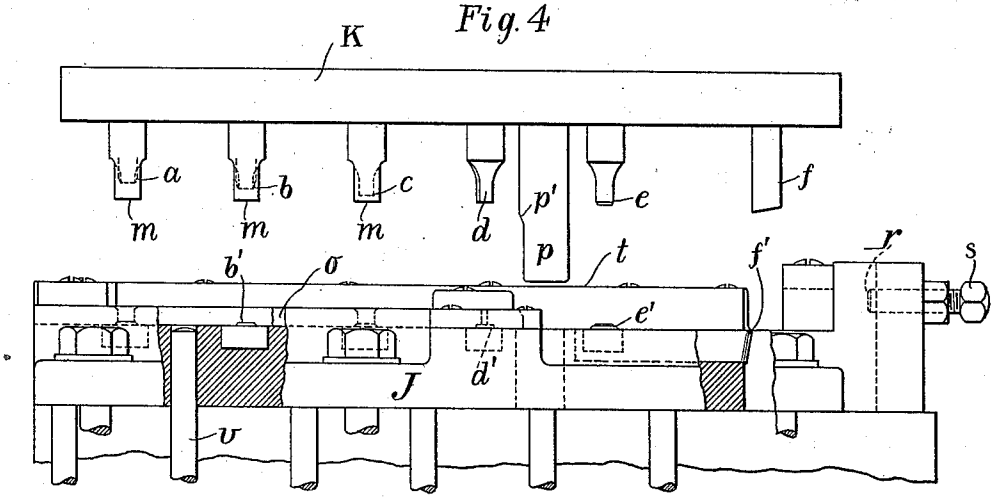


Fig. 4



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4 SHEETS—SHEET 4.

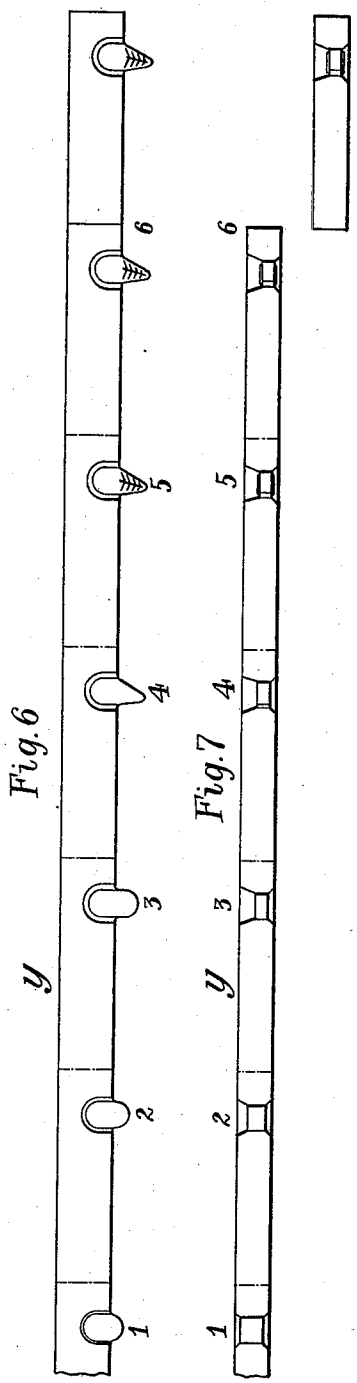

Fig. 6

Fig. 7

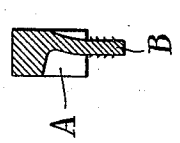

Fig. 9

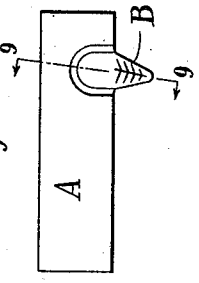

Fig. 8

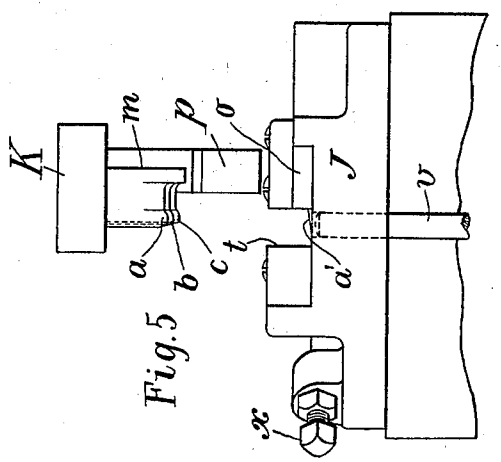

Fig. 5

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UNITED STATES PATENT OFFICE.

WILLIAM J. KENT, OF NEW YORK, N. Y.

MACHINE FOR MAKING TOE-CALKS.

1,001,862. Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed March 25, 1911. Serial No. 616,939.

To all whom it may concern:

Be it known that I, WILLIAM J. KENT, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Machines for Making Toe-Calks, of which the following is a specification.

This invention relates to machines for making toe-calks for horse shoes and aims to provide certain improvements therein.

In a pending application Serial No. 616,938, filed March 25, 1911, I have described and claimed a certain new and improved toe-calk and process of making the same, which toe-calk consists preferably of a body portion having a fastening nib formed of metal swaged down from the body portion between the ends of the latter. According to the process set forth in the above application the metal is swaged or punched between the ends of the calk and shaped to the desired configuration, preferably by a series of swaging operations successively performed upon a bar of cold metal, the finished calks being severed from the bar at such points as to locate the nibs between the ends of the calks. According to the present invention I provide a machine for carrying out the steps of this process in an efficient and rapid manner so that the calks may be commercially produced in an economical way.

In the drawings wherein I have illustrated one form of the invention,—Figure 1 is a front view thereof broken away to disclose some of the parts. Fig. 2 is an end view of Fig. 1 looking to the right. Fig. 3 is a plan of the bed of the machine, the punches being removed. Fig. 4 is a side elevation of Fig. 3 showing the lower ends of the punches. Fig. 5 is an end view of Fig. 4 looking to the right. Fig. 6 is a plan view of the strip of metal showing the various operations. Fig. 7 is an edge view thereof. Fig. 8 is a side view of the calk. Fig. 9 is an end view thereof.

Referring first to Fig. 8, let A indicate the body of the calk and B its nib. The nib as set forth in the application previously referred to is constructed preferably by swaging down a portion of the metal forming the body between the ends of the latter. Preferably the calks are fully formed from a bar *y* of low grade steel by a succession of swaging operations before the individual calks are severed from the bar. In Figs. 6 and 7 I have shown a bar illustrating these successive operations, although in practice some of them may be omitted. In these figures the parts marked 1, 2 and 3 illustrate the shape of the bar after the first three swaging operations. These operations are performed by appropriate dies striking the body of the metal near its edge and swaging out a portion thereof beyond the edge of the bar in the forms shown. After sufficient metal has been so swaged, it is acted upon by lateral dies which give the nib the shape shown at 4. The nib is then acted upon by configuring dies which corrugate it or roughen it in the desired manner as shown at 5, and after this operation is completed the calk is severed from the bar. As illustrated in Figs. 4 and 5 preferably the bar is given an idle step before the action of the shearing dies (indicated at 6) in order to avoid crowding the mechanism. The machine provided by the present invention for effecting these operations is illustrated in Figs. 1 to 5.

Referring first to Figs. 1 and 2, let C indicate a punching press of suitable proportions having a plunger D operated by a pitman E connected with a crank shaft F which is driven by a suitable pulley G. The throw of the plunger D may be adjusted by any suitable mechanism H. The press is controlled by the usual treadle M. The forming dies by which the metal is swaged beyond the edge of the bar preferably comprise a series of punches carried upon the plunger and a series of fixed dies supported in the bed J of the machine. I preferably employ three swaging punches *a b* and *c* (Fig. 4) which are carried upon a plate K fixed to the under side of the plunger. Immediately beneath the punches *a b c* are arranged a series of dies *a' b' c'* (Fig. 3). Each of the punches is preferably of the configuration shown in Fig. 5 wherein the active faces of the punches are indicated by the letters *a b c*, these active faces being formed integrally with a punch carrier or guide *m* which is designed to fit within a slot *m'*, m^2 or m^3 formed in a guiding plate *o* fixed above the bed of the machine in order to support the punches against the lateral strain due to the fact that they act upon the edge of the bar. It will be ob-

served that the punches *a b c* are of different degrees of projection so that the metal is forced outwardly to an increasing extent at each operation. The fixed dies *a'*, *b' c'* are, however, shown as of the same degree of projection with the result that the nib is displaced somewhat toward one side of the bar. However, by an appropriate mounting of the fixed dies and movable dies the nib may be located at any point desired in the thickness of the metal. Indeed one set of dies may be omitted if desired so that the metal is displaced wholly to one side, although this is not preferred. After sufficient metal has been swaged out beyond the edge of the bar to form the nib, the nib is given its proper shape by means of dies *d d' d^2 d^3*. Of these the dies d^2 d^3 (Fig. 3) are laterally acting dies, one of which d^3 is shown as fixed and the other of which d^2 is shown as movable being pivoted at its front in any suitable manner. It is actuated by a cam *p* fixed to the plunger and having a cam face *p'* which bears against the outer side of the die and forces it to the left, thereby giving the nib a triangular shape as shown at 4 in Figs. 6 and 7. Preferably a spring *q* is provided for normally holding the die d^2 in its retracted position. During this lateral swaging operation the dies *d d'* act principally as holding dies, in order to prevent the metal from crowding upward and downward during the action of the dies d^2 d^3.

After the formation of the body of the nib in the manner just described the latter is according to the present invention subjected to the action of configuring dies *e e'* which roughen or corrugate the nib in order to enable it to hold its position in the horse shoe when it is driven into the latter. These operations practically complete the nib and it remains only to sever the bar at an appropriate distance from its end in order to form the completed calk. This in the present form of the invention is effected by the two cutting or shearing knives *f f'*, the former of which *f* is carried on the plunger while the latter is held in the bed of the machine. In order to provide suitable means of adjustment the knife or blade *f'* is arranged in an angular position and is adapted to be acted upon at its rear by an adjusting screw *x*. The knives are so arranged relatively to the last set of dies that the cut 6 in Figs. 6 and 7 will sever the completed calk between two successive nibs as they are formed upon the bar. By this means the nib instead of being located at the end of the calk is preferably located between its ends as best shown in Fig. 8. By preference the bar is given an idle movement of one step before reaching the cutting position in order that the cutting mechanism may be displaced to the right a sufficient distance to avoid crowding the punches.

At the right hand side of the machine is provided a gage *r* which is preferably the inner end of adjustable screw *s* against which gage the end of the bar rests at the end of each feeding movement.

Any suitable means may be provided for holding the bar during the punching movements, but it is preferably guided in a channel formed by an adjustable abutment *t* and the plate *o* best seen in Figs. 3, 4 and 5.

The feeding movements may be accomplished in any desired way, by hand or by devices provided for this purpose, and in Figs. 1 and 2 I have illustrated a common form of feed which consists essentially of a slide *u* having pivoted at its forward end a feed dog *u'*, the upper end of which is connected by a rod u^2 with a bell crank lever u^3 which is oscillated by a pitman u^4 actuated by a crank disk u^5. When the pitman u^4 is depressed, the dog *u'* is tilted backwardly, thus freeing its engaging end from the stock, and upon a continuation of this movement the slide *u* is drawn back, while the rod, being held between the guides, remains stationary. When the pitman u^4 begins its upward movement the first effect is to tilt forward the dog *u'* to again engage the stock, and upon this movement being continued, the slide *u* moves forwardly with the stock.

Whether hand feed or machine feed be adopted, it is necessary or desirable that the stock after each operation of the dies shall be disengaged from the lower dies, so as to permit it to be moved forward to its next position. It is also necessary or desirable that the partly formed nib shall pass over the die d^3 into position to be shaped while the nib previously shaped is passed over the die d^2 toward the configuring dies. While this result can be attained by depressing the dies I prefer for this purpose to elevate the stock, and in the construction this is accomplished by a series of lifting pins *v v* (Figs. 1, 2, 4 and 5) which pass up through the bed plate of the machine and engage the under side of the stock. The pins *v v* are engaged at their lower ends by a lifter bar *w* fixed to a lever *w'* which is actuated by an eccentric rod w^2 connected with an eccentric upon the main shaft. The parts are so timed in their operations that after the ascent of the punch the stock is lifted and then fed forwardly by the feeding mechanism before the next succeeding operation of the plunger.

By the machine just described I am enabled to rapidly form toe-calks from a metal bar of ordinary stock dimensions without the necessity of heating the bar. I am further enabled to produce a calk in which the nib is located between the ends of the

calk, which permits the calk to be applied to a horse shoe without the necessity of driving the nib into the crease of the shoe. The invention also permits me to effect a considerable saving in cost over other processes of manufacture wherein the desired location of the nib is attained since the operation of forming the nib by my invention is accompanied by no waste of metal.

The machine herein described can easily be adjusted to adapt it for the manufacture of toe-calks of different proportions. The throw of the plunger is adjustable by the mechanism H while the degree of projection of the lower dies may be easily varied by introducing filling pieces into the die sockets. If calks of different lengths are required, the bed plate J and plunger plate K and their connected mechanism can be easily separated from the press and others of appropriate construction substituted therefor.

The machine thus described while primarily intended for the production of toe calks is adapted for the manufacture of other devices in which similar operations are to be performed.

While I have described in detail one form of the invention, it is to be understood that I do not wish to be limited thereto since wide changes in construction and operation may be made without departing from the spirit of the invention.

What I claim is:—

1. In a machine for making toe-calks or the like, the combination of a plurality of dies, adapted to act upon a bar of metal to swage a portion of the metal thereof beyond the edge of said bar, said dies adapted to act successively upon said portion to form a nib.

2. In a machine for making toe-calks or the like, the combination of a series of dies, adapted to act upon a bar of metal to swage a portion of the metal thereof beyond the edge of said bar, said dies adapted to act successively upon said portion to form a nib, and means for cutting off a portion of said bar to form a toe-calk.

3. In a machine for making toe-calks or the like, the combination of a series of dies spaced apart a distance substantially equal to the length of the finished calk, means for moving said dies substantially simultaneously to act upon a bar of metal and means for guiding said bar in such relation to said dies that the latter act upon the edge of the bar to successively form a series of nibs.

4. In a machine for making toe-calks or the like, the combination of a series of dies spaced apart a distance substantially equal to the length of the finished calk, means for moving said dies substantially simultaneously to act upon a bar of metal, means for guiding said bar in such relation to said dies that the latter act upon the edge of the bar to successively form a series of nibs, and means for lifting said bar after each operation of said dies.

5. In a machine for making toe-calks or the like, the combination of a series of dies spaced apart a distance substantially equal to the length of the finished calk, means for moving said dies substantially simultaneously to act upon a bar of metal, means for guiding said bar in such relation to said dies that the latter act upon the edge of the bar to successively form a series of nibs, and means for feeding said bar.

6. In a machine for making toe-calks or the like, the combination of a series of dies mounted to act upon a bar of metal to swage a portion of the metal thereof beyond the edge of the bar, and means for laterally shaping the nib thus formed.

7. In a machine for making toe-calks or the like, the combination of a series of dies mounted to act upon a bar of metal to swage a portion of the metal thereof beyond the edge of the bar, and means for laterally shaping the nib thus formed, said means comprising a laterally acting die and means for actuating the same.

8. In a machine for making toe-calks or the like, the combination of a series of dies mounted to act upon a bar of metal to swage a portion of the metal thereof beyond the edge of the bar, said dies being graduated to successively act upon the swaged metal, a shaping die for laterally shaping said swaged metal, and a configuring die adapted to roughen or corrugate the nib thus formed.

9. In a machine for making toe-calks or the like, the combination of a series of movable dies and a series of fixed dies co-acting therewith, said dies being adapted to act upon both sides of a bar of metal to swage a portion of the metal thereof on both sides of the bar beyond the edge of the latter, whereby to form a nib.

10. In a machine for making toe-calks or the like, the combination of a series of movable dies and a series of fixed dies co-acting therewith, said dies being adapted to act upon both sides of a bar of metal to swage a portion of the metal thereof on both sides of the bar beyond the edge of the latter, whereby to form a nib, and means for lifting said bar after each operation above the fixed dies whereby the bar may be advanced.

11. In a machine for making toe-calks or the like, the combination of a movable plunger having a series of punches, a bed having a series of fixed dies beneath said punches, means for guiding a bar of metal between said punches and dies, whereby to swage portions of said bar beyond its edge, a laterally acting die for shaping the nib thus formed, a configuring punch and die fixed to said plunger and bed respectively, and a cutting mechanism, the members of which

are also respectively fixed to said plunger and bed.

12. In a machine for making toe-calks or the like, the combination of a movable plunger having a series of punches, a bed having a series of fixed dies beneath said punches, means for guiding a bar of metal between said punches and dies whereby to swage portions of said bar beyond its edge, a laterally acting die for shaping the nib thus formed, a configuring punch and die fixed to said plunger and bed respectively, a cutting mechanism, the members of which are also respectively fixed to said plunger and bed, a series of lifting rods adapted to act against the under side of said bar to lift the same, and means for actuating said rods after each operation of said plunger.

13. In a machine for making toe-calks or the like, the combination of a plurality of dies adapted to act upon a bar of metal to swage a portion of the metal thereof beyond the edge of said bar, said dies adapted to act successively upon said portion to form a corrugated nib.

14. In a machine for making toe-calks or the like, the combination of successively acting dies comprising an indenting die adapted to act upon the side portion of a body of metal to indent the latter and swage a portion of the metal thereof beyond the edge of the bar, and a corrugating die adapted to act subsequently upon said portion to form a corrugated nib.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM J. KENT.

Witnesses:
EUGENE G. MYERS,
THOMAS F. WALLACE.