To all whom it may concern:

Be it known that we, BLOOMFIELD H. HOWARD and ERNEST J. TURNER, citizens of the United States, residing, respectively, at the city of Washington, District of Columbia, and Pittsburgh, county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Reversible Feeders for Ingot Molds, of which the following is a specification.

Our invention relates to improvements in reversible feeders for ingot molds.

The object of our invention is to provide a reversible feeder for ingot molds whereby the distance the feeder extends into the mold may be readily varied, and whereby the length of the ingot can be made greater or less in the same mold, and at the same time produce a feeder having all of the advantages of the ordinary feeder, to prevent seams and holes known as "piping" and also reduce segregation to a minimum.

Another object of our invention is to provide a feeder of this character in which the same means supports the feeder in its normal and reversed position and said means firmly supporting the feeder within the upper end of the mold against longitudinal or lateral movement.

Another object of our invention is to provide a feeder of this character which will have a great number of adjustments for varying the length of the ingot in the mold, and at the same time provide a simple, cheap and effective reversible feeder having certain details of structure and combination of parts herein after more fully set forth.

In the accompanying drawings:

Fig. 1 is a perspective view of an ingot mold showing our improved feeder applied thereto.

Fig. 2 is a vertical sectional view of Fig. 1 showing the feeder in the reversed position in dotted lines.

Fig. 3 is a side elevation of our improved feeder.

Fig. 4 is a side elevation partly in section of a modified form of feeder.

Fig. 5 is a side elevation partly in section of a still further modified form of feeder.

Fig. 6 is a top plan view of a modified form of feeder.

Fig. 7 is a side elevation partly in section of another modified form of feeder.

Fig. 8 is a top plan view of another modified form of feeder.

Fig. 9 is a top plan view of a still further modified form of feeder.

Fig. 10 is a vertical sectional view of a mold and feeder showing another modified form of feeder.

Fig. 11 is a sectional view of a mold showing in side elevation another form of feeder for having a greater number of adjustments in the mold.

Fig. 12 is a side elevation partly in section showing means for the adjusting of the form of feeder shown in Figures 1, 2 and 3 in the mold.

Fig. 13 is a side elevation partly broken away showing a modified form of supporting ribs.

Fig. 14 is a side elevation of the feeder partly broken away showing another modified form of supporting ribs.

Fig. 15 is a side elevation similar to Fig. 14 showing the ribs having a single slit.

Referring now to the drawings, the numeral 1 represents the ordinary ingot mold, and 2 our improved feeder in the form shown in Figures 1, 2 and 3. The feeder 2 is provided on each side with two short ribs 3 and 4, which have their upper ends 5 closer to the upper edge 6 of the feeder than their lower edge 7 are to the lower edge 8 of the feeder. By this structure it will be seen that by reversing or inverting the feeder as shown in dotted lines Fig. 2, the feeder will not extend so far into the mold and a longer ingot will be produced.

In Fig. 4, the feeder 9 is of a circular form and is provided with a wedge-shaped rib extending outwardly entirely around the same, and said rib being closer to the upper end 11 than the lower end to allow for a greater or less portion of the feeder to extend into the mold. While we have shown and described this wedge-shaped rib as applied to a circular feeder, it will be understood that it could be applied to any shape mold.

In Fig. 5, we have shown the same form of feeder 13 with a semi-circular rib 14 extending around the same, and like Fig. 4 is closer to one end of the feeder than the other.
In Fig. 6 we have shown two opposite sides of the feeder 15 provided with longitudinally arranged flanges 16 and 17 placed nearer one end of the feeder than the other.

Fig. 7 shows the circular feeder 18 having a continuous rib 19 around the same, and rectangular in cross section and arranged nearer one end of the feeder than the other.

Fig. 8 shows the feeder 20 having all four sides provided with flanges 21, 22, 23 and 24, which are of a length less than the width of the side having the corners free from engagement with the upper edge of the mold when the feeder is inserted in the mold.

In Fig. 9, we have shown the feeder with two opposite sides having the flanges 26 and 27 of a length less than the width of the sides of the feeder.

In Fig. 10, we have shown the feeder 28 having two sets of lugs 29 and 30 carried by the outer periphery and said lugs weakened as indicated at 32 and 33, whereby either set of lugs may be broken for giving four adjustments in the mold. By reversing or inverting the feeder less of the feeder will extend into the mold. By breaking of the lugs 29 and inverting the mold, a considerable more of the feeder will enter the mold, and by breaking off the lugs 30 nearly the whole feeder will enter the mold.

In the form shown in Fig. 11, we have shown the feeder 34 with five horizontally arranged staggered rows of lugs 35, 36, 37, 38 and 39, whereby a great number of adjustments of the feeder in the mold is obtained.

In Fig. 12, in order to give further adjustments of the feeder than shown in the other figures, a fire brick or block 40 of non-combustible material may be placed on the upper edge of the mold below the ribs 3 and 4.

In Fig. 13, we have shown a modified form of supporting ribs. In this form the ribs 41 are made comparatively thin, and of considerable length to give sufficient strength to sustain the weight, but being thin can be readily broken off so the feeder may enter the mold different distances.

In Fig. 14, we have shown the projections 42 of an elongated narrow form having the ends different distances from the ends of the feeder and having cross cuts 43 so that any portion of the lug or projection 42 may be broken to vary the distance feeder enters the mold.

In Fig. 15, the same principle is employed as in Fig. 14, except the ribs 44 are provided with a single cross cut 45.

We claim:
1. A feeder for ingot molds comprising a reversible body portion, and an integral projection carried by the body portion and adapted to support the feeder with either end in the mold.

2. A feeder for ingot molds comprising a reversible body portion, and an integral projection carried by the body portion nearer one end than the other and adapted to support the feeder with either end in the mold.

3. A feeder for ingot molds comprising a reversible body portion, an integral projection carried by the outer face of the body portion nearer one end than the other and adapted to support the feeder with either end in the mold and whereby a block may be placed on the upper end of the mold below the projection for raising the feeder in the mold.

4. A feeder for ingot molds, comprising a body portion, and projections carried by the outer face of the body portion and forming means for supporting the feeder within the mold and said projections weakened so that they may be broken off to allow the feeder to enter the mold different distances.

5. A feeder for ingot molds, comprising a reversible body portion, and projections carried by the outer face of the body portion and weakened so that they may be broken off to allow the feeder to enter the mold different distances.

6. A feeder for ingot molds, comprising a reversible body portion, and projections carried by the outer face of the body portion different distances from the ends of the body portion and forming means for supporting the feeder in the mold and said projections weakened so that they may be broken off to allow the feeder to enter the mold different distances.

7. A feeder for ingot molds, comprising a reversible body portion, and integral projections carried by the body portion and arranged different distances from the ends of the feeder.

8. A feeder for ingot molds, comprising a body portion, and projections carried by the body portion and arranged different distances from the ends of the feeder and constructed to be broken off.

9. A feeder for ingot molds, comprising a body portion, and projections carried by the outer face of the body portion and constructed to be broken off for the purpose described.

10. A feeder for ingot molds, comprising a body portion, and integral projections carried by opposite sides of the feeder and nearer one end than the other.

11. A feeder for ingot molds, comprising a body portion, and a series of horizontal rows of staggered projections carried by the outer face of the feeder and adapted to be broken off.

12. A feeder for ingot molds, comprising a body portion and a series of horizontal rows of staggered projections carried by the outer face of the feeder and weakened so that they may be broken off to allow the feeder to enter the mold different distances.
13. A feeder for ingot molds, comprising a reversible body portion of refractory material and integral projections carried by the body portion and arranged different distances from the end of the feeder.

14. A feeder for ingot molds comprising a reversible body portion, and integral projections so constructed to sustain weight and at the same time can be readily broken off. In testimony whereof we affix our signatures.

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