

No. 720,905.

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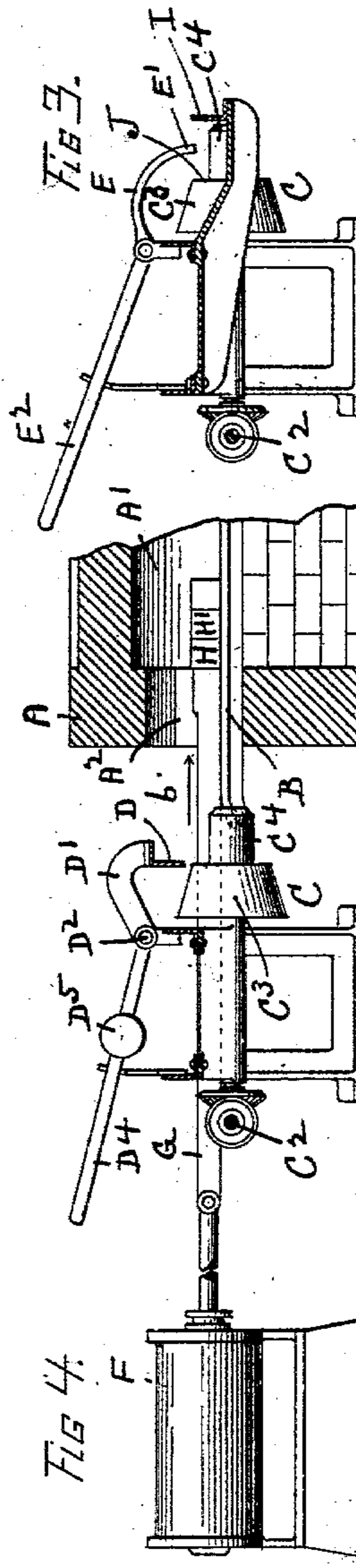
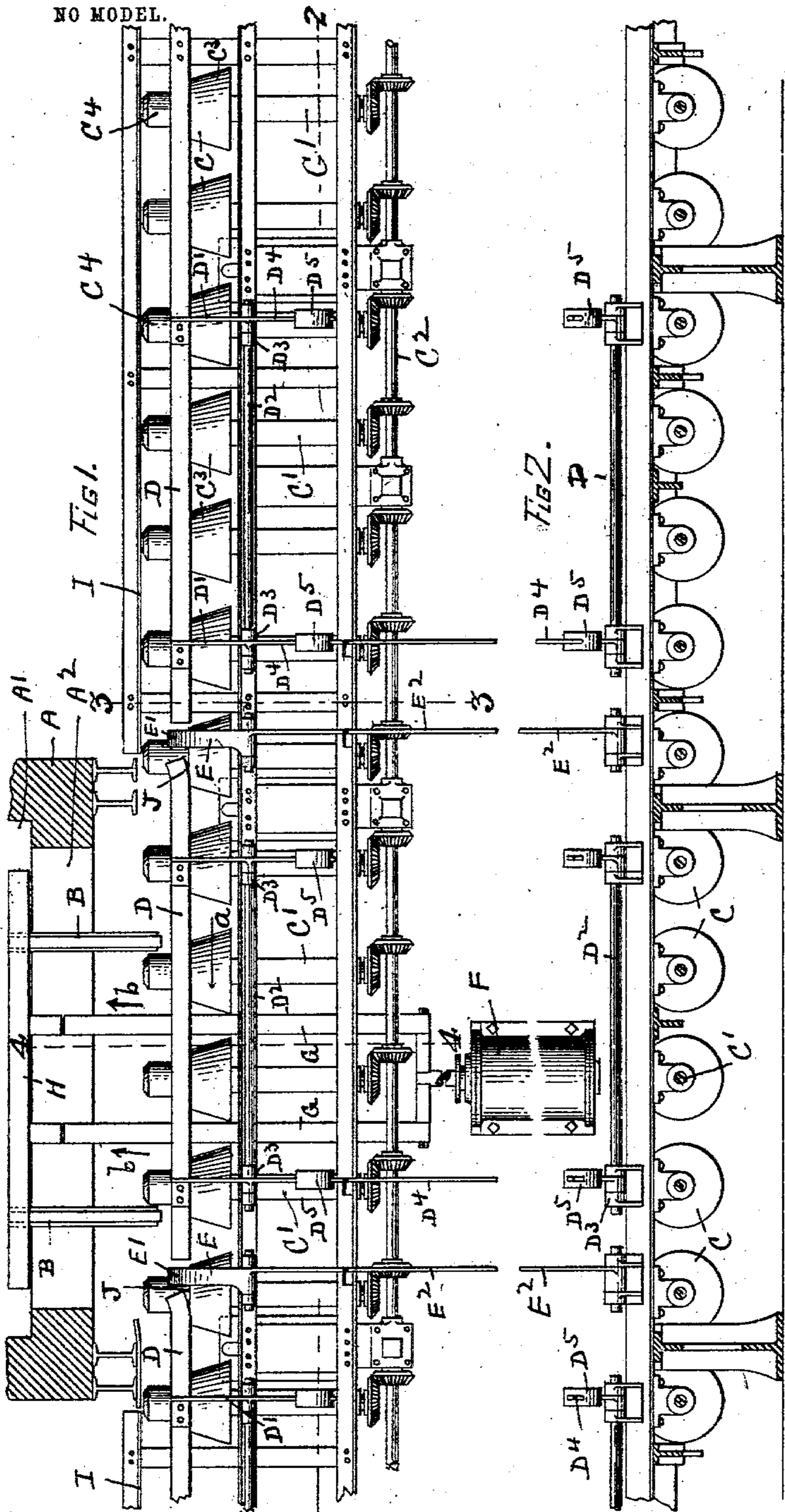
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FEEDING MECHANISM FOR BILLET HEATING FURNACES.

APPLICATION FILED NOV. 18, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

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Inventor

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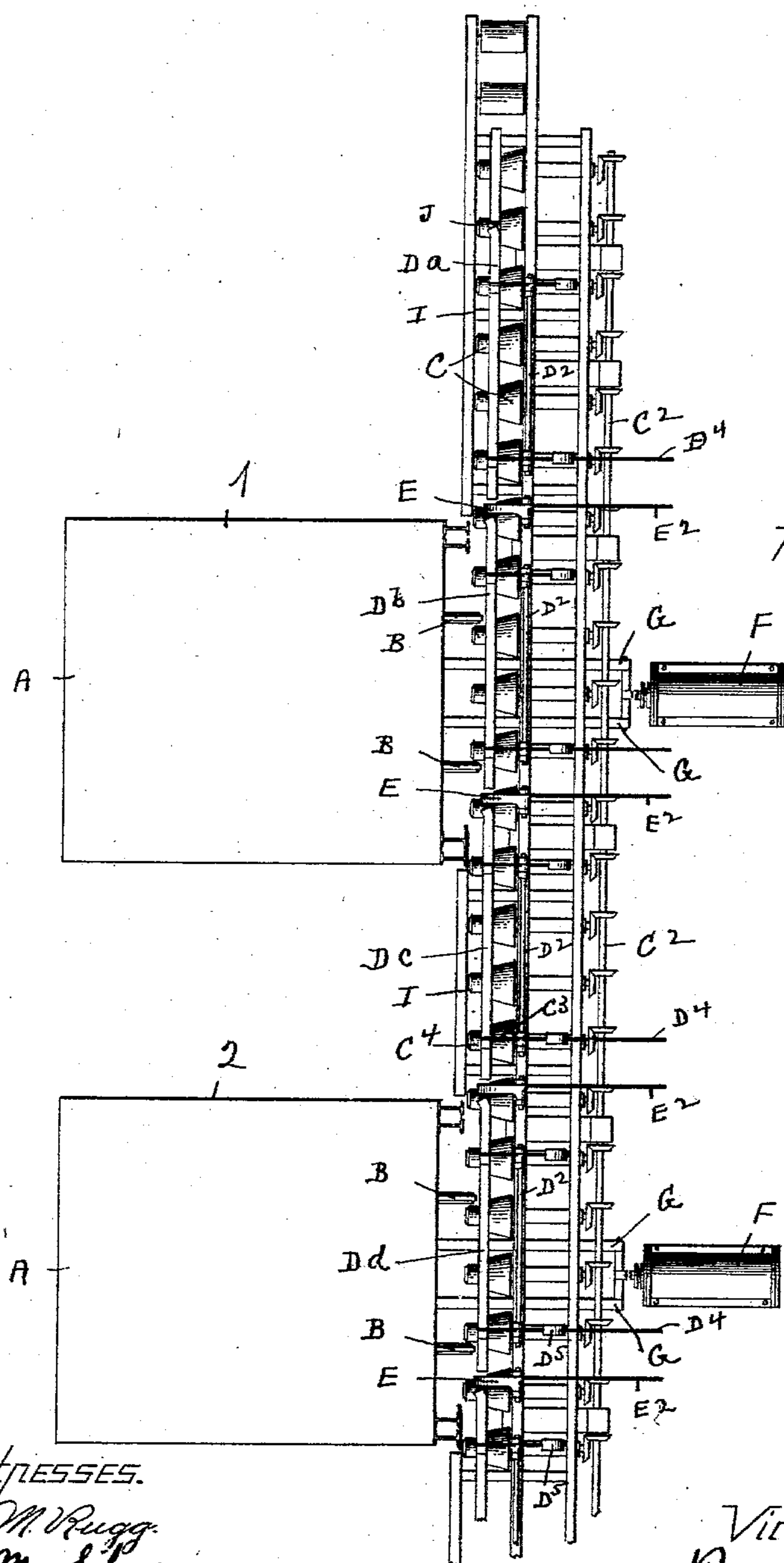


FIG 5

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FEEDING MECHANISM FOR BILLET-HEATING FURNACES.

SPECIFICATION forming part of Letters Patent No. 720,905, dated February 17, 1903.

Application filed November 18, 1901. Serial No. 82,806. (No model.)

To all whom it may concern:

Be it known that I, VICTOR E. EDWARDS, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Feeding Mechanism for Billet-Heating Furnaces, of which the following is a specification, accompanied by drawings, forming part
10 of the same, in which—

Figure 1 is a plan view of a feeding mechanism embodying my invention. Fig. 2 is a longitudinal sectional view on line 2 2, Fig. 1. Fig. 3 is a sectional view on line 3 3, Fig. 1.
15 Fig. 4 is a sectional view on line 4 4, Fig. 1; and Fig. 5 is a plan view of a series of furnaces provided with a feeding mechanism embodying my invention.

Similar reference letters and figures refer
20 to similars parts in the different views.

The object of my invention is to provide a mechanism for feeding billets to one or more heating-furnaces; and it comprises a conveyor by which a series of billets are success-
25 sively fed into alinement with the admission-opening of a billet-heating furnace by a longitudinal movement of the billet and having means by which the longitudinal movement of the billet is arrested and the billet fed by
30 a sidewise movement from the conveyor to the heating-chamber of the furnace, and I accomplish these results by means of the mechanism hereinafter described and shown in the accompanying drawings, the novel fea-
35 tures of my invention being pointed out in the annexed claims.

In Fig. 1 of the accompanying drawings I have shown a portion of my feeding mechanism, so much being represented as illustrates
40 its application to the purpose of feeding billets to a single furnace. A series of furnaces similar to the one represented and having openings for the admission of billets by a side-
wise movement may be arranged in a line
45 with the feeding mechanism as represented in the drawings continued past the receiving ends of the several furnaces, as represented in Fig. 5.

Referring to Figs. 1 to 4 of the drawings,

in which the parts of my feeding mechanism 50 are shown on a larger scale, A denotes the receiving end of a billet-heating furnace, having a heating-chamber A' and an admission-opening A², adapted to receive a billet by a
55 sidewise movement upon a longitudinal track B B, extending into the heating-chamber of the furnace. Arranged in front of the receiving end of the furnace A is a billet-con-
veyer embodying my invention and comprising a series of rolls C, carried upon the ends of
60 shafts C', which are connected by miter-gears with a rotating driving-shaft C², by which the rolls C are simultaneously rotated at a uniform speed to move a billet resting thereon in
the direction of the arrow a, Fig. 1. Each of
65 the rolls C consists of a conical base-section C³ and a cylindrical section C⁴. The billet-supporting surface of the conical section C³ is sufficiently inclined to allow a billet resting thereon to slide downwardly upon the cylindrical
70 section C⁴, except as the billet is held from sliding by means of longitudinal guide-plates D, which are supported upon the ends of le-
vers D', attached to rocking shafts D², jour-
naled in bearings D³. The rocking shafts D²
75 are provided with rearwardly-extended handles D⁴, by which the shafts D² are rocked for the purpose of raising and lowering the longitudinal guide-plates D, which are coun-
terbalanced by weights D⁵, attached to the
80 lever-handles D⁴. Between the adjacent ends of the guide-plates D are spaces in which are placed curved pivoted stops E, having
their free ends E' extending into the path of
85 a billet as it is moved endwise over the cylindrical sections C⁴ of the rolls. Each of the stops E is provided with a lever-handle E², by which the end E' of the stop may be low-
ered into the path of a billet traveling on the
90 cylindrical sections of the conveyor-rolls in order to arrest its longitudinal movement or lifted above the path of the billet to allow
the billet to be moved longitudinally by the cylindrical sections of the conveyor-rolls. The longitudinal track B of the heating-fur-
95 nace is extended through the admission-opening A² slightly past the ends of the conveyor-rolls and preferably in a lower plane,

so that a billet when pushed by a sidewise movement from the cylindrical sections of the conveyer-rolls will be received upon the longitudinal tracks B B. Opposite the admission-opening A² of the furnace is placed a steam or hydraulic cylinder F, having its piston-rod suitably connected with the billet-pushing bars G G, by which at a suitable period a reciprocating motion is given to the pushing-bars G G in the direction of the arrows *b b*, Figs. 1 and 4, for the purpose of pushing a billet from the cylindrical sections of the conveyer-rolls upon the longitudinal tracks B B, each of the billets being pushed from the cylindrical sections of the conveyer-rolls into the position of the billet H or just within the heating-chamber A. As the next successive billet is pushed from the conveyer-rolls into the heating-chamber the billet H is pushed into the position of the billet H', and a series of billets is thus formed upon the longitudinal track B, which are moved by a step-by-step motion toward the delivery end of the furnace. When a billet is once supported upon the conical sections of the rotating conveyer-rolls, it is moved along in the direction of the arrow *a* by a longitudinal movement as long as it is held upon the conical sections by the longitudinal guide-plates D. Whenever any one of the longitudinal guide-plates D opposite a billet is raised, the billet is carried by gravity over the conical sections upon the cylindrical sections C⁴, upon which the billet is moved longitudinally, but with a slower motion, until its movement is arrested by interposing the end E' of one of the pivoted stops into the path of the billet, and when a billet has thus been brought to rest in front of one of the admission-openings of a furnace it may be pushed by a sidewise movement by the reciprocating pushing-bars G over the cylindrical section C⁴ upon the longitudinal tracks B and into the heating-chamber of the furnace.

In Fig. 5 I have represented in plan view two furnaces 1 and 2 and a common feeding mechanism by which billets may be fed to either of said furnaces at will by a common series of conveyer-rolls C, provided with longitudinal guide-plates D and pivoted stops E, with reciprocating pushing-bars G placed opposite the admission-openings of each of the furnaces. In Fig. 5 the longitudinal guide-plates D are four in number, one being placed opposite each of the furnaces 1 and 2 and the other two serving to retain the billet upon the conical sections of the conveyer-rolls as it approaches the furnaces 1 and 2. The guide-plate D^a serves to prevent the sidewise movement of the billet as it approaches furnace 1, the guide D^b holding the billet when opposite furnace 1, the guide-plate D^c holding the billet as it approaches furnace 2, and guide-plate D^d holding the billet when opposite furnace 2. A billet when opposite either of the four guide-plates may be allowed to slide

upon the cylindrical sections of the conveyer-rolls and held from longitudinal movement by one of the pivoted stops E, while a succeeding billet, carried upon the conical sections of the conveyer-rolls, may be allowed to pass the preceding billet. For example, the first billet when opposite the longitudinal guide-plate D^a may be allowed to slide upon the cylindrical sections of the conveyer-rolls by elevating said guide-plate, and the longitudinal movement of the billet may be stopped by interposing in its path the end of the first pivoted stop. The guide-plate D^a may then be lowered and a second billet allowed to pass the first billet until it is opposite the second guide-plate D^b, when it in turn may be moved upon the cylindrical sections of the rolls and stopped by the second pivoted stop E, allowing the second billet to be first pushed into the furnace 1. If desired, a series of billets may be supported on the cylindrical sections of the conveyer-rolls and held from longitudinal movement by the several pivoted stops E, leaving the series of rolls free for the longitudinal movement of a billet supported upon their conical sections. By the overlapping movement of the billets as they are moved longitudinally on the conveyer-rolls I am enabled to feed billets with great rapidity to any one of a series of furnaces arranged in alinement with the series of conveyer-rolls C.

The billet-feeding mechanism, comprising the series of rolls C, extending past the admission ends of the furnaces 1 and 2, is divided into sections, each having its own movable longitudinal side guide D and its own movable stop E, whereby a billet can be transferred from the conical to the cylindrical sections of the rolls and stopped in its longitudinal movement opposite either of the side guides D^b or D^d and be acted upon by the pushing mechanism, or it may be transferred when opposite either of the side guides D^a or D^c. When a billet is transferred to the cylindrical sections of the rolls by raising the movable guides D^a or D^c, the billet can be held at rest on the cylindrical ends of the rolls and between the fixed guides I and the shoulders J of the rolls.

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

1. In a feeding mechanism for billet-heating furnaces, the combination of a series of rolls arranged to support a billet upon their upper surfaces, means for rotating said rolls, whereby a longitudinal movement is given to the billet, a longitudinal guide-plate by which a billet is held near one end of said rolls, means for transferring a billet by a sidewise movement toward the opposite ends of said rolls and a stop interposed in the path of a transferred billet by which its endwise movement is stopped, substantially as described.

2. The combination of a series of rolls provided with conical and cylindrical sections

adapted to support a billet on their upper surfaces, means for rotating said rolls, whereby a longitudinal movement is imparted to the billet, a side guide placed above said rolls and between their conical and cylindrical sections, means for raising said guide to allow the billet to be moved by gravity from the conical to the cylindrical sections of said rolls, substantially as described.

3. The combination of a series of rolls provided with conical and cylindrical sections, means for rotating said rolls, whereby a longitudinal movement is imparted to the billet, means for retaining the billet on and releasing it from the conical sections of said rolls, and a stop interposed in the path of the billet carried on the cylindrical sections of said rolls, substantially as described.

4. The combination of a series of rolls, each of said rolls having a reduced section at one end forming a shoulder on the roll, means for transferring a billet by a sidewise movement from the larger to the smaller section, and a side stop, whereby the billet is held between said side stop and the shoulders on said rolls, substantially as described.

5. The combination of a series of rotating shafts, rolls carried on the ends of said shafts and having reduced sections at their outer ends, means for transferring a billet from the larger portion of the rolls upon said reduced sections, a stop interposed in the path of a billet as it is moved along on the reduced sections of said rolls, and a pushing mechanism by which the billet is pushed off said reduced section of the rolls, substantially as described.

6. The combination with a furnace provided with an admission-opening for the admission of a billet by a sidewise movement of a billet-feeding mechanism consisting of the following instrumentalities, a series of rolls extending transversely across the admission ends of said furnace and in front of the admission-opening adapted to support a billet thereon, a side guide placed above said rolls, means for raising said side guide in front of the furnace admission-opening, and means for pushing the billet from said rolls into said admission-opening, substantially as described.

7. The combination with a series of rolls adapted to support a billet thereon, said rolls having sections reduced in diameter, of a billet-pushing mechanism comprising pushing-bars, means for imparting a reciprocating motion to said pushing-bars in a line parallel with the axes of said rolls and in a plane below the supporting-surfaces of said rolls and above the supporting-surfaces of their reduced sections, whereby said bars will pass beneath a billet carried on the larger portions of said rolls, but will engage a billet carried on the smaller portions of said rolls, substantially as described.

8. The combination with a furnace provided

with an admission-opening of a series of rolls in front of said admission-opening, said rolls having cylindrical ends reduced in diameter and arranged to support a billet in the plane of said admission-opening, means for transferring a billet from the larger portion of said rolls to said reduced cylindrical ends, a stop interposed in the path of a billet held on said cylindrical ends, and a reciprocating pushing mechanism by which a billet is pushed from said cylindrical ends of the rolls into said admission-opening, substantially as described.

9. The combination of a series of rolls arranged in alinement and adapted to move a billet by an endwise motion, said series of rolls being divided into sections, each of said sections having a movable, longitudinal side guide by which a billet is held from sidewise movement as it passes each of said sections, and movable stops at the ends of each section capable of being carried into and removed from the path of a billet as it is moved endwise on said rolls, substantially as described.

10. The combination with one or more billet-heating furnaces of a common billet-feeding mechanism consisting of a series of rolls having conical and cylindrical sections, and extending past the admission ends of said furnaces, movable, longitudinal side guides placed above said rolls and between their conical and cylindrical sections, movable stops arranged in the path of the billet carried on the cylindrical sections of said rolls, and pushing mechanisms opposite each of said furnaces by which a billet is pushed from said rolls into one of said furnaces, substantially as described.

11. In a billet-feeding machine comprising a series of rotating rolls, each of said rolls having a conical section provided with an inclined upper billet-supporting surface upon which a billet will be moved by gravity, and a cylindrical section arranged to receive a billet from said conical section, the combination with said rolls of a movable side guide by which the billet is held on or released from the conical sections of the roll, a movable stop arranged to be interposed in the path of a billet held on said cylindrical sections, fixed side guides opposite the cylindrical sections, and pushing mechanisms alternating with said fixed side guides by which a billet is pushed off said rolls, substantially as described.

12. In a feeding mechanism for billet-heating furnaces, the combination of a series of rolls arranged to support a billet upon their upper surfaces, means for rotating said rolls whereby a longitudinal movement is given to the billet, said rolls being long enough to form two separate and independent paths for billets, means for transferring a billet by a sidewise movement from the first to the second path, and a stop interposed in said second path whereby the endwise movement of a billet moving in said second path is arrested, substantially as described.

13. In a billet-feeding mechanism, the combination of a series of rolls arranged to support a billet upon their upper surfaces, each of said rolls being long enough to form two
5 separate and independent paths for billets, a movable guide between the first and second path and a fixed guide on the opposite side of said second path, substantially as described.

14. In a billet-feeding mechanism, the combination of a series of rolls arranged to support a billet upon their upper surfaces, each of said rolls being long enough to form two
10 separate and independent paths for billets, a movable guide between the first and second path, a fixed guide on the opposite side of the
15 second path with the end of the roll adjacent said fixed guide of less diameter than the op-

posite end of the roll, substantially as described.

15. In a billet-feeding mechanism, the combination of a series of rolls arranged to support a billet upon their upper surfaces, each of said rolls being long enough to form two
20 separate and independent paths for billets, a movable guide between the first and second
25 path, and means for raising said guide to allow a billet to be moved by a sidewise movement from the first to the second path, substantially as described.

Dated this 14th day of November, 1901.

VICTOR E. EDWARDS.

Witnesses:

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M. M. SCHUERMANN.