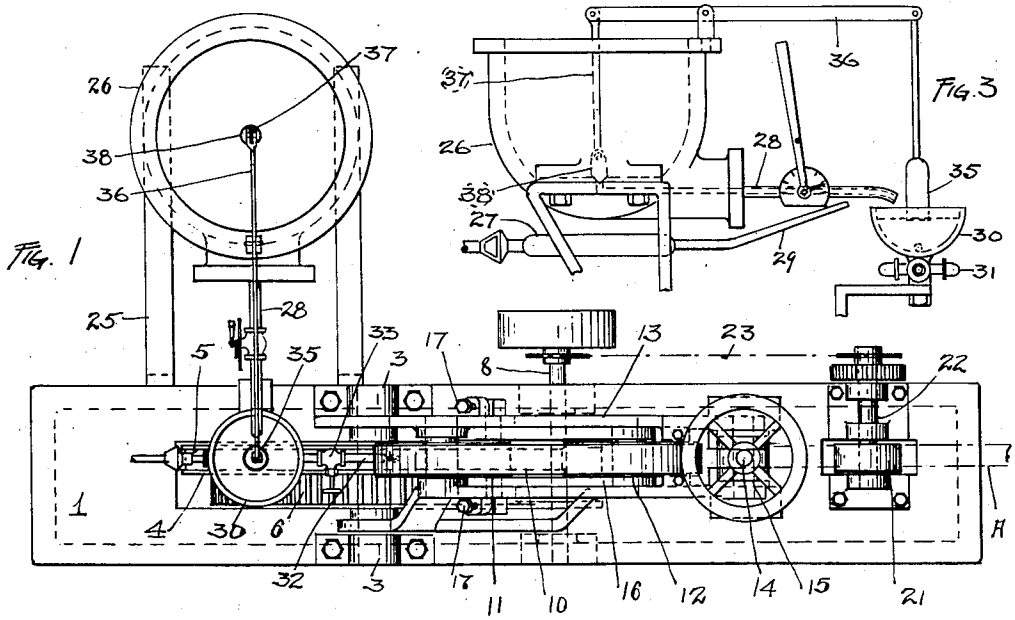
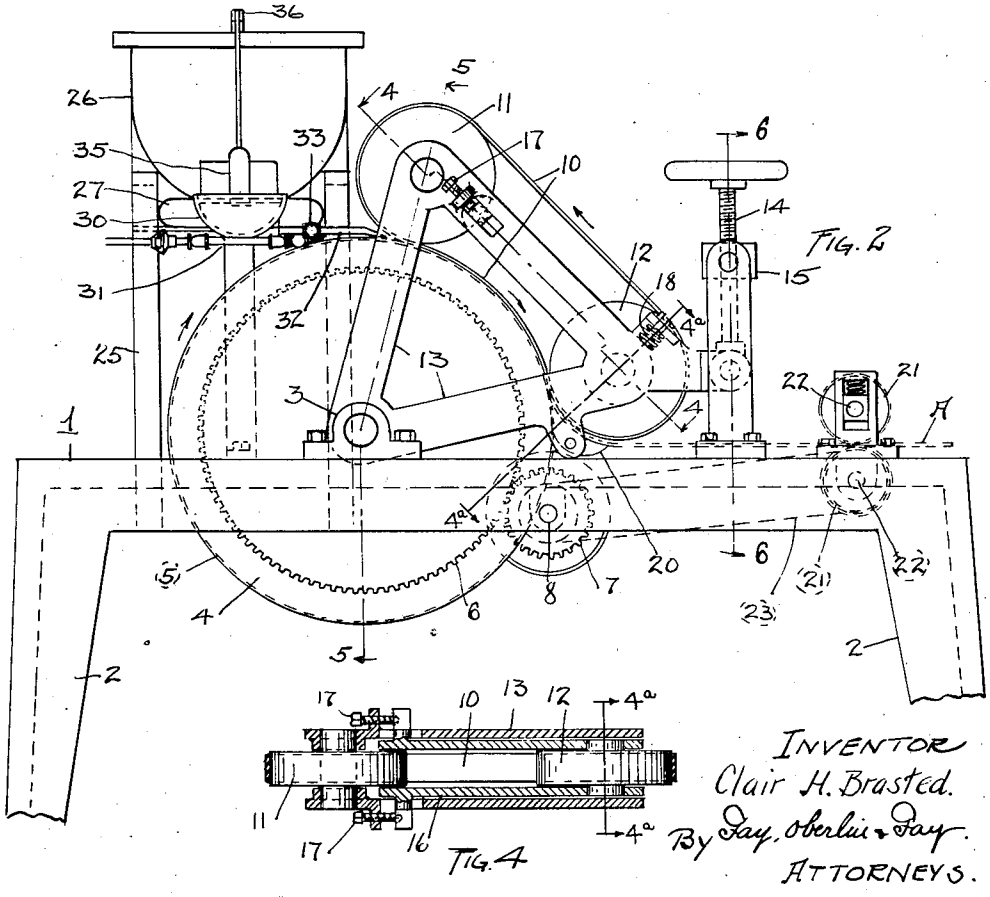
Sept. 2, 1924. 1,507,456

C. H. BRASTED

STRIP CASTING MECHANISM

Filed Sept. 13, 1918 2 Sheets-Sheet 1





INVENTOR
Clair H. Brasted.
By Fay, Oberlin & Fay.
ATTORNEYS.

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C. H. BRASTED

STRIP CASTING MECHANISM

Filed Sept. 13, 1918 2 Sheets-Sheet 2

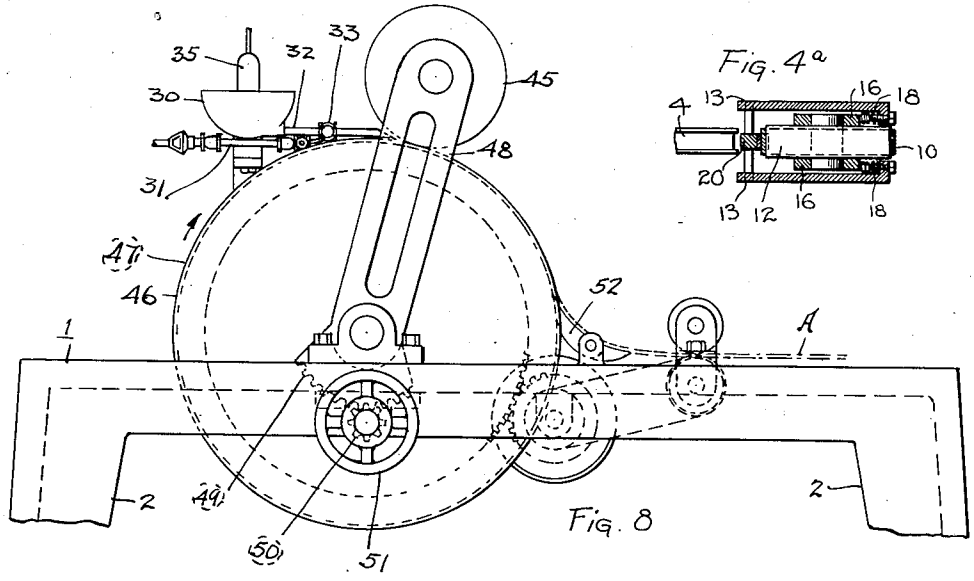


Fig. 8

Fig. 4a

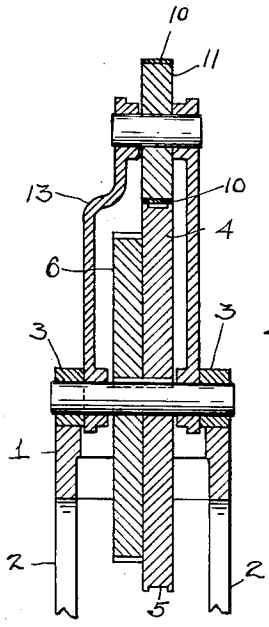


Fig. 5

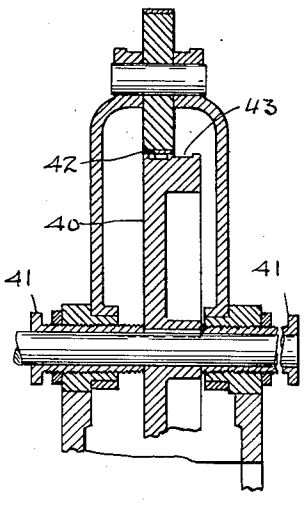


Fig. 7

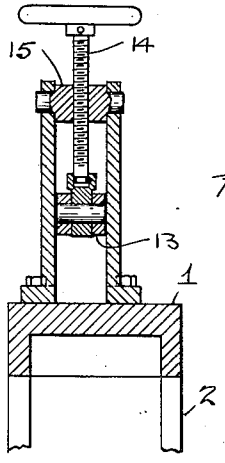


Fig. 6

INVENTOR
Clair H. Brasted.
BY Gay, Oberlin & Gay
ATTORNEYS.

Patented Sept. 2, 1924. 1,507,456

UNITED STATES PATENT OFFICE.

CLAIR H. BRASTED, OF EAST CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE LUDLOW TYPOGRAPH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

STRIP-CASTING MECHANISM.

Application filed September 13, 1918. Serial No. 253,915.

To all whom it may concern:

Be it known that I, CLAIR H. BRASTED, a citizen of the United States, and a resident of East Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Strip-Casting Mechanism, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present improvements relate more particularly to the production of metal strips in the form known in the printing art as rules, leads and the like, the object of the invention being to provide an apparatus for forming strips of this sort in an expeditious and economical manner from the metal that is ordinarily employed in casting type bars or slugs for printing. By being able to produce rules and leads at a low enough cost, they may be remelted, just as it is the current practice in linotype work to remelt such type bars or slugs, and so provide fresh material for each form.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain mechanism embodying the invention, such disclosed means illustrating, however, but several of the various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—

Fig. 1 is a plan view of my improved machine for forming metal strips of the kind in question; Fig. 2 is a front elevational view of the same; Fig. 3 is a side elevation of a part of such machine, namely, the melting pot and associated feeding mechanism; Figs. 4 and 4ª are sectional views of portions of the machine taken on the planes indicated by the line 4—4 and 4ª—4ª, Fig. 2; Figs. 5 and 6 are sectional views taken on the planes indicated by the lines 5—5 and 6—6 respectively, Fig. 2; Fig. 7 is a sectional view corresponding with that of Fig. 5, but showing a modification in construction; and Fig. 8 is a front elevation corresponding with that of Fig. 2, and showing still another modification.

The general frame of the machine may of course take on various forms, but is shown as a table 1 with suitable supporting legs or standards 2 at its respective ends. Mounted on such table in transversely aligned bearings 3 is a solid wheel or disk 4 which has its periphery formed with a molding groove 5 of a depth and cross-section corresponding with the width and thickness of the strip which it is desired to form. This disk is adapted to be driven through an attached gear 6, with which a pinion 7 on a driving shaft 8 meshes, as best shown in Fig. 2.

Co-operative with the periphery of wheel 4 is an endless belt 10 consisting preferably of a flexible steel band that passes around two pulleys or rollers 11 and 12 supported at the proper radial distance from the axis of the wheel and spaced a sufficient distance apart to cause such belt or band to close the groove 5 in the wheel for an angular distance of approximately thirty degrees in the construction illustrated. However, as to the extent to which the groove is thus covered, it will be understood that this is a matter permitting of considerable variation. The rollers in question are shown as being carried in a suitable frame 13 mounted so as to be bodily oscillatory about the axis of the wheel, and means are provided for adjusting such frame, and thus the wheels conjointly with the belt or band carried thereby, angularly about such axis. In the construction under consideration, these means consist of a handled screw 14 in a swivel mounting 15 on the bed or table 1, pivotally connected to the frame. The latter includes a supplemental member 16, the one roller 11 being directly journaled in the main frame member, and the other roller 12 being carried in such supplemental member which is movable towards and away from the first mentioned roller by means of suitable adjusting screws 17. It accordingly results that the two rollers, in addition to being conjointly adjustable in an arc having the axis of the disk for its axis, are relatively adjustable in a straight line approximately tangential to said disk. Member 16 in which such second roller 12 is thus carried furthermore also has a slight movement in a radial direction with respect to the axis of the wheel, compression springs 18 being interposed between said member and the main frame, so

as to force such end of the former inwardly. By means of the foregoing construction the portion of the belt or band 10 that contacts with the wheel 4 will obviously be held in close-fitting contact therewith at all times, while nevertheless free to be driven around the pulleys by its frictional contact with such wheel.

The frame 13 also carries a device for stripping the metal from the groove in the wheel, consisting of a shoe 20 oscillatorily mounted below the lower roller 12 and having one end formed to engage in the groove 5, its upper face being curved to direct the strip in a general horizontal direction. At a suitable distance from the stripping device and the adjacent roller, a pair of pulling rolls 21 are desirably provided, in order to exert a certain amount of tension on the strip A and also straighten it out. The spindles 22 carrying these rolls are intergeared and are driven by means of a sprocket chain 23 connecting one such spindle with the drive shaft 8.

For supplying the necessary molten metal to the machine, a casting pot possessing certain special features of construction is provided, such pot being carried on a bracket 25 located to one side, or rather the rear, of the machine, regarding the same as shown in Figs. 1 and 2. The main melting pot 26 is of more or less familiar construction, being heated by a suitable burner 27. Leading from the bottom of such pot 26 is a valve-controlled duct 28, a supplemental burner 29 being arranged to heat its projecting end, as shown in Fig. 3. This duct discharges into a supplemental pot 30 of considerably smaller size than the main pot, and having a burner 31 beneath it to keep the metal in proper molten condition. From this smaller pot a second duct, or rather discharge nozzle 32, leads to a point approximately directly over the axis of the wheel 4, and in line with the molding groove 5 in the periphery of such wheel. The point of discharge in fact is preferably a trifle over the center in the direction in which the wheel rotates, such direction being indicated by the arrow in Fig. 2, and just in advance of the point where the belt or band contacts with such wheel. A valve 33 in this nozzle serves to regulate the rate of discharge so that just enough metal will flow from the nozzle to fill the groove, at the rate of speed at which the wheel is being rotated.

In order that the flow may be as nearly uniform as possible, it is desirable that the level of molten metal in the auxiliary pot should not vary an appreciable amount. Accordingly, an automatic arrangement for maintaining such level constant is provided, consisting of a float 35 in said pot connected with one end of a lever or walking beam 36, the other end of which has attached to it a rod 37 with a valve 38 on its lower end (see Fig. 3) adapted to co-operate with the opening in the bottom of the main pot that communicates with the duct 28. The arrangement is such that as the level of the metal falls in the auxiliary pot this valve is opened wider, and vice versa.

The mode of operation of my improved machine should be readily apparent from the foregoing description. The flow of molten metal being properly regulated, a strip A is formed of such metal in the groove on the periphery of the wheel, since such metal will have time to congeal or solidify as it passes along in contact with the belt. At the lower point of contact of the latter with the wheel, the strip can accordingly be detached from the wheel and directed between the rollers 21 which, as previously indicated, assist in the foregoing operation by putting a certain amount of tension on the strip, and at the same time serve to straighten it out. The strip may then be handled in any desired fashion, but preferably it will be cut up by an automatic cutting device (not shown) into lengths desired.

The wheel shown in Figs. 1 to 6 inclusive, is adapted to form but a single kind of strip. Should one of different dimensions be desired, such wheel accordingly requires to be replaced with another having a groove of corresponding size. It is not at all a difficult matter to thus interchange wheels, but in order to reduce the necessity, a wheel 40 of greater width having two or more grooves can be utilized if desired, as is shown in Fig. 7. In such event, the wheel will have to be shiftable longitudinally of its axis, or else the rollers and belt will have to be thus shiftable. In the figure in question the construction provides for thus rendering the wheel adjustable by means of threaded sleeves 41 to bring either one of two grooves 42 and 43 in its periphery into line with the rollers 11 and 12 and belt 10.

In Fig. 8 a further modification is shown, consisting in the elimination of the second roller and also of the belt, a single roller 45, contacting with the periphery of wheel 46, being relied upon to cause the metal to conform to the groove 47. This will be entirely satisfactory if the metal is caused to set quickly enough so that, as it passes beyond the roller, it is no longer fluid. In this construction I show a different arrangement for adjusting the angular position of the frame 48 carrying the single roller, such arrangement consisting of a segment gear 49 on the lower end of the frame, with which a pinion 50, operated by a hand-wheel 51, is adapted to mesh. The position of the frame, and thus of the roller, can in this way be readily varied while the machine is in operation. Also, the device 52 for stripping the metal from the groove is shown as being di-

rectly supported on the bed 1 of the machine.

With the foregoing mechanism I have found it practicable to form strip stock closely conforming to any prescribed dimensions, without any trimming thereof being necessary. However, if desired, in order either to make the stock with perfectly rectangular edges, or to decrease the width of the stock without having to change the dimensions of the molding groove, a suitable trimming device may be employed in conjunction with either form of mechanism hereinbefore described.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitably supply of such metal; of a rotary disk provided with a molding groove in its outer face, a nozzle adapted to discharge a graduated stream of metal into such groove; and a member contacting with such face of said disk to close a section of such groove adjacent said nozzle, said member being movable conjointly with the disk face wherewith it thus contacts and also being bodily angularly adjustable about the axis of said disk.

2. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove; and a traveling band contacting with such face of said disk to close a section of such groove adjacent said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts and also being bodily angularly adjustable about the axis of said disk.

3. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove; a frame angularly adjustable about the axis of said disk; two rollers mounted in said frame; and an endless band traveling around said rollers and contacting with such face of said disk to close a section of such groove adjacent said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts.

4. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove; two rollers mounted so as to be relatively adjustable in a straight line approximately tangential to said disk; and an endless band traveling around said rollers and contacting with such face of said disk so as to close a section of said groove adjacent said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts.

5. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove; a frame angularly adjustable about the axis of said disk, two rollers relatively adjustably mounted in said frame; and an endless band traveling around said rollers and contacting with such face of said disk to close a section of such groove adjacent said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts.

6. In apparatus for forming a strip or the like direct from molten metal; the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove; a frame angularly adjustable about the axis of said disk; two rollers relatively adjustable in said frame in a straight line approximately tangential to said disk; and an endless band traveling around said rollers and contacting with such face of said disk so as to close a section of said groove adjacent said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts.

7. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove; a frame angularly adjustable about the axis of said disk; a roller mounted in said frame; a secondary frame carried by said first frame and movable towards and from the axis of said disk; a second roller mounted in said secondary frame; and an endless band traveling around said rollers and contacting with such face of said disk to close a section of such groove adjacent said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts.

8. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of

a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove; a frame angulary adjustable about the axis of said disk; a roller mounted in said frame; a secondary frame carried by said first frame and movable towards and from the axis of said disk; resilient means tending to move said secondary frame towards such axis; a second roller mounted in said secondary frame; and an endless band traveling around said rollers and contacting with such face of said disk to close a section of such groove adjacent said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts.

9. In apparatus for forming a strip or like element direct from molten metal, the combination of a member provided with a plurality of parallel grooves of differing cross-section, said member being movable longitudinally of said grooves; and a nozzle adapted to discharge a graduated stream of metal, said member and nozzle being relatively adjustable in a direction transverse of such grooves to bring a selected one thereof in line with said nozzle.

10. In apparatus for forming a strip or like element direct from molten metal, the combination of a member provided with a plurality of parallel grooves of differing cross-section, said member being movable longitudinally of said grooves; a nozzle adapted to discharge a graduated stream of metal, said member and nozzle being relatively adjustable in a direction transverse of such grooves to bring a selected one thereof in line with said nozzle; and a second member contacting with said first member to close a section of the groove thus aligned with said nozzle, said member being movable conjointly with the disk face wherewith it thus contacts.

11. In apparatus for forming a strip or like element direct from molten metal, the combination of a member provided with a plurality of parallel grooves of differing cross-section, said member being movable longitudinally of said grooves, a nozzle adapted to discharge a graduated stream of metal, said member and nozzle being relatively adjustable in a direction transverse of such grooves to bring a selected one thereof in line with said nozzle; and a traveling band contacting with said member to close a section of the groove thus aligned with said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts.

12. In apparatus for forming a strip or like element direct from molten metal, the combination of a rotary disk provided with a plurality of parallel grooves in its outer face of differing cross-section; and a nozzle adapted to discharge a graduated stream of metal onto such disk face, said disk being axially adjustable to bring a selected groove into alignment with said nozzle.

13. In apparatus for forming a strip or like element direct from molten metal, the combination of a rotary disk provided with a plurality of parallel grooves in its outer face of differing cross-section; a nozzle adapted to discharge a graduated stream of metal onto such disk face, said disk being axially adjustable to bring a selected groove into alignment with said nozzle; and a member contacting with such disk-face to close a section of the groove thus aligned with said nozzle, said member being movable conjointly with the disk face wherewith it thus contacts.

14. In apparatus for forming a strip or like element direct from molten metal, the combination of a rotary disk provided with a plurality of parallel grooves in its outer face of differing cross-section; a nozzle adapted to discharge a graduated stream of metal onto such disk-face, said disk being axially adjustable to bring a selected groove into alignment with said nozzle; and a traveling band contacting with such disk-face to close a section of the groove thus aligned with said nozzle, said band being movable conjointly with the disk face wherewith it thus contacts.

15. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove; and a member contacting with such face of said disk to close a section of such groove adjacent said nozzle, said member being movable conjointly with the disk face wherewith it thus contacts and said member being also adjustable in an approximately tangential direction to vary the distance between said nozzle and such closed groove section.

16. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove at a point approximately directly over the axis of said disk; and a member contacting with such face of said disk to close a section of such groove adjacent said nozzle, said member being movable conjointly with the disk face wherewith it thus contacts.

17. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharged a graduated

stream of metal into such groove at a point approximately directly over the axis of said disk and in a substantially tangential direction; and a member contacting with such face of said disk to close a section of such groove adjacent said nozzle, said member being movable conjointly with the disk face wherewith it thus contacts.

18. In apparatus for forming a strip or the like direct from molten metal, the combination with a suitable supply of such metal; of a rotary disk provided with a molding groove in its outer face; a nozzle adapted to discharge a graduated stream of metal into such groove at a point approximately directly over the axis of such disk and in a substantially tangential direction; and a member contacting with such face of said disk to close a section of such groove adjacent said nozzle.

Signed by me, this 16th day of August, 1918.

CLAIR H. BRASTED.