My invention relates to the hot-working of metal and more especially to an improvement in the manufacture of corrugated tubes by heating a smooth sheet metal tube by passing through it zones and exerting axial pressure on the tube, as described in the specification of Letters Patent of the United States granted to Wladyslaw Maciejewski No. 1,010,931, according to which the corrugation last made is protected from the action of the heat on the blank for making the next corrugation by applying a cooling medium, such as water, a heat insulating ring or both.

This method involves several drawbacks. Quenching with water causes the metal to be hardened in the zone where a fresh corrugation shall be formed and considerably delays the heating of the fresh zone. This drawback can be obviated by using an insulating ring, but the ring must be displaced along the tube whenever a fresh corrugation shall be produced. This is connected with serious practical difficulties due to the flame which burns near to the ring and further due to the rotation of the tube.

To this end I provide means for protecting the corrugation last formed against the action of the flames heating a fresh zone, by means of a veil of air which forms a protective screen between the last corrugation and the heating zone.

In the drawings affixed to this specification and forming part thereof a device embodying my invention is illustrated diagrammatically by way of example.

In the drawings
Fig. 1 is a cross section
Fig. 2 a longitudinal section.

The tube 1, to which rotation may be imparted by any suitable means (not shown) is surrounded by an annular casing 3 arranged to allow the radial passage of the flames emerging from the burners 2. An annular air supply chamber 4 adjoining and forming part of the casing 3 is supplied with cooling air by pipes 6, preferably under the same pressure and from the same source as the air of combustion supplied to the burners 2. The air escapes from the chamber 4 in radial direction through a slot and forms a veil or screen \( \frac{1}{2} \) of an inch in thickness and surrounding the tube.

The casing 3 with the burners 2 is mounted on a frame 7 which is adapted to be moved along the tube 1.

The corrugation last made is indicated at b. The next corrugation is to be formed by axial compression of the tube after heating the zone a. The corrugation b is protected from the action of the flames in the zone a by the veil of air emerging from the slot 5.

Obviously, it is inevitable that the air is heated while flowing through the chamber 4 and escapes at the slot 5 at a comparatively high temperature, but the temperature is not raised to such an extent as to transmit heat to the corrugation b. Experience shows that it is possible to heat the zone a to the temperature required for forming the corrugation while the adjacent finished corrugation b remains quite black.

The rate of operating is greatly accelerated and the consumption of gas is reduced by about 50 per cent.

The veil of air and the flame being interdependent, if the air supply fails, the burners cease to operate also.

The present invention refers to the preparation of the blank and can be utilized in connection with other operations, such as riveting or the like as well as in corrugating.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

Apparatus for hot-working metal comprising an annular casing, means for injecting a burning mixture of gas and air into said casing substantially in radial direction and means connected with said casing and adjoining said injecting means for forming a radial veil of air adapted to screen off the heat emitted by said burning mixture.

In testimony whereof I affix my signature.

WACLAW W. KOSSOWSKI.