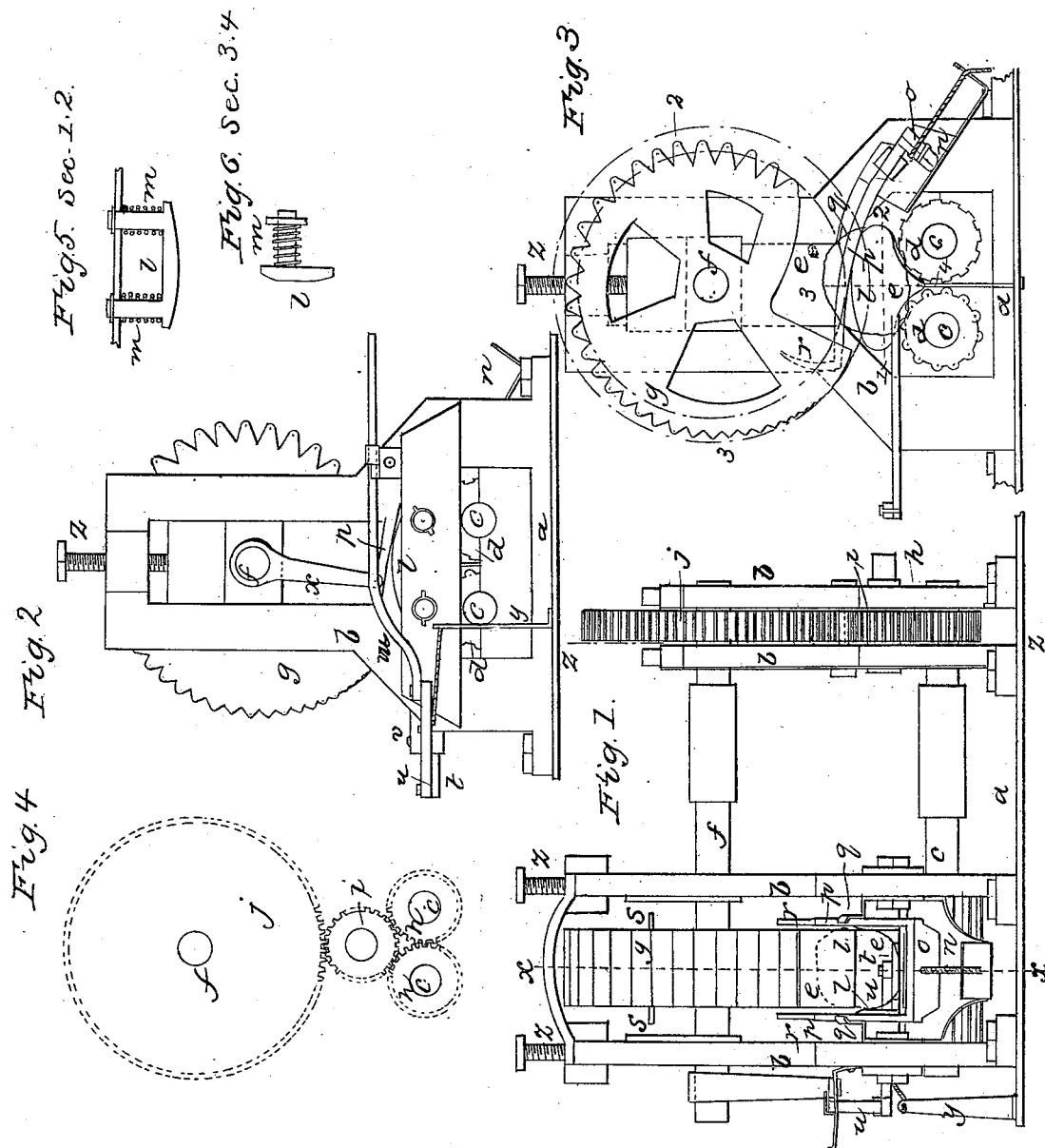


J. F. WINSLOW.

Compressing Puddler's Balls into Blooms.

No. 5,399.

Patented Dec. 18, 1847.



# UNITED STATES PATENT OFFICE.

JNO. F. WINSLOW, OF TROY, NEW YORK.

## ROLLING AND COMPRESSING PUDDLERS' BALLS.

Specification of Letters Patent No. 5,399, dated December 18, 1847.

*To all whom it may concern:*

Be it known that I, JOHN F. WINSLOW, of Troy, in the county of Rensselaer and State of New York, have invented a new and useful Machine for Compressing or Shingling Puddlers' Balls or Loupes of Iron Into Blooms, &c., and that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation of the machine; Fig. 2, a side elevation; Fig. 3, a vertical section taken at the line (X, X) of Fig. 1, and Fig. 4 a like section taken at the line (Z, Z) of the same figure.

The same letters indicate like parts in all the figures.

The nature of the first part of my invention consists in rolling and compressing puddlers' balls or loupes of iron into blooms, &c., by means of, a rotating cam-formed compressor combined with two or more rollers placed near to one another and at the same distance from the axis of motion of the compressor, so that the compression and elongation of the loupe will be due entirely to the eccentricity of the compressor—the whole being so geared that the rollers shall turn in the direction opposite to the motion of the compressor that the loupe may be rotated and retained between the rollers and the compressor. The surfaces of the rollers are formed with slight projections to take hold of and turn the loupe of iron, and the surface of the cam formed compressor with teeth which are very large at first, or on that part of the compressor which first acts on the loupe to squeeze out the impurities, and at the same time insure the turning of the loupe and then gradually diminished until the surface becomes quite or nearly smooth to finish the bloom. And the second part of my invention consists in combining with the compressor and rollers two cheeks, one on each side, and provided with springs that force them toward one another, that they may yield to the ends of the loupe of iron as it is lengthened out by the action of the compressor and rollers, and at the same time to make sufficient resistance to give a proper form to the ends of the bloom, &c. And the third

part of my invention consists in combining with the compressor and rollers a feeder or sliding frame operated by a projection on the compressor or the shaft thereof to carry in the ball of iron between the compressor and rollers as that part of the compressor which is recessed for this purpose comes around to the proper place for the introduction of the ball and the discharge of the bloom. And also in combining in like manner a follower for discharging the bloom after it has been completed.

In the accompanying drawings (a) represents the bed plate of the machine to which are securely bolted four standards or frames (b, b, b, b) properly adapted as represented to the operative parts of the machine. In the lower part of these standards there are two horizontal and parallel shafts (c, c) coupled in the usual manner of rolling mills, and these carry the two bed rollers (d, d) placed so near together as just to clear one another in turning; the surface of these rollers is formed with cogs which project just enough to take hold of the loupe of iron (e) and insure its turning. And in the upper part of the frame there is another and parallel shaft (f) which carries the rotating compressor (g) the periphery of which is cam formed as represented in Fig. 3, where two red lines represent circles concentric with the shaft and of a diameter equal to the smallest and greatest diameter of the compressor. The cam formed surface that acts on the iron commences at (1), at the smallest diameter, and extends around three-fourths of the circumference. It runs out from the axis with a sudden curve from the point (1) to (2) for the purpose of squeezing the loupe of iron suddenly when first put into the machine and when in a highly heated state to force out the impurities, and then from the point (2) to (3) it gradually runs out from the axis in the form of a segment of a volute to act gradually on the iron and lengthen it out in the direction of the axis of motion—and from the point (3) to (4), where the cam form ends, it gradually and slightly approaches the axis. And then from (4) to (1), the point of beginning, it is recessed for the remaining quarter of the circumference to give room for the discharge of the bloom and the introduction of a new ball or loupe to be acted upon.

From the point (1) to (3) the cam

formed surface is grooved to form cogs, which from the point (1) to (2) are very deep that they may suddenly force their way into the loupe of iron and squeeze out the impurities by an operation somewhat resembling the kneading of dough, and from the point (2) to (3) the sizes of these cogs or projections are gradually reduced, and from (3) to (4) they gradually disappear to smooth the surface of the bloom, the cam form slightly approaching the axis as its surface becomes smooth. This is the form which I deem best for the purpose contemplated, but I do not wish to confine myself to it, as it may be varied without changing the principle of my invention. The shafts of the rollers have each of them a cog pinion (*h*) the two being of equal diameter that the rollers may turn with equal velocity, and they are turned in the same direction by an intermediate pinion (*i*) which also engages with a cog wheel (*j*) on the shaft of the compressor that it, (the compressor) may act on the loupe of iron (*e*) in a direction the reverse of the peripheries of the two rollers; and the diameter of the pitch line of the pinions and the cog wheel is such, relatively to the diameter of the rollers and the compressor, as to cause them to act on the loupe of iron in opposite directions and with nearly equal velocities that the loupe may be turned on its axis and retained in proper place between the rollers and compressor.

Above the two rollers and on the sides of the compressor are placed two cheeks (*l, l*), one on each side—these are plates of metal with their inner surfaces slightly curved to upset the ends of the loupe of iron when drawn out and forced against them by the action of the compressor, and to enable these cheeks to yield to the gradual elongation of the loupe as the bloom is being formed these cheeks have each of them two round bolts, extending out from their outer faces and passing through appropriate holes in the standard frames which act as guides when the cheeks move in and out. Helical springs (*m, m*) surround the bolts and bear against the inner face of the standard frames and against the outer faces of the cheeks to force them toward one another and to make the requisite pressure against the ends of the iron. And to prevent the cheeks from coming in contact with the sides of the compressor the outer ends of the bolts have pins passing through them which check them at the required place. The form which I prefer to give to the inner face of these cheeks is represented in Figs. 5 and 6, which are horizontal and vertical sections of one of them taken at the lines (1, 2) and (3, 4) of Fig. 3; but this form is given merely as a representation of the form which I deem

the best, not wishing to limit myself to this form as it may be variously altered without varying the principle of my invention. At the front part of the machine there is an inclined table (*n*) on which the ball or loupe of iron to be worked is placed and resting against a bar (*o*) of a feeding frame which consists of this bar (*o*) and two arms (*p, p*) that slide in ways (*q*) on each side of the compressor; and the rear ends of the arms are turned up as at (*r, r*), and there are two pins (*s, s*) projecting from the faces of the compressor, one on each side, and so placed that so soon as the recess in the compressor reaches the rollers the pins (*s, s*) strike the turned up ends of the arms of the feeding frame and roll in the ball or loupe of iron to be acted upon by the compressor, and at the same time the formed bloom is forced out by a follower (*t*) which is jointed to one end of a lever (*u*) that turns on a fulcrum pin at (*v*), the other end being jointed to a rod (*w*) that has a projection on the side of it that is struck at the proper time by an arm (*x*) on the compressor shaft to push the follower forward and discharge the bloom—a spring (*y*) being connected with the lever to draw back the follower so soon as the bloom has been discharged. The shafts of the rollers turn in fixed boxes and that of the compressor in boxes that are adjustable by set screws (*z, z*) in the usual way.

It will be obvious from the foregoing that any slight change may be made in the form of the compressor or rollers, in the manner of mounting them, or in the cheeks and the manner of forcing them up against the ends of the bloom, and in the manner of operating the feeding frame and discharging follower without materially affecting the principle of my invention as pointed out above.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method substantially as herein described of compressing or shingling puddlers' balls or loupes of iron into blooms, by the combination of the cam formed compressor and two or more rollers, substantially as described.

2. I claim the spring or yielding cheeks for setting up the ends of the blooms in combination with the combined cam formed compressor and rollers, substantially as described.

3. And finally, I claim the feeder and discharging follower in combination with the combined cam formed compressor and rollers, for the purpose and in the manner described.

JOHN F. WINSLOW.

Witnesses:

S. REYNOLDS, Jr.,  
GEO. DAY.