A. E. SWAIM.

MACHINE FOR TRUING STANDING VALVE PACKING RINGS.

APPLICATION FILED FEB. 24, 1915.

1,165,635.

Patented Dec. 28, 1915.

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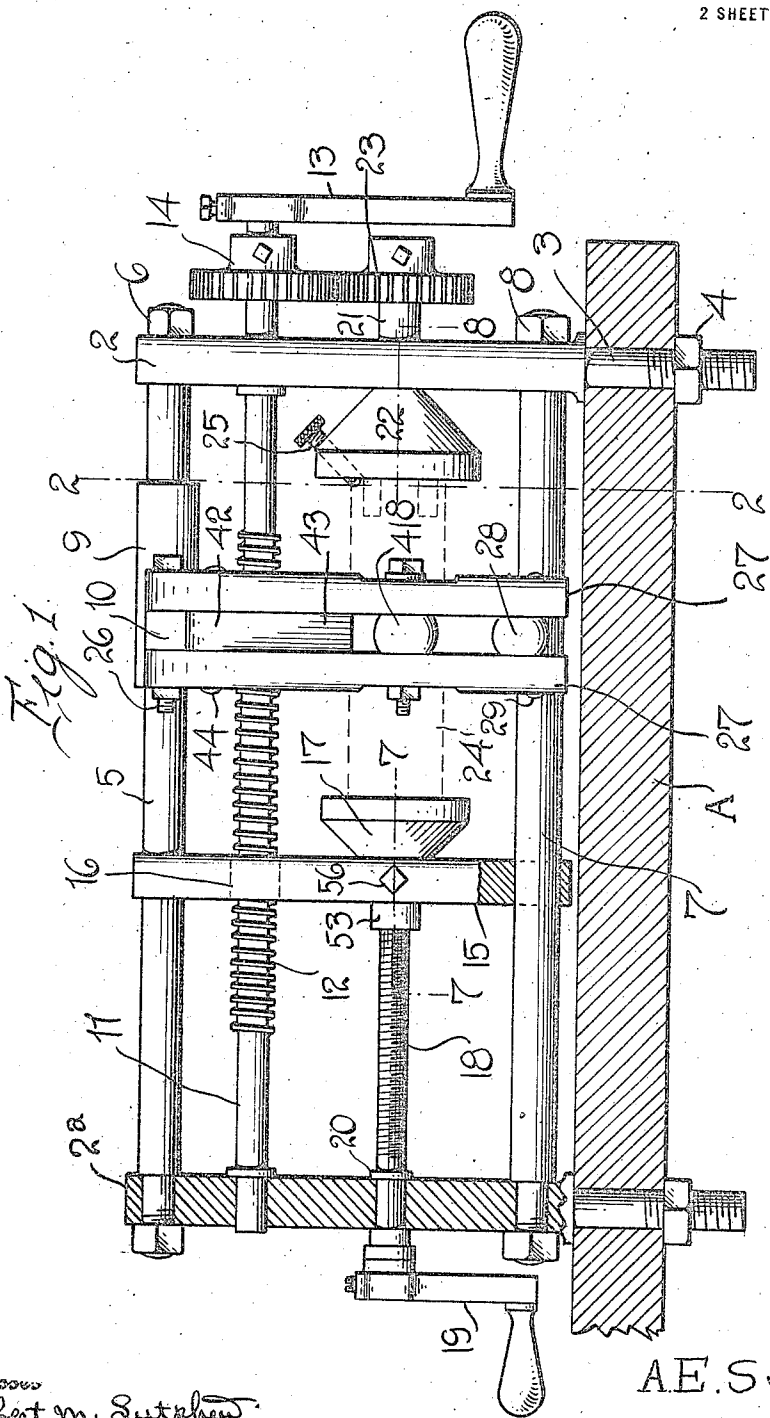


Fig. 1.

Witnesses
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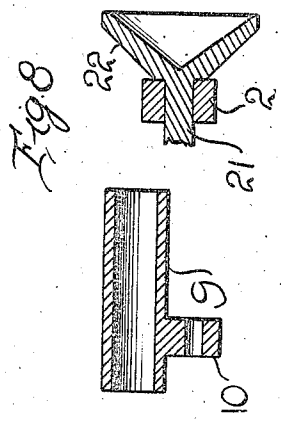
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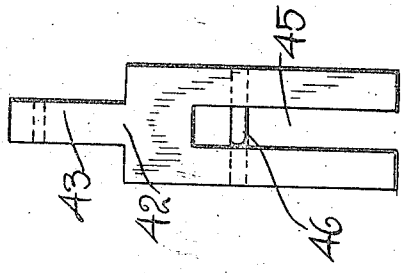
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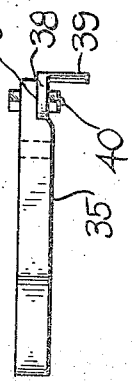
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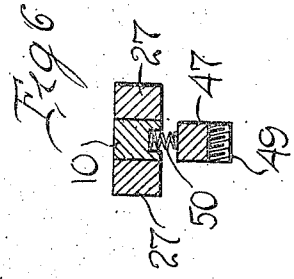
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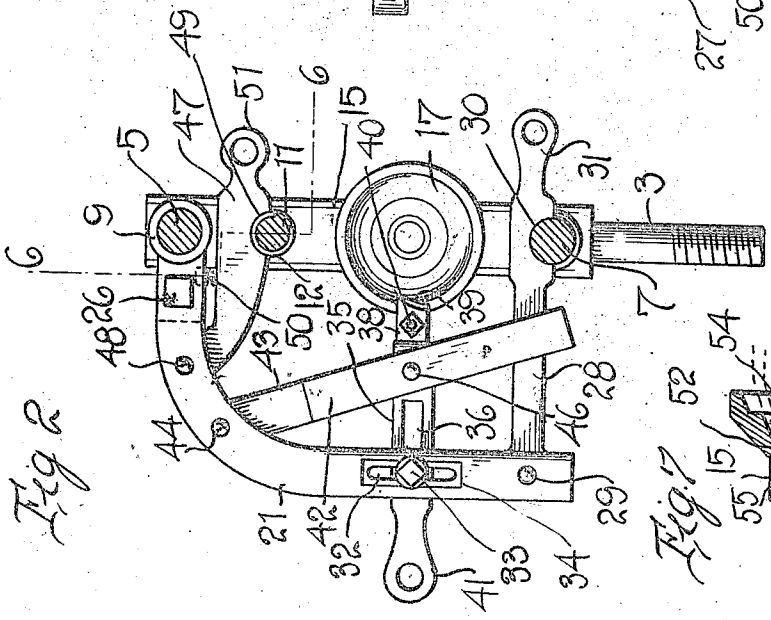
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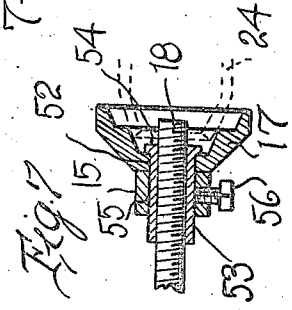












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UNITED STATES PATENT OFFICE.

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MACHINE FOR TRUING STANDING-VALVE PACKING-RINGS.

1,165,635. Specification of Letters Patent. Patented Dec. 28, 1915.

Application filed February 24, 1915. Serial No. 10,362.

To all whom it may concern:

Be it known that I, ARVEL E. SWAIM, a citizen of the United States, residing at Osage, in the county of Osage and State of Oklahoma, have invented certain new and useful Improvements in Machines for Truing Standing-Valve Packing-Rings, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to machines for turning down or of truing new leather rings when repairing standing valves or oil well pumping rings.

The lower standing valve in an oil well pumping outfit is provided with a large number of leather packing rings. When these rings are new they are larger than the interior diameter of the working barrel of the pump, and as a consequence the standing valve cannot be driven into place in the working barrel until the packing rings have been trimmed down to a tight driving fit.

One object of my invention is to provide a simple and effective machine for trimming down these packing rings after they are put in place upon the standing valve, and for so trimming them that the exterior edges of the packing rings shall be truly concentric to the axis of the standing valve, and so that the exterior faces of the packing rings will be even and smooth without either flat places or protuberances.

A further object of the invention is the provision of a machine of this character which may be driven by hand if desired, and which is adapted to receive valves of any length.

Still another object is to provide a knife support coacting with the chucks supporting the valve, this knife support being so arranged that the knife may be adjusted both diametrically with relation to the axis of the valve and toward and from said axis, and still another object is to provide means for supporting the knife which will brace the knife against lateral strain.

A further object is to provide means which will cause the knife to move uniformly along the entire extent of the packing rings, and in this connection to provide for readily placing the knife against the packing rings or removing it therefrom.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of a machine made in accordance with my invention; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a sectional view of the sleeve which supports the upper end of the knife carrier; Fig. 4 is a top plan view of the knife carrying bar; Fig. 5 is a front elevation of the knife bar brace; Fig. 6 is a sectional view on the line 6—6 of Fig. 2; Fig. 7 is a sectional view on the line 7—7 of Fig. 1; Fig. 8 is a sectional view on the line 8—8, Fig. 1.

Referring to these figures, it will be seen that the frame of my machine consists of the standards or posts 2 and 2^a which are vertically disposed and spaced from each other. Each standard is reduced at its lower end as at 3 so as to pass through a table or other supporting body A, and this reduced lower end is screw threaded for engagement with a nut 4. The upper end of each standard is connected by means of a longitudinally extending bar 5, the ends of which are reduced and pass through the upper ends of the standards and are engaged by nuts 6. The lower ends of the standards are braced from each other by means of a longitudinal bar 7, also reduced at its ends and held in place by nuts 8.

Mounted upon the upper bar 2 for sliding movement therealong is a sleeve 9, this sleeve, as shown in Fig. 3, being provided with a projecting perforated lug 10 for engagement with the supporting members which will be later described.

Rotatably mounted upon the standards 2 and extending between the same is the feed shaft 11 formed with the screw threads 12, one end of the feed shaft extending out through one of the posts 2 and being provided with a detachable crank 13 and with a gear wheel 14. Slidably mounted upon the bars 5 and 7 for longitudinal movement thereon is a cross head 15 which has an opening 16 through it through which the shaft 11 passes, this opening being of such diameter that the feed screw 12 does not engage with the wall of the opening. Mounted upon this cross head 15 in a manner which will be later described is a chuck 17, and engaged with this chuck and thus with the cross head 15 is an adjusting screw shaft 18. The rear end of this shaft passes

through and has a bearing in the post 2^a, and mounted upon the end of this shaft is the crank 19, this shaft 18 having a collar 20 which bears against the inner face of the posts 2^a.

Rotatably mounted in the standard or post 2 is a spindle 21 of a driving chuck 22, and mounted upon this spindle is the spur gear wheel 23 which engages with the gear wheel 14 and is driven thereby. These chucks 17 and 22 are interiorly conical in form so as to receive the opposite ends of a standing valve which is illustrated in dotted lines in Fig. 1, and is designated 24, the chucks being approximately conical for the purpose of engaging standing valves having different diameters. The chuck 22 is provided with a diagonally arranged set screw 25 which is adapted to engage the openings of the valve cage so as to hold the valve 24 from rotation relative to the chuck 22.

Pivotally mounted upon the lug 10 by means of the bolt or pivot pin 26 are the knife supporting members 27. There are two of these members, spaced from each other a definite distance, and each of the members is curved outward from the pivot point and then downward, as shown clearly in Fig. 2, these members being spaced from each other their entire length. Disposed between the lower ends of the knife supporting members 27 is a bar 28 pivoted to said members by means of a rivet or bolt 29, this bar being formed with a recess 30 in its face adapted to rest upon and have sliding contact with the bar 22 and thus support the knife supporting members 27 in definite spaced relation to the bar 7.

The guide bar 28 which extends beyond the bar 7, as shown in Fig. 2, is provided with a handle 31 whereby the knife holder may be manipulated. The members 27 are longitudinally slotted at 32 for the passage of an adjusting bolt 33, the face of the members 27 being recessed as at 34 for the reception of a washer. Disposed between the members 27 is a knife bar 35. This knife bar is slotted as at 36, this slot 36 intersecting the slot 32, the bolt 33 passing through the slot 32 and the slot 36. The end of the knife bar 35 at its inner extremity is recessed as at 37 to form a seat for the base 38 of a knife 39, this base being disposed at right angles to the knife blade. The base of the knife is held to the seat by means of a set bolt 40, shown clearly in Fig. 4. The knife bar 35 is prolonged beyond the slotted portion 36 to form a handle 41 whereby it may be easily manipulated. Pivotally supported between the upper ends of the members 27 is a knife bar brace, illustrated in detail in Fig. 5, this brace being designated 42. The upper end of the brace is reduced as at 43 to form a tongue projecting between the members 27, and pivoted thereto by the rivet 44. The lower portion of the brace is longitudinally slotted as at 45 for the reception of the knife bar 35, this knife bar being pivoted to the two legs of the brace by means of the rivet or pivot pin 46.

It will now be obvious that the knife bar may be oscillated upon the pivot 46 to raise or lower the knife and change its angle of inclination, and that the knife may be held in any angular adjusted position by tightening up upon the bolt 33. It will also be seen that the knife bar may be adjusted toward or from the axial center of the chucks 17 and 22 by means of the bolt 33. The lower end of the brace member 42 embraces the guide bar 28, and thus the upper and lower ends of this brace member are held from lateral movement, and thus the knife bar is thoroughly braced from any lateral movement.

The knife carriage formed by the members 27, 28 and 42 is automatically moved along the frame of the machine or fed by means of the feed lever 47 which is pivoted at its outer end between the members 27 by means of the rivet or pivot pin 48. The under face of the feed lever 47 is formed with a screw threaded recess 49 engaging with the screw threads 12 of the shaft 11 and the lever is held in engagement with these screw threads by means of a coiled spring 50 disposed in a socket in the lug 10 and bearing against the upper face of the lever 47. The lever 47 is prolonged to form a handle 51 whereby it may be manipulated.

It is necessary that the chuck 17 should have swiveled engagement with the cross head 15, and to this end I form the member 17 at its base with a central opening 52 through which passes a collar 53, this collar being formed with a head 54 which bears against the inside face of the chuck 17. The cross head 15 has an opening 55 just large enough to receive the collar 53, and the collar is held in non-rotative engagement with the cross head by means of a set screw 56. The interior of the collar is screw threaded for engagement with the screw threads on the feed shaft 18, and it will be noted that this feed shaft has free movement through the collar and through the chuck.

The operation of my invention is as follows: In order to repair a valve and replace the old rings with new, the cage is unscrewed from the valve body, then the series of leather rings are placed upon the valve body until there are sufficient rings on the body to make sure that the cage when screwed down on the valve body will hold the valves tightly in place. The valve body and cage are then placed in the machine between the two centers or chucks 17 and 22 with the top or cage end of the valve

body in the chuck 22, and the crank 19 is turned until the chuck 17 tightens on the bottom of the valve and crowds the valve to the center of both of the chucks, so that when the valve is turned it will turn true, and the feed lever 47 of the valve carriage is then raised and the carriage is slid to the right until its knife moves to its starting point, that is, to the edge of the leather ring next to the cage. The knife is then adjusted by the raising and lowering or moving in and out the knife bar 35 to suit the size of the valve to be operated on. When the knife has been adjusted to the right position the locking nut or bolt 33 is tightened, and when the knife has been adjusted the lever 47 is lowered down onto the screw 12 so that the threads on the lever 47 and the screw 12 are in mesh, then the crank 13 is turned and the carriage with the knife will move toward the left, the knife trimming off the leather rings as it goes. Of course the rotation of the crank 13 will not only feed the knife but will rotate the valve body and its rings. After the knife has reached the other end of the valve, then the feed lever 47 is lifted and the carriage may be slid back to its starting point and is thus ready for another valve.

All standing valves have a central opening extending through the bottom of the valve body, and this central opening receives the screw 18 in case this screw projects beyond the chuck 17. Thus when a long valve is in the machine the chuck 17 and the cross head 15 are moved toward the d of the machine and the screw 18 will extend on through the chuck 17 and the valve. Of course the valve does not touch the screw 18, and thus the centering chuck turns with the valve when the machine is in motion.

It will be seen that the knife may be readily removed for grinding or to permit the addition of a new knife, and it will also be seen that the knife is readily adjusted to secure the proper cutting angle and the proper depth of cut. The machine may be easily taken apart for transportation and may be as easily set up. I have found it very effective in actual practice, and that it not only cuts the valve leathers perfectly true, but that it does very quickly work which heretofore has been done by hand and relatively slowly and with difficulty.

It will of course be obvious that many minor changes might be made in the construction of this device without departing from the principle of the invention, and I therefore do not wish to be limited to the details of construction as illustrated.

Having described my invention, what I claim is:

1. A machine for truing packing rings including a frame with opposed chucks, a knife carriage movable along the frame, a knife carried thereby, a screw feed shaft operatively engaging the knife carriage, and means for rotating the chucks and the feed shaft, the knife carriage being pivotally mounted on the frame for lateral movement with relation to the axis of the chucks whereby the knife may be withdrawn from engagement with the packing rings without removing the knife from the carriage.

2. A machine for truing packing rings including a frame, oppositely disposed chucks, a knife carriage movable along the frame and pivotally supported for movement toward and away from the axis of the chucks, a screw feed shaft, means for rotating one of the chucks and simultaneously rotating the feed shaft, means for longitudinally adjusting the other chuck, and means mounted upon the carriage and adapted to have detachable engagement with the screw of the feed shaft, said last named supporting means of the carriage in spaced relation to the screw of the feed shaft.

3. A machine for truing packing rings including a frame having parallel longitudinally extending supporting bars, a longitudinally extending screw feed shaft mounted on the frame and extending parallel to said longitudinal bars, a knife carriage slidingly supported on the longitudinal bars, a knife mounted thereon, oppositely disposed chucks, means for rotating one of said chucks and simultaneously rotating the feed shaft, means pivotally mounted on the carriage detachably engaging the screw threads of the shaft, and means for longitudinally adjusting the other chuck relative to the first named chuck.

4. A machine for truing packing rings comprising vertical standards and longitudinal bars, a sleeve slidably mounted upon one of said bars, a knife carriage mounted upon the sleeve and having detachable engagement with the other of said bars, an adjustable knife mounted upon the carriage, a screw threaded feed shaft mounted between the standards, means mounted upon the knife carriage and having detachable engagement with the screw threads of the feed shaft, a cross head mounted upon said longitudinal bars, a chuck rotatably carried upon the cross head, means for shifting the cross head and chuck longitudinally, an oppositely disposed chuck, and means for simultaneously rotating the last named chuck and said feed shaft.

5. In a machine of the character described, upper and lower parallel bars, a knife carriage comprising a pair of members having sliding and rotative engagement with one of said bars, said members being spaced from each other, means operatively connecting the free ends of said members with the other of

said longitudinal bars, a knife support adjustably mounted between said members, and a knife carried by said support.

6. A machine of the character described including a longitudinally shiftable knife carriage having spaced parallel members, the members being longitudinally slotted, a knife supporting member also longitudinally slotted, and a locking bolt passing through the slots in said members and through the knife supporting member and holding the knife supporting member in adjusted relation to the carriage.

7. In a machine of the character described, a longitudinally movable knife carriage including spaced parallel members, said members being longitudinally slotted, a longitudinally slotted brace pivotally connected to the upper ends of said members and depending therefrom, a knife supporting bar pivoted to said brace and extending between said members, said knife supporting bar being longitudinally slotted, and a bolt passing through the slots of said members into the knife supporting bar.

8. In a machine of the character described, a longitudinally sliding carriage, a brace pivotally connected to the carriage and depending therefrom, a knife supporting bar pivoted to said brace and passing through said carriage, the carriage and knife supporting bar being slotted at right angles to each other, and a locking bolt passing through said slots and holding the knife supporting bar in adjusted position relative to the carriage.

9. In a mechanism of the character described, oppositely disposed vertical standards, upper and lower longitudinally extending bars connecting the standards, a screw shaft rotatably mounted in the standards below the upper bar, a chuck rotatably mounted in one of said standards, gear wheels connecting the screw shaft with the chuck, means for manually rotating the screw shaft, a cross head mounted upon said upper and lower bars for sliding movement, a chuck rotatably mounted on the cross head and opposed to the first named chuck, an adjusting screw operatively engaging the cross head to shift it and the chuck longitudinally, a knife carriage having sliding and rotative engagement with one of said longitudinal bars and sliding and detachable engagement with the other of said bars, a knife adjustably mounted upon said carriage, and a member pivotally mounted upon the carriage and resting upon and having screw threaded engagement with said feed shaft.

10. A machine of the character described including oppositely disposed standards having means for operatively connecting the standards to a table, longitudinal bars detachably connected to the standards and spaced from each other, a carriage operatively and slidingly mounted upon one of said bars and having sliding engagement with the other bar, oppositely disposed rotatable chucks, a screw shaft mounted in said standards and carrying a gear wheel, a gear wheel connected to one of said chucks and meshing with the first named gear wheel, means for manually rotating the screw shaft, a cross head longitudinally movable upon the longitudinal bars and carrying the other of said chucks, manually operable means for adjusting said cross head on the corresponding chuck, a knife support adjustably mounted upon the carriage, a member pivotally mounted upon the carriage, a portion thereof having screw threaded engagement with the feed screw, and a spring forcing said member into such engagement.

11. In a machine of the character described, a frame including a longitudinally extending guide bar, a feed screw parallel to the guide bar, oppositely disposed chucks mounted in the frame, means for rotating said chucks and feed screw, a pivotally supported knife carriage having sliding engagement with the guide bar, and a member carried by the carriage and detachably engaging the feed screw.

12. In a device of the character described, a frame including a pair of longitudinally extending guide bars, a feed screw parallel thereto, oppositely disposed chucks, means for rotating the chucks and feed screw, a knife carriage slidably supported on and pivotally supported with relation to one of the guide bars for movement toward and away from the other guide bar, and a member pivotally connected to the carriage and having sliding detachable engagement with the other guide bar, said carriage being operatively engaged by the feed screw.

13. In a device of the character described, a frame including parallel longitudinally extending guide bars, a feed screw, oppositely disposed chucks, means for rotating the chucks and the feed screw, a knife carriage slidably supported on and pivotally supported with relation to one of the guide bars, a member pivotally connected to the carriage and having sliding detachable engagement with the other guide bar, and a member pivoted to and forming a part of the carriage resting loosely upon the feed screw and having screw-threaded engagement therewith.

14. In a device of the character described, a frame including parallel guide bars, a feed screw, a sleeve slidably mounted upon one of said guide bars, a knife carriage pivotally connecting the sleeve, means for detachably supporting the free end of the knife carriage in spaced relation to the other guide bar, and means movably mounted upon the carriage

and having detachable engagement with the feed screw.

15. In a device of the character described, a frame including longitudinally extending guide bars, a feed screw mounted thereon, a knife carriage slidably supported on and pivotally supported with relation to one of the guide bars, said knife carriage having members extending outward and downward parallel to the frame, a guide member pivotally connected to the lower ends of the guide bars and having a seat adapted to fit over and in guiding contact with the other guide bar, and a member pivoted to the carriage and having an interiorly screw threaded semi-circular seat adapted to fit over and have screw threaded engagement with the feed screw.

16. In a device of the character described, a supporting frame, a longitudinal movable knife carriage, a feed screw, a member pivoted to the carriage and having an interiorly screw threaded semi-circular seat adapted to rest upon and engage with the feed screw, and a spring urging said member into engagement with the feed screw but permitting the member to be released from the screw.

17. In a device of the character described, a supporting frame, a knife carriage mounted thereon and including a vertically slotted member, a longitudinally slotted knife holder coacting with said member and the knife carriage, a bolt passing through the slots of the knife holder and member, and a brace pivotally connected at one end to the knife carriage and pivotally connected to the knife holder.

18. In a device of the character described, a supporting frame including a guide bar, a longitudinally movable knife carriage including a vertically slotted member, a member connected to the knife carriage and engaging the said guide bar to hold the knife carriage in spaced relation thereto, a longitudinally slotted knife holder intersecting said first named member, a bolt passing through the slots of said holder and the member, and a brace pivotally connected to one end of the carriage and pivotally connected intermediate its ends to the holder and bearing against the member engaging the guide bar and acting to support the knife.

19. In a device of the character described, a supporting frame, a knife carriage slidably mounted thereon, a knife holder adjustable vertically upon the carriage and adjustable longitudinally with relation thereto, and a brace pivotally connected to the carriage and pivotally connected to the knife holder.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ARVEL E. SWAIM.

Witnesses:
T. C. SMITH,
CHAS. JACOBSEN.