

No. 647,319.

Patented Apr. 10, 1900.

J. J. NASH.
BULLET CASTING MACHINE.

(Application filed Aug. 23, 1899.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

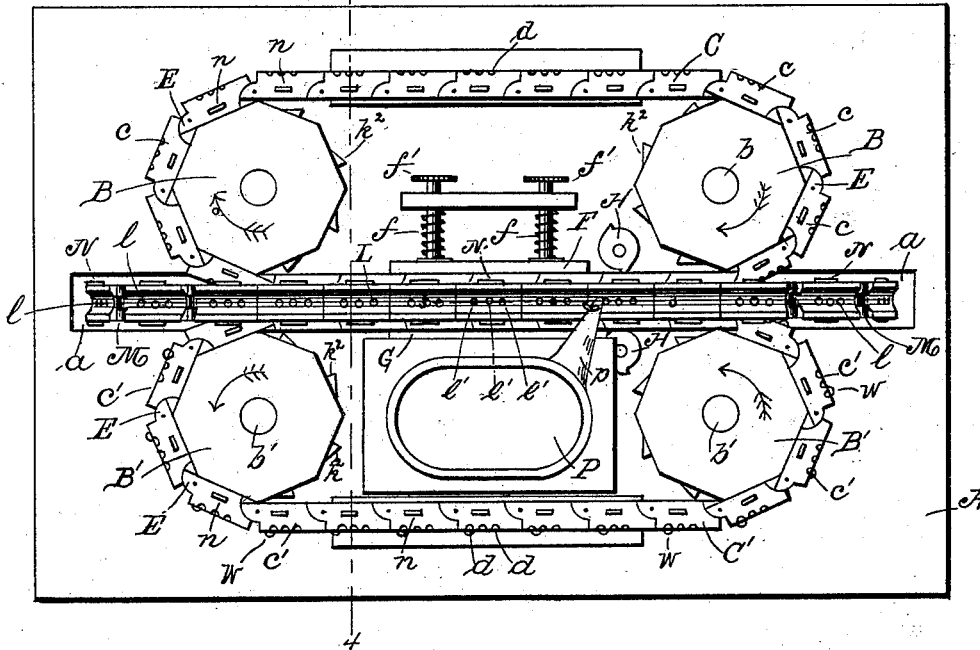
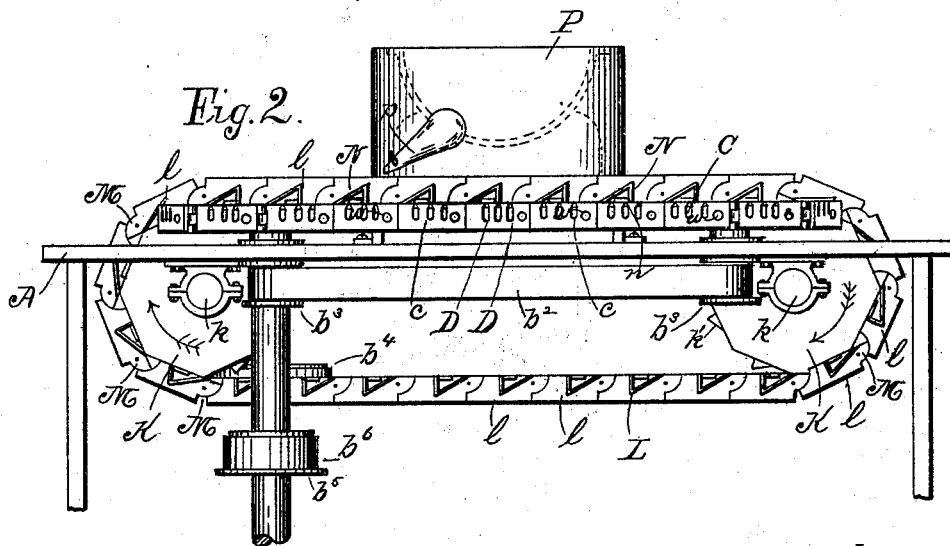


Fig. 2.



Witnesses.

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Fig. 3.

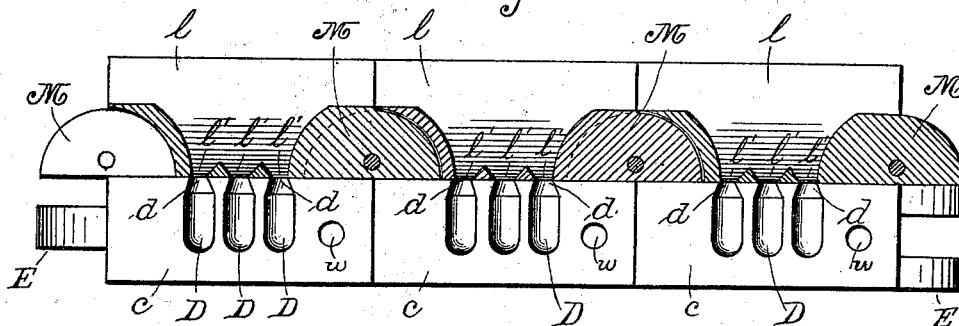
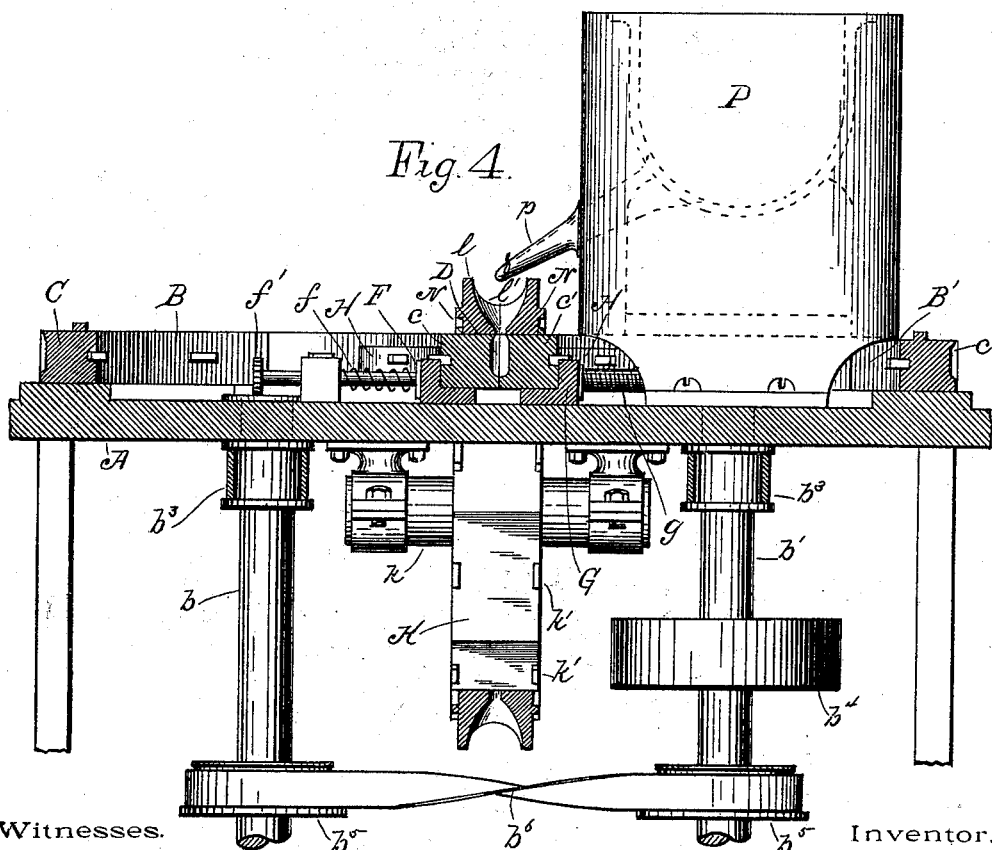


Fig. 4.



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Fig. 5.

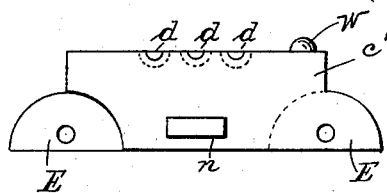


Fig. 6.

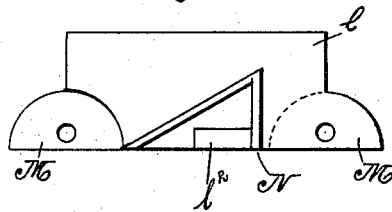
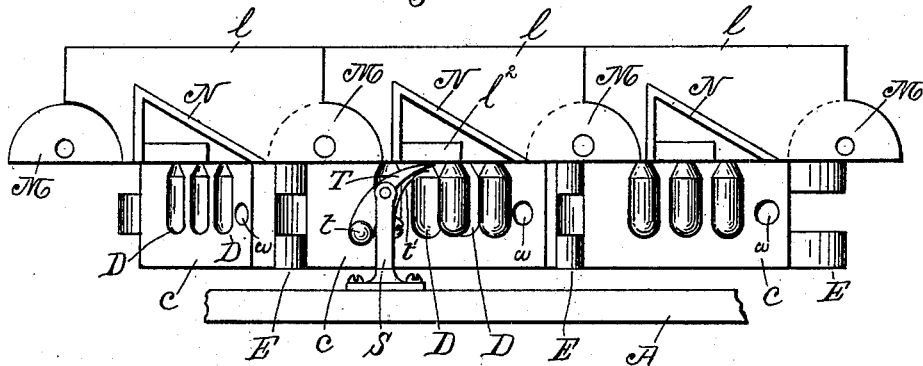


Fig. 7.



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4 Sheets—Sheet 4.

Fig. 8.

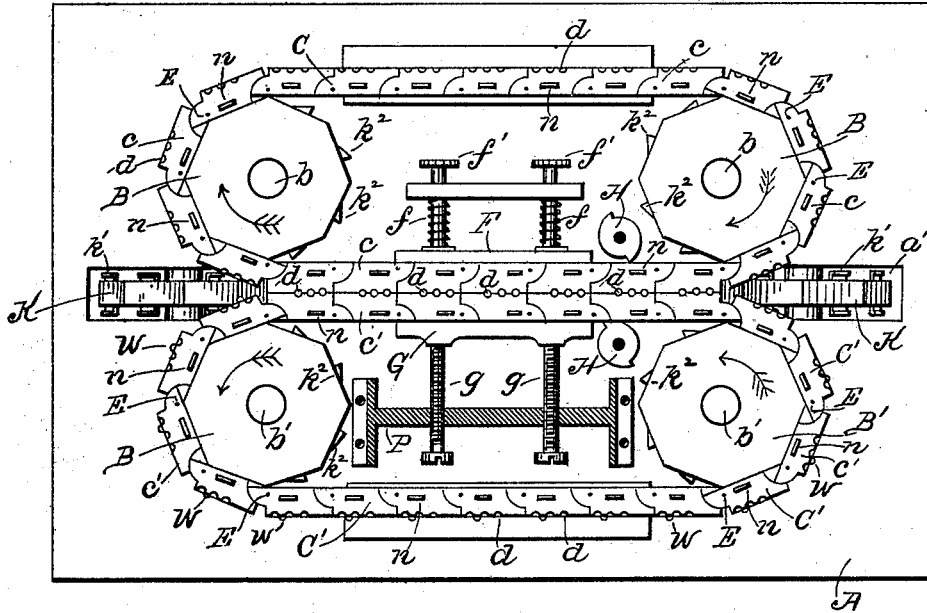
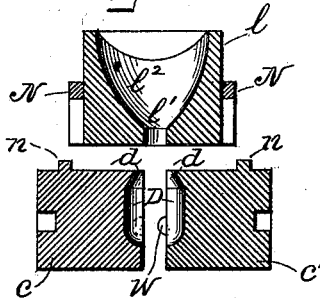


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHN J. NASH, OF NEW HAVEN, CONNECTICUT.

BULLET-CASTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 647,319, dated April 10, 1900.

Application filed August 23, 1899. Serial No. 728,191. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. NASH, of the city and county of New Haven, in the State of Connecticut, have invented a new and useful Improvement in Bullet-Casting Machines, of which the following is a full, clear, and exact description when taken in connection with the accompanying drawings, which form a part thereof, and in which—

Figure 1 represents a plan view of a machine embodying my invention; Fig. 2, a side elevation of the same; Fig. 3, a sectional view on lines 3 3 of Fig. 1 of a detail of the machine; Fig. 4, a transverse section on lines 4 4 of Fig. 1; Figs. 5 and 6, a detail view of one of the bottom mold-links and of one of the top links, respectively; Fig. 7, a detail view, in side elevation, of the knife and associated parts; Fig. 8, a plan view of the machine with the upper chain and melting-pot removed; and Fig. 9, a cross-sectional view of the links, shown enlarged and slightly separated.

In all figures similar letters of reference represent like parts.

This invention relates to machines for automatically rough casting bullets and similar articles; and it consists in the various improvements and novel combinations of parts set forth and claimed hereinafter.

Referring to the drawings, the parts designated by the letter A represent the bed or table of the machine, on which are located two pairs of horizontally-rotating sprocket-wheels B and B', mounted on the vertical shafts b and b'. Each pair of rotary shafts is rotated simultaneously by means of bands b², passing over pulleys b³, rigidly keyed to the shafts, Figs. 2 and 4, or by any suitable gearing or other means, while a shaft of each pair is operated by a band b⁶, passing over rigidly-mounted pulleys b⁵. On one shaft, Fig. 4, is shown a driving-wheel b⁴.

Passing around and operated by each pair of sprocket-wheels B and B' are two horizontally-moving endless chains C and C', the composite parts or links c and c' of which are formed as follows: Each link c or c' is provided on one side with one or more semicylindrical slots D of the form of substantially one-half the bullet or other article to be molded. At the upper end of the slot D is a smaller slot d, extending to the top of the link,

Fig. 3. The links are connected by means of extensions E at each end, which overlap and are pivoted to similar extensions on the preceding and succeeding links. When the links c are traveling on that portion of the chain C which is adjacent to the chain C', the slots D of the links c correspond with the slots D in the links c', so that together they form a complete mold for a bullet or other article, as shown in Fig. 4. The links of the two chains are forced into contact with each other at this point by means of slides F and G, on which they travel. The slide F is held in place by coiled springs f, (or other means,) the tension of which is regulated by screws f', while the slide G is positively adjusted by means of screws g. Idler sprocket-wheels H are shown in Fig. 1 bearing against the sides of the links of the two chains to force them together before passing into the slides F and G. The links c and c' are locked to move synchronously by means of one or more studs W on one link engaging in a socket w on the other.

Rotating in two slots a on the bed A of the machine are two vertical sprocket-wheels K, which are mounted on shafts k. The wheels K carry an endless distributing-chain L, composed of links l of corresponding size with the links c and c'. The chain L travels in a vertical plane, and its upper strand or portion passes over and rests on the links c and c' of the chains C and C' when in contact with each other. The links l are all provided with longitudinal slots l² on their upper sides, from which depend perforations l', adapted to fit over the smaller slots d in the links c and c' when the links of the three chains are traveling in contact, Figs. 3 and 4. The links l are pivoted in succession by means of connections M, similar to the connections E on the links C and C'. Lateral angular projections N on the links l are engaged by two sprockets k' on the outer edge of the surface of the wheels K, and the projections N are also engaged by similar lugs or sprockets n on the upper sides of the links c and c'. As the links c and c' are positively driven by the wheels B and B' and engage the links l by lugs n the chain L is moved synchronously with the chains C and C'.

Suitably located on the bed A is a pot P for

the molten metal, which passes out through the faucet or outlet *p* into the longitudinal slot *l'* in the links *l* of the chain *L*.

- A knife *T* is shown, Fig. 7, pivoted on a bracket *S*, mounted on the bed *A* of the machine directly under the upper strand of the vertical chain *L* and located at a point where the two horizontal chains have begun to separate in the course of their revolutions. A weight *t* or spring *t'* (or both) is adapted to press the cutting edge of the knife against the bottom of the links, (allowing also a slight movement for irregularities in the under surface of the links,) so that the molded bullets which may be held (after the links *c* and *c'* with the half-molds have separated) by the extra metal in the links *l* are severed by the knife *T* and fall into a proper receptacle. (Not shown.)
- The operation of the device is as follows: The links *c* and *c'* of the horizontal chains *C* and *C'* as they are revolved by the sprocket-wheels *B* and *B'* (in the direction of the arrows, Fig. 1) are brought in contact as they pass over the slides *F* and *G*. The chains move synchronously and are adjusted so that each of the links *c* is adapted to correspond with one of the links *c'*, and the half-molds *D* come opposite each other to make a complete cylindrical mold with mouth *d*. The links are held in proper connection by means of the locking-stud *W* and socket *w*. At the same time the distributing-chain *L* is driven by the lugs *n* on the links *c* and *c'* engaging the lateral projection *N* on each of the links *l*. By this means the links of the chain *L* are moved synchronously with the links of the horizontal chains *C* and *C'*, and when the links *c* and *c'* are in contact (as above described) a link *l* is adjusted to fit over each pair of links *c* and *c'*, so that the depending perforations *l'* are directly over the mouths *d* of the molds. Such is the position of the links *l*, *c*, and *c'* when they pass under the outlet *p* of the pot *P*, Figs. 1, 2, and 4, so that the molten metal as it is poured into the longitudinal slot *l'* in the links *l* will be distributed by passing down through the perforations *l'* into the molds *D*, Figs. 3 and 4. The bullets are hardened by cooling as the links are moved onward until the point is reached where the links *c* and *c'*, each with a half-mold, move away from each other in their journey around their respective sprocket-wheel *B* and *B'*. At this point the bullet will naturally fall into a proper receptacle, except (as is apt to be the case) the metal in the link *l* has not been entirely exhausted, but some is still retained in the perforations *l'*. This metal hardens with the bullet, and when the links *c* and *c'* separate the bullet is left hanging to the under side of the link *l*, Fig. 7, by the extra metal in the link *l*. As the link *l* proceeds the bullet comes in contact with the knife *T*, which severs it close to the under surface of the link *l*. The metal remaining in the link *l* is dropped

from the link as the link is turned over in its revolving about the sprocket-wheel *K*.

I am aware that a single endless chain has been used to mold bullets and similar articles; but

What I claim, and desire to secure by Letters Patent, is—

1. In a machine for casting bullets or similar articles, the combination with a vessel from which the molten metal is poured; of a plurality of endless chains formed of series of traveling links having partial molds, the links of each series adapted to come in contact with links of the other series during a part of their revolution, and when so in contact form with the other links complete molds for the desired article, gates to said molds in said links together with mechanism for operating said chains and for passing the molten metal from said vessel to said links when so in contact, substantially as described.

2. In a machine for casting bullets or similar articles, the combination with a vessel from which the molten metal is poured; of a plurality of endless chains formed of series of traveling links having partial molds, the links of each series adapted to come in contact with links of the other series during part of their revolution and when so in contact form with the other links complete molds for the desired article, gates to said molds in said links, mechanism for operating said chains and for passing the molten metal from said vessel to said links when so in contact, and means for revolving said chains synchronously, substantially as described.

3. In a machine for casting bullets or similar articles, the combination with a vessel from which the molten metal is poured; of a plurality of endless chains formed of series of traveling links having partial molds, the links of each series adapted to come in contact with links of the other series during part of the revolution and when so in contact form with the other links complete molds for the desired article; gates to said molds in said links, means for locking the links in such contact to move synchronously; and mechanism for operating said chains and for passing the molten metal from said vessel to said links when so in contact, substantially as described.

4. In a machine for casting bullets or similar articles, the combination with a series of traveling molds having gates thereto; of a vessel from which the molten metal is poured; a traveling distributing device situated over the molds when under the outlet from said vessel adapted to receive a continuous flow of metal from said vessel and having perforations for distributing the molten metal to the gates of the various molds; and mechanism for operating said molds and distributing device, substantially as described.

5. In a machine for casting bullets or similar articles, the combination with a series of traveling molds having gates thereto; of a vessel

from which the molten metal is poured; a traveling distributing device situated over the molds when under the outlet from said vessel adapted to receive a continuous flow
5 of metal from said vessel and having perforations for distributing the molten metal to the gates of the various molds; an engagement between said series of molds and distributing device by which one member is operated by the other; and mechanism for operating said other member, substantially as described.

6. In a machine for casting bullets or similar articles, the combination with a plurality of
15 endless chains formed of series of traveling links having partial molds, the links of each series adapted to come in contact with links of the other series during a part of their revolution, and when so in contact form with the
20 other links complete molds for the desired article; said molds having gates thereto of an endless chain for distributing the molten metal situated over said links when in such contact and having perforations adapted to
25 correspond with the gate of each of said molds when complete; and mechanism for operating said chains, substantially as described.

7. In a machine for casting bullets or similar articles, the combination with a plurality of
30 endless chains formed of series of traveling links having partial molds, the links of each series adapted to come in contact with links of the other series during a part of their revolution, and when so in contact form with the
35 other links complete molds for the desired article; said molds having gates thereto of an endless chain for distributing the molten metal, situated over said links when in such contact and having perforations adapted to
40 correspond with the gate of each of said molds when complete; and mechanism for operating said chains at the same rate of speed, substantially as described.

8. In a machine for casting bullets or similar
45 articles, the combination with two endless chains formed of series of traveling links having partial molds, the links of each series adapted to come in contact with and correspond to links of the other series during a part
50 of their revolution and when so in contact form with the other links complete molds for the desired article; of an endless chain for distributing the molten metal, formed of a series of links, each of which during a part of
55 its revolution rests on and corresponds to a pair of links forming a complete mold, and is provided with a perforation fitting over the gate of each complete mold; and mechanism for operating the same, substantially as described.

9. In a machine for casting bullets, or similar articles, the combination with two endless chains revolving on the same plane and
65 formed of series of traveling links having partial molds, the links of each series adapted to come in contact with links of the other series

during a part of their revolution and when so in contact form with the other links complete molds; of an endless chain for distributing the molten metal, formed of a series of links,
70 which revolve in a plane at right angles to the plane of revolution of said first two series, and have perforations therein, and during a part of their revolution pass over the links of the first two series when forming complete molds;
75 and mechanism for operating said chains, substantially as described.

10. In a machine for casting bullets or similar articles, the combination with a series of traveling molds having gates therein; of an
80 endless chain for distributing the molten metal to said molds; formed of a series of links having a longitudinal channel on their outer surface and depending perforations therefrom, said chain revolving in a vertical plane
85 and during part of its revolution having its links arranged to rest on and travel with said traveling molds; and mechanism for operating said molds and chain, substantially as described.

11. In a machine for casting bullets or similar articles, the combination with a series of traveling molds having gates thereto; of a
90 vessel from which the molten metal is poured; a traveling distributing device situated over the molds when under the outlet from said vessel, and having perforations for distributing the molten metal to the gates of the various molds; means for separating the molded
95 bullets from said distributing device; and mechanism for operating said molds and distributing device, substantially as described.

12. In a machine for casting bullets or similar articles, the combination with a series of traveling molds having gates thereto; of a
105 vessel from which the molten metal is poured; a traveling distributing device situated over the molds when under the outlet from said vessel and having perforations for distributing the molten metal to the gates of the various
110 molds; a cutting device pivotally mounted on said machine, the cutting edge of which is yieldingly held in contact with the under side of said distributing device; and mechanism for operating said molds and distrib-
115 uting device, substantially as described.

13. In a machine for casting bullets or similar articles, the combination with two endless chains, formed of series of traveling links
120 having partial molds, the links of each series adapted to come in contact with links of the other series during a part of their revolution, and when so in contact form with the other links complete molds for the desired article; of an endless chain for distributing the molten
125 metal, having each link provided with one or more depending perforations and situated over a pair of links forming a complete mold during part of its revolution; a cutting device for separating the molded bullet or other
130 article from the under side of the links of said distributing-chain after the links of the

chains forming the molds have separated; and mechanism for operating said chains, substantially as described.

14. In a machine for casting bullets or similar articles, the combination with two endless chains formed of links having one or more partial molds on their outer side extending to the top thereof, and engaging lugs; of gates to said molds in said links an endless distributing-chain composed of links, provided with a longitudinal channel and depending perforations corresponding to the gates of said molds, and lateral extensions for engagement by said engaging lugs; and mechanism for operating said endless chains, substantially as described.

15. In a machine for casting bullets or similar articles, the combination with a plurality

of endless chains formed of series of traveling links, the links of each chain being provided with one or more partial molds and adapted to come in contact with links of the other chain or chains during a part of their revolution, and when so in contact form with the other links complete molds for the desired article; of adjustable slides on which said links pass when in contact; and mechanism for operating said chains, substantially as described.

In witness whereof I have hereunto set my hand this 17th day of August, A. D. 1899.

JOHN J. NASH.

Witnesses:

E. K. PENDLETON,
SAMUEL H. FISHER.