May 11, 1948. E. C. DEITRICH 2,441,474

APPARATUS FOR SCARFING BILLETS OR BLOOMS

Filed June 14, 1944 3 Sheets-Sheet 1

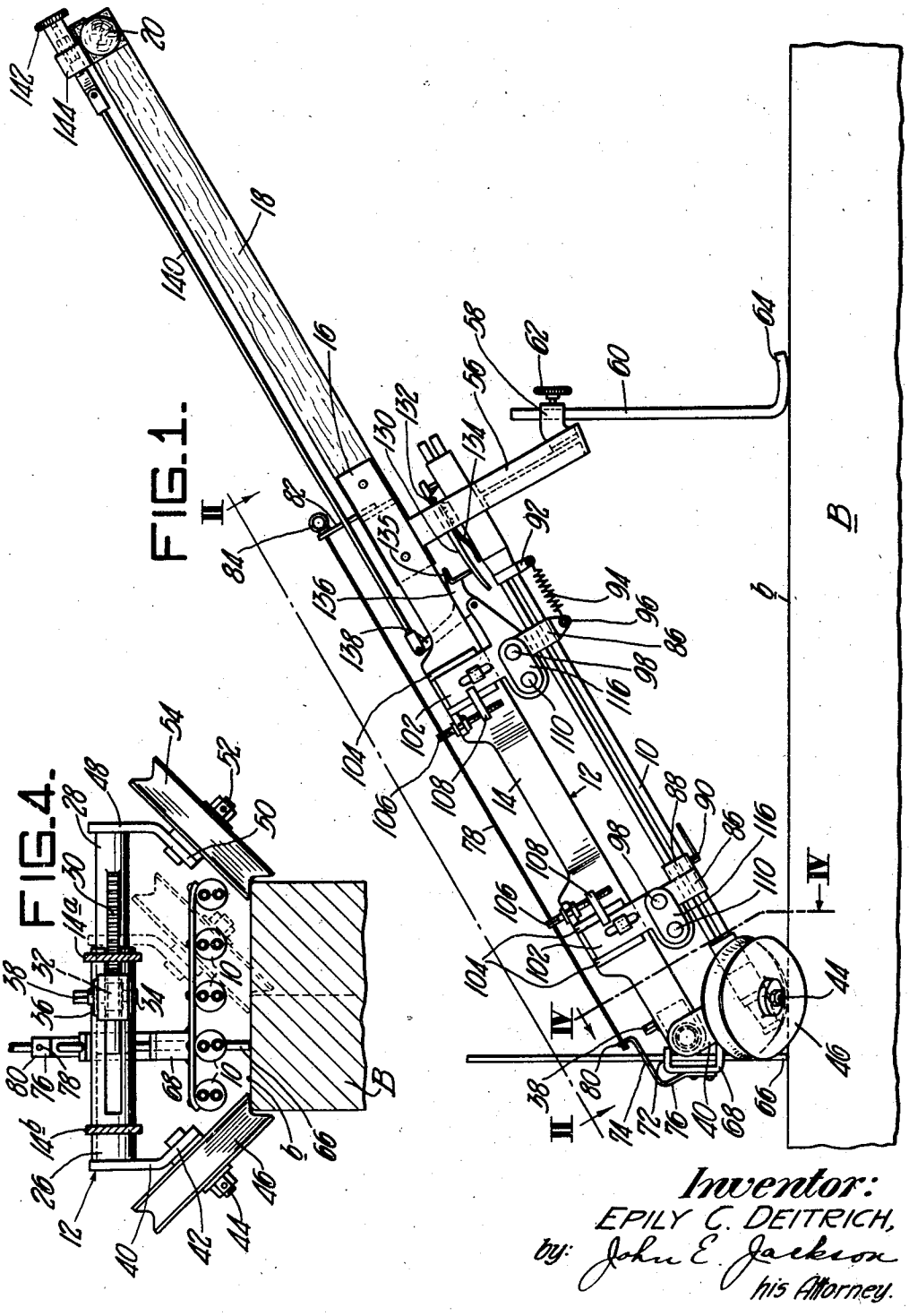


FIG. 1.

FIG. 4.

Inventor:
EPILY C. DEITRICH,
by: John E. Jackson
his Attorney.

May 11, 1948. E. C. DEITRICH 2,441,474

APPARATUS FOR SCARFING BILLETS OR BLOOMS

Filed June 14, 1944 3 Sheets-Sheet 2

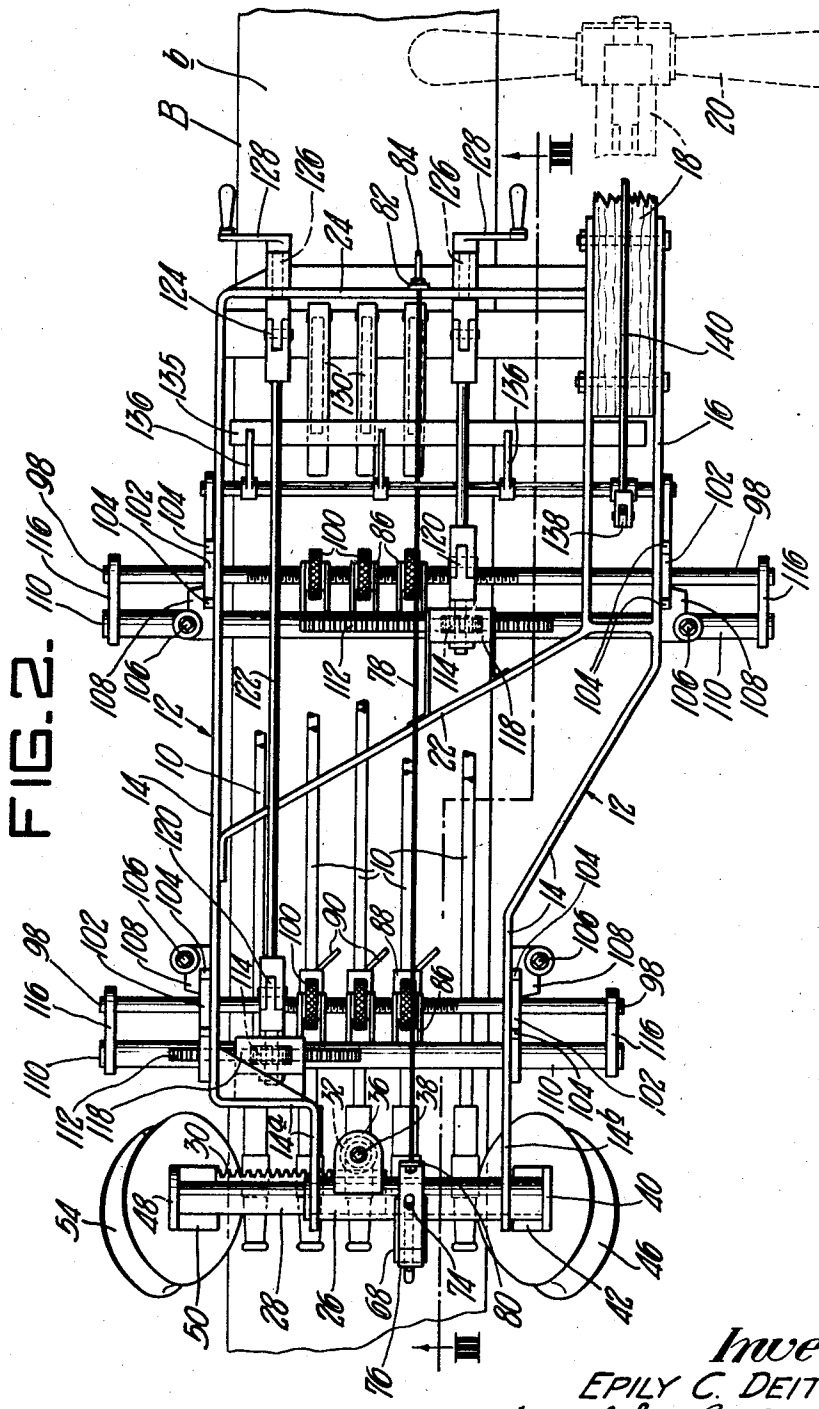


FIG. 2.

Inventor:
EPILY C. DEITRICH,
by: John E. Jackson
his Attorney.

May 11, 1948. E. C. DEITRICH 2,441,474

APPARATUS FOR SCARFING BILLETS OR BLOOMS

Filed June 14, 1944 3 Sheets-Sheet 3

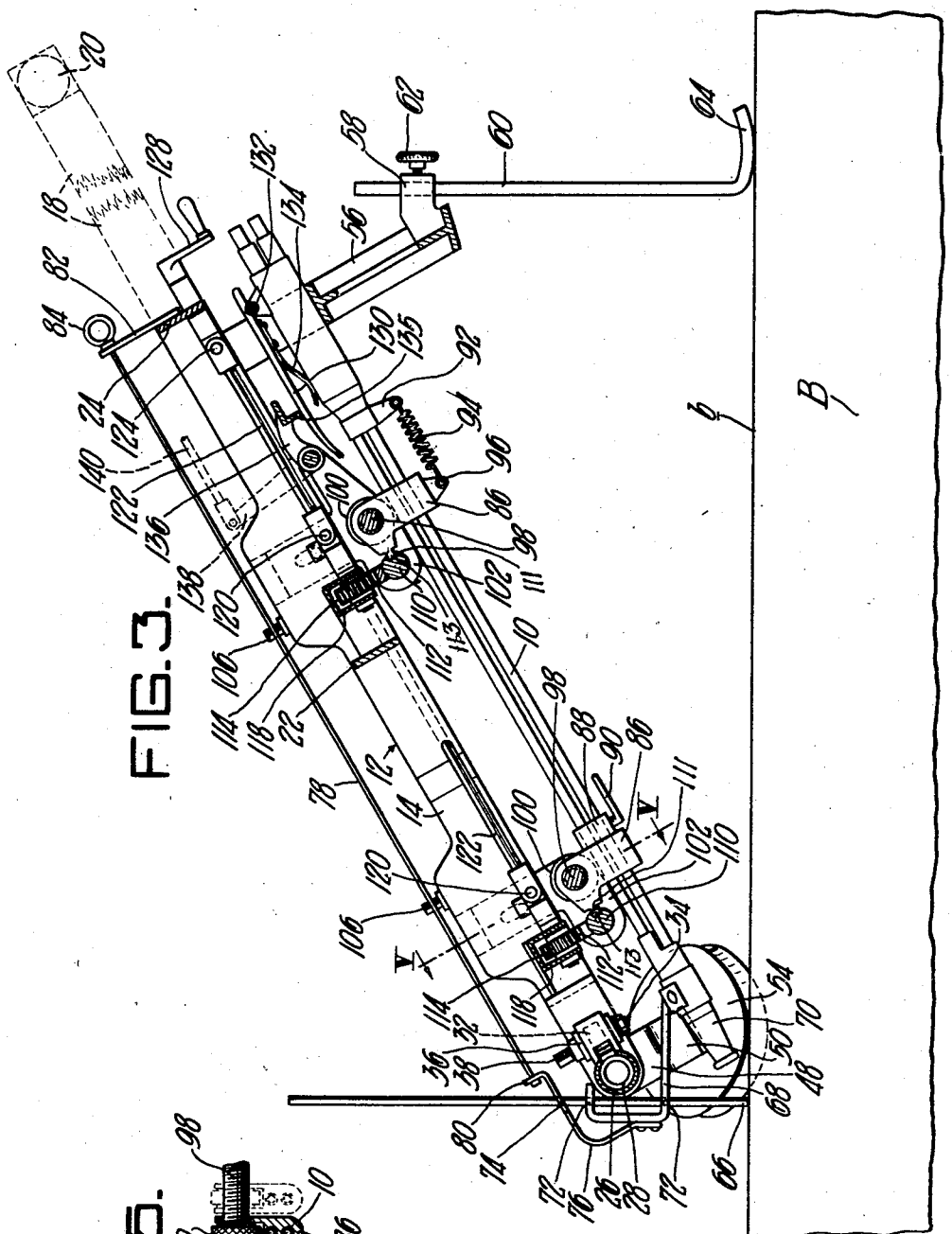


FIG. 3.

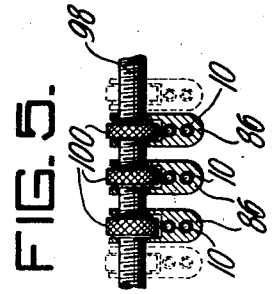


FIG. 5.

Inventor:
EPILY C. DEITRICH,
by: John E. Jackson
his Attorney

Patented May 11, 1948 2,441,474

UNITED STATES PATENT OFFICE

2,441,474

APPARATUS FOR SCARFING BILLETS OR BLOOMS

Epily C. Deitrich, Pittsburgh, Pa., assignor to Carnegie-Illinois Steel Corporation, a corporation of New Jersey

Application June 14, 1944, Serial No. 540,358

4 Claims. (Cl. 266—23)

1

The present invention relates to the features of construction and arrangement of means for supporting torches used to scarf the surfaces of blooms or billets.

One object of the invention is to provide a supporting carriage having billet-engaging guide wheels so arranged that one of them can be adjusted with respect to the other, to adapt the apparatus for guiding engagement with blooms or billets of different widths.

A further object of the invention is to provide a construction wherein the operating handle for the carriage is offset laterally, so that the operator can walk alongside of the bloom or billet to propel the carriage therealong.

Another object is to provide hangers and cradles for the scarfing torches and means for adjusting the same.

An additional object is to provide a back-rest which, in coaction with the guiding rolls on the carriage, positions the scarfing torches at various desired oblique angles with respect to the bloom or billet.

Another object is to provide a starting rod adapted to cooperate with the torches in initiating the scarfing operation and in the provision of control means operable from a point readily accessible to the operator for controlling the release of the starting rod.

The above and related features of the invention will be more fully apparent from a consideration of the following detailed disclosure, the accompanying drawings, and the appended claims.

In the drawings:

Figure 1 is a side elevation of billet scarfing apparatus embodying the herein claimed invention.

Figure 2 is a projection perpendicular to Figure 1 (on line II—II).

Figure 3 is a vertical section on line III—III of Figure 2.

Figure 4 is a traverse section on line IV—IV of Figure 1, illustrating the means for adjusting the flanged guide wheels of the carriage for guiding coaction with different widths of billets.

Figure 5 is a transverse section on line V—V of Figure 3, illustrating the torch-supporting cradles and details of related parts coacting therewith.

Referring in detail to the drawings, reference letter B represents a bloom or billet whose upper face *b* is adapted to be scarfed by means of a plurality of torches 10 hung from a carriage indicated as a whole at 12. The carriage comprises side frame members 14—14 and a laterally offset

2

portion 16 to which is secured a handle rod 18 having a transversely-extending handle bar 20 secured at the upper end thereof. The side frame members 14—14 are held in spaced relation by an intermediate transverse member 22 and a rear transverse member 24. At its forward end one of the members 14 is offset inwardly, as indicated at 14^a in Figure 2. Bridging the space between this member 14^a and the member 14^b opposite thereto is a sleeve 26 serving as a guide for a bar 28 having a rack 30 secured thereto. A pinion 32 is supported by a stub shaft 34 mounted in suitable bearings 36. The upper end of the stub shaft is squared as indicated at 38, for coaction with a socket wrench or the like by means of which the rack 30 can be reciprocated transversely.

Depending from one end of the sleeve 26 or from any other relatively fixed part of the forward end of the frame 14 is a bracket 40 having a bent extremity 42 carrying a trunnion pin 44 which rotatably supports a flanged wheel 46. The rack bar 28 carries a bracket 48 having an inwardly bent end 50 carrying a trunnion 52 which rotatably supports a flanged wheel 54. The flanged wheels 46 and 54, as shown and described, are mounted on trunnions whose axes are oblique to the upper face of the billet to be scarfed, and by manipulation of the pinion 32 it will be understood that one of the flanged wheels can be adjusted with respect to the other, so as to shift the wheel 54, for example, from the full-line position of Figure 4 to the dotted-line position of the same figure, thus adapting the wheels of the carriage for guiding coaction with the upper corners of the billets of different widths to be scarfed.

Depending from the rear of the carriage is a portion 56 carrying a bracket 58 having a back rest rod 60 slidable therein and adapted to be secured in the desired position of adjustment by clamp screw 62, the rod having a foot 64 arranged for sliding engagement with the upper surface of the billet to be scarfed. It will be understood that the wheels 46 and 54, in coaction with the backrest 60, are effective to support the scarfing torches 10 at any desired oblique angle with respect to the upper face of the billet.

To start a scarfing operation on a bloom or billet, it is desirable to first melt the end of a starting rod such as indicated at 66. To this end I secure a bracket 68 to a nozzle 70 of one of the scarfing torches. This starting rod is supported in a position substantially perpendicular to the billet to be scarfed, the rod sliding freely through registering openings 72 formed in portions of the bracket 68 as shown in Figure 3.

The rod also passes through an opening 74 formed in a resilient spring member 76 which in cooperation with the bracket 68 constitutes a clutch control for release of the rod. An operating link 78 is connected to an extension 80 on the spring 76 and passes through a guide opening formed in a bracket 82 secured to the rear cross member 24 of the carriage. An operating finger ring 84 is secured to the rear extremity of the link 78, this ring being at a location within the convenient reach of the operator. Thus after the lower extremity of the starting rod 66 has been burned away in initiating the scarfing operation, when it is desired to again initiate scarfing on another billet or on a different portion of the billet, it is merely necessary for the operator to pull on the finger ring 84 so that the clutch spring 76 will be released and cause a new length of rod to come into contact at its lower end with the face of the new billet or new portion of the billet to be acted upon.

In the apparatus illustrated, improved means are provided for laterally adjusting the scarfing torches individually with respect to one another, and collectively with relation to their supporting carriage. This improved supporting means includes cradles 86, there being one set of cradles 86 supporting the lower portions of the torches and another set of identical cradles supporting the upper portions of the torches, as indicated in Figure 3. Thus a description of one of the cradles and its supporting and adjusting means will suffice for all.

Each torch carries a collar 88 equipped with a clamp screw 90, and each torch has a depending lug 92 which is connected by a spring 94 anchored to one of the upper cradles, as indicated at 96. Thus the springs tend to move the torches downwardly toward the work. By a manipulation of the clamp screw 90 of the collar 88, the proximity of the nozzle at the lower end of the torch with respect to the billet to be scarfed can be readily adjusted. The torch cradles are hung from screw shafts 98 which pass freely through openings therein, and associated with each cradle there is a knurled adjusting nut 100 by means of which any given cradle torch can be laterally adjusted individually with respect to its neighbors. Each screw shaft 98 is rotatably supported near its ends in hangers 102 which are slidably mounted in guides 104 carried by the side frame members of the carriage. An adjusting screw 106 having a squared portion at its upper extremity for coaction with a suitable wrench, is threaded through an extension 108 formed on each hanger so as to provide for the adjustment of each cradle toward or from the billet.

Extending parallel to each screw shaft 98 and also rotatably supported by the hangers 102 is a bar 110 having rack teeth 112 meshing with a coacting pinion 114. Each bar 110 is formed with a groove 111 for guiding engagement with a tongue 113 extending from each cradle 86. The screw shaft 98 and bar 110 at their ends are rotatably mounted in respective plates 116. The pinions 114 are confined in housings 118 which are adapted to partake of the adjustment of the hangers 102. The shaft on which each pinion 114 is mounted is connected by a universal joint 120 which is connected by a reach rod 122 with a similar universal joint 124 including a shaft portion 126 to which is secured a crank 128 within easy reach of the operator. As thus arranged it will be apparent, that by turning a respective crank 128, the operator can reciprocate the rack

bar 110 so as to thus collectively shift either the forward portion or the rear portion, or in fact both portions of the torches, so as to thus vary the angularity of the torches with respect to the longitudinal center line of the billet. Thus the angularity of flame impingement is made variable. This adjustment also provides for collectively positioning the torches for coaction with selected portions of the face of the billet to be scarfed. This collective adjustment, when taken with the individual adjustment of the torches relatively to one another by manipulation of the knurled nuts 100, provides for precision adjustment and enables the user to set the apparatus quickly and easily and with a great degree of accuracy, to suit the requirements of the particular billets to be scarfed.

The torches 10 are connected by flexible tubing to suitable sources of fuel and comburent such as acetylene gas and oxygen. The scarfing torches per se are of known conventional construction. Such torches are equipped with a means for opening and closing the gas passage and a similar means for opening and closing the oxygen passage (not shown on the drawing). During the scarfing operation it becomes necessary to increase the amount of oxygen to bring about oxidation of the metal being scarfed; therefore it is necessary to provide a suitable means for controlling the oxygen supply. In Figure 1 I have shown such a high pressure control valve in the form of a lever 130 pivoted at 132 and equipped with a spring 134. For actuating such valve levers I provide a universal bar 135 common to all torches, this bar being connected at its ends to arms 136 of bell crank levers 138. One lever 138 is connected by a link 140 with an operating knob 142 located in a position readily accessible to the operator. In the case illustrated the fuel control knob 142 is conveniently mounted on a bracket 144 secured to the handle bar 20.

From the foregoing description it is manifest that the improved apparatus illustrated provides means for attainment of the objects of the invention enumerated in the opening paragraphs of this specification.

While I have described quite precisely a preferred construction of highly desirable cooperating instrumentalities, it is not to be construed that I am limited thereto, since various modifications and substitutions of equivalents may be resorted to by those skilled in the art without departure from the invention as defined in the appended claims.

I claim:

1. Billet scarfing apparatus comprising a carriage adapted to be propelled lengthwise of the billet and guided by the edges thereof, a pair of oppositely inclined flanged wheels whose treads are adapted to traverse the substantially parallel upper corners of the billet, means on the carriage for rotatably supporting said wheels, hangers adjustable toward and from the carriage, torch-supporting cradles supported by said hangers, means for individually adjusting said cradles laterally relatively to one another, and means for simultaneously shifting said cradles laterally with respect to said hangers so as to vary the lateral zone of flame impingement by said torches.

2. Billet scarfing apparatus comprising a carriage adapted to be propelled lengthwise of the billet and guided by the edges thereof, a pair of oppositely inclined flanged wheels whose treads are adapted to traverse the substantially parallel upper corners of the billet, means on the

carriage for rotatably supporting said wheels, hangers slidable in guides secured to the carriage, adjusting screws for moving said hangers relatively to the carriage, a rack bar and a screw shaft slidably supported by said hangers, torch-supporting cradles, nuts on said screw shaft coacting with said cradles for positioning them relatively to one another, a pinion coacting with said rack bar for simultaneously shifting said cradles transversely of the carriage, and means on the carriage for actuating said pinion.

3. Flame treating apparatus comprising a carriage adapted to be propelled along a workpiece to be treated, hangers on the carriage adjustable toward and away therefrom, torch-supporting cradles supported by said hangers, torches carried by said cradles, means for individually adjusting said cradles laterally relatively to one another, and means for simultaneously shifting said cradles laterally with respect to said hangers so as to vary the lateral zone of flame impingement by said torches.

4. Flame treating apparatus comprising a carriage adapted to be propelled along a workpiece, hangers slidable in guides secured to the carriage, adjusting screws for moving said hangers relatively to the carriage, a rack bar and screw shaft slidably supported by said hangers, torch-supporting cradles supported by said hangers,

nuts on said screw shaft coacting with said cradles for positioning them relatively to one another, a pinion coacting with said rack bar for simultaneously shifting said cradles transversely of the carriage, and means on the carriage for actuating said pinion.

EPILY C. DEITRICH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,162,587	Eimann	Nov. 30, 1915
1,861,758	Shippy	June 7, 1932
1,882,417	Graham	Oct. 11, 1932
1,931,696	Hedenstrom	Oct. 24, 1933
2,018,259	Hartley	Oct. 22, 1935
2,075,982	George	Apr. 6, 1937
2,125,179	Doyle	July 26, 1938
2,269,636	Mott	Jan. 13, 1942
2,309,096	Bucknam et al.	Jan. 26, 1943
2,334,301	Young	Nov. 16, 1943

FOREIGN PATENTS

Number	Country	Date
474,033	Great Britain	Oct. 21, 1937