(No Model.) 4 Sheets—Sheet 1.

# P. C. PATTERSON.

## SKELP CHARGING APPARATUS.

No. 593,968. Patented Nov. 16, 1897.

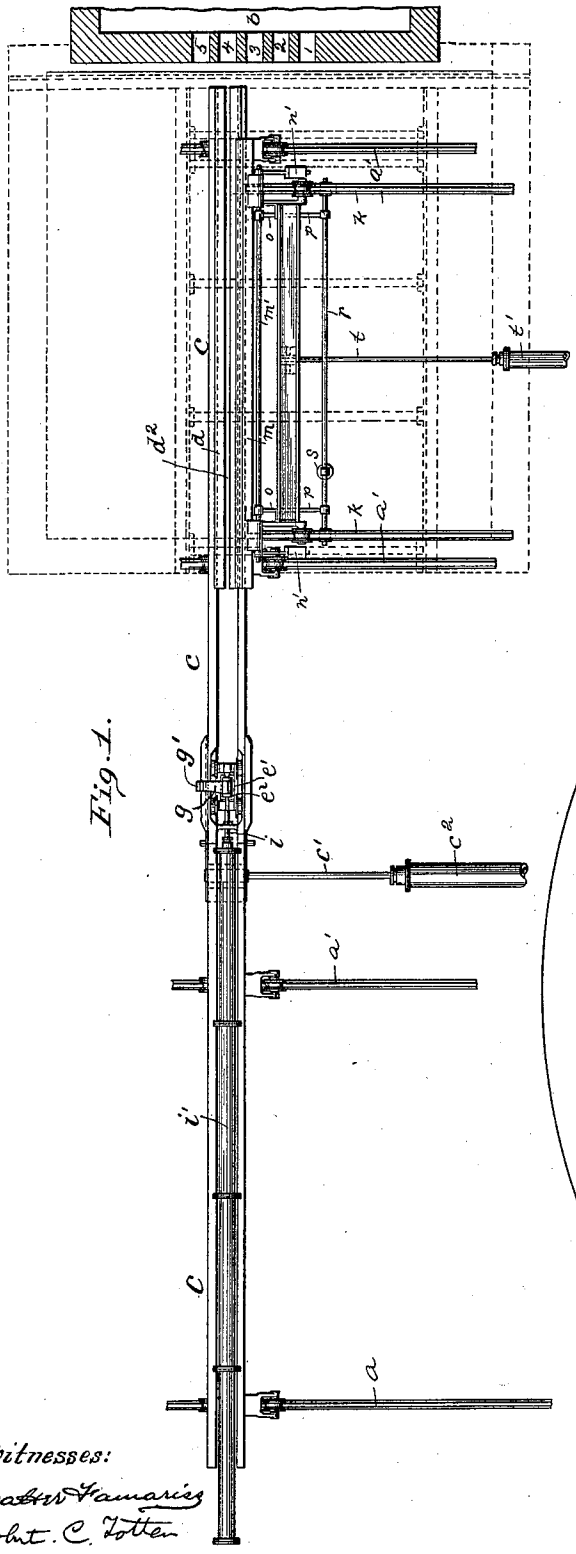


Fig. 1.

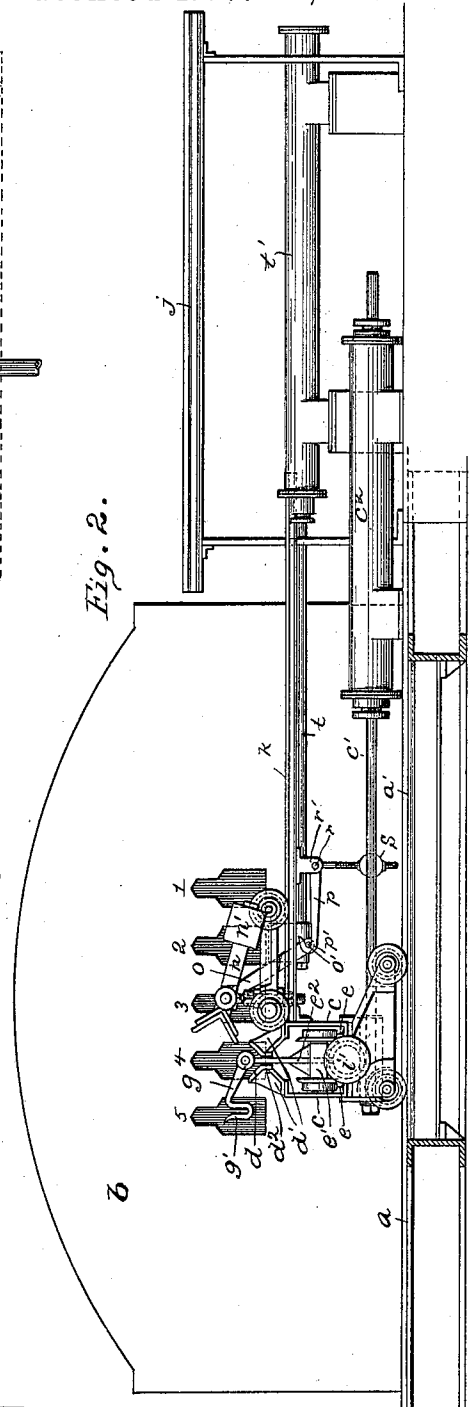


Fig. 2.

Witnesses:
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Robt. C. Totten

Inventor
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(No Model.) 4 Sheets—Sheet 2.

# P. C. PATTERSON.

## SKELP CHARGING APPARATUS.

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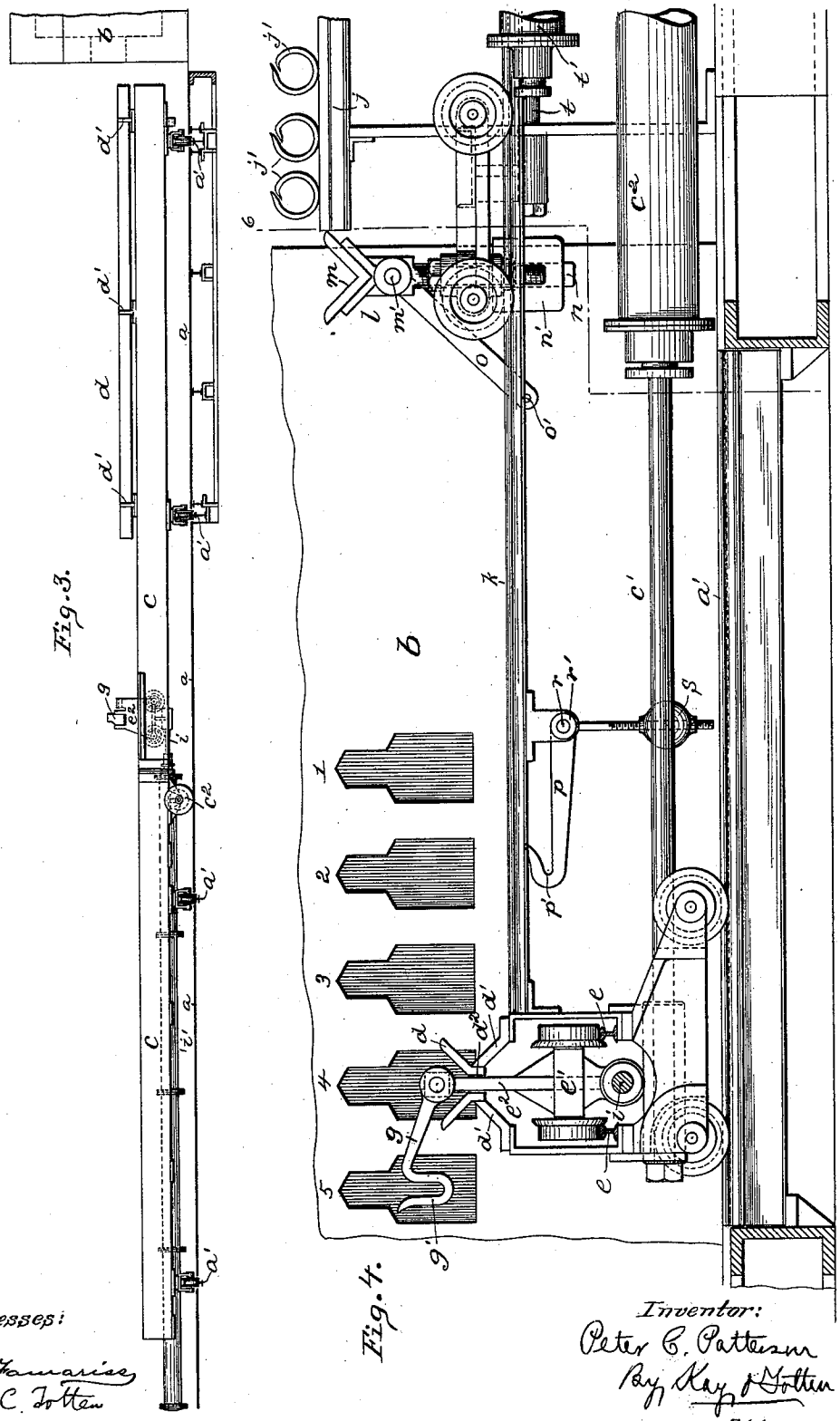


Fig. 3.

Fig. 4.

Witnesses:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

# P. C. PATTERSON.

## SKELP CHARGING APPARATUS.

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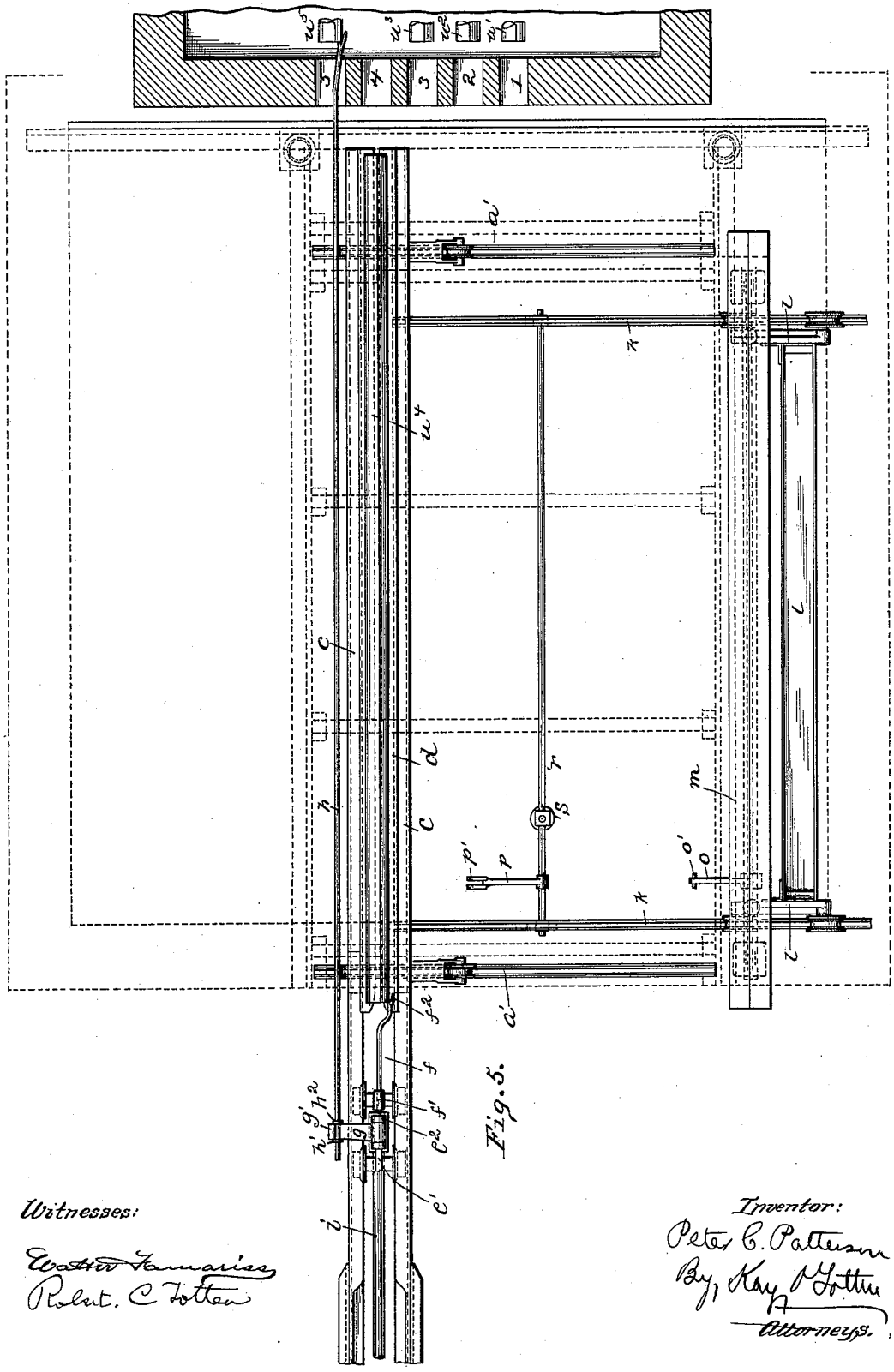


Fig. 5.

Witnesses:

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(No Model.) 4 Sheets—Sheet 4.

# P. C. PATTERSON.

## SKELP CHARGING APPARATUS.

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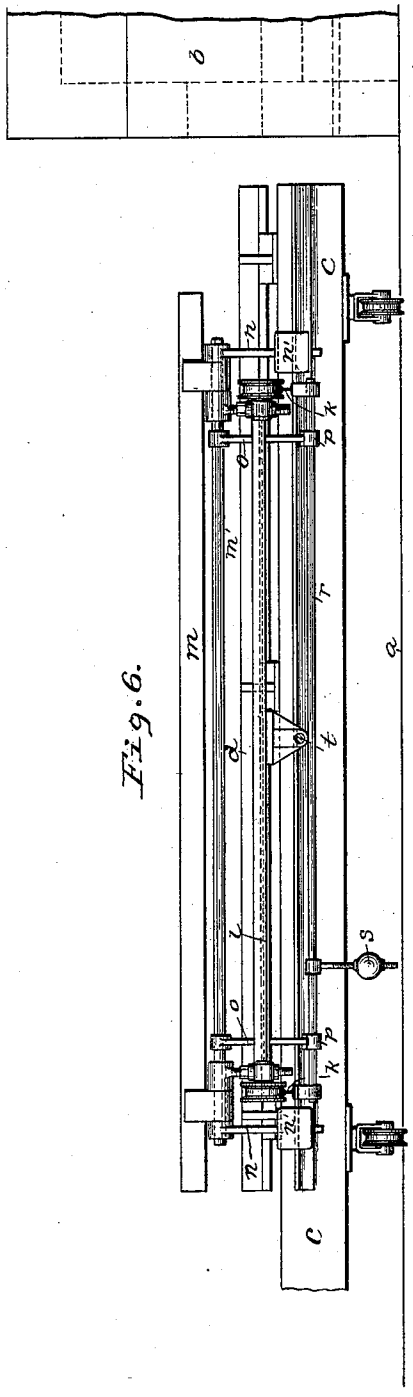


Fig. 6.

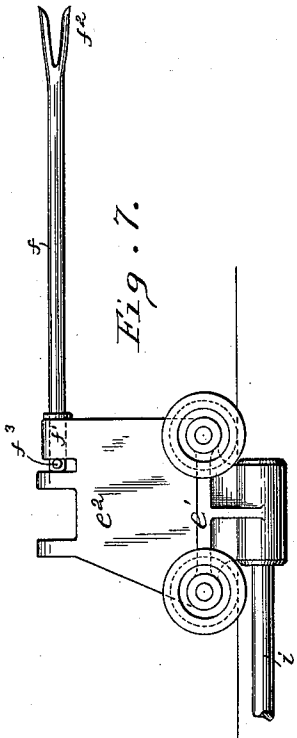


Fig. 7.

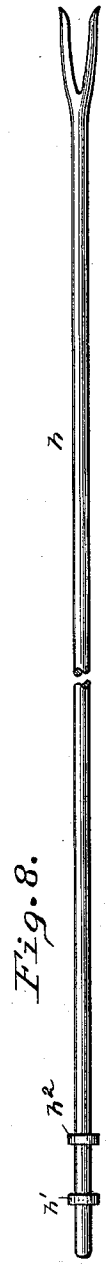


Fig. 8.

Witnesses:

Robt. C. Totten

Inventor:

Peter C. Patterson

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Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

PETER CHARLES PATTERSON, OF McKEESPORT, PENNSYLVANIA.

## SKELP-CHARGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 593,968, dated November 16, 1897.

Application filed May 4, 1896. Serial No. 590,216. (No model.)

*To all whom it may concern:*

Be it known that I, PETER CHARLES PATTERSON, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Skelp-Charging Apparatus; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the manufacture of lap-weld tubing.

The steps ordinarily followed in the manufacture of lap-weld tubing are, first, the heating and skelping of the scarfed plate; second, the insertion of the scarfed tube-skelp into the heating-furnace at one end thereof at a side opening thereof; third, the rolling of the skelp when partially heated from the side to the center of the furnace, and, fourth, the pushing of the skelp through the opposite end of the heating-furnace and feeding it to the welding-rolls arranged in front of said furnace. With the apparatus heretofore employed these steps were carried out with great difficulty and inconvenience, as well as with great loss to the manufacturer, due to the imperfect welding of the pipe. This was chiefly due to the necessity of rolling over the skelps in the heating-furnace preparatory to bringing them into position with their scarfed edges up, so that when pushed from the furnace they would enter the welding-rolls in the proper position. This turning over of the tube-skelp in the furnace often destroys the uniformity of the scarfed edges or twists the skelp out of shape, so that when fed to the rolls a "sticker" is formed or an imperfect seam is obtained and the pipe has to receive a second or a third run. By the apparatus heretofore employed for charging the heating-furnace and pushing the skelps therefrom the handling of the skelps was done by hand, the men being exposed to the intense heat of the furnace. The insertion of the skelps and the turning of them while in the furnace to bring them with their lapped edges up into position to be pushed therefrom involved a great deal of hard labor, as well as liability of injuring the skelps for the reasons above set forth.

The object of my invention is to provide means for rapidly handling the skelps in the charging of the furnace and introducing the skelps to the rolls without the necessity of turning the skelps in the furnace, thereby preserving the uniformity of the shape of skelps and scarfed edges

My invention comprises, generally stated, in connection with a welding-furnace having openings arranged side by side and in the rear end thereof, a transversely-moving carriage carrying a trough or platform adapted to be brought into line with said openings and a longitudinally-traveling buggy on said carriage for carrying the charging and pushing rods, whereby a tube-skelp is inserted into one of said openings and a tube-skelp previously inserted is pushed out of the furnace.

The invention comprises certain other features, all of which will be fully hereinafter set forth and broadly claimed.

The invention is adapted to be employed in connection with such a welding-furnace and welding apparatus as is set forth and claimed in an application for Letters Patent of the United States filed by me of even date herewith, Serial No. 590,215.

In the accompanying drawings, Figure 1 is a plan view of my improved apparatus. Fig. 2 is an end view. Fig. 3 is a side view. Fig. 4 is an enlarged end view. Fig. 5 is an enlarged plan view. Fig. 6 is a section on line 6 6, Fig. 4. Figs. 7 and 8 are detail views of the charging and pushing forks.

The apparatus is mounted on a suitable foundation or floor *a*. Any suitable welding-furnace *b* may be employed, the furnace having the charging-openings 1 2 3 4 5 arranged side by side in the rear or charging end, like openings coinciding with said charging-openings in the front or welding end of said furnace.

Mounted on suitable tracks *a'* on the floor *a* is the transversely-moving carriage *c*, which is connected to the piston-rod *c'*, working in a cylinder $c^2$, whereby said carriage *c* is moved on the tracks *a'*. A trough or platform *d* is supported on the carriage *c*, said trough resting upon the angle-bars *d'*, a trough being employed in charging skelp and a flat platform in charging the flat plates for making drawn welded tubing. A slot $d^2$ is formed the entire length of the trough *d*, and rails *e* are laid on the carriage *c* below the slot, on which rails the buggy *e'* travels. This buggy *e'* has the upwardly-extending pusher $e^2$, which

extends up through the slot $d^2$ in the trough $d$. Secured within a suitable seat $f'$ in the pusher $e^2$ is the charging-fork $f$, having the fork-shaped end $f^2$. The charging-fork $f$ is held in place by the pin $f^3$. An arm $g$ is also attached to the pusher $e^2$ and extends out to one side of the trough $d$, said arm having the hook $g'$ formed at the outer end thereof. This hook $g'$ engages with the pushing-fork $h$ between the two collars $h'$ $h^2$, so that when the pushing-fork $h$ is advanced the hook $g'$ will be in contact with the collar $h^2$, and when the fork is withdrawn the hook $g'$ will be in contact with the collar $h'$. The pushing-fork $h$ is employed to push the heated skelp into the welding-rolls in front of the furnace. The buggy $e'$ is advanced and withdrawn by means of the piston-rod $i$, working in the cylinder $i'$.

At one side of the welding-furnace $b$ is the platform or table $j$, upon which the tube-skelps $j'$ are deposited as they come from the skelping-bench, said tube-skelps being arranged side by side on said table. Mounted on suitable tracks $k$, which extend from the table $j$ to the carriage $c$, is the buggy $l$. A trough $m$ is supported by the buggy $l$, said trough being mounted on the rocking shaft $m'$. Suspended from the rocking shaft $m'$ are the weighted arms $n$, carrying weights $n'$. Rigidly secured to the shaft $m'$ is the arm $o$, said arm having a pin $o'$ at its lower end adapted to engage with the hook $p'$ of the arm $p$, secured to the shaft $r$, adapted to rock in bearings $r'$. A weight $s$ is suspended from the shaft $r$ to retain said arm $p$ in its normal position. The buggy $l$ is advanced and withdrawn by means of the rod $t$, connected thereto and working in the cylinder $t'$.

The operation of my improved apparatus is as follows: The furnace $b$ is first charged with the tube-skelps $u$ $u'$ $u^2$, &c. This is done without the use of the pushing-fork $h$, which is accordingly removed for the time required in charging. The tube-skelps are deposited upon the table $j$ as they come from the skelping-bench. With the parts in the positions shown in Fig. 4 the trough $m$ is in position to receive a tube-skelp from the table $j$. Accordingly one of the tube-skelps is rolled from the table $j$ into the trough $m$, and the buggy $l$, carrying the trough $m$, is advanced by the piston-rod $t$ along the tracks $k$ toward the charging-machine. As said buggy $l$ advances the pin $o'$ in the arm $o$ will engage with the hook $p'$ of the arm $p$, and the movement of said arm being arrested, so that upon a farther advance of the buggy $l$ the shaft $m'$ will be rocked. This rocking of the shaft $m'$ will bring the trough $m$ into the position shown in Fig. 2, whereby the tube-skelp is dumped into the trough $d$, care being taken to have said tube-skelp rest within said trough $d$ with its lapped edges facing upward. The trough $d$ has been previously brought opposite any desired opening, such as the opening 1 of the furnace, by means of the piston-rod $c'$, which is connected to the carriage $c$, which supports said trough. The buggy $e'$ is then advanced, with the charging-fork $f$ engaging with the tube-skelp in the trough $d$ in the manner shown in Fig. 5. In this manner the tube-skelp is readily inserted into the welding-furnace, with its lapped edges facing upward and in line with a corresponding opening at the opposite end of said furnace. When the tube-skelp has been pushed into the furnace the proper distance, on the backward movement of the buggy $e'$ the charging-fork is withdrawn. In the meantime the trough $m$, having dumped its contents into the trough $d$, has resumed its normal position and the buggy $l$ has been drawn back into position to receive another tube-skelp from the table $j$. The carriage $c$ is then moved until the trough $d$ is opposite opening 2 of the furnace $b$, when the operation just described is repeated.

After the furnace $b$ has been once charged it can be worked in such a way that the charging and discharging of the tube-skelp therefrom can be done continuously—that is, each time a tube-skelp is pushed from the furnace a new one is inserted. This operation is illustrated in Fig. 5, where the parts of the apparatus are in such positions that the tube-skelp $u^4$ is just about to enter opening 4 of the furnace, while the tube-skelp $u^5$ is about to be pushed from said furnace to the welding-rolls. In this case the pushing-fork $h$ is employed and engages with the arm $g$ and the tube-skelp $u^5$. The buggy $e'$ is now advanced, whereupon the tube-skelp $u^4$ is inserted into the furnace on a straight line, with its lapped edges up, while the tube-skelp $u^5$ is pushed out of the furnace on a straight line, with its lapped edges up and just in position to be fed to the welding-rolls situated at the other end of the furnace. In this manner the tube-skelps are always inserted with their lapped edges up, and exposed in the zone of highest heat in the furnace, and they remain in that position when in the furnace, and without being rolled over, or turned, in the furnace, they are pushed out and fed to the welding-rolls. After feeding the skelp $u^5$ to the rolls the buggy $e'$ is again withdrawn and the carriage $c$ moved over, with the pushing-fork $h$ opposite opening 1 of the furnace. The pushing-fork $h$ is advanced to push out the tube-skelp $u'$. After this the carriage $c$ is moved over, with the trough $d$ opposite opening 1 of the furnace. A tube-skelp is then dumped into the trough $d$ in the manner hereinbefore described, and the operation of pushing and charging at the same time is repeated.

By the above operations the handling of the tube-skelp is done with great ease, there being practically no manual labor involved, while at the same time the charging of the furnace and the pushing of the tube-skelp therefrom is a continuous one, and is performed by the one operation. The tube-skelps are fed to the furnace with their scarfed and lapped edges up and remain in that position

in the zone of highest heat until fed to the rolls, so that all liability of destroying the shape of the skelp or injuring their scarfed edges is removed. This of itself will greatly improve the quality of the pipe and at the same time greatly increase the output of a mill.

While the apparatus has special points of advantage when operated in the way above described, it is evident that it can also be employed to advantage where the skelp is turned or rolled over within the furnace-chamber, the charging mechanism being brought into line with one or the other charging-opening through which the skelp may be pushed, and that it has like advantages when employed in connection with the feeding of skelps or blanks for making butt-weld tubing. These are intended to be included within the scope of the invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An apparatus for the manufacture of tubing in which are combined: a furnace having a series of charging-openings, a transversely-moving carriage for supporting the blanks in line with said openings, and pushing mechanism traveling longitudinally along said carriage to push the blanks into the respective charging-openings when the carriage is brought into line therewith, substantially as set forth.

2. An apparatus for the manufacture of tubing in which are combined: a furnace having a series of charging-openings, a transversely-moving carriage for supporting the blanks in line with said openings, and transversely and longitudinally moving pushing mechanism traveling longitudinally along said carriage to push the blanks into the respective charging-openings when the carriage and pushing mechanism are brought into line therewith, substantially as set forth.

3. An apparatus for the manufacture of tubing in which are combined: a furnace having a series of charging-openings, a transversely-moving carriage having a trough or platform thereon, and charging apparatus on and movable transversely with the carriage, and movable longitudinally of the carriage to push the blank into the respective charging-openings when the carriage is brought into line therewith, substantially as set forth.

4. An apparatus for the manufacture of tubing in which are combined: a furnace having a series of charging-openings, a transversely-moving carriage having a slotted trough or platform for supporting the blanks in line with said openings, and pushing mechanism on and movable transversely with the carriage and having an upwardly-extending pusher passing up through the slot of the trough and traveling longitudinally along the same to push the blanks into the respective charging-openings when the carriage is brought into line therewith, substantially as set forth.

5. An apparatus for the manufacture of tubing in which are combined: a furnace having a series of charging-openings, a transversely-moving carriage having a slotted trough or platform for supporting the blanks in line with the openings, and having below the same a longitudinally-extending track, and a pushing-buggy traveling longitudinally on said track and having an upwardly-extending pusher passing up through the slot of the trough to push the blanks into the respective charging-openings when the carriage is brought into line therewith, substantially as set forth.

6. In apparatus for the manufacture of tubing, the combination with a suitable furnace, of a transversely-moving carriage having a trough or platform thereon, a buggy mounted on said carriage, a forwardly-projecting rod on said buggy adapted to engage the tube-skelp on said trough, a second forwardly-projecting rod on said buggy at one side of said first-mentioned rod, and mechanism for advancing and withdrawing said buggy, substantially as set forth.

7. In apparatus for the manufacture of tubing, the combination with a suitable furnace, of a transversely-moving carriage, a trough or platform on said carriage, said trough having a slot therein, a buggy mounted on said carriage, an upwardly-extending pusher on said buggy passing up through said slot, a forwardly-projecting rod carried by said pusher, an arm extending out at one side of said pusher, a second forwardly-projecting rod carried by said side arm, and mechanism for advancing and withdrawing said buggy, substantially as set forth.

8. In apparatus for the manufacture of tubing, the combination with a suitable furnace, of a transversely-moving carriage, a trough or platform on said carriage having a slot therein, a buggy mounted on said carriage, an upwardly-extending pusher on said buggy passing up through said slot, a forwardly-projecting rod carried by said pusher, a hooked arm extending out at one side of said pusher, a second forwardly-projecting rod having collars thereon engaged by said hooked arm, and mechanism for advancing and withdrawing said buggy, substantially as set forth.

9. In apparatus for the manufacture of tubing, the combination of a furnace, charging mechanism in line with the charging-opening in the furnace, and a transversely-moving carrying-buggy adapted to carry the skelp transversely to and deposit it on the charging mechanism, substantially as set forth.

10. In apparatus for the manufacture of tubing, the combination with a furnace, of charging mechanism having a receiving-trough, and a transversely-moving carrying-buggy, adapted to carry the skelp to and deposit it in the trough of the charging mechanism, substantially as set forth.

11. In apparatus for the manufacture of

tubing, the combination with a furnace, of a transversely-moving carriage, a trough on said carriage, a transversely-moving carrying-buggy having a trough and mechanism for dumping the trough of the carrying-buggy, substantially as set forth.

12. In apparatus for the manufacture of tubing, the combination with a suitable furnace having openings therein, of a charging-trough supported in line with said opening, a transversely-moving trough and mechanism for dumping said transversely-moving trough, substantially as set forth.

13. In apparatus for the manufacture of tubing, the combination with a suitable furnace having openings therein, of a charging-trough supported in line with said openings, a transversely-moving buggy, a trough mounted on said buggy, and mechanism for dumping said trough, substantially as set forth.

14. In apparatus for the manufacture of tubing, the combination with a suitable furnace having openings therein, of a charging-trough supported in line with said openings, a transversely-moving buggy, a rocking shaft, a dumping-trough on said rocking shaft, and mechanism for dumping said trough, substantially as set forth.

15. In apparatus for the manufacture of tubing, the combination with a suitable furnace having openings therein, of a charging-trough supported in line with said openings, a transversely-moving buggy, a rocking shaft, a dumping-trough on said rocking shaft, an arm extending from said rocking shaft, and mechanism for arresting the lower end of said arm as said buggy advances, whereby said last-mentioned trough is dumped, substantially as set forth.

16. In apparatus for the manufacture of tubing, the combination with a suitable furnace having openings therein, of a charging-trough supported in line with said openings, a transversely-moving buggy, a rocking shaft, a dumping-trough on said rocking shaft, a hooked arm in the path of said buggy adapted to engage the lower end of said first-mentioned arm, substantially as set forth.

17. In apparatus for the manufacture of tubing, the combination with a suitable furnace having openings therein, of a charging-trough supported in line with said openings, a transversely-moving buggy, a rocking shaft, a dumping-trough on said rocking shaft, a weight depending from said dumping-trough, an arm extending from said shaft, a hooked arm in the path of said buggy adapted to engage the lower end of said first-mentioned arm, substantially as set forth.

In testimony whereof I, the said PETER CHARLES PATTERSON, have hereunto set my hand.

PETER CHARLES PATTERSON.

Witnesses:

ROBERT C. TOTTEN,

WALTER FAMARISS.