F. JOHANSON.

MEANS FOR WORKING INGOTS, BLOOMS, OR THE LIKE BY CONTINUOUS FORGING.

APPLICATION FILED AUG. 16, 1911.

1,180,296.

Patented Apr. 25, 1916.

2 SHEETS—SHEET 1.

Fig. 2.

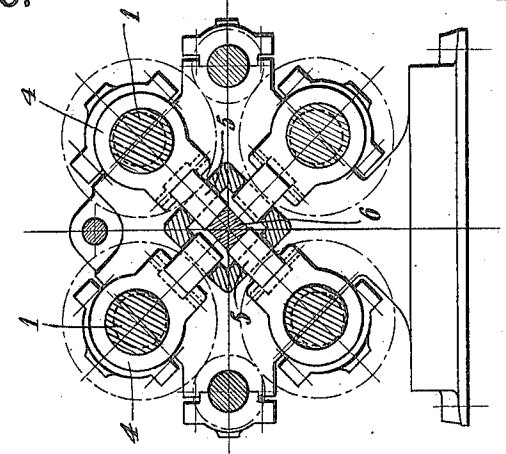
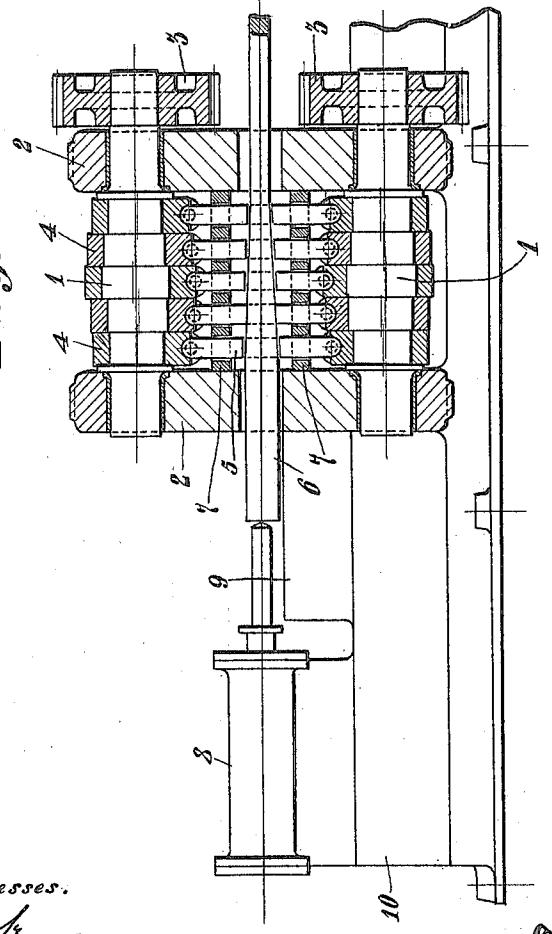


Fig. 1.



Witnesses.

Inventor.

Frits Johanson.

F. JOHANSON.

MEANS FOR WORKING INGOTS, BLOOMS, OR THE LIKE BY CONTINUOUS FORGING.

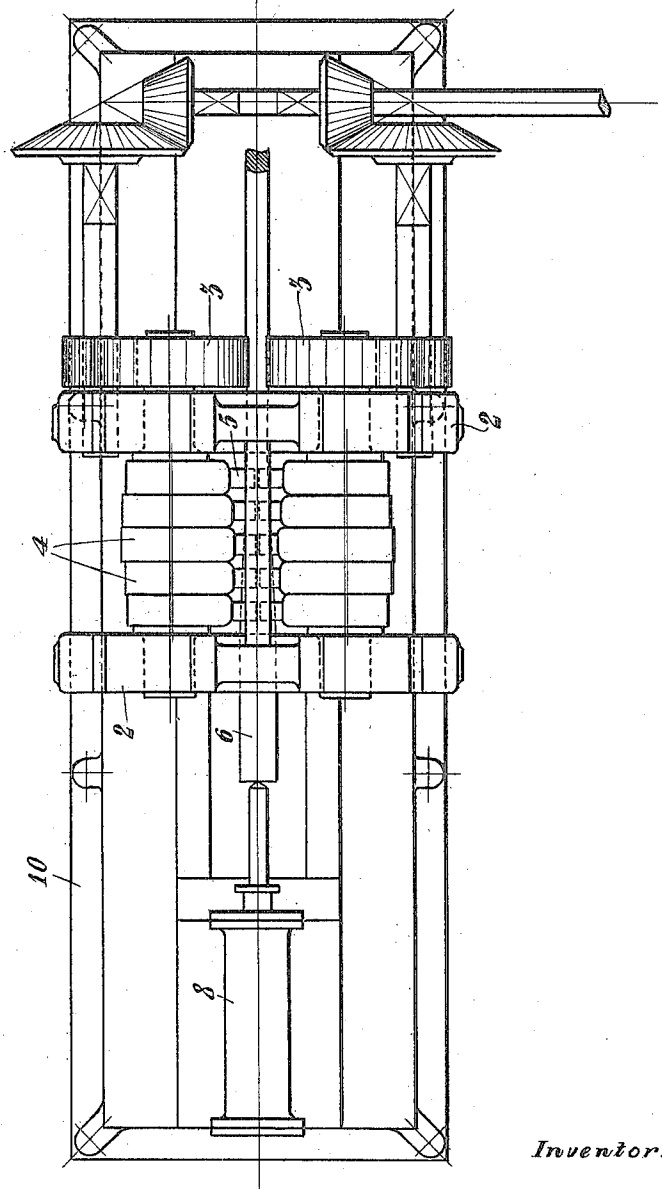
APPLICATION FILED AUG. 16, 1911.

1,180,296.

Patented Apr. 25, 1916.

2 SHEETS—SHEET 2.

Fig. 3.



Witnesses.

Aug. Sörensen

Karl Runeskov

Inventor.

Frith Johansen.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRITZ JOHANSON, OF FALUN, SWEDEN.

MEANS FOR WORKING INGOTS, BLOOMS, OR THE LIKE BY CONTINUOUS FORGING.

1,180,296. Specification of Letters Patent. Patented Apr. 25, 1916.

Application filed August 16, 1911. Serial No. 644,416.

To all whom it may concern:

Be it known that I, FRITZ JOHANSON, a subject of the King of Sweden, residing at Falun, in the Kingdom of Sweden, have invented new and useful Improvements in Means for Working Ingots, Blooms, or the like by Continuous Forging, of which the following is a specification, reference being had to the drawings, accompanying and forming a part hereof.

The object of the invention is to make it possible to continuously forge down ingots, blooms, etc., by normal pressure only so as to successively reduce the section without exposing the work to noxious strains, as is the case in usual rolling.

A further object is to make it possible to work the blank in one place and by feeding it forward in one direction only.

The invention consists, chiefly, in certain novel means hereinafter described. It comprises the combination, in a continuous forging mill, of a series of dies, stamps or the like arranged by pairs, means for causing the dies of each pair to move alternately toward and away from each other, and means for feeding the work between the said dies. Preferably, two sets of dies are used working at right angles to each other, the ingot being pressed together and reduced in section between the said two sets of dies.

The invention further comprises the construction and combination of parts hereinafter described with reference to the drawings.

Inasmuch as the blank is exposed to normal pressures only, it will be better worked than by regular rolling. Moreover, since the blank need not be worked in different stages along its whole length, no means are required for handling the blank during the process.

In the drawings, I have shown by way of example a forging mill embodying the invention.

Figure 1 is a longitudinal section, Fig. 2 is a cross-section, and Fig. 3 is a plan view of the mill.

Referring to the drawings, 1, 1, are shafts journaled in housings 2. The said shafts, suitably four in number, are mounted by pairs opposite each other, with their axes parallel. They may be driven in any suitable way, such as by gears 3. Placed on the shafts 1 are eccentrics 4, preferably journaled on ball bearings (not shown), in order that the eccentrics may be placed more closely together, and pivotally connected to the said eccentrics are dies 5, adapted to press on the blank. On account of the pivotal connection of the dies to the eccentrics, the dies are free to move with the work 6 during the time they are in contact therewith. The eccentrics are displaced certain angles relatively to each other so as to work in proper sequence. Mounted between the housings 2, 2 are bars 7 for guiding the dies, said bars being arranged in such a manner as to cause the dies to move backward during their movement away from the blank so that the dies will take up proper positions when again brought into contact with the work. Obviously springs or other means may be used for the same purpose. The feeding of the ingot is effected by any suitable means, such as a hydraulic cylinder 8, a feed screw or the like causing the ingot to move with a desired constant speed. 9 is a supporting table for the ingot, and 10 is the machine bed carrying the housings.

The dies or the like should be made of the best material so as to withstand the heat from the ingot. They may be provided with even or grooved working surfaces. The reduction in cross-sectional area is determined by the movement of the dies into the ingot; the volume of metal displaced is determined by the said movement and the feed movement of the ingot. At the foremost dies, where the feed is small and the cross-sectional area is large, the volume displaced for each stroke of the dies should be about the same as at the rear dies, where the cross-sectional area is small and the feed is comparatively large. By this means the force consumed in changing the form of the ingot and thus the pressure exerted by the dies will be approximately the same at all the dies.

Two or more pairs of housings like that shown in the drawings are intended to be placed in line, one after the other, so as to form a whole train similar to a continuous rolling mill. The ingot is entered at one end of the mill and pressed between each pair of dies and moves rectilinearly with an increased speed toward the other end of the mill which it preferably leaves with a speed and a cross-section suitable for subsequent rolling in a usual rolling mill connected to the mill hereinbefore described. In this way it is made possible to automatically

produce different articles, such as wires and the like, directly from the ingot in one heating and in very long lengths.

In forging articles of round cross-section means may be provided for successively turning the work, in which case the dies need not work in different planes.

I claim:

A forging mill comprising a frame, shafts journaled in pairs in the said frame, eccentrics placed beside one another along the said shafts, and working dies pivotally connected to the said eccentrics and arranged to compress successively the work along its path through the mill, substantially as and for the purpose set forth.

FRITZ JOHANSON.

Witnesses:
KARL RUNCSKOG,
AUG. SORENSEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."