B. M. HANLY.

HOT RIVET PASSER.

APPLICATION FILED MAY 19, 1921.

1,413,727.

Patented Apr. 25, 1922.

2 SHEETS—SHEET 1.

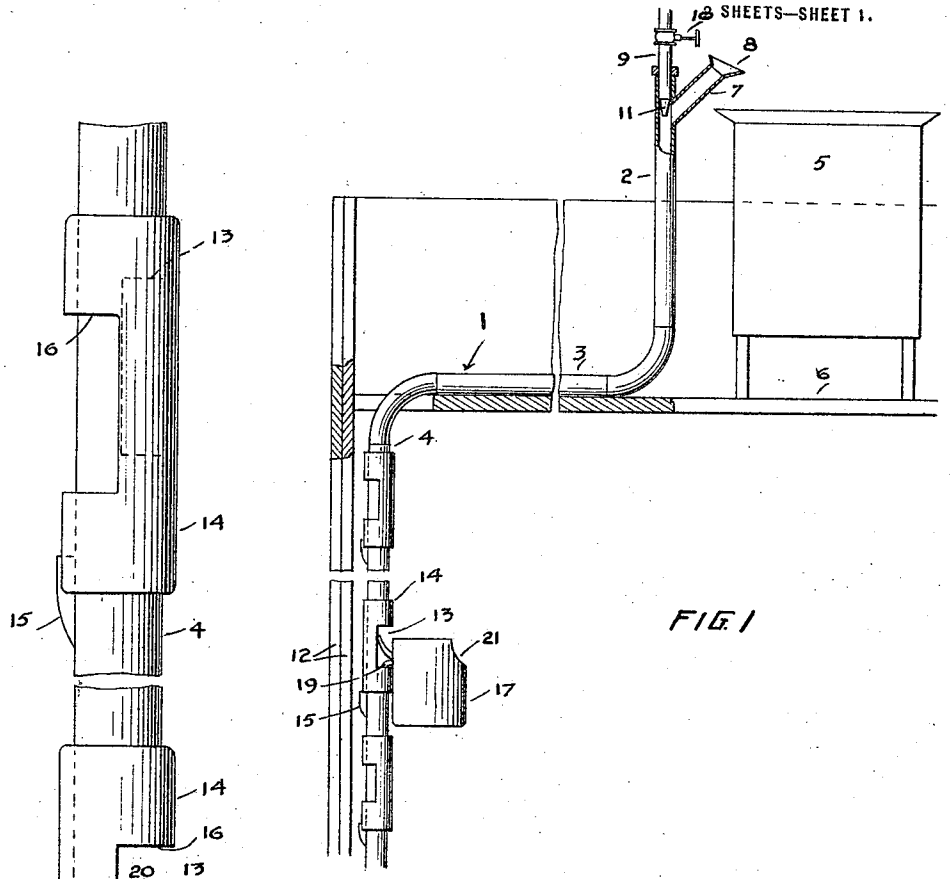


FIG. 1

FIG. 2

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2 SHEETS—SHEET 2.

FIG. 3

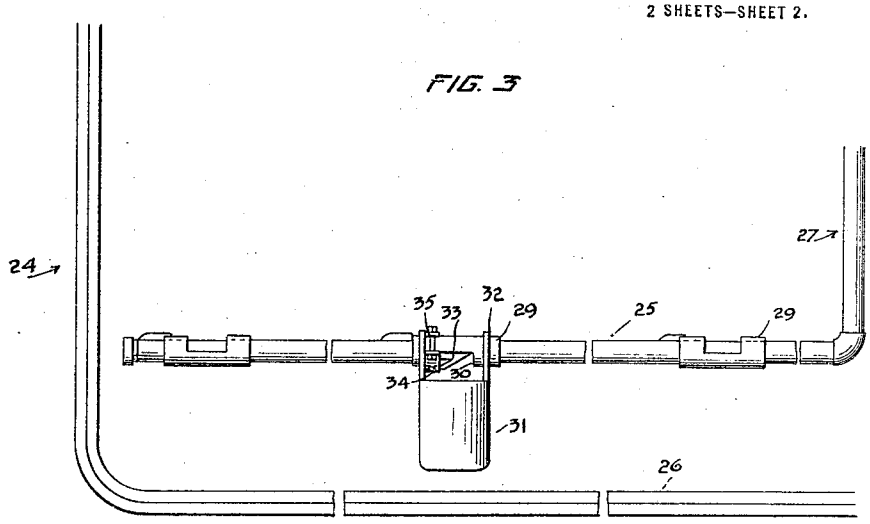


FIG. 4

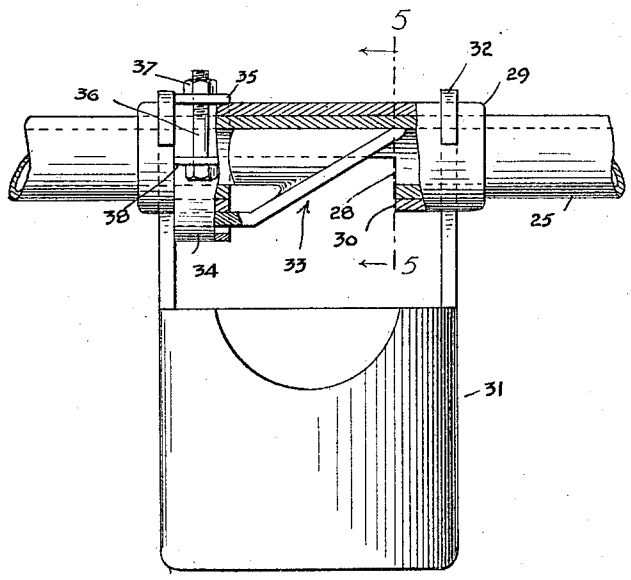
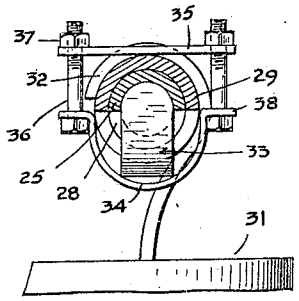


FIG 5



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UNITED STATES PATENT OFFICE.

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HOT-RIVET PASSER.

1,413,727. Specification of Letters Patent. Patented Apr. 25, 1922.

Application filed May 19, 1921. Serial No. 470,827.

To all whom it may concern:

Be it known that I, BENJAMIN M. HANLY, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Hot-Rivet Passers, of which the following is a specification.

The present invention relates to apparatus for delivering hot rivets from a rivet forge or furnace to various points of a ship, building or other construction job.

The primary object of the invention is to provide comparatively inexpensive and simply constructed and operated apparatus of the character described which will deliver hot, properly workable rivets to any desired point or points and to ordinarily inaccessible places, in a more expeditious, reliable and convenient manner and without danger of injury to workmen or requiring the employment of as many workmen or rivet forgers and other equipment as are necessary under the present hand passing system, whereby a saving in labor, time and expense is provided.

Another object of the invention is to provide apparatus of the character described which will entirely eliminate the necessity of passing hot rivets by hand and insure the delivery of each rivet to the predetermined or designated point whereby dropping, cooling off and loss of rivets are prevented.

The invention possesses other advantages and features some of which, with the foregoing will be set forth at length in the following description where I shall outline in full that form of the invention which I have selected for illustration in the drawings accompanying and forming a part of the present specification. In said drawings I have shown one form of the construction of my invention, but it is to be understood that I do not limit myself to such form since the invention as expressed in the claims may be embodied in a plurality of forms.

Referring to the drawings:

Figure 1 is a fragmentary cross section of a ship showing the apparatus of this invention installed thereon and in side elevation and in section.

Figure 2 is an enlarged fragmentary detail side elevation of the take off pipe and rivet catching bucket, shown partly in section.

Figure 3 is a fragmentary cross sectional view of a ship showing a modified form of apparatus used when working on double bottom or deck work, the take-off pipe being horizontally disposed.

Figure 4 is an enlarged fragmentary side elevation of the take-off pipe and bucket of the type shown in Fig. 3.

Figure 5 is a sectional view taken on line 5—5 of Fig. 4.

In carrying out my invention I lay a system of piping from a rivet heating forge or furnace which, in the case of ship building, will be located centrally of the ship structure or I may use several pipe systems and forges, or several forges for each pipe system. The piping is laid so that the terminal portions are located near the riveting jobs and forges respectively. The forge terminal of the piping will be connected with a compressed air supply line and a suitable valve will be provided at this connection so as to be accessible to the forge operator. A hot rivet intake is provided at a point on one side of and near said forge terminal of the piping.

At the other end of the piping, a take-off pipe or section of piping is provided and this section or pipe is constructed so as to provide for the delivery or taking off of hot rivets therefrom at points suitably spaced apart. The outlet or take-off points may be, for example, three feet apart or may be closer or farther apart as best suited to the work. For side or vertical work, as in riveting the side plates of a hull, the take-off pipe will stand vertically, whereas in double bottom or deck or other horizontal work the take-off pipe will be horizontally disposed. In either case the take-off or outlet openings in said pipe will be independently opened and closed by suitable valve means and an adjustable bucket will be provided and arranged for selective movement opposite the openings so as to catch the rivets issuing from the openings. Suitable means is provided for insertion into the take-off pipe through the openings so as to deflect the rivets into the bucket.

In the operation of the apparatus, a hot rivet is taken from the forge and placed into the intake of the piping. The operator then opens the valve and compressed air is charged into the piping and rapidly impels the hot rivet to the take-off pipe. When the rivet strikes the deflecting means at a particular take-off opening, it will be deflected into the bucket and can be readily removed by the workmen. The compressed air impels the rivets so rapidly that in the piping the rivets do not cool appreciably and are

workably hot when delivered into the bucket. The workmen may shift the bucket to any one of the take-off openings in the take-off pipe which pipe may be from 15 to 30 feet or longer, with as many take-off openings as desired. In this way the delivering of hot rivets to any part of the hull or building may be provided for in a reliable, cheap and time saving manner.

One practical embodiment of the invention is illustrated in the accompanying drawings, in connection with a ship hull, and comprises a system of piping 1 made up of pipe sections having a diameter sufficient to permit rivets to be rapidly impelled therethrough. These sections extend vertically as at 2 then horizontally as at 3 and then vertically as at 4, which section 4 is the take-off pipe. Said section may be otherwise arranged as desired. The upper end of the section 2 is arranged adjacent to a rivet forge or furnace 5 which, as shown, is installed upon the deck 6 of a ship hull. An inclined intake pipe 7 is disposed adjacent the forge and is branched out from one side of the pipe section 2, said intake having an enlarged mouth 8. A compressed air supply pipe 9 is connected with the upper end of the section 2 above the rivet intake pipe and has a suitable valve 10 thereon. This air pipe is connected with a suitable source of compressed air not shown, and has a nozzle 11 extending into the pipe section 2, to a point substantially opposite the lower end of the intake pipe, so as to create a suction in the intake pipe when the compressed air is directed downward into said section 2.

The vertical take-off section or pipe 4 is disposed at the point where riveting of the plates 12 is required and this point may be forward, aft or amidships, the other pipe sections being suitably laid to make proper connection with the pipe 4. Take-off pipe is provided on one side with a plurality of spaced hot rivet take-off or discharge openings 13, which may be three or more feet apart as desired. Each of the openings is controlled by independent means for opening and closing the same, which means is preferably in the form of a sleeve 14 rotatable upon the pipe and held against sliding thereon by stop means 15, of any suitable form. Each sleeve is slotted or formed with an opening as at 16 which is adapted to register with an opening 13 when the sleeve is turned or rotated on the pipe 4. When otherwise turned these sleeves will close the take-off or discharge openings.

To provide for catching the rivets delivered through the openings 13, I employ a suitable bucket 17 having one side cut away as at 18, so as to register with the openings 13 and 16. This bucket is supported upon the pipe opposite the opening 13 which is opened for the discharge and preferably has a hook 19 on the cut out side thereof which hook is adapted to extend through the registering openings 13 and 16 and hook over the lower edges of said openings as shown in Figs. 1 and 2, whereby one side of the bucket will rest upon the pipe 4.

As a means for deflecting the rivets into the bucket I employ a deflecting member in the form of a tongue or strip 20 carried by the bucket and arranged to extend through the openings 13 and 16 into the pipe 4 so as to lie in the path of the rivets. This member or tongue is inclined or shaped so that when the rivets come into contact therewith they will be deflected sideways out through the openings 13 and 16 in a downward as well as outward direction and into the bucket. The bucket is cut away on its outer side as at 21, so as to permit the operator to readily insert tongs, not shown, to remove the rivets. Any suitable means may be used for temporarily holding the piping in place and it is not thought necessary to describe this obvious expedient.

Operation.

A hot rivet is placed in the intake pipe 7 and the valve 10 is immediately opened. A charge of compressed air will be directed through the nozzle 11 into the piping 1 and will rapidly impel the rivet through the piping. With the bucket set, as shown in Figs. 1 and 2, when the rivet encounters the deflecting member 20, the rivet will be thrown or discharged into the bucket from which it may be readily removed. The valve need be kept open but a moment in order to cause the rivet to be forcibly and swiftly impelled and the rivet in thus being quickly delivered in a metal pipe will not cool off and will be hot when delivered to the point of its use. Thus, each rivet requires but a small amount of air to cause its delivery through the piping.

As the work advances the bucket is advanced along the pipe 4. If the pipe is 30 feet long, for example, and has from five to eight take-off openings, the bucket may be placed at any of these openings to receive the rivets. Thus it will be seen that with this apparatus the rivets may be delivered hot at various points throughout a height of from 10 to 30 or more feet. By taking out or "coupling in" pipe sections in the main line, and this may be quickly done, the take-off pipe section 4 may be quickly and easily moved to different positions and likewise the take-off pipe may be shortened and lengthened by the addition or removal of sections thereof.

In Figs. 3, 4 and 5, I have shown a modified form of this invention such as would be used on deck or double bottom work of a ship or like structure. I have shown a ship

24 with the take-off pipe 25 extending horizontally close to the bottom 26, of the ship. This take-off pipe is connected with a system or line of piping 27 which latter corresponds to the piping 1 of the form of invention heretofore described, and said piping is connected with the air line and associated with the forge, (both not shown) as in said piping 1. The under side of the take-off pipe 25 is provided with a plurality of spaced discharge or take-off openings 28 controlled by sleeves 29, rotatable on the pipe and having openings 30 therein, adapted to register with the openings 28. These sleeves are similar to the sleeves 14, being independently operable to open and close the openings 30.

A bucket 31 is movable along the pipes 25 so as to be disposed opposite any of the openings 28 and has hooks 32 adapted to engage over and upon said pipe, whereby the bucket will hang under the said openings. The operator may slide the bucket from one opening 28 to another along the pipe, dependent on the point of work. To deflect the rivets a deflecting member 33 is inserted into the pipe through the openings in the pipe and sleeves at the desired point along the pipe. This member is similar to the one 19 and is carried on a curved jaw 34 of a two jaw clamp, the other jaw 35 of which, being adjustably connected by means of bolts 36 and nuts 37. The jaw 34 is curved to conform to and embrace the pipe, having lateral flanges 38 on its free ends. The jaw 35 engages upon the upper side of the pipe and the bolts 36 extend therethrough and through the flanges 38, with the nuts 39 on the upper ends thereof, whereby a quick clamping and unclamping may be effected. The operation of this form of the invention is carried out in the same way as in the form hereinbefore described, the deflecting member and bucket being moved to the desired point or advanced with the advancing of the riveting operation.

While I have shown and described the invention in connection with ship building work, it is obvious it may be equally well used in other building or construction jobs where riveting is required.

I claim:

1. Apparatus for delivering hot rivets comprising a rivet delivering conduit, means for the introduction of hot rivets into the conduit, means for introducing a rivet impelling medium into the conduit so as to impel the rivet through the conduit and means providing for the discharge of the rivets from said conduit at any one of a plurality of spaced points along said conduit, a bucket movable along the conduit to catch the rivets discharged therefrom and means cooperating with said bucket and conduit for deflecting and directing rivets discharged from the conduit into said bucket.

2. In apparatus for delivering hot rivets, a rivet discharge conduit having a plurality of spaced rivet discharge openings thereon, means for selectively opening and closing said openings, a rivet delivering conduit connected with the discharge conduit, means providing for introduction of hot rivets into the delivery conduit, means for introducing an impelling medium into the delivering conduit so as to impel the rivets into the discharge conduit, a bucket arranged to be moved into position to catch the rivets delivered from the discharge conduit and means capable of insertion into the discharge conduit through any one of the discharge openings which means will cause the rivet to be deflected out of the conduit into the bucket.

3. In apparatus for delivering hot rivets, a rivet delivering conduit having a rivet discharge opening therein, means providing for the introduction of hot rivets into the delivering conduit, means for introducing an impelling medium into said delivering conduit, a receptacle adapted to catch the rivets delivered from said discharge opening, means extending into said conduit through said opening for deflecting and directing the rivets into the receptacle.

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