C. C. HOCKMAN.

MEANS FOR MAKING PRINTERS' LEADS OR RULES.

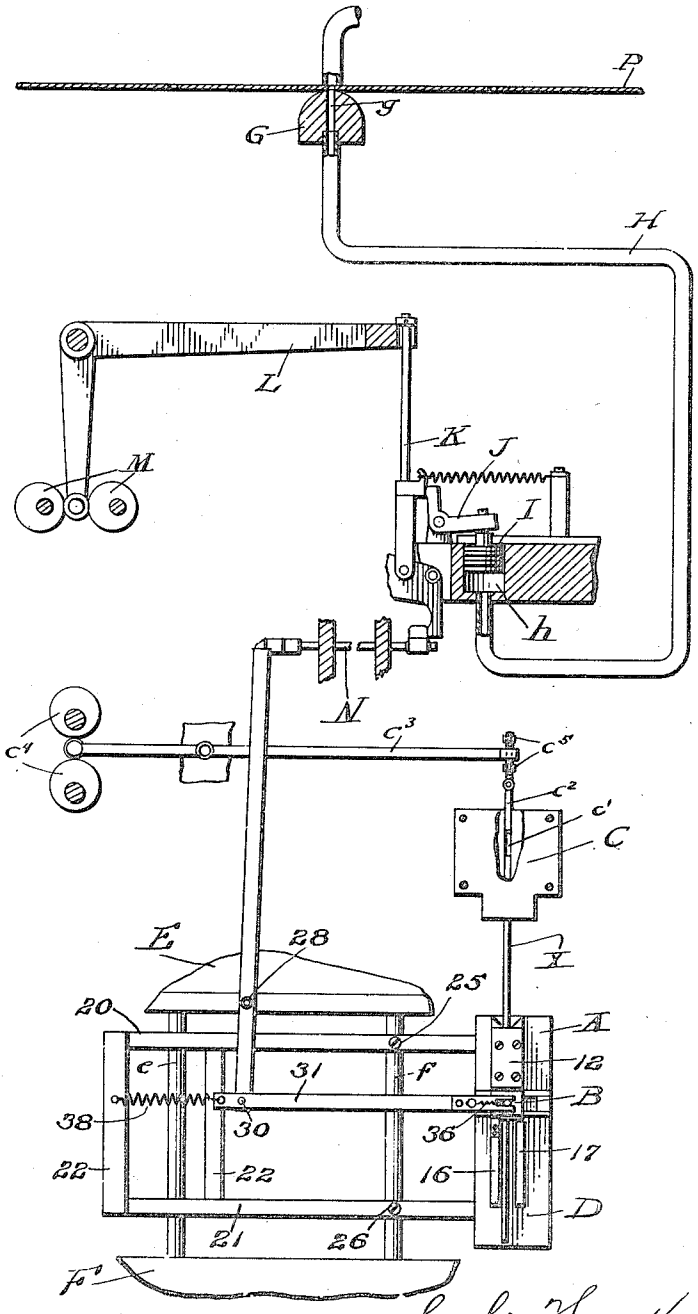
APPLICATION FILED DEC. 11, 1914.

1,193,388.

Patented Aug. 1, 1916.

4 SHEETS—SHEET 1.

FIG. 1



Witnesses

A. M. Trogner

A. Stockman

Inventor

C. C. Hockman

By C. J. Stockman

Attorney

C. C. HOCKMAN.

MEANS FOR MAKING PRINTERS' LEADS OR RULES.

APPLICATION FILED DEC. 11, 1914.

1,193,388.

Patented Aug. 1, 1916.

4 SHEETS—SHEET 2.

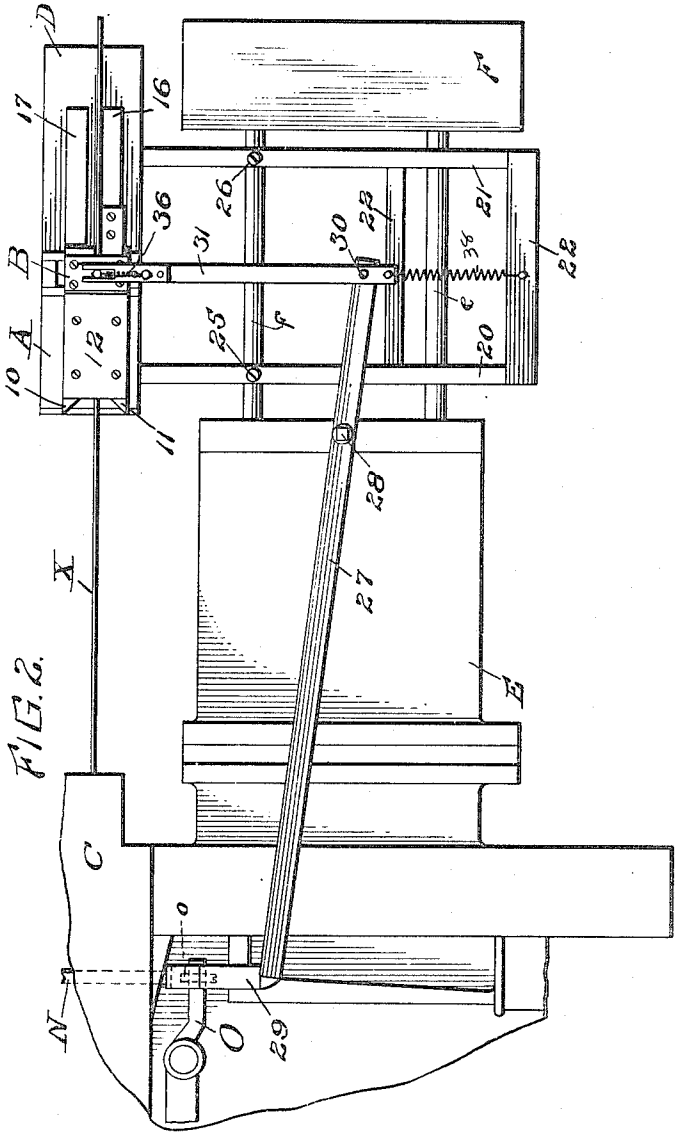


FIG. 2.

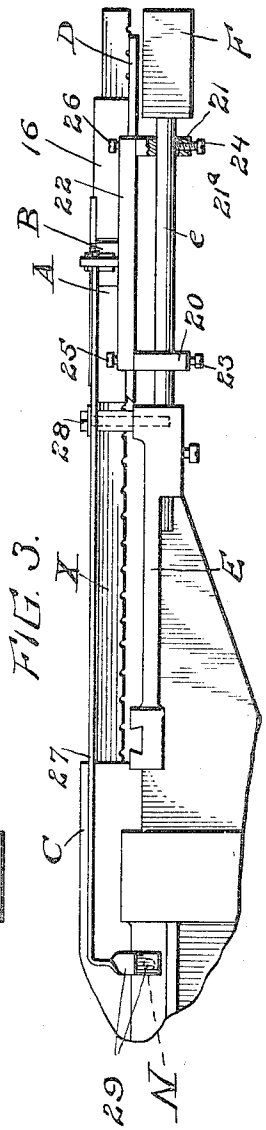


FIG. 3.

Witnesses

A. M. Trogner.

A. Stockman

Inventor

C. C. Hockman

By C. J. Hockman

Attorney

C. C. HOCKMAN.

MEANS FOR MAKING PRINTERS' LEADS OR RULES.

APPLICATION FILED DEC. 11, 1914.

1,193,388. Patented Aug. 1, 1916.

4 SHEETS—SHEET 3.

FIG. 4

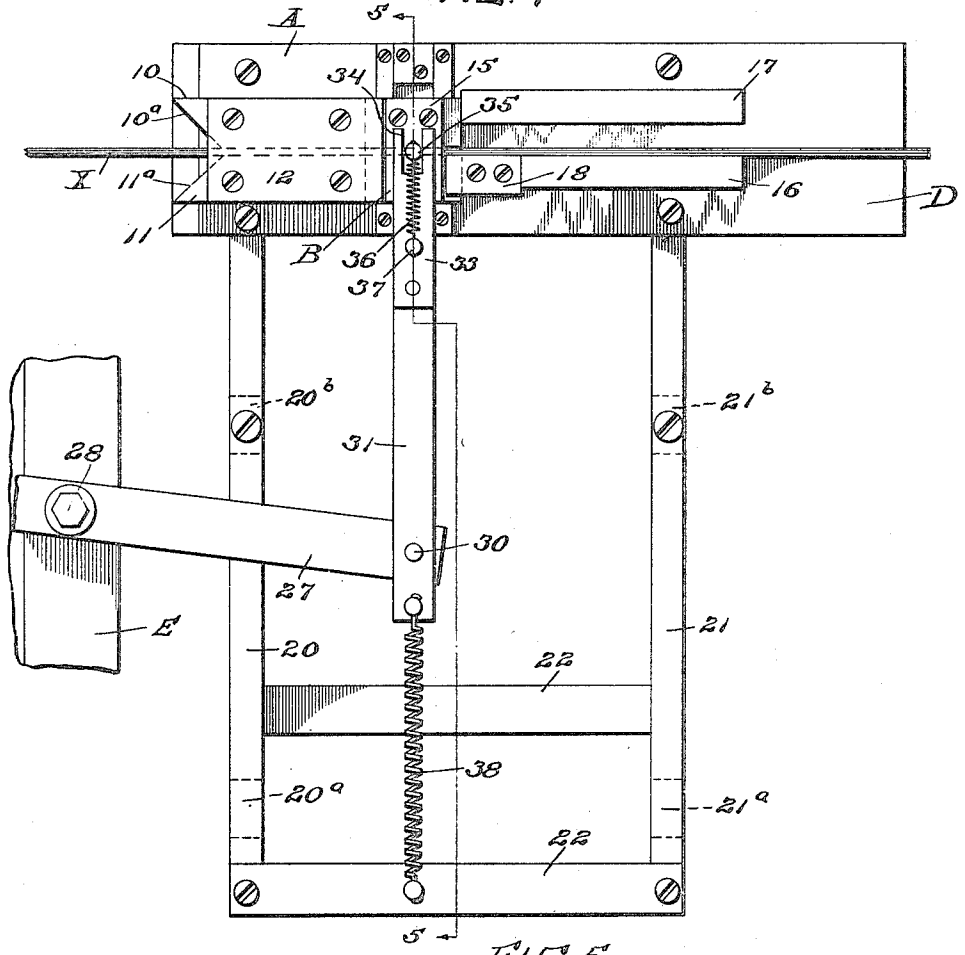
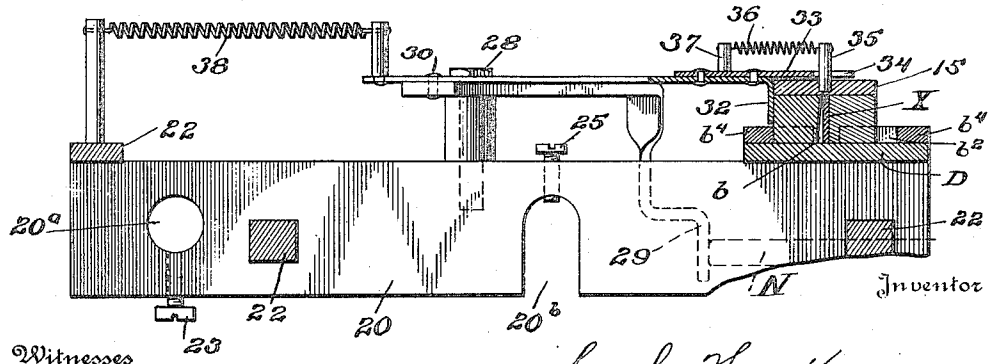


FIG. 5.



Witnesses

A. M. Fognes.

A. Stockman.

Inventor

C. C. Hockman

By C. J. Stockman

Attorney

C. C. HOCKMAN.

MEANS FOR MAKING PRINTERS' LEADS OR RULES.

APPLICATION FILED DEC. 11, 1914.

1,193,388.

Patented Aug. 1, 1916.

4 SHEETS—SHEET 4.

FIG. 6.

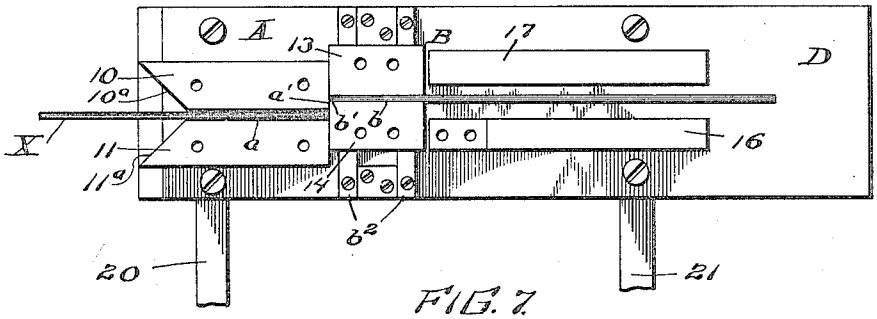


FIG. 7.

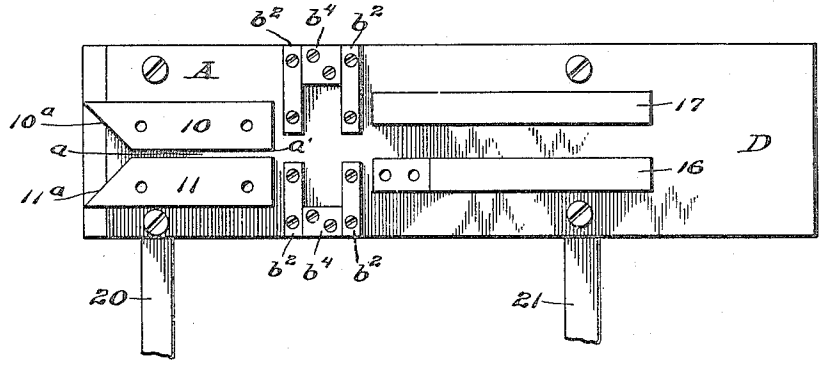


FIG. 8.

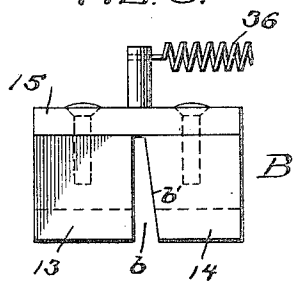
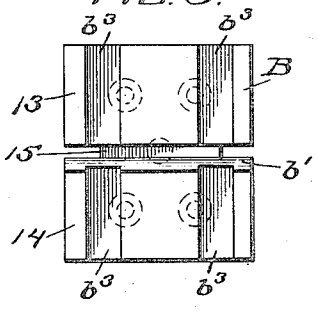


FIG. 9.



Inventor

C. C. Hockman

By C. J. Hockman Attorney

Witnesses

A. M. Trogner

A. Stockman

UNITED STATES PATENT OFFICE.

CHARLES C. HOCKMAN, OF DORCHESTER, MASSACHUSETTS, ASSIGNOR TO LANSTON MONOTYPE MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF VIRGINIA.

MEANS FOR MAKING PRINTERS' LEADS OR RULES.

1,193,388. Specification of Letters Patent. Patented Aug. 1, 1916.

Application filed December 11, 1914. Serial No. 876,661.

To all whom it may concern:

Be it known that I, CHARLES C. HOCKMAN, a citizen of the United States, residing at Dorchester, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Means for Making Printers' Leads or Rules, of which the following is a specification.

In the well known monotype machine the matter is composed by striking the proper keys of the key-board, each key struck producing perforations in a paper ribbon. This paper ribbon is associated with mechanism of the casting machine whereby it controls automatically the character the casting machine will produce. The key-board includes justification keys, and at the end of the line, or at any desired point in it, the compositor at the key-board justifies the line, or portion of it by striking the justification keys. Thus the ribbon when placed in the casting machine compels the latter to cast type in justified lines exactly as composed by the compositor at the key-board.

In making up the matter it frequently becomes necessary to insert leads between the lines in order to secure required spacing. The monotype machine has been provided with an attachment for casting metal into strips of continuous lengths, these strips being later cut or sawed by hand into sections of appropriate lengths for the leads, that is to say, into lengths according with the lengths of the lines which are to be separated from each other thereby. The strip casting attachment referred to is so arranged that it can be applied to the type casting machine by removing the type casting mold or matrix and substituting the strip casting mold therefor, and by it a strip of continuous length is formed of a series of separately cast sections whose ends are integrally united with each other, the attachment having a molding chamber into which molten metal is squirted in successive jets with intervening pauses by the parts of the type casting machines which in the type-casting operation squirts the molten metal into the type mold, the sequence of squirting operations or the temperature of the molten metal being so arranged in the formation of the strips that the end of the previously formed section will be melted and united integrally with the newly forming section. The molding chamber, moreover, has one of its walls formed by a gate or blade which confronts the end of the formed section and is spaced therefrom while molten metal is being injected into the molding chamber, the distance between the end of the formed section and the inner end of the gate or blade determining the length of the section to be formed. This gate or blade is reciprocated by a lever which derives movement from the type carrier cam of the type casting machine, its movement in one direction being away from the formed section of strip and opening the chamber for a supply of molten metal and occurring immediately before the metal is squirted into said chamber, and its movement in the other direction forcing the strip away from the mold. The throw of this gate or blade is adjustably regulated in a suitable way to accord with the length of the sections of the strip which are to be cast at each operation of the casting mechanism. This manner of producing the leads necessitates manual labor in the cutting or sawing of the strips into leads of the required lengths and moreover results oftentimes in the production of useless leads, as it frequently happens that the leads and rules when cut by hand are bent to an extent which prevents their being used.

It is one of the important purposes of the present invention to provide a means which will automatically produce leads or rules of the sizes required, without necessitating any manual sawing or cutting thereof.

Another of the important purposes of the present invention is to provide an apparatus capable of producing leads of required lengths automatically, having the further characteristic of being applicable to the monotype casting machine.

In accordance with these severally new and important purposes of the invention, I have produced an apparatus involving in its construction a correlation of parts whereby the strips of metal while being cast are cut into sections of appropriate predetermined length for use as leads or rules, the cutting of the strip into the sections re-

ferred to being accomplished automatically under control of a ribbon which is perforated by proper keys of the key-board of the monotype machine, and in which construction the parts also are so correlated that the casting and cutting mechanism may be applied to the monotype machine.

In the herein exemplified form of the invention I have, in the carrying out of the before mentioned important purposes thereof, and other purposes which will be understood from the hereinafter description of the preferred embodiment of the invention, produced an apparatus which has several new and useful features among which the following are particularly mentioned to wit: (1) A casting machine for leads or rules embodying a casting member, a cutting member and a means for automatically operating the cutting member under control of an appropriate part of a monotype casting machine; (2) a casting machine for leads or rules embodying a casting member, a cutting member, a perforated controller and mechanism controlled by the perforated controller for automatically operating the cutting member; (3) a casting machine for leads or rules embodying a casting member, a cutting member and a means for automatically operating the cutting member to cut into appropriate lengths the strip of metal being cast; (4) certain new and useful features in the construction of the cutting part of the apparatus.

Having in a general way set forth some of the important aims of the present invention I will now proceed to describe the preferred embodiment wherein all of the said aims or purposes are carried into practice; but I would have it understood that this embodiment is merely exemplary and that important changes in the details may be made and that the invention, or its several new features, may be otherwise and variously embodied without departing from the spirit thereof or the scope of the subjoined claims.

In the accompanying drawings, wherein like characters of reference indicate similar parts in the various views: Figure 1 is a diagrammatic representation of a casting and cutting mechanism embodying the present improvements; several of the parts thereof being parts which are now employed in the well known monotype casting machine; Fig. 2 is a plan view of the cutter mechanism forming a part of the present invention, together with certain parts of a monotype machine which are associated therewith; Fig. 3 is a side elevation of the parts shown in Fig. 2; Fig. 4 is a detail plan view of the cutter mechanism, on a larger scale than the preceding figure; Fig. 5 is a vertical section on the line 5—5 of Fig. 4; Fig. 6 is a detail plan view of the cutters with the cover plates removed; Fig. 7 is a detail plan view showing the fixed cutting member and the guide for the movable cutting member, the latter cutting member and the cover plates being removed; Fig. 8 is an end view of the movable cutting member; and Fig. 9 is an inverted plan view of the latter member.

The cutting mechanism herein exemplified includes two relatively movable strip cutting and guiding members A and B having channels a and b respectively through which the strip of metal X is fed as it comes from the mold C. Preferably, the member A is fixed and the member B mounted to reciprocate across the end of the member A, the member B having an inclined cutting edge b' which coöperates with the edge a' of the member A in the severing of the strip X, the operation being substantially a shearing one upon the strip as will be apparent. The movable member B is guided in its reciprocations, preferably by strips b^2 seated in recesses b^3 formed in the lower surface of said member, and stops b^4 are provided to engage the ends of the member B and limit its movement. In practice, the member A is preferably formed of two blocks 10 and 11 spaced to provide the channel a and connected with each other by a plate 12 mounted upon their upper surfaces, the said blocks having beveled ends 10^a and 11^a arranged to form a gradually-reducing mouth leading to said channel. The member B in practice is also preferably formed of two blocks 13 and 14 spaced to provide the channel b and having a top plate 15 suitably secured to the blocks and connecting them with each other. The members A and B are preferably mounted on a suitable base plate D having front and rear spaced elements 16 and 17 which guide and support the lead. The front element 16 is preferably provided with a projection 18 which extends over the movable member B and holds it down in its proper plane of operation.

The cutting mechanism herein exemplified includes, in addition to the parts just described, an appropriate frame by which it is adapted to be mounted upon rods, as e, f which project from the galley stand E and support the galley pan support F of the at present well known monotype casting machine. When the herein exemplified cutting mechanism is to be applied to such a machine the galley pan support F is removed from the machine in order to afford room for the cutting mechanism, and after the cutting mechanism has been applied, the galley pan support may be replaced on the rods e, f in the position shown best in Fig. 2. The frame comprises side members 20 and 21 connected with each other by cross pieces 22, and is preferably mounted on the rods e, f in a manner which permits the cutting and guiding members to be adjustably fixed in position to receive the strip X and sever the

same. Such a connection is preferably effected as follows:

The members 20 and 21 are formed with openings 20^a and 21^a which receive the rod *e* and by which the frame is pivotally mounted on said rod. Said members also have open ended slots 20^b and 21^b which receive the rod *f*. Adjacent to the openings 20^a and 21^a are screws 23, 24 which extend upwardly against the rod *e*, and adjacent to the openings 20^b, 21^b are screws 25 and 26 which extend downwardly through the members 20 and 21 into engagement with the rod *f*. These screws coöperate with each other, by their engagement with the rods, to raise or lower the cutter to a predetermined height.

The cutting mechanism further embodies a means by which the movable member B may be operated automatically. In the herein exemplified form of the invention this means includes certain parts of the justifying mechanism of the monotype casting machine, a perforated controller for operating said parts of the justifying mechanism automatically, or controlling the operation thereof, and connections between the said parts and said member B.

The preferred embodiment of the invention illustrated in the accompanying drawings and herein particularly set forth does not essentially call for any particular changes in the monotype casting machine, for which reason it is considered to be unnecessary to illustrate or describe said machine in detail. Inasmuch, however, as certain parts of the monotype casting machine are utilized in the preferred embodiment of the invention it is thought to be advisable to illustrate such parts in a conventional or diagrammatic way. The parts referred to are those parts of the justifying mechanism which are employed in the illustrated embodiment of the invention as a part of the means for operating the member B and also the galley stand E and galley pan support F. As is well known to those familiar with the monotype casting machine there is employed in such machine a cross girt, indicated at G, having a perforation *g*, from which an air pipe H leads to a chamber *h* in which is an air pin I, the said air pin operating upon a bell crank J one of whose arms is so correlated with a justification wedge lever arm K that it pushes the said arm K into operative relation with a centering pin lever L which is operated positively by cams M mounted on cam shafts M′ and raises the justification wedge lever arm K when the latter has been connected with it as described. This raising of arm K causes the same to press the galley trip rod N and this rod, in the monotype casting machine, operates upon a trip lever O, the latter in turn shoving the line of type forward. In the machine referred to there is also a suitable source of supply of compressed air, not shown, which air operates the air pin I under control of perforations in a paper ribbon, or "paper tower", the ribbon being indicated at P. When the machine referred to is employed for operating the cutter mechanism it is preferred in the present invention to disconnect the galley trip rod N from the trip lever O, this being conveniently accomplished merely by adjusting the set screw *o* (see Fig. 2,) away from the end of the galley trip rod, it being understood that in these machines the set screw is normally adjusted in the end of a trip lever so that its end will contact with the trip rod and thereby cause the trip lever to be operated by the trip rod.

In the herein exemplified form of the invention the cutter mechanism is provided with a lever 27 which is fulcrumed at 28 on the galley stand E and has one of its ends provided with a lateral arm 29 which is arranged in the path of movement of the galley trip rod N. The other end of the lever 27 is pivotally connected at 30 to an arm 31 which in turn is connected to the movable member B of the cutter. Preferably, the end of the arm 31 adjacent to the end of the cutter member B is bent downward as shown at 32 in Fig. 5 and is provided with a rearwardly extending blade 33 having a slot 34 through which projects a pin 35 rising from the upper surface of the member B, the connection between the arm 31 and the member B being thereby of a lost-motion nature, it being noted that the downwardly-bent portion 32 is not fastened to the member B. A retractile spring 36 is connected to the pin 35 and to a pin 37 on the plate 33 and effects the forward movement of the member B when the latter has been pressed rearward by its actuating levers, like movement of the said levers being effected by a retractile spring 38 which connects the end of the arm 31 with one of the cross members 22 of the frame.

It will now be apparent that when the galley trip rod N is operated it will by its engagement with the projection 29 from the lever 27 press the said lever in a direction which moves the member B transversely across the end of the member A, the cutting edges *a′* and *b′* of said members coöperating during such movement to cleanly sever from the strip X a section thereof of a length appropriate for use as a lead or rule, the operation of the said galley trip rod being controlled, as already explained, by perforations in the ribbon P. When the movable member B has been moved to the rear by the operation of the arm 27 it is restored to its former position by the spring 36, the said lever 27 being similarly restored by the spring 38, ready for another cutting operation. The lost-motion connection between the arm 31

and the cutting member B enables the latter to traverse a straight guided path and the means herein described for restoring such cutting member and its actuating lever 27 and arm 31 to their forward position ready for another operation are of advantageous nature particularly when the mechanism is intended for use as a part of a monotype casting machine.

The strip casting mechanism may be of any suitable kind, but I prefer to employ the one which is now supplied to be attached to the type-casting machine when it is desired to cast strips for conversion into leads or rules. In the strip-casting attachment referred to the mold C is so arranged that it may be removably applied to the type-casting machine (the type mold of the latter being removed when the mold C is being used and replaced when the casting of type is again to be performed by the machine) the said mold C when in place on the machine being connected to the pumping mechanism from which it receives the supply of molten metal, the latter mechanism being the one which supplies molten metal to the type-casting mold when the machine is casting type. The strip mold C has a reciprocatory gate or blade c^2 whose inner end forms the rear wall of the molding chamber c'. This gate or blade is reciprocated by means which are well known as a part of the type casting machine and are used in the hereinbefore referred to attachment for casting strips. I consider it to be unnecessary to particularly illustrate or describe said means but have shown the same diagrammatically, c^3 indicating the type carrier cam lever which is positively operated by the type carrier cams c^4 (the latter in practice being mounted on the same shafts as the cams M), the said type carrier cam lever having a lost-motion connection with the gate or blade c^2, the gate traveling ordinarily about one-half inch while the throw of the lever is considerably greater. The extent of the lost motion may be regulated as required to variably determine the length of movements of the gate or blade, by varying the distance between the nuts c^5, the said nuts being adjustable for this purpose. The front wall of the mold C is the section of lead strip previously cast and to which it is desired to cast another section. In operation molten lead is squirted into the chamber c' when the gate or blade c^2 is in retracted position and after the metal has been allowed to cool slightly and has become united to the end of the previously cast section, the gate or blade c^2 is automatically moved forward, forcing the strip X out from the mold, toward the cutting mechanism, after which the gate or blade is again retracted and the chamber is opened to receive another charge of molten metal, the phases of movements of the gate or blade c^2 being properly timed with relation to the operation of the pump which forces the molten metal into the chamber c' by means which are well known as a part of the monotype machine The intervals between the operations of the cutting mechanism is determined by the distance between the perforations in the ribbon P and in turn control the length of the severed sections which respectively constitute a lead or rule.

In the composing machine at present used for producing the perforations in the ribbon employed for controlling the operation of the casting and justifying mechanism of the type casting machine there is a blank key, so called. The operation of this key feeds the ribbon but does not perforate the same. In producing the perforations in the ribbon P for controlling the operation of the cutting mechanism, the composer strikes the blank key the number of times which accords with the intervals desired between the perforations and then strikes the justification key, the latter producing the perforation; he then again strikes the blank key the required number of times, following this with another operation of the justification key, and so on until the required number of perforations arranged at predetermined intervals have been produced in the ribbon for the purpose of casting the required number of rules. For the purpose of illustration, assuming that leads or rules five inches long are to be produced and that each operation of the blank key represents a distance of one-half inch, it will be apparent that the blank key is struck ten times between each striking of the justification key.

The casting operations must be so correlated with the cutting operations that the latter will occur only when the required length of lead has been cast into strip form and, moreover, must take place during the pauses of the step-by-step feeding of the strip by the gate c^2. Hence the length of reciprocatory movements of the gate is so arranged that each section cast will be an even devisor of the length of lead or rule required, it being remembered that the length of each section of the strip cast accords with the movement of the gate as does the length of each feeding movement of the strip: the cutting occurring during the non-feeding movements of the gate or while the gate is stationary.

Having now described the invention what I believe to be new and desire to secure by Letters Patent, is:—

1. In combination, mechanism adapted to mold a strip of metal composed of successively cast sections having their ends integrally united with each other, the said mechanism including means for intermittently feeding the strip away from the mold-

ing mechanism and a cutting mechanism including a perforated controller whose perforations are spaced at intervals such that each cutting operation occurs when a predetermined number of sections of the strip have been cast and during the pauses in the movements of the strip.

2. In combination, mechanism adapted to mold a strip of metal composed of successively cast sections having their ends integrally united with each other, the said mechanism including a molding chamber and a reciprocatorily mounted intermittently-operated gate or blade whose movement controls the length of the sections cast, the said gate or blade also serving to feed the strip intermittently away from the mold, and a cutting mechanism having means arranged to operate it during the pauses in the movement of the strip and after a predetermined number of sections thereof have been cast.

3. In combination, means for molding a strip of metal, and a cutting mechanism comprising relatively movable members having channels to receive the strip as it comes from the molding means and cutting edges adjacent to the channels, the said cutting mechanism also having means for automatically operating it at predetermined times.

4. In combination, means for molding a strip of metal and a mechanism for cutting said strip automatically into sections of predetermined length while the strip is being formed, the said cutting mechanism having a perforated element for controlling the times of the operations thereof.

5. In combination, mechanism for molding a strip composed of successively cast sections having their ends integrally united, the said mechanism including a molding chamber in which the said sections are successively cast and united with each other to form the strip and an element for intermittently feeding the strip away from the molding mechanism, and a cutting mechanism arranged to sever the strip into sections of predetermined length, the said cutting mechanism including a controller for timing its cutting operations with relation to the casting and feeding operations.

6. In combination, mechanism for molding a strip composed of successively cast sections having their ends integrally united, the said mechanism including a molding chamber in which the said sections are successively cast and united with each other to form the strip and an element for intermittently feeding the strip away from the molding mechanism, and a cutting mechanism arranged to sever the strip into sections of predetermined length, the said cutting mechanism including a perforated controller for timing its cutting operations with relation to the casting and feeding operations, the perforations in said controller being disposed at spaced distances bearing a definite relationship to the length of the sections cast and being arranged to cause the cutting operations to occur during the pauses in the intermittent movements of the strip.

7. A strip casting and cutting mechanism for attachment to a type casting machine, including a cutting mechanism arranged to be connected with an appropriate part of the justifying mechanism of the type casting machine, and a controller for timing the operation of the cutting mechanism.

8. A strip casting and cutting mechanism for attachment to a type casting machine, including a cutting mechanism arranged to be connected with an appropriate part of the justifying mechanism of the type casting machine, means for casting the strip and feeding it intermittently toward the cutting mechanism and a controller for timing the operations of the cutting mechanism.

9. A strip casting and cutting mechanism for attachment to a type casting machine, including a cutting mechanism arranged to be connected with an appropriate part of the justifying mechanism of the type casting machine, means for casting the strip and feeding it intermittently toward the cutting mechanism and a controller for timing the operations of the cutting mechanism, the said controller having a perforated element whose perforations are arranged to cause the cutting mechanism to sever the strip at predetermined intervals with relation to the casting and feeding operations.

10. A strip casting and cutting mechanism for attachment to a type casting machine, comprising a cutting mechanism having operating means arranged to be connected with an appropriate part of the justifying mechanism to be actuated thereby, means for casting the strip and feeding it intermittently to the cutting mechanism, the cutting mechanism being channeled to receive the strip, and a controller for timing the operations of the cutting mechanism, the said controller being arranged to be connected with the justifying mechanism of the type casting machine.

11. In a type casting machine having justifying mechanism, a strip casting and cutting mechanism for attachment thereto, comprising a cutting mechanism having operating means connected with an appropriate part of the justifying mechanism, means for casting the strip and feeding it intermittently toward the cutting mechanism, the cutting mechanism including channels which receive the strip as it comes from the casting means, and a controlling means having connection with the part of the justifying mechanism which operates the cutting mechanism, the said controlling means operating through the justifying mechanism to cause

the cutting mechanism to sever the strip into sections of predetermined length.

12. In a type casting machine having justifying mechanism; a strip casting and cutting mechanism for attachment thereto, comprising a cutting mechanism having operating means connected with an appropriate part of the justifying mechanism, means for casting the strip and feeding it intermittently toward the cutting mechanism, the cutting mechanism including relatively movable members having channels to receive the strip and cutting edges to sever the same, and a controlling means having connection with the part of the justifying mechanism which operates the cutting mechanism, the said controlling means operating through the justifying mechanism to cause the cutting mechanism to sever the strip into sections of predetermined length.

13. In a type casting machine having justifying mechanism including parts which are intermittently connected with each other, a strip casting and cutting mechanism for attachment to said machine, comprising a cutting mechanism having operating means arranged to be connected to one of said parts of the justifying mechanism, means for casting the strip and feeding it intermittently to the cutting mechanism, and means for controlling the connection of said parts of the justifying mechanism, to thereby cause the cutting mechanism to sever the strip into sections of predetermined length.

14. In a type casting machine having justifying mechanism including parts which are intermittently connected with each other, and an air-operated means for controlling such connection, the said means including an element having perforations which control the air, a strip casting and cutting mechanism for attachment to said machine, comprising a cutting mechanism having operating means arranged to be connected to one of said parts of the justifying mechanism, and means for casting the strip and feeding it intermittently to the cutting mechanism, the perforated element of the controlling means having its perforations so arranged that the cutting mechanism will perform its cutting operation at predetermined times with relation to the casting and feeding operations.

15. In combination, means for molding and feeding a strip of metal, a galley trip rod, and a cutting mechanism, the said cutting mechanism having channels to receive the strip as it comes from the mold, the said mechanism also having cutting portions to sever said strip and means whereby it is operated by the galley trip rod.

16. In combination, means for molding and feeding a strip of metal, a galley trip rod, and a cutting mechanism having relatively movable members provided with channels to receive the strip as it comes from the mold and cutting edges adjacent to said channels, the said mechanism also including means whereby it is operated by the galley trip rod.

17. In combination, means for molding and feeding a strip of metal, a galley trip rod, means whereby the trip rod is operated intermittently at times predetermined with relation to the casting and feeding operations and a cutting mechanism operated by said trip rod.

18. A cutting mechanism comprising a frame having openings adapting it to be connected to a type casting machine, cutting mechanism carried by the frame, and adjustable means for holding the frame to properly position the cutting mechanism with relation to the type casting machine.

19. A cutting mechanism comprising a frame having openings adapting it to be connected to a type casting machine, cutting mechanism carried by the frame, and adjustable means for holding the frame to properly position the cutting mechanism with relation to the type casting machine, the cutting mechanism including relatively movable members, guides to receive the material to be cut and coöperating cutting edges.

20. In combination, a frame having openings adapting it to be connected to a type casting machine, means applicable to such machine for casting and intermittently feeding a strip of metal therefrom, cutting and guiding members carried by the frame and adjustable means for securing the frame in position to place the cutting and guiding mechanism with relation to the strip as the latter is fed from the casting means.

21. In combination, means for casting and feeding a strip of metal, and a cutting mechanism comprising relatively movable cutting members having channels to receive the strip as it is cast and fed and also having cooperating cutting edges adjacent the channels, and mechanism arranged to operate the movable member intermittently, the said mechanism comprising a member having a lost-motion connection to the movable cutting-member.

22. In combination, means for casting and feeding a strip of metal, and a cutting mechnism comprising relatively movable cutting members having channels to receive the strip as it is cast and fed and also having coöperating cutting edges adjacent the channels and a mechanism arranged to operate the movable member in a timed relation to the said mechanism comprising a member having a lost-motion connection to the movable cutting-member and the said connection including a spring.

23. In combination, means for molding and feeding a strip of metal, a galley trip

rod, means whereby the trip rod is operated in a timed relation to the casting and feeding operations, and a cutting mechanism comprising a movable cutting member and means connecting said member with the galley trip rod, the said means including a lever, an arm having connection with the lever and cutting member and a returning spring.

24. In combination, means for molding and feeding a strip of metal, a galley trip rod, means whereby the trip rod is operated automatically at times predetermined with relation to the casting and feeding operations, and a cutting mechanism comprising a movable cutting member and means connecting said member with the galley trip rod, the said means including a lever, an arm having connection with the lever and cutting member and a returning spring, the connection between the arm and cutting member being of a lost-motion nature.

25. In combination, means for molding and feeding a strip of metal, a galley trip rod, means whereby the trip rod is operated intermittently at times predetermined with relation to the casting and feeding operations, and a cutting mechanism comprising a movable cutting member and means connecting said member with the galley trip rod, the said means including a lever, an arm having connection with the lever and cutting member and a returning spring, the connection between the arm and cutting member being of a loose nature and including a spring.

26. In combination, means for molding and feeding a strip of metal, a galley trip rod, means whereby the trip rod is operated intermittently at times predetermined with relation to the casting and feeding operations, and a cutting mechanism comprising relatively-movable cutting members having channels to receive the strip as it is cast and fed and also having coöperating cutting edges adjacent the channels, and mechanism connecting the movable member with the galley trip rod, the said mechanism including a returning spring.

27. In combination, means for molding and feeding a strip of metal, a galley trip rod, means whereby the trip rod is operated intermittently at times predetermined with relation to the casting and feeding operations, and a cutting mechanism comprising relatively-movable cutting members having channels to receive the strip as it is cast and fed and also having coöperating cutting edges adjacent the channels, a lever connected to the galley trip rod, an arm connecting the lever with the movable member and a returning spring.

28. In combination, means for molding and feeding a strip of metal, a galley trip rod, means whereby the trip rod is operated intermittently at times predetermined with relation to the casting and feeding operations, and a cutting mechanism comprising relatively-movable cutting members having channels to receive the strip as it is cast and fed and also having coöperating cutting edges adjacent the channels, a lever having connection with the galley trip rod, an arm having connection with said lever and also having a lost-motion connection with the movable member and a plurality of returning springs, one of said springs being arranged in the connection between the arm and movable member.

29. In combination, a type casting machine having means for casting and feeding a strip of metal, a cutting mechanism comprising a fixed member having a longitudinal channel, a member movable across one end of the fixed member and provided with a transverse channel, said channels being arranged to receive the material as it is cast and fed and said members also having cooperating cutting edges and an operating mechanism for the movable member, including an arm having a lost-motion connection with the movable member and an actuating lever having connection with said arm and adapted to be operated by a part of the type-casting machine.

30. In combination, means for casting and feeding a strip of metal, a cutting mechanism comprising a base, a fixed member on said base, a member movable on the base across one end of the fixed member, the fixed and movable members having channels to receive the material as it is cut and fed and also having coöperating cutting edges adjacent to the channels, the movable member and base also having coöperating guiding portions for the movable member and means whereby the movable member is operated in a timed relation to the casting and feeding operations.

31. In combination, means for casting and feeding a strip of metal, a cutting mechanism comprising a base, a fixed member on said base and a member movable on the base across one end of the fixed member, the fixed and movable members having channels to receive the material as it is cut and fed and also having coöperating cutting edges adjacent to the channels, the base also having means forming a channel beyond the movable member and the movable member and base having coöperating guiding portions for the movable member, and means whereby the movable member is operated in a timed relation to the casting and feeding operations.

32. The combination with a casting mechanism, of a cutting mechanism, movable elements constituting a part of the casting mechanism and moving in unison therewith, and means for bringing the cutting mecha-

nism into operative connection with said movable elements at intervals whereby said elements actuate the cutter.

33. The combination with a casting mechanism, of a cutting mechanism, members constituting an actuating means between the casting mechanism and the cutting mechanism whereby the latter is operated by the former, said members being normally out of engagement with each other, and means for establishing a connection between said members at intervals.

34. The combination with a casting mechanism, of a cutting mechanism, members constituting an actuating means between the casting mechanism and the cutting mechanism whereby the latter is operated by the former, said members being normally out of engagement with each other and controllable means for establishing a connection between said members at intervals.

35. The combination with a casting mechanism, comprising a moving part of a cutting mechanism, means for imparting movement to said cutting mechanism intermittently from the moving part of the casting mechanism, whereby the cutting mechanism is caused to sever the article cast, and means for varying the time at which said movement takes place.

36. The combination with a casting mechanism, comprising a moving part of a cutting mechanism, means for imparting movement to said cutting mechanism intermittently from the moving part of the casting mechanism, whereby the cutting mechanism is caused to sever the article cast, and controllable means for varying the time at which said movement takes place.

37. The combination with a casting mechanism comprising a moving element, of a cutting mechanism arranged to act upon the material produced by said casting mechanism and means normally out of the path of, but arranged to be moved into the path of said movable member of the casting mechanism and serving when moved into the path of said member to actuate the cutting mechanism from the casting mechanism.

38. The combination with a casting mechanism comprising a moving element of a cutting mechanism arranged to act upon the material produced by said casting mechanism and means normally out of the path of, but arranged to be moved into the path of said movable member of the casting mechanism and serving when moved into the path of said member to actuate the cutting mechanism from the casting mechanism and variable controllable means for determining the time at which said actuation of the cutting mechanism takes place whereby articles of varying dimensions are formed by the casting mechanism between said actuations of the cutting mechanism.

39. In an apparatus such as described, the combination of the following instrumentalities, to-wit, means for casting successively sections of an integral strip, means for feeding the strip intermittently distances corresponding to the length of the sections cast and means for severing the strip into sections corresponding in length to multiples of the length of the cast sections.

40. In an apparatus such as described, the combination of the following instrumentalities, to-wit: means for casting successively sections of an integral strip, means for varying the length of the individual sections cast and feeding the strip intermittently distances corresponding to the length of the sections cast and allowing the strip to remain at rest between feed movements, and means for severing the strip into sections corresponding in length to multiples of the length of the cast sections.

41. In combination, mechanism adapted to mold a strip of metal composed of successively cast sections having their ends integrally united with each other, the said mechanism including a molding chamber and a reciprocatorily mounted intermittently-operated gate or blade whose movement controls the length of the sections cast, the said gate or blade also serving to feed the strip intermittently away from the mold, means for varying the length of the movement of the gate or blade, and a cutting mechanism having means arranged to operate it during the pauses in the movement of the strip and after a predetermined number of sections thereof have been cast.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES C. HOCKMAN.

Witnesses:
GEORGE F. TUCKER,
ALBERT F. FLINT.