

June 8, 1926.

R. W. DULL

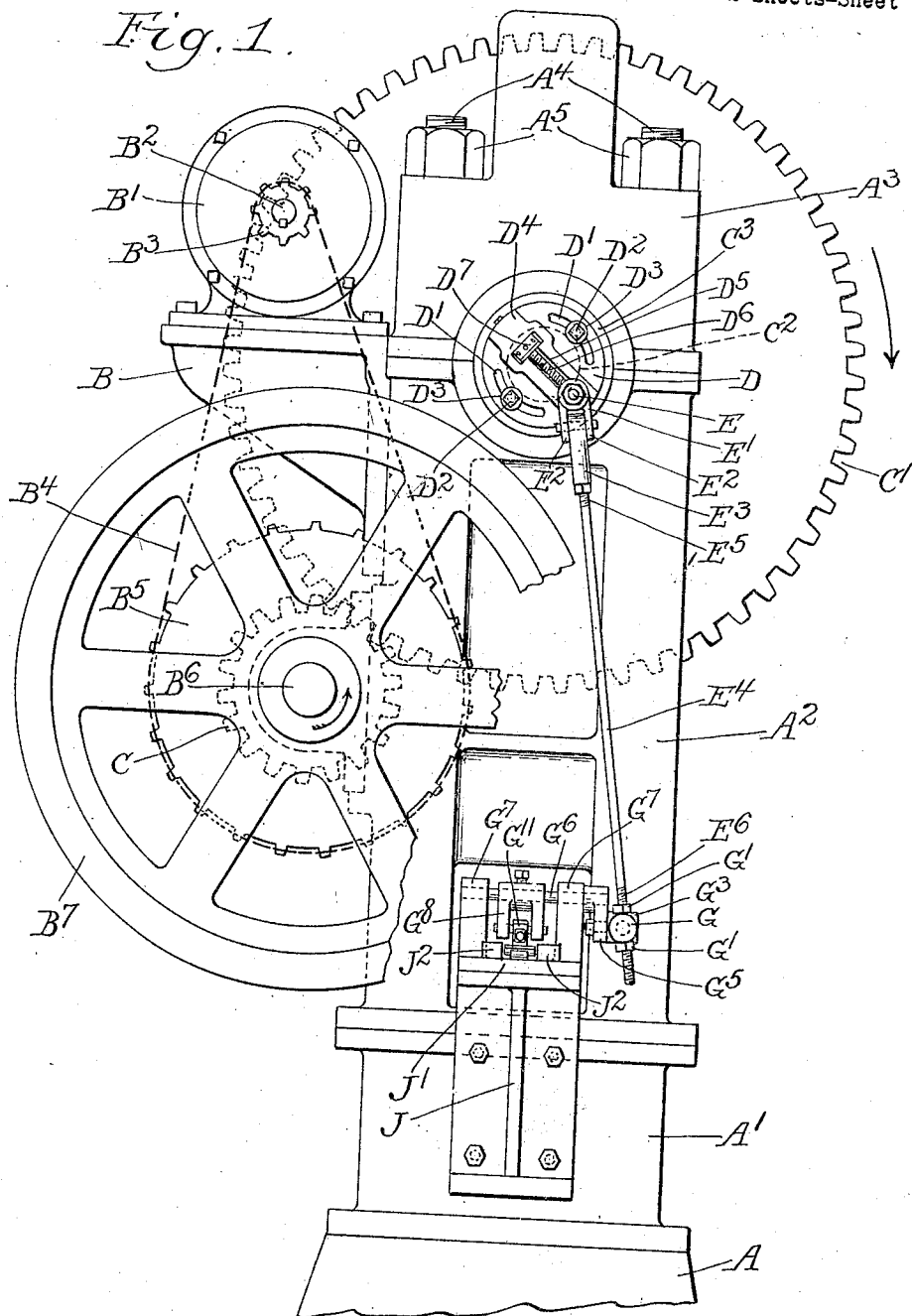
1,587,635

CHAIN FEED

Filed Nov. 28, 1924

2 Sheets-Sheet 1

Fig. 1.



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2 Sheets-Sheet 2

Fig. 2.

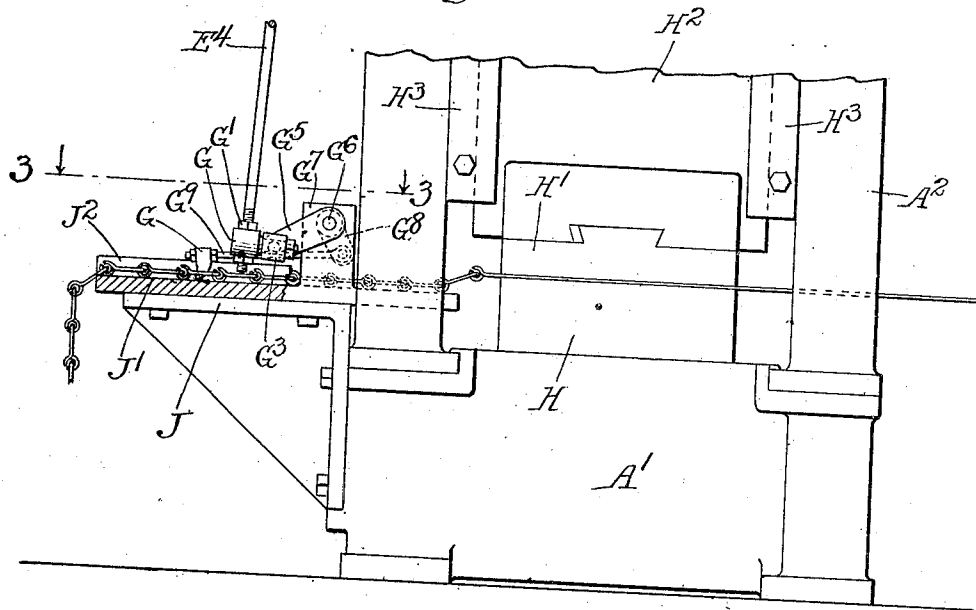
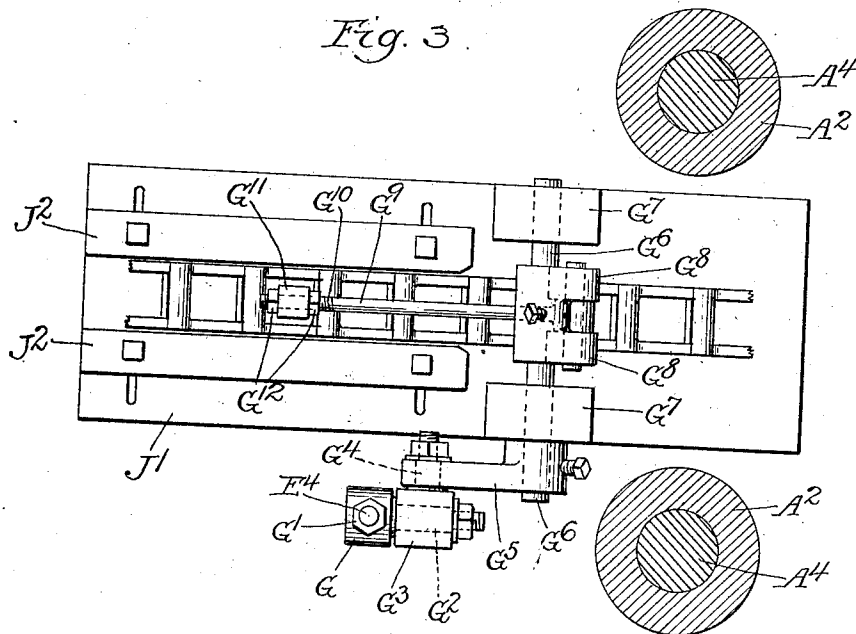


Fig. 3.



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UNITED STATES PATENT OFFICE.

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CHAIN FEED.

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My invention relates to a feeding means for chain presses and particularly to a chain feed for employment with a chain press of the type which produces chain having links each comprising flat side bars and cylindrical end bars. My invention relates particularly to feeding means for drawing the feed chain forwardly from the press, as the links are completed in the press, and joined to each other by action of the press.

One object is to provide a chain feed which shall be synchronized with the actuation of the press gate. Another object is to provide a chain feed driven from the main shaft of the press. Another object is to provide a chain feed having a maximum range of adjustability both as to the length of the feed stroke, and the length of the individual link, and the timing of the feed strokes. Other objects will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings wherein—

Figure 1 is an end elevation of the press;

Figure 2 is a partial side elevation; and

Figure 3 is a section on the line 3—3 of Figure 2.

Like parts are indicated by like symbols throughout the specification and drawings.

A is any suitable base, upon which is mounted the lower frame supporting element A¹ on which in turn is superposed the main frame A² of the press. This frame may be of any suitable type and its details are not claimed as part of the present invention. A³ is an upper frame portion and the entire assembly may be tied together by massive vertical bolts A⁴ and the securing nuts A⁵.

B is a bracket on the main frame member A², upon which is superposed any suitable motor means B¹ having the shaft B² and the sprocket B³ thereupon. B⁴ is any suitable driving chain which passes about the larger sprocket B⁵ on the shaft B⁶. B⁷ is any suitable fly wheel on the same shaft and C is a toothed gear, mounted on the shaft B⁶ and in mesh with the larger gear C¹ mounted upon the shaft C² which passes horizontally through the junction of the frame members A² and A³ and terminates in the cap C³.

Adjustably mounted on said rotating cap C³ is the adjusting disk D provided with

arcuate concentric slots D¹ through which pass the adjusting bolts D², mounted on the cap C² and provided with washers D³. The adjusting disk D is provided with a transverse raised portion D⁴ centrally slotted as at D⁵ and provided with a worm D⁶ and a perforated turn wheel D⁷, therefor. E is a securing pin or bolt the inner end of which is in mesh with the worm D⁶ and is adapted to be moved therealong in response to rotation of the wheel D⁷. Rotatable about the pin E is the yoke E¹ having the arms E² between which is provided the terminal portion E³ of the link or rod E⁴. The element E³ is rotatable about an axis substantially perpendicular to the axis of rotation of the element E¹. The link or rod E⁴ is screw-threaded at each end as at E⁵ E⁶ and is thereby longitudinally adjustable as to effective length.

Adjustably mounted along the lower screw-threaded end of the rod E⁴ is the adjusting block G, the position of which may be controlled by the adjusting nuts G¹. It is provided with an inwardly projecting pin G² in rotatable relation with the block G³ which is also provided with a pin G⁴ rotatable in the arm G⁵ fast on the transverse rock shaft G⁶ mounted in the bearings G⁷.

H is the die member of the chain press and H¹ the punch member mounted on the gate H² which is adapted to reciprocate up and down along the vertical guides H³. The details of the chain press form no part of the present invention, but it will be realized that the press, in response to the timed and regular reciprocation of the punch member, feeds forwardly a continuous completed chain. This chain passes outwardly across a flat bottomed table J, having the chain supporting surface J¹ and the adjustable side guide blocks J².

The rock shaft G⁶ transversely overlies the chain as it is fed forward. Held against rotation on said rock shaft is the lever element G⁸ at end of which is pivoted the stem G⁹ outwardly screw-threaded as at G¹⁰. Adjustable along the terminal screw-threaded portion is the dog element G¹¹ held by the adjusting nuts G¹².

While I have illustrated a fully operative device, it will be realized that many changes may be made in the size, shape, number, and disposition of parts without departing from the spirit of my invention, and that I wish

my drawings and description to be taken as in a broad sense illustrative, rather than as limiting me to the specific structure described and shown.

5 The use and operation of my invention are as follows:

I illustrate a form of chain feed which may be applied to any type of chain press in which opposed punch or press elements are given relative movement toward and away from each other to form a chain from stock fed therebetween. I employ a press actuating shaft, driven in any suitable manner, which serves to reciprocate a press gate toward and away from a die block, the details of this drive and of the punch and block forming no part of the present invention.

In the form of press herein illustrated, the opposed punch and die elements are so shaped as to punch out the central aperture of each link blank, to form hook and pintle tongues from the material so punched out, to sever the adjacent blanks, and to roll the hook tongue of each blank about the pintle of the adjoining blank, to form a continuous chain. The chain presses from the press to the feed table, which consists of a plane surface, along the sides of which are positioned adjustable or removable guide blocks, which may be adjusted or varied to permit and guide the feed of chain of various widths.

In the form of press herein shown the stock and the chain stock is fed forward one step between each forming impact of the punch upon the die, but the means for feeding the stock forward are not shown, since they form no part of my present invention. The stock is fed forward by a step-by-step movement, because each single blank, to form chain of the type described, must receive a plurality of forming impacts from the forming elements which are spaced along the punch and die. As soon as the individual links have been severed from each other it becomes necessary to draw the completed chain forwardly from the press, and it is to this forward movement or feeding of the chain that the present improvement is directed.

I provide a plane table J along which the chain is adapted to be moved. In order to permit the use of the machine with chain of different width I provide guide blocks J² shown as adjustable on the table J. In order to feed the chain I provide a dog or pusher which reciprocates along the table J between the guides J², and engages the outer end of each link successively, reciprocating in unison with the movement of the press, and having a feeding stroke equivalent in length to the particular link length of the chain being fed.

65 In order to obtain this timed motion I

provide a rotating cap C³ at the end of the shaft C². Adjustable on the rotating cap is the disk D upon which in turn is adjustably mounted the crank pin E. Since the pin E can be moved radially toward and away from the center of the disk and since it may also be arcuately adjustable about the center of the disk, I can adjust not only the stroke but the point of departure of the stroke of any member driven from the crank pin. The link E⁴ is in universal pivotal connection with the crank pin E, and is also adjustable as to length in relation to it. Mounted transversely across the table J is the rock shaft G⁶ the rock lever G⁵ of which is rocked by the link E⁴, in response to rotation of the shaft C². The lever G⁵ is engaged by the member G which is longitudinally movable along the link E⁴, thus providing another means of adjustment.

The rock shaft G⁶ carries the rocking lever or rocking arms G⁸ to which is pivoted the stem G⁹. At the outer end of the stem is longitudinally adjustable the element G¹¹ which actually engages the chain.

It will thus appear that although the shaft C² is constantly driven and that therefore the dog G¹¹ will always move in direct response to its rotation, and thus in synchronized relation with the press gate, nevertheless I can adjust the chain feed flexibly to any size of chain. I can, for example, adjust the actual length of stroke by adjusting the crank pin E toward or away from the center of the crank disk. This permits adjustment to compensate for changes in size of link, since the feeding stroke must be equal to the length of the link. However since all links, no matter what their size, issue from the press at a fixed point, it becomes necessary to adjust the point at which each individual feeding stroke of the dog begins. Otherwise, when the length of chain link is changed the dog might start its stroke intermediate the ends of the particular link it overlies and move a considerable distance before it contacts the end link against which it should abut when its stroke starts. The necessary adjustment may be effected in a number of ways. The element G¹¹ may be moved along the stem G⁹. The rock lever G⁴ may be longitudinally adjusted along the link E⁴. The link E⁴ may be adjusted as to length in relation to the holding member E³. Or the crank disk D may be rotated in relation to the shaft C². In practice I may use some one of these various adjustments or a combination of them, depending upon the degree of adjustment to be made.

I claim:

1. The combination with a chain press, having a fixed die and an opposed punch and means for reciprocating it, of chain

feeding means for feeding the completed chain forwardly from the press step by step, in response to reciprocation of the punch, comprising a chain engaging dog and a

chain supporting element adapted directly to receive the chain passing thereacross along which the dog is adapted to be reciprocated. 70

2. The combination with a chain press of a chain feed comprising a plane surfaced support adapted directly to receive the chain passing thereacross, a dog and means, synchronized with the movement of the press, for reciprocating the dog across the support. 75

3. The combination with a chain press of a chain feed comprising a plane surfaced support adapted directly to receive the chain passing thereacross, a dog and means, synchronized with the movement of the press, for reciprocating the dog across the support, and means for adjusting the initial position of the dog along the support. 80

4. The combination with a chain press of a chain feed comprising a plane surfaced support adapted directly to receive the chain passing thereacross, a dog and means, synchronized with the movement of the press, for reciprocating the dog across the support, and means for adjusting the effective length of the dog. 85

5. The combination with a chain press of a chain feed comprising a plane surfaced support, a dog and means, synchronized with the movement of the press, for reciprocating the dog across the support, means for adjusting the initial position of the dog along the support, and means for adjusting the effective length of the dog. 90

6. The combination with a chain press of a chain feed comprising a chain supporting table adapted directly to receive the chain passing thereacross, a dog adapted to engage the individual link elements of the chain, and means for reciprocating said dog to impart to said chain a step by step movement across said table. 95

7. The combination with a chain press of a chain feed comprising a chain supporting table adapted directly to receive the chain passing thereacross, a dog adapted to engage the individual link elements of the chain, means for reciprocating said dog to impart to said chain a step by step movement across said table, and means for adjusting the effective length of the dog. 100

8. The combination with a chain press and a fixed die and an opposed punch, and means for reciprocating the punch, of chain feeding means comprising in part a chain supporting table adapted directly to receive the chain passing thereacross, a rock shaft positioned above said table, a dog mounted on said rock shaft, and means for rocking said shaft in response to the reciprocation of said punch. 105

9. The combination with a chain press having a fixed die and an opposed reciprocating punch and means for reciprocating it, comprising in part a drive shaft, of chain feeding means directly responsive to the rotation of said drive shaft, comprising a crank plate, a connecting link pivoted on said plate, a rock shaft actuated by said link, a rocking lever extending outwardly from said shaft, a chain engaging dog pivoted upon said lever, and a feed table adapted directly to receive and support the completed chain. 110

10. The combination with a chain press having a fixed die and an opposed reciprocating punch and means for reciprocating it, comprising in part a drive shaft, of chain feeding means directly responsive to the rotation of said drive shaft, comprising a crank plate, a connecting link pivoted on said plate, means for adjusting the point of connection of said link with said crank plate in relation to the center of rotation of said plate, a rock shaft actuated by said link, a rocking lever extending outwardly from said shaft, a chain engaging dog pivoted upon said lever, and a feed table adapted to support the chain. 115

11. The combination with a chain press having a fixed die and an opposed reciprocating punch and means for reciprocating it, comprising in part a drive shaft, of chain feeding means directly responsive to the rotation of said drive shaft, comprising a crank plate, a connecting link pivoted on said plate, a rock shaft actuated by said link, a rocking lever extending outwardly from said shaft, a link engaging dog pivoted upon said lever, a feed table adapted directly to receive and support the completed chain, and means for adjusting the length of the dog. 120

12. The combination with a chain press having a fixed die and an opposed reciprocating punch and means for reciprocating it comprising in part a drive shaft, of chain feeding means directly responsive to the rotation of said drive shaft, comprising a crank plate, a connecting link pivoted on said plate, a rock shaft actuated by said link, a rocking lever extending outwardly from said shaft, a link engaging dog pivoted upon said lever, a feed table adapted directly to receive and support the completed chain, and means for adjusting the initial position of the dog along the table. 125

13. The combination with a chain press, having a fixed die and an opposed punch and means for reciprocating it, of chain feeding means for feeding the completed chain forwardly from the press step by step, in response to reciprocation of the punch, comprising a link engaging dog and 130

50 of a chain feed comprising a chain supporting table adapted directly to receive the chain passing thereacross, a dog adapted to engage the individual link elements of the chain, means for reciprocating said dog to impart to said chain a step by step movement across said table, and means for adjusting the effective length of the dog.

55 8. The combination with a chain press and a fixed die and an opposed punch, and means for reciprocating the punch, of chain feeding means comprising in part a chain supporting table adapted directly to receive the chain passing thereacross, a rock shaft positioned above said table, a dog mounted on said rock shaft, and means for rocking

a chain supporting element along which the dog is adapted to be reciprocated, and chain guiding means positioned upon said supporting element.

5 14. The combination with a chain press, having a fixed die and an opposed punch and means for reciprocating it, of chain feeding means for feeding the completed chain forwardly from the press step by step, in response to reciprocation of the punch, 10 comprising a chain engaging dog and a plane surfaced chain supporting element along which the dog is adapted to be reciprocated, and laterally adjustable guiding means positioned on said supporting element. 15

15 15. In a chain forming press, a fixed die and an opposed reciprocating die, and means for reciprocating it comprising in part a 20 rotary drive shaft, means for feeding the completed chain forwardly from the press, comprising a feed table over which the chain is adapted to pass, a crank plate rotating in direct response to the rotation of the rotary 25 drive shaft, a connecting link extending thence, a dog actuating lever mounted adjacent said table, a dog actuated thereby and adapted to reciprocate along the feed table, a driving connection between said lever and 30 said connecting link, and means for adjusting the point of connection of the connecting link and the dog actuating lever.

35 16. In a chain forming press, a fixed die and an opposed reciprocating die, and means for reciprocating it comprising in part a rotary drive shaft, means for feeding the completed chain forwardly from the press, comprising a plane surfaced feed table over which the chain is adapted to pass, a crank 40 plate rotating in direct response to the rotation of a rotary drive shaft, a connecting link extending thence, a dog actuating lever mounted adjacent said table, a dog actuated thereby, a driving connection between said lever and said connecting link, and means 45 for adjusting the length of the dog.

17. In a chain feed mechanism adapted to be actuated by a chain press drive shaft, a plane surfaced feed plate over which the chain is adapted to be fed from the press, 50 means for feeding the chain forward step by step, comprising a pivoted dog adapted successively to engage the end of each link, and means for reciprocating said dog in timed relation to the movement of the press, 55 comprising a crank disk mounted upon one end of said drive shaft, a connecting link pivoted to said crank disk adapted to rotate about an axis at right angles to the axis of rotation of said shaft, means for adjusting 60 the point of connection between said connecting rod and said crank disk in relation to the center of rotation of said shaft, a rock shaft mounted above the chain feed plate, a plurality of lever arms projecting there- 65 from, said dog being pivoted to one arm of said rock shaft, and a pivot connection between said connecting link and the other arm of said bell crank lever.

18. The combination with a chain press of 70 chain feeding means for feeding the completed chain forwardly from the press step by step in response to its reciprocation, comprising a supporting element adapted directly to receive and support the chain, a 75 dog, and means for reciprocating it along said element in response to movement of the press.

19. The combination with a chain press of 80 chain feeding means for feeding the completed chain forwardly from the press step by step in response to its reciprocation, comprising a supporting element adapted directly to receive and support the chain, a dog, 85 and means for reciprocating it along said element in response to movement of the press, and means for adjusting the effective width of said chain supporting element.

Signed at Chicago, county of Cook and State of Illinois, this 24th day of November, 1924. 90

RAYMOND W. DULL.