April 15, 1958 F. KAMENA 2,830,700

EXTRUSION PRESS RUN-OUT TABLE

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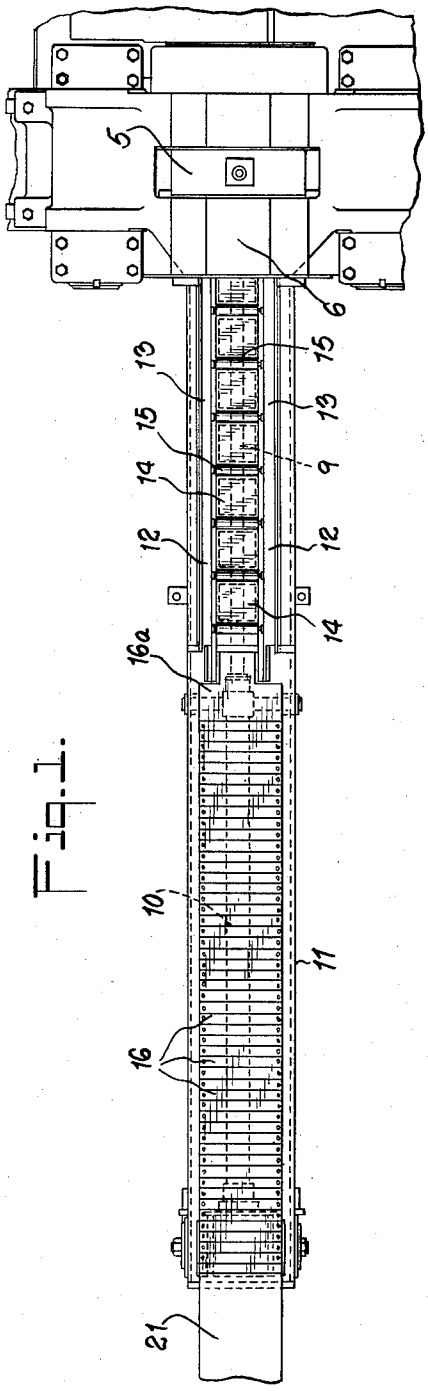


Fig. 1.

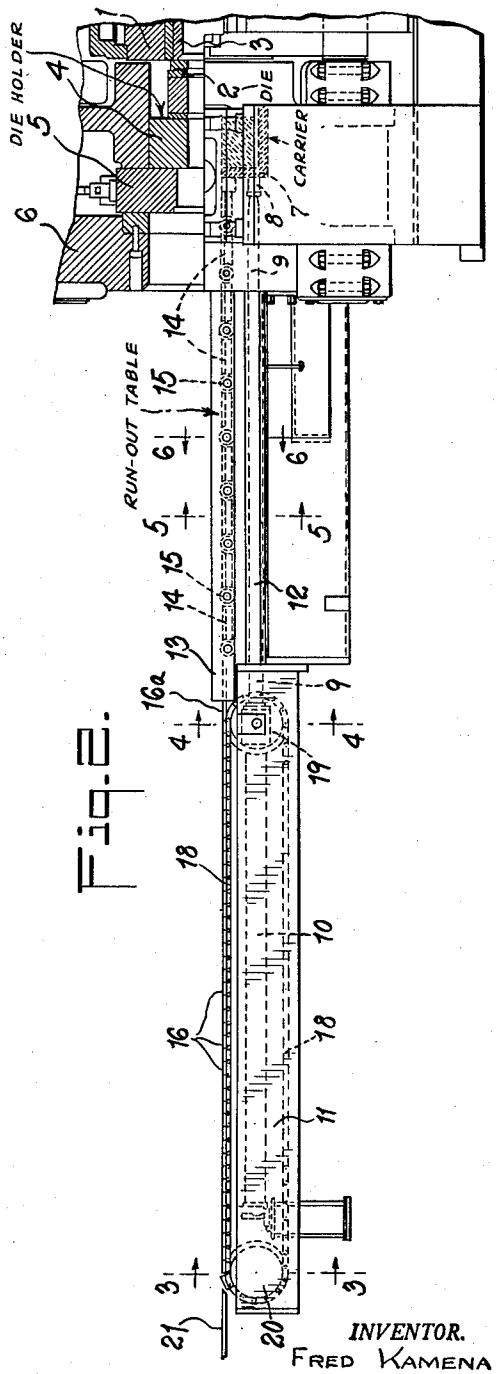


Fig. 2.

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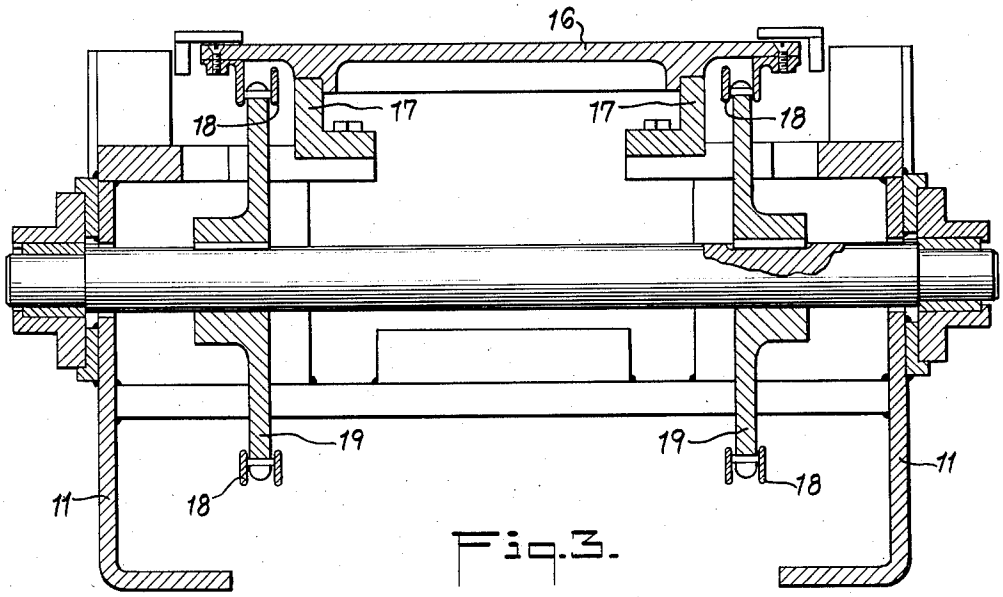


Fig. 3.

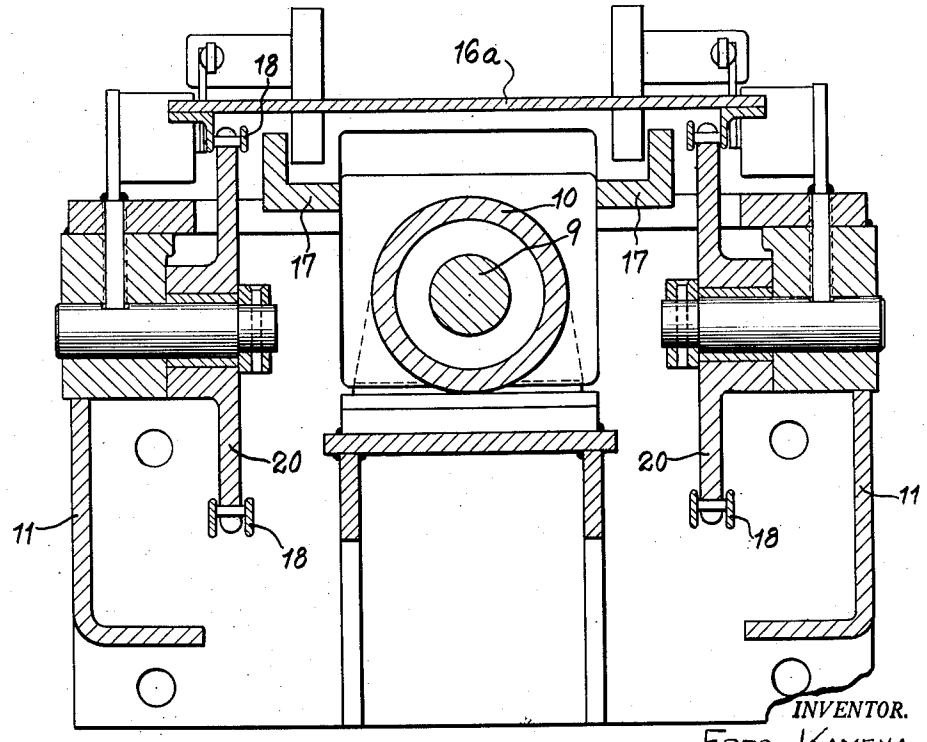


Fig. 4.

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Fig. 5.

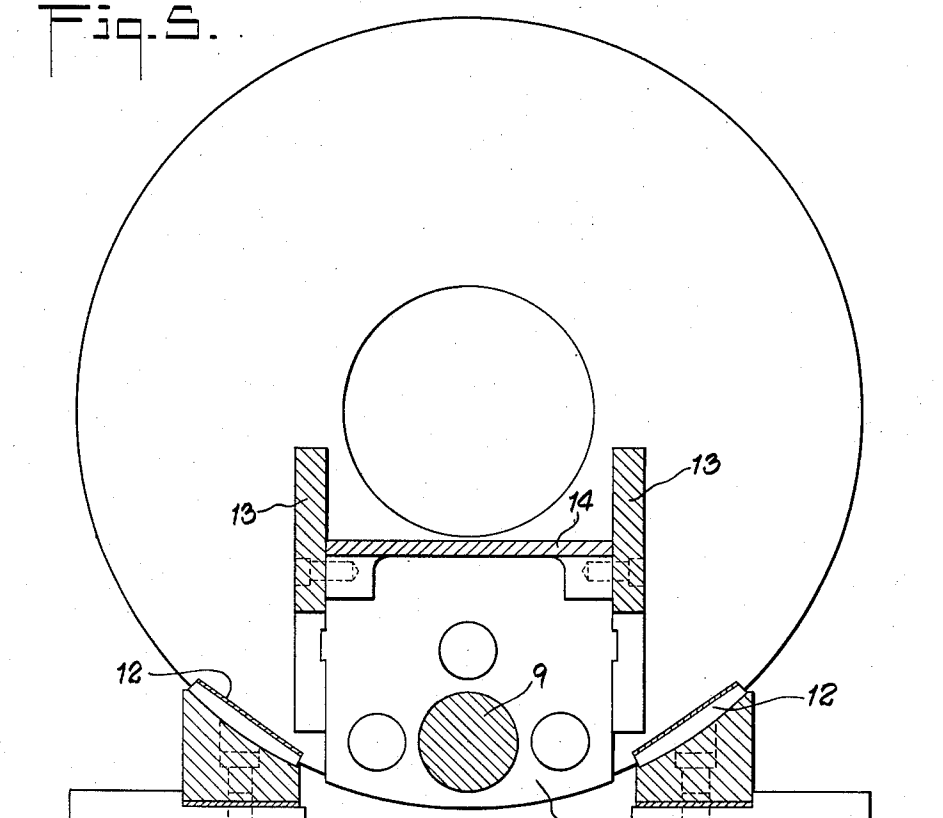
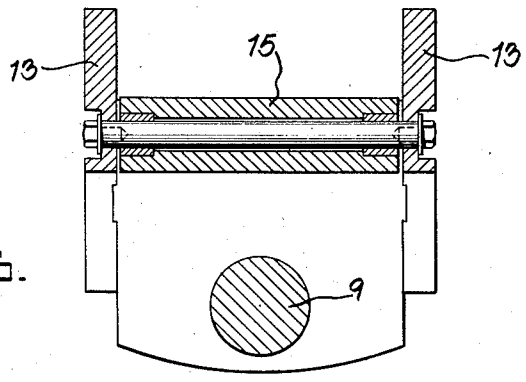


Fig. 6.



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Fig. 7.

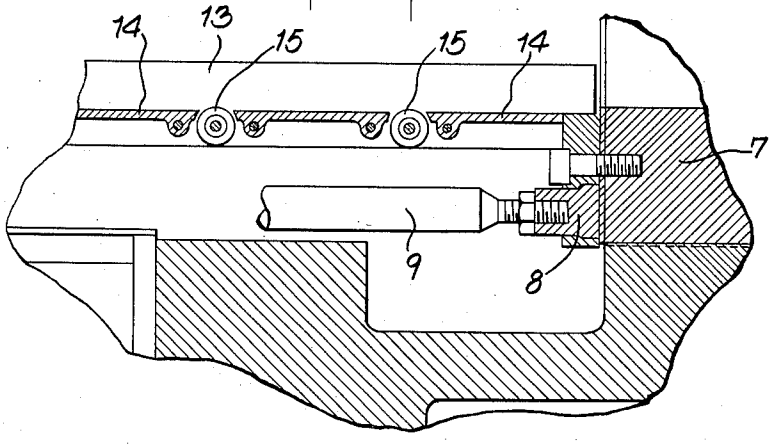
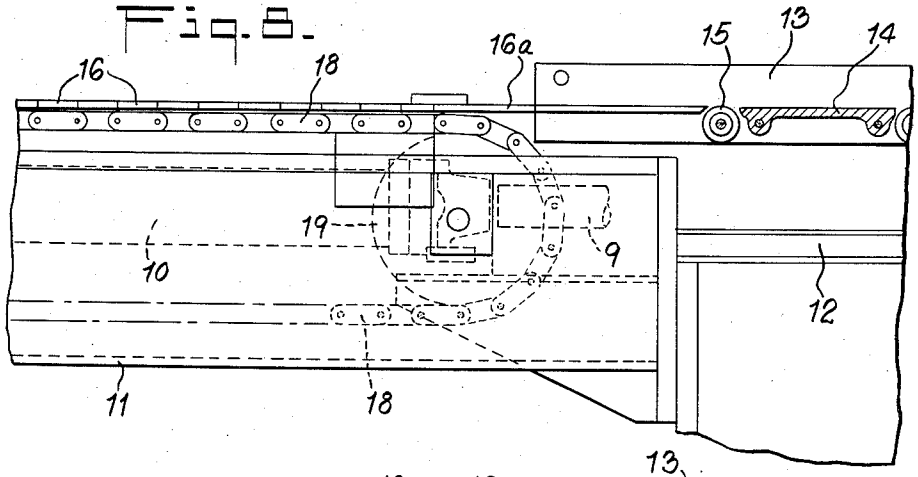


Fig. 8.



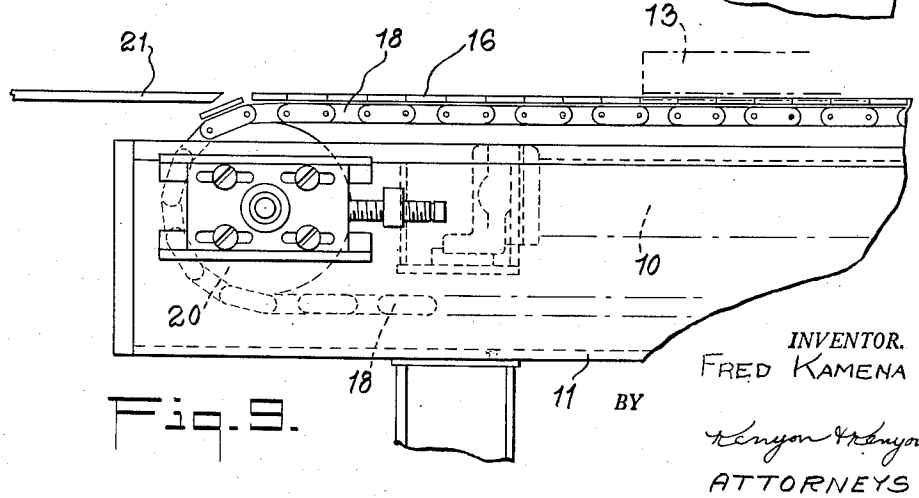


Fig. 9.

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2,830,700

EXTRUSION PRESS RUN-OUT TABLE

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Application March 1, 1954, Serial No. 413,046

2 Claims. (Cl. 207—1)

This invention relates to an extrusion press run-out table.

A horizontal extrusion press, designed to extrude metal shapes, must provide for moving the die forwardly away from the forward or delivery end of the press after each extrusion. This is made necessary by the fact that the tail or butt end of the billet must be severed from behind the die so that the extruded shape and the die may be separated.

Incidentally, the forward end of such a press is the end towards which the extrusion moves from its loading or back end. Thus, in Figs. 1, 2, 7, 8 and 9, the left-hand end is the forward end and motion towards the left is forwardly, and the right-hand end is the back end and motion towards the right is backwardly.

Ordinarily the die holder, which mounts the die backer and die, is mounted on a die-holder carrier which is reciprocative in a direction away from the forward end of the press. Thus the die holder may be moved backwardly to locate the die against the end of the container liner, a wedge locking the die holder in position during the extrusion. Thereafter, the wedge is removed so that the die-holder carrier may be pulled from the press, carrying the die holder, and, of course, the die backer and die, away from the press far enough to permit the butt end to be severed from the balance of the extruded shape.

Because of the above the run-out table, required to carry the extruded shape away from the press, must be constructed to provide clearance for the reciprocative die-holder carrier. Ordinarily the manufacturer of the press provides a short run-out table which is constructed with this clearance requirement in mind, the purchaser of the press then providing in the plant a longer run-out table. The present invention is concerned with the short run-out table which forms, in effect, a part of the extrusion press.

Heretofore such a run-out table has been constructed so that it is offset upwardly from the table surface leading from it, this permitting the necessary reciprocative motion by reason of the run-out table riding over the other surface.

The above type of construction is objectionable because of the step which necessarily results in the run-out surfaces leading away from the delivery end of the press. As the extruded shape is pushed forwardly from the die the shape is hot and malleable to a degree approaching limpness. Therefore, anything that obstructs or interferes with its smooth and even progress is apt to cause the extruded work to be deformed. This step, resulting from the prior art construction, introduces the danger of this trouble.

With the foregoing in mind, one of the objects of the present invention is to provide an extrusion press run-out table which provides for the necessary clearance required by the die-holder carrier motion and which, at the same time, provides a continuous surface, running forwardly from the delivery end of the press, which is free from the described objectionable step or other discontinuities in the surface level such as might tend to impede or divert the forwardly travelling extruded shape pushed from the press. It is, of course, desired to attain this objective in a manner permitting the use of the invention in a practical manner with commercial extrusion presses. Other objects may be inferred from the following disclosure of a specific example of an extrusion press run-out table incorporating the principles of the invention.

This example is illustrated by the accompanying drawings in which:

Fig. 1 is a plan view;

Fig. 2 is a side view of Fig. 1 showing certain of the parts sectioned in a vertical longitudinal plane to clarify the construction;

Fig. 3 is a cross section taken on the line 3—3 in Fig. 2, this figure and the following figures being on an enlarged scale with respect to the scale used in Figs. 1 and 2;

Fig. 4 is a cross section taken on the line 4—4 in Fig. 2;

Fig. 5 is a cross section taken on the line 5—5 in Fig. 2;

Fig. 6 is a cross section taken on the line 6—6 in Fig. 2;

Fig. 7 is an enlarged section of Fig. 2 which shows the connection between the die-holder carrier and the rear end of the run-out table;

Fig. 8 is a side view on the enlarged scale of Fig. 7 and showing the central portion of the run-out table, certain parts being sectioned on a vertical plane; and

Fig. 9 is like Fig. 8 excepting that no parts are sectioned and it shows the forward end of the run-out table which delivers the extruded work to the longer run-out table provided in the plant by the purchaser of the press.

As used herein, the terms "forward," "forwardly," "rear," "backwardly," and the like, refer to portions of the equipment or directions of movement on the basis that "forwardly" is the direction of movement of the extruded shape during the extrusion operation.

These drawings show only the forward or delivery end of a horizontal extrusion press such as is used to extrude aluminum and brass shapes and perhaps even steel shapes. The billet is charged in the unillustrated rear or breech end of the container 1. The die and die backer assembly 2 seals against the forward end of the container's liner 3 by being pushed backwardly thereagainst because this assembly is mounted by the die holder 4 which is jammed backwardly by the wedge 5 which works vertically in the platen 6 of the press. Extrusion is effected by the unillustrated ram which applies pressure to the rear end of the billet in the container liner 3 and causes the billet metal to extrude forwardly through the die of the assembly 2, forwardly and away from the press. The resulting shape must, of course, be conveyed away from the press and this should be done as gently and as free from impedance as is possible.

After the extrusion the wedge 5 is, of course, lifted to unlock the parts, and then the die holder 4 is pulled forwardly.

The above action is made possible because the die holder 4 is connected to the die-holder carrier 7 which is in turn connected, by a coupling 8, with the connecting rod 9 of a hydraulic reciprocating motor, this rod 9 extending backwardly from a double acting hydraulic motor 10 of the cylinder and piston type. The stroke of this motor is long enough to pull the die-holder carrier and the various die parts forwardly far enough to permit the butt end to be severed from the balance of the extruded shape.

An elongated frame assembly 11 extends forwardly from the press and serves to mount the motor 10. This frame assembly also mounts guideways 12 on which the die holder rides as it is carried forwardly by its carrier upon a forward stroke by the motor 10, reverse action of the motor, of course, replacing the die holder, whereby

the various die parts, including the holder and its carrier, are reciprocative through a path which would be obstructed by any fixed run-out table. It is for this reason that any run-out table used must be capable of reciprocating with the die holder and its carrier.

According to the present invention a run-out table is used which has a rear section constituted by an elongated platform which reciprocates with the die holder and its carrier, and a forward link belt section which is provided with means for diverting it from linear travel when it moves forwardly with the platform section to provide clearance for the parts which must be moved from the delivery end of the press. This diversion is effected by looping the link belt section reversely so that it extends reversely with respect to the balance of the table, and means are provided for aligning the two sections, when they are run forwardly, so that then the table forms a run-out surface, for carrying the work, which is smooth and free from any step or other discontinuity.

This rear platform section is provided by two laterally spaced, horizontally extending beams **13** having their rear ends connected to the coupling **8**. Alternating plates **14** and rollers **15** extend transversely between these beams **13**, the plates serving to strut the beams apart to form what is in effect a longitudinally extending bridge, and the rollers **15** being journaled to turn and so that the rollers project very slightly above the top surfaces of the plates **14**. This entire structure reciprocates forwardly and backwardly with reciprocation of the die-holder carrier **7**.

The forward section is formed by a link belt carrier comprising links **16** having top surfaces horizontally registered with and aligned with the tops of the rollers **15** of the rear platform section, when the latter is moved backwardly so that the carrier **7** has moved the die holder to the position it occupies during extrusion. When in this position the link belt is supported by horizontal guides **17** which extend longitudinally with respect to the table and are mounted between the side members of the frame assembly **11**.

This link belt is made from flat segments which are interconnected by a sprocket chain **18**. This chain is in the form of a loop to the upper span of which the belt links **16** are fixed, the loop being endless and extending around a rear sprocket wheel **19** and a forward sprocket wheel **20** respectively journaled by axles extending between the side members of the frame assembly **11**. The rearmost link **16***a* of the belt is extended backwardly and connects with the forward end of the previously described platform section.

This new table, in operation, runs forwardly when the motor **10** is powered to pull the die-holder carrier forwardly, after removal of the wedge **5** at the end of an extrusion, the link belt section **16** running around the forward sprockets **20**, doubling back on itself, and running at a lower level through the bottom stretch of the loop formed by the sprocket chains. Thus the link belt section is moved out of the way so as to permit the platform section to move forwardly as required to clear the reciprocating path of the die-holder carrier.

After the die is cleared and the motor **10** is operated to push back the die-holder carrier **7** the platform and link belt run-out sections align their top surfaces mutually, at the same level, due to the guides **17** supporting the links **16**, so that the extruded work is provided with a completely level surface over which to run while being pushed from the press. The motor **10** which is always required to reciprocate the die-holder carrier, also serves to power the flexible table section formed by the link belt conveyor.

It is to be noted that the long table provided by the purchaser, generally indicated at **21**, may be spaced very closely to the forward end of the link belt table section with its top surface at exactly the same level as the top surface of the run-out table described. Thus the run-out table structure provided by the press manufacturer cooperates with the table structure provided by the purchaser, in the plant, to form a completely smooth run-out table surface for the work. At the same time, the die-holder carrier is cleared by the working run-out table whenever necessary and in a practical and foolproof manner.

I claim:

1. A run-out table for an extrusion press having a reciprocative die-holder carrier, said table comprising an elongated platform section extending forwardly from said press and having means for connecting its rear end to said carrier, means for reciprocatively mounting said platform section for movement forwardly and backwardly with its top at a fixed level supporting work extruded by said press, laterally spaced horizontally elongated loops of sprocket chains having mounting sprocket wheels located to position said loops so that they extend forwardly from the forward end of said platform section, links extending transversely between said chains at the upper spans thereof to form a link-belt extending from one of said sprocket wheels to the other, means for connecting the rear end of said link-belt to the forward end of said platform section, said sprocket wheels being positioned to locate the upper spans of said chains at levels substantially positioning the top of said link-belt at said fixed level, said wheels rotating with forward motion of said carrier and said platform section so that said link-belt runs around the forward ones of said sprocket wheels.

2. A run-out table for an extrusion press having a reciprocative die-holder carrier, said table comprising an elongated platform extending forwardly from said press and having means for connecting its rear end to said carrier, means for reciprocatively mounting said platform section for movement forwardly and backwardly with its top at a fixed level supporting work extruded by said press, laterally spaced horizontally elongated loops of sprocket chains having mounting sprocket wheels located to position said loops so that they extend forwardly from the forward end of said platform, links extending transversely between said chains at the upper spans thereof to form a link-belt extending from one of said sprocket wheels to the other, means for connecting the rear end of said link-belt to the forward end of said platform section, said sprocket wheels being positioned to locate the upper spans of said chains at levels substantially positioning the top of said link-belt at said fixed level, said wheels rotating with forward motion of said carrier and said platform so that said link-belt runs around the forward ones of said sprocket wheels, and horizontal guide elements mounted below said link-belt to maintain a level surface over which work can run while being pushed from the press.

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