Aug. 7, 1945. A. E. BORTON 2,380,918

STRIP FEED

Filed Sept. 4, 1943 2 Sheets-Sheet 1

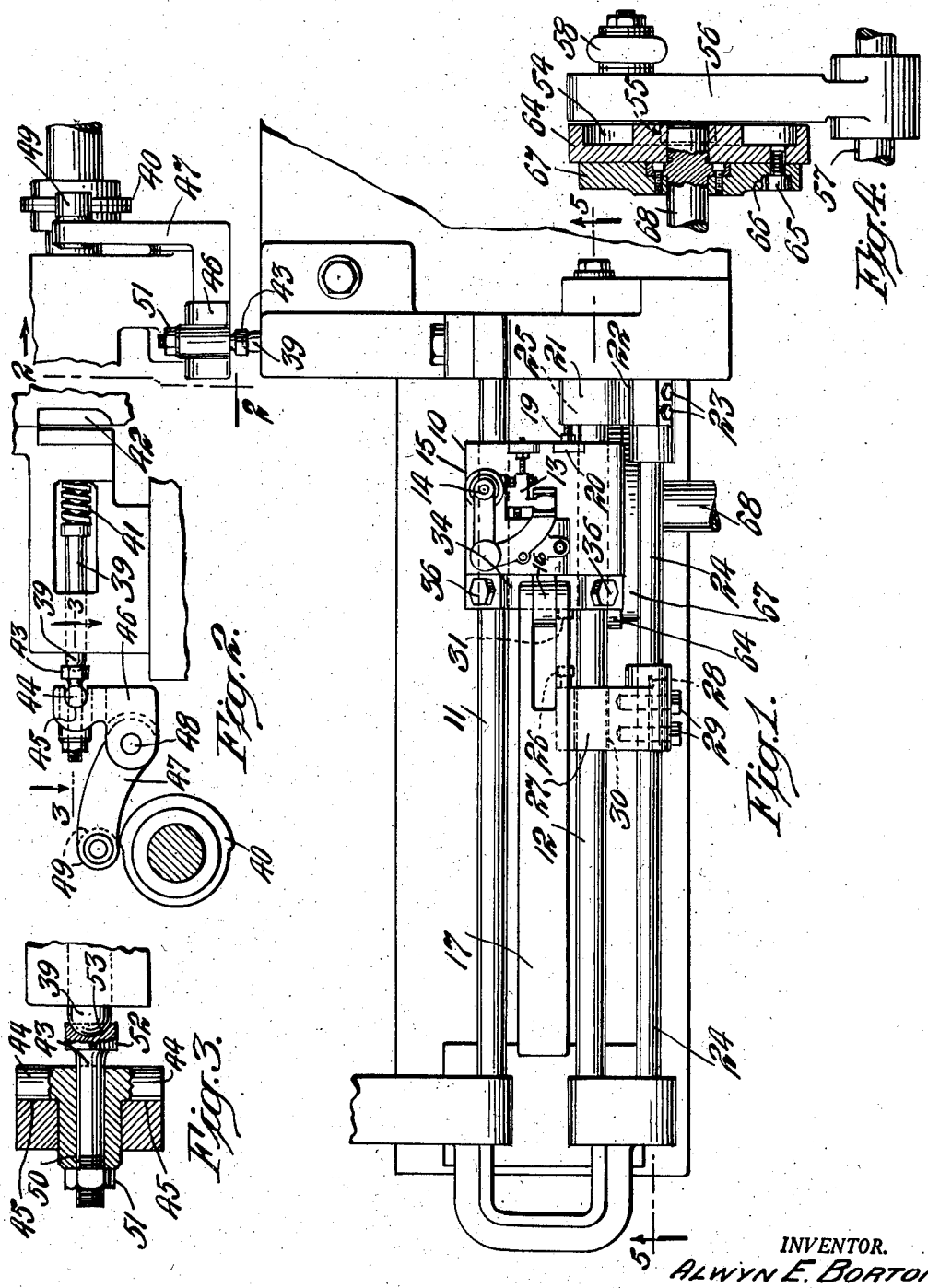


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

INVENTOR.
ALWYN E. BORTON
BY
ATTORNEY

Aug. 7, 1945. A. E. BORTON 2,380,918

STRIP FEED

Filed Sept. 4, 1943 2 Sheets-Sheet 2

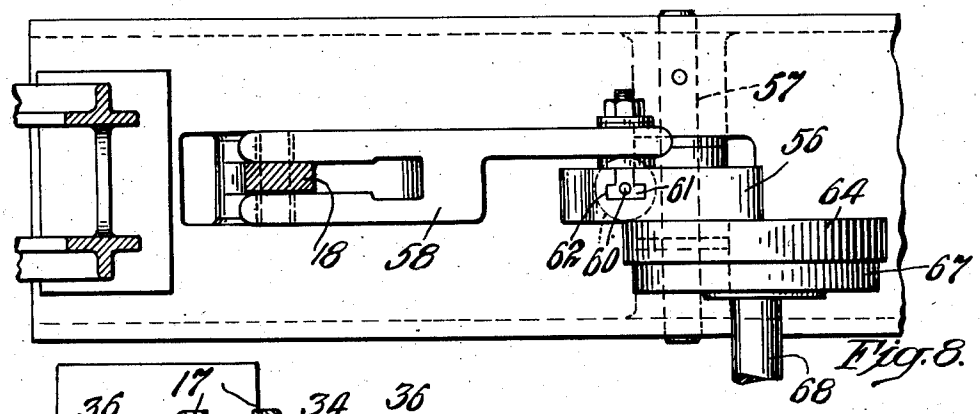


Fig. 8.

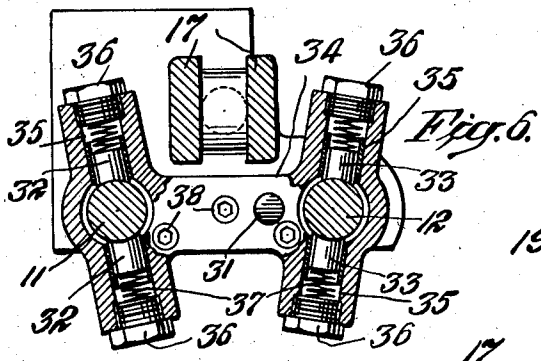


Fig. 6.

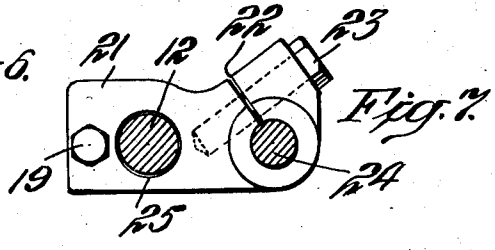


Fig. 7.

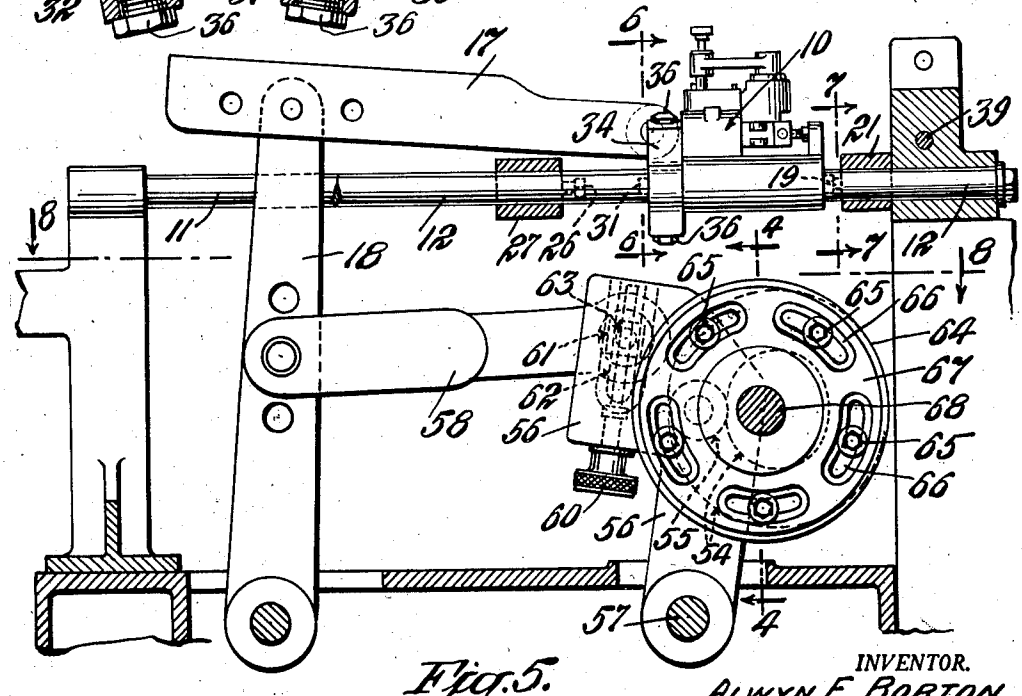


Fig. 5.

INVENTOR.
ALWYN E. BORTON
BY
Philip S. Hoffman
ATTORNEY

Patented Aug. 7, 1945

2,380,918

UNITED STATES PATENT OFFICE

2,380,918

STRIP FEED

Alwyn E. Borton, South Orange, N. J., assignor to Associated Patentees, Inc., Ampere, N. J., a corporation of New Jersey

Application September 4, 1943, Serial No. 501,329

8 Claims. (Cl. 271—2.5)

The invention here disclosed relates to the feeding of strip stock, particularly in machines of the "multi-slide" type such as disclosed in the Borton Patents #1,883,513, October 18, 1932, and 1,959,853, May 22, 1934.

In such machines, the stock is advanced by a reciprocating feed slide having its stroke governed by fixed stops. Action of the slide is further controlled by a so-called "drag," in the nature of a brake acting on the rods on which the slide reciprocates. It was found that even with the greatest of care in setting the parts this feed would get out of adjustment after the machine had been running for a time.

Similarly in respect to the feed check for holding the stock in advanced position, it was found that after the machine had been run for an appreciable time, the check would begin to fail to hold the stock at just the right point.

While variations resulting from the above might not be objectionable ordinarily, there are special cases where any such losses in accuracy might become important.

Objects of the present invention are to overcome and eliminate the possibility of changes such as mentioned in the feeding of the stock and to provide feed mechanism of a particularly accurate and constant form which may be relied upon to continue in action without variation in the feed.

A related object is to utilize the accuracy of feed attained, to the greatest extent, by speeding up the feed stroke to the maximum limits possible or practical.

Other desirable objects and advantages attained by the invention will become apparent or are specifically mentioned in the following specification.

The drawings accompanying and forming part of the specification illustrate a present practical embodiment of the invention. Structure, however, may be modified and changed as regards this present illustration, all within the true intent and broad scope of the invention, as hereinafter defined and broadly claimed.

Fig. 1 in the drawings is a broken top plan view of the feed slide and stock check mechanism.

Fig. 2 is a broken sectional view as on the line 2—2 of Fig. 1 showing the stock check cam and related parts.

Fig. 3 is an enlarged broken sectional detail as on the line 3—3 of Fig. 2.

Fig. 4 is a broken vertical sectional view of the quick feed cam structure.

Fig. 5 is a side elevation and broken vertical sectional view as on substantially the line 5—5 of Fig. 1.

Fig. 6 is an enlarged broken sectional view on substantially the plane of line 6—6 of Fig. 5 showing particularly the drag block assembly.

Fig. 7 is an enlarged cross sectional detail of the front stop, as on substantially the plane of line 7—7 of Fig. 5.

Fig. 8 is a broken horizontal sectional view as on substantially the plane of line 8—8 of Fig. 5.

The feed slide is shown as of the same general construction disclosed in the patents above identified, comprising a block 10 sliding on guide rods 11, 12 and carrying a lever 13 pivoted at 14 for gripping the strip stock against a clamp plate 15, said lever being engaged by a slide rod 16 pivotally connected by link 17 with an oscillating lever 18.

The advancing movement of the feed slide is limited by an adjustable stop screw 19 engaged by a hardened plate 20 in the front face of the slide block. This front stop screw is carried by a block 21 having a split clamp portion 22 secured by bolts 23 over a supporting rod 24 positioned to the outside of the slide block supporting rod 12.

As shown in Fig. 7, the front stop block 21 has a passage 25 therethrough, clear or free of the slide rod 12 to the extent that this rod may expand or contract without effecting the setting of the front stop 19.

Similarly the back stop screw 26 is carried by a block 27 adjustably clamped at 28, 29 on the supporting rod 24, said block having an opening 30 for free passage of the slide supporting rod 12. This back stop screw is engaged by a hardened stop piece 31 carried by the feed slide block.

The drag for controlling the movements of the slide block is shown as composed of oppositely disposed spring pressed brake plugs 32 engaging opposite sides of guide rod 11 and corresponding spring pressed friction plugs 33 engaging opposite sides of the slide supporting rod 12, Fig. 6.

These two sets of spring pressed friction elements are shown in Figs. 1 and 6 as all carried by an H shaped block or frame 34 having passages 35 slidingly receiving the brake members and closed at the outer ends by screw plugs 36 forming abutments for the springs 37.

The drag mechanism thus constituted forms a single complete unit which can be made up

as such and bolted on at 38 over the end of the slide block. The back stop piece 31 may be set in and be carried by this drag block.

The division of the braking surface into two parts engaging opposite sides of a slide supporting rod distributes and equalizes wear and lessens the tension necessary on any particular one of these brake elements. Hence the resultant heat is to an extent segregated from the body of the slide block by the constituting of the drag as a separate, small unit bolted onto the end of the slide block.

With the construction disclosed also there may be no need for separately adjusting the individual brake elements, it being sufficient to merely provide springs 37 which will closely approximate the desired braking pressure and which then need only be confined in place by abutment screws such as 36, with no special provision for tension adjustments.

Such heating of the slide supporting rods 11, 12 as may be occasioned by the drag does not harmfully affect the accurate setting of the front and back stops because of the fact that those stops are supported on a rod 24 separate from the slide supporting rods and by blocks 21, 27 having free passage for the rod 12 which they encircle.

The stop check is similar to that in the patents above identified in that it comprises a plunger 39 projected by a cam 40 against the force of a spring 41 to grip the strip against a fixed guide plate 42.

In the patented construction, however, a certain amount of wear was occasioned by a continued rubbing action between the cam rocker and the outer end of the plunger.

The possibility of such accruing inaccuracy is avoided in the present disclosure by constructing the pusher 43 for the plunger 39 as a T shaped member, Fig. 3, having transverse journal extensions 44 rocking in journal seats 45 in the upstanding arm 46 of the bellcrank lever 47 pivoted at 48 and carrying the roll 49 in engagement with cam 40.

For purposes of fine adjustment the pusher 43 is shown as a bolt having a screw threaded mounting 50 in the journal block 44, and secured in adjusted relation by lock nut 51, the projecting head portion 52 of this bolt having a rocking ball and socket engagement with the end of the plunger at 53.

This articulated pivotal connection between the cam rocker and plunger assures continuous accurate gripping engagement of the stock, serving in co-action with the accurate slide feed operation to keep the machine effective for fine work over long continued periods of operation.

Another factor contributing to the accurate, speedy operation of the machine is the actuation of the feed slide through a cam specially designed to give the slide a quick feed stroke and allow as much time as may be desired for the return movement and the timing of the parts to take the fullest advantage of the quick feed possible with such a specially designed cam.

In the illustration, the special feed cam is indicated at 54, Fig. 5, engaged by roll 55 on rock lever 56 pivoted at 57 and connected by link 58 with the feed slide operating lever 18.

Accurate timing of these parts is accomplished by adjustment of the connection between cam lever 56 and link 58 through the medium of a screw 60 turning in lever 56 and connected with the block 61 sliding substantially vertically in a guide 62 in lever 56 and carrying the stud 63 on which the link 58 is pivoted.

Also the cam is shown as formed in a disc 64 secured in circumferentially adjustable relation by bolts 65 passing through slots 66, to a drive disc 67 on shaft 68, the latter operated by gearing (not shown) from the left-hand cross shaft of the machine.

The last described, in conjunction with the previous features, enable the machine to be set to best advantage for quick and accurate strip feeding action and with the assurance that the machine will continue with the same accuracy of operation.

What is claimed is:

1. A slide feed, comprising supporting rods, a slide block reciprocating on said rods, a drag carried by said block and engaging said rods, front and back stops for said slide block, a supporting rod on which said front and back stops are adjustably fixed, said front and back stops being free of said slide supporting rods so as to be unaffected by expansion of the same resulting from heat occasioned by action of the drag on said supporting rods, said drag including an H shaped block separably attached to one end of said slide block and having passages open to opposite sides of the supporting rods, brake plugs slidably mounted in said passages, springs engaging said brake plugs and screw plugs closing said passages and holding said springs in place.

2. A slide feed, comprising supporting rods, a slide block reciprocating on said rods, a drag carried by said block and engaging said rods, front and back stops for said slide block and a supporting rod on which said front and back stops are adjustably fixed, said front and back stops being free of said slide supporting rods so as to be unaffected by expansion of the same resulting from heat occasioned by action of the drag on said supporting rods, said front and back stops comprising blocks with split clamp portions adjustably secured on said stop supporting rod and having passages surrounding and of larger diameter than one of said slide block supporting rods.

3. A slide feed, comprising supporting rods, a slide block reciprocating on said rods, a drag carried by said block and engaging said rods, front and back stops for said slide block, a supporting rod on which said front and back stops are adjustably fixed, said front and back stops being free of said slide supporting rods so as to be unaffected by expansion of the same resulting from heat occasioned by action of the drag on said supporting rods and a stop check including a plunger for gripping the stock advanced by the feed slide, a rocker, a cam for actuating said rocker and a pusher pivoted in said rocker at one end and having a ball and socket engagement with said plunger at the opposite end.

4. A slide feed, comprising supporting rods, a slide block reciprocating on said rods, a drag carried by said block and engaging said rods, front and back stops for said slide block, a supporting rod on which said front and back stops are adjustably fixed, said front and back stops being free of said slide supporting rods so as to be unaffected by expansion of the same resulting from heat occasioned by action of the drag on said slide supporting rods and a stop check including a plunger for gripping the stock advanced by the feed slide, a rocker, a cam for actuating said rocker and a pusher pivoted in said rocker and having a ball and socket engagement with said plunger, said pusher including a T-shaped mem-

ber having laterally projecting journal extensions and a longitudinally adjustable screw stud screw threaded in the stem portion of said T-shaped member and having a head with one element of a ball joint incorporated therein.

5. A slide feed, comprising supporting rods, a slide block reciprocating on said rods, a drag carried by said block and engaging said rods, front and back stops for said slide block, a supporting rod on which said front and back stops are adjustably fixed, said front and back stops being free of said slide supporting rods so as to be unaffected by expansion of the same resulting from heat occasioned by action of the drag on said slide supporting rods, a cam for reciprocating said slide block, a lever vibrated by said cam, a link having pivotal connection with said lever, screw means for accurately setting the position of said pivotal connection and a lever vibrated by said link and connected with said slide block.

6. A slide feed, comprising supporting rods, a slide block reciprocating on said rods, a drag carried by said block and engaging said rods, front and back stops for said slide block, a supporting rod on which said front and back stops are adjustably fixed, said front and back stops being free of said slide supporting rods so as to be unaffected by expansion of the same resulting from heat occasioned by action of the drag on said supporting rods, a cam for reciprocating said slide block, a lever vibrated by said cam, a link having pivotal connection with said lever, screw means for accurately setting the position of said pivotal connection and a lever vibrated by said link and connected with said slide block, said cam forming part of a disc, a drive disc with which said cam disc is engaged, one of said discs having slots therein and bolts passing through said slots into the other disc for securing said cam disc in circumferentially adjustable relation to said drive disc.

7. In a slide feed, the combination of a slide block and a drag block detachably secured together, supporting rods on which said slide block is mounted, said drag block having seats at opposite sides of said supporting rods, brake plugs slidably mounted in said seats, closures over the outer ends of said seats and springs confined by said closures in engagement with said slidably disposed brake plugs.

8. In combination with stock feeding mechanism, a stop check comprising a stock engaging plunger, a cam, a rocker actuated by said cam and a pusher journaled in said rocker on an axis parallel to the axis of said rocker; and having an adjustably mounted screw stud intersecting said journal axis and having a ball and socket engagement with said plunger.

ALWYN E. BORTON.