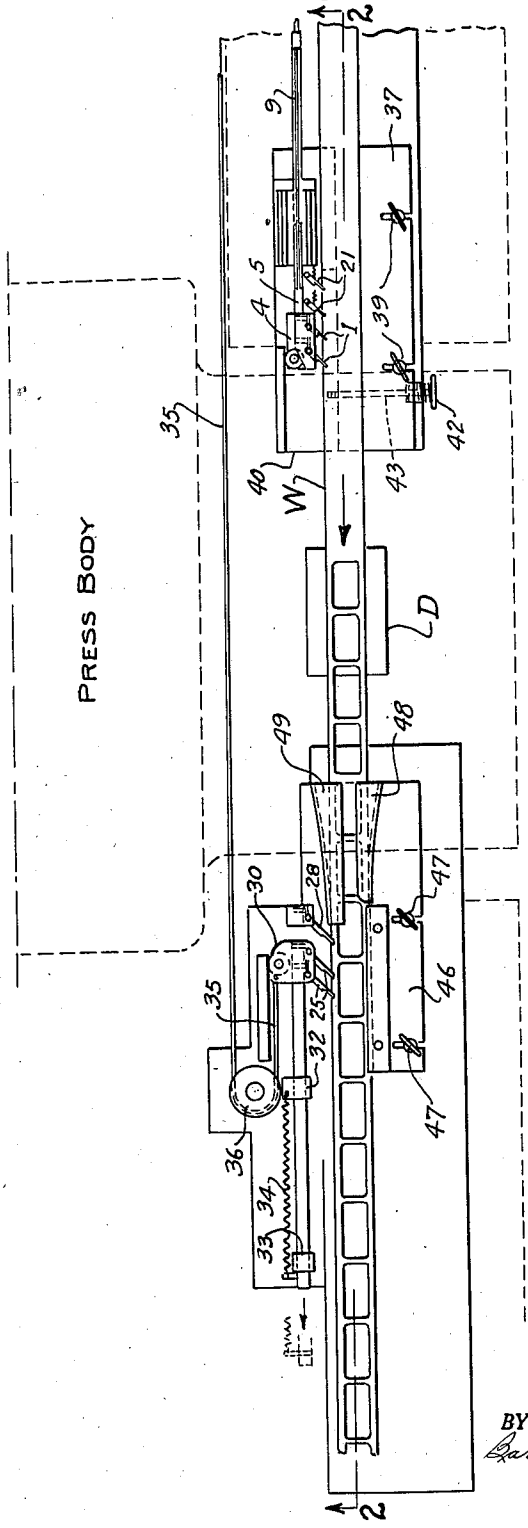
Aug. 19, 1947. W. D. CHILTON 2,425,994

PRESS FEED

Filed Sept. 19, 1945 4 Sheets-Sheet 1

FIG. 1.



INVENTOR.
William D. Chilton

BY
Barnes, Kisselle, Laughlin & Raisch
ATTORNEYS

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PRESS FEED

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FIG. 3.

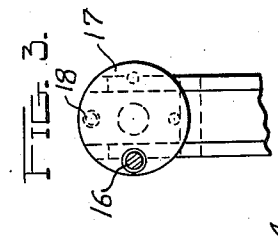

FIG. 2.

INVENTOR.
William D. Chilton

BY
Barnes, Kisselle, Laughlin & Raisch
ATTORNEYS

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FIG. 4.

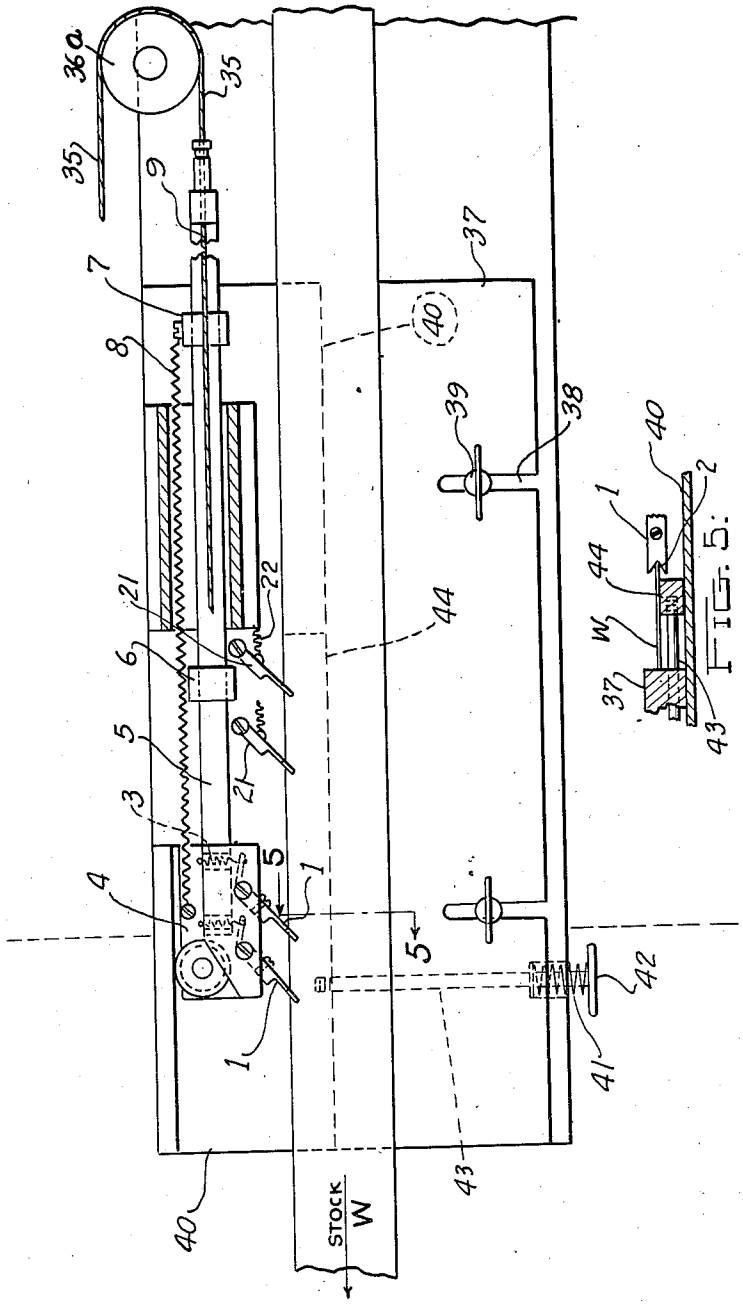

FIG. 5.

INVENTOR.
William D. Chilton

BY
Barnes, Kisselle, Laughlin & Raisch
ATTORNEYS

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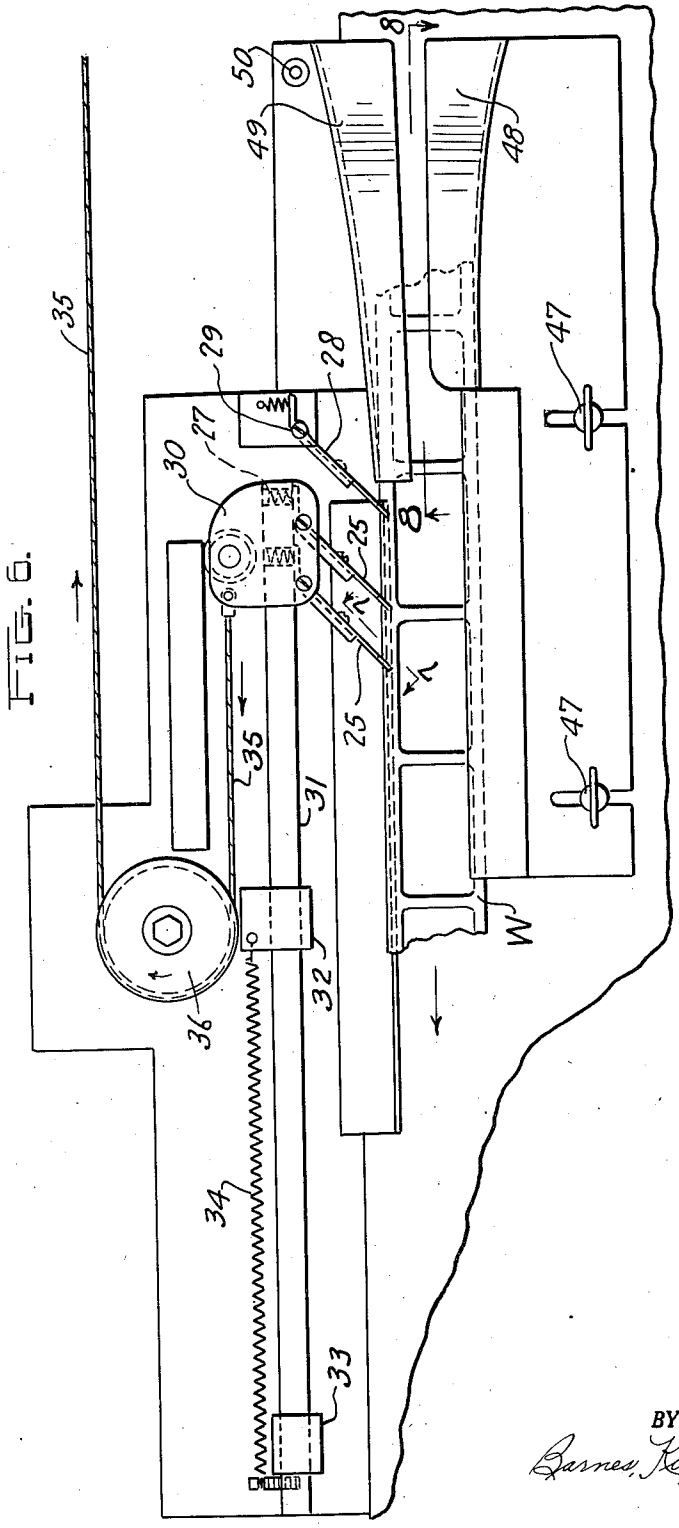

FIG. 6.

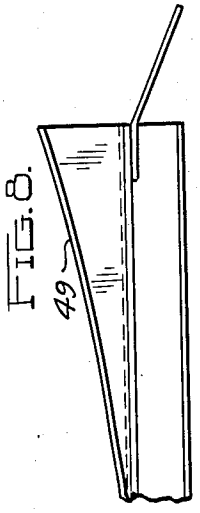

FIG. 8.

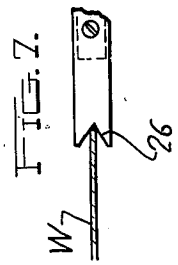

FIG. 7.

INVENTOR.
William D. Chilton

BY
Barnes, Kisselle, Raichlin & Raisch
ATTORNEYS

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2,425,994

UNITED STATES PATENT OFFICE

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William D. Chilton, Memphis, Tenn., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application September 19, 1945, Serial No. 617,234

13 Claims. (Cl. 164—117)

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This invention relates to a work feed for punch presses or similar machines.

It is the object of the invention to provide a measured feed which will automatically move a piece of stock a measured distance each time the press is operated. It is not broadly new to provide apparatus to do this, but my improvement is adapted to reliably feed strips of sheet metal stock without marring or injuring them and is also adapted to feed the stock its full length to the punch so that the strip does not have to be reversed to feed all portions to the punch or else be discarded without utilizing the entire stock. The length of the feed may be reliably and easily adjusted.

Referring to the drawings:

Fig. 1 is a plan view of the apparatus.

Fig. 2 is a front elevation of the push feed.

Fig. 3 is a section taken on the line 3—3 of Fig. 2.

Fig. 4 is a plan view of the push feed.

Fig. 5 is a section taken on the line 5—5 of Fig. 4.

Fig. 6 is a plan view of the pull feed.

Fig. 7 is a section taken on the line 7—7 of Fig. 6.

Fig. 8 is a section taken on the line 8—8 of Fig. 6.

W is the work strip. D is a die above which will be a cooperating punch (not shown). The work strip W is moved across the die and under the punch by the push and pull feeds now to be described.

The push feed is an operable device by itself and can be used without the pull feed, but in that case the strip will either have to be reversed or discarded without utilizing the entire length of the strip for the punching operation. It is also possible, of course, to use the pull feed without the push feed, but with the same disadvantages. When the two are used together no wastage occurs and the full length of the strip can be utilized without feeding it a second time through the press.

The push feed is shown best in Figs. 1, 2 and 4. Referring to Fig. 4, it will be seen that there are four spring-actuated fingers, the two fingers 1 at the left are the feed fingers. Referring to Fig. 5, it will be seen that these fingers 1 have each a V-notch 2 at its end which is arranged to straddle the strip stock, as shown in Figs. 4 and 5. The tractile springs 3 pull these pivoted fingers into tight engagement with the stock. On fingers 1 are little bell crank levers pivoted on the block or head 4 which is secured to the sliding rod 5

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which is guided in brackets 6 and 7. These brackets are secured to the plate 40. A long tractile spring 8 biases the rod and block 4 to the right. A cable 9 passes over the sheave 10 and the upper end is fastened to a spring clasp 11 which may be easily and detachably hooked over pin 12 fastened to nut 13 on lever arm 14. The nut 13 is adjustable along the lever arm 14 when screw 15 is revolved by turning crank 16 which is fastened eccentrically to disc 17 secured to the end of the screw 15 (see Fig. 3). A ball detent 18 holds the adjustment. The contact member 19 on the end of the lever arm 14 is arranged to engage a moving part of the press, such as the upper platen or ram 20. When the upper platen moves upwardly it strikes the contact 19 and moves the lever arm upwardly. This pulls the cable 9 a definite distance depending upon the position of the nut 13 on the lever arm. The cable pulls the sliding rod 5 to the left, the feed fingers 1 grip the edge of the stock and ordinarily will not mar the stock. But if they do scratch or dent it, it is immaterial as this is done to a portion of the stock that is not utilized.

When the press starts downwardly the tractile spring 8 pulls the slide, the head 4 and the feed fingers back to their initial position. The feed fingers slide along the stock, but the stock is held from being drawn back by means of the check fingers 21 which are pivoted to the bed of the machine and drawn against the edge of the stock by the tractile springs 22. These fingers have the same V-notch on the end to grip the stock.

23 is a bell crank arm fastened to the pivoted end of the lever arm 14 which is adapted to contact screw 24 which forms an adjustable stop. This stop can limit the downward travel of the lever arm 14 so that the feeder can be entirely inactive at the time the punch contacts and enters the stock. The precise point of inactivity can be adjusted so as to accord with the thickness of the stock. The distance of the feed can obviously be altered by changing the position of the nut 13 on the lever arm. The farther out on the lever arm the nut is the greater the throw of the nut and the more the cable will be pulled over the sheave and the greater the travel of the feed fingers and the work strip.

If the push feed is used alone obviously when the end of the stock is reached and the stock passes beyond the fingers there can be no further feed and so there will be some wastage between the punch and the feed fingers unless the strip is pulled out and reversed and fed through the

press again to utilize that portion of the stock that has not passed over the punch. However, I overcome this difficulty by providing a pull feed on the other side of the press. This pull feed is quite similar to the push feed. It has fingers **25** that have V-notches **26** (Fig. 7) adapted to grip the work strip W. These are spring pulled into contact with the work by springs **27**. A check finger **28** also with a V-notch on the end is pivoted at **29** to a stationary part of the press so that it holds the feed strip from being dragged backwardly when the slides and the feed fingers are on their return stroke. The feed fingers **25** are pivoted to the sliding block **30** which is on the end of a rod **31** which is guided in brackets **32** and **33** and which is pulled towards the right by tractile spring **34**. Cable **35** passes over sheave **36**. This cable, when it is pulled, pulls the block and slide to the left and feeds the work strip forward by reason of the feed fingers **25** gripping the edge of the work. Cable **35** also passes over sheave **36***a* and is connected to the slide **5** of the push feed so that when the push feed advances cable **35** is pulled so as at the same time to pull the sliding rod **31**, the block **30** and the fingers **25** forward to coincidentally pull the strip forward.

The push feed apparatus has a stationary guide plate **37** which can be adjusted for different widths of stock by the groove **38** and the wing screw **39** adjustment. The stationary-finger release bar **44** is free to slide on plate **40** (Fig. 5). The spring-pressed fingers **1** and **21** keep the stock pressed against the first guide plate **37**. The stock may be easily released from the guide plate and fingers by simply pushing in on button **42** which is fastened to shaft **43** which in turn is fastened to the finger release bar **44** slidable on plate **40** (see Fig. 5) to press back the feed fingers.

The pull feed has a stationary guide plate **46** which is adjustable by slots and wing screws **47**. This has the forward end funnel shaped as at **48**, the opening in this funnel diverging both upwardly and outwardly. **49** is a similarly shaped gathering funnel section which is pivoted at **50** and which is lightly spring pressed at the free end to cause it to bear against the work and push it up against the stationary guide **46**. These two gathering funnel sections **48** and **49** guide the work strip into proper relation to the fingers of the pulling unit.

What I claim is:

1. An automatic feed for punch presses or the like, having in combination a lever arm arranged to be swung by a movable part of the press, a slide guided toward and away from the punching tool of the press, a guide for one edge of a strip of stock, one or more gripping fingers mounted upon the slide for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves and connections between the lever arm and the slide to automatically move the slide with the movement of the movable press part.

2. An automatic feed for punch presses or the like, having in combination a member arranged to be moved by a movable part of the press, a slide guided toward and away from the punching tool of the press, a guide for one edge of a strip of stock, one or more gripping fingers mounted upon the slide provided with V-notches for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves and connections between the movable member and the slide to automatically move the slide with the movement of the movable press part.

3. An automatic feed for punch presses or the like, having in combination a member arranged to be moved by a movable part of the press, a slide guided toward and away from the punching tool of the press, a guide for one edge of a strip of stock, one or more gripping fingers mounted upon the slide for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves, one or more check fingers pivoted to a stationary part and arranged to engage the edges of the stock to prevent retrograde movement of the stock and connections between the movable member and the slide to automatically move the slide with the movement of the movable press part.

4. An automatic feed for punch presses or the like, having in combination a member arranged to be moved by a movable part of the press, a slide guided toward and away from the punching tool of the press, a guide for one edge of a strip of stock, one or more gripping fingers mounted upon the slide for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves and connections between the movable member and the slide to automatically move the slide with the movement of the movable press part.

5. An automatic feed for punch presses or the like, having in combination a member arranged to be moved by a movable part of the press, a slide guided toward and away from the punching tool of the press, a guide for one edge of a strip of stock, one or more spring-stressed gripping fingers mounted upon the slide provided with V-notches for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves and connections between the movable member and the slide to automatically move the slide with the movement of the movable press part.

6. An automatic feed for punch presses or the like, having in combination a lever provided with a nut adjustable therealong and arranged to be swung by a movable part of the press, a slide guided toward and away from the punching tool of the press, a guide for one edge of a strip of stock, one or more gripping fingers mounted upon the slide for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves and connections between the nut and the slide to automatically move the slide with the movement of the movable press part.

7. An automatic feed for punch presses or the like, having in combination a member arranged to be moved by a movable part of the press, a slide guided toward and away from the punching tool of the press, a guide for one edge of a strip of stock, one or more gripping fingers mounted upon the slide for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves, one or more check fingers pivoted to a stationary part and provided with V-notches arranged to engage the edges of the stock to prevent retrograde movement of the stock and connections between the movable member and the slide to automatically move the slide with the movement of the movable press part.

8. An automatic feed for punch presses or the like, having in combination slides one on each side of the press tool, guides for strip stock,

fingers on the said slides for gripping the work strip to feed the same along when the slides are moved and means for coordinating the movement of the slides and for automatically causing the slides to move each time the part on the press is moved, the said means comprising cables and sheaves for connecting the slides together and a member arranged to contact a movable part on the press and cause the cable to move therewith.

9. An automatic feed for punch presses or the like, having in combination slides one on each side of the press tool, guides for strip stock, fingers on the said slides for gripping the work strip to feed the same along when the slides are moved and means for coordinating the movement of the slide and for automatically causing the slides to move each time a part on the press is moved, the said means comprising cables and sheaves for connecting the slides together and a lever for contacting a movable part of the press and connected with the cable to move the cable.

10. An automatic feed for punch presses or the like, having in combination slides one on each side of the press tool, guides for strip stock, fingers on the said slides for gripping the work strip to feed the same along when the slides are moved and means for coordinating the movement of the slides and for automatically causing the slides to move each time the part on the press is moved, the said means comprising cables and sheaves for connecting the slides together and a lever arranged to contact a movable part of the press to be actuated thereby and having an adjustable connection with the cable to change the point on the lever at which the cable is connected.

11. An automatic feed for punch presses or the like, having in combination a lever arm arranged to be swung by a movable part of the press, a slide guided toward and away from the punching tool of the press, a guide for one edge of a strip of stock, one or more gripping fingers mounted upon the slide for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves and connections between the lever arm and the slide to automatically move

the slide with the movement of the movable press part, the said lever having attached thereto a crank arm and an adjustable stop for contacting the crank arm and lifting the movement of the lever arm in one direction to coordinate the action of the slide with the entry of the punch into the work strip.

12. In an automatic feed for punch presses or the like, a full feed comprising a stationary strip stock guide, a slide coordinated with the press to be operated by the movement of the press and one or more spring-pressed fingers for gripping the edge of the stock to feed the stock forward when the slide moves, the said stationary guide being provided with a gathering funnel section for engaging one side of the stock and a pivoted gathering funnel section for engaging the other side of the stock.

13. An automatic feed for punch presses or the like, having in combination a member arranged to be moved by a movable part of the press, a slide guided toward and away from the punching tool of the press and a transversely movable plate for supporting the guides for one slide, a guide for one edge of the strip of stock, one or more gripping fingers mounted on the slide for engaging the opposite edge of the stock and causing it to bear against the guide and for feeding the stock when the slide moves, connections between the movable member and the slide to automatically move the slide with the movement of a movable press part, yieldable means for pressing the plate that carries the slide toward the stock and guide and means by which the said plate may be manually pressed away from the stock and stock guide to release the fingers from the stock.

WILLIAM D. CHILTON.

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