

No. 815,463.

T. H. NAUGHTON.

PATENTED MAR. 20, 1906.

APPARATUS FOR RECOVERING WASTE ALCOHOL FROM LIQUOR CASKS
AND BARRELS.

APPLICATION FILED JAN. 11, 1905.

2 SHEETS—SHEET 1.

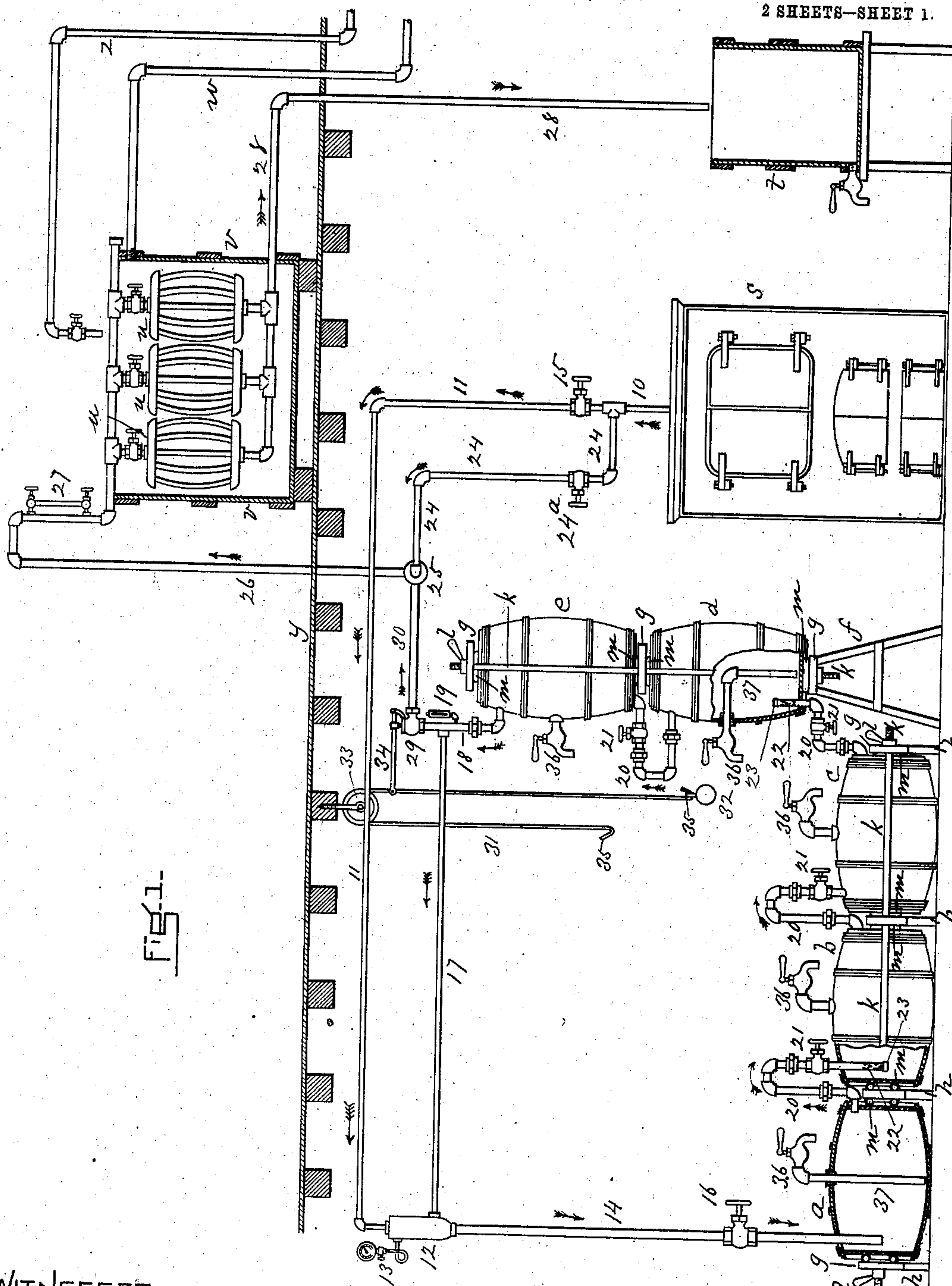


Fig. 1.

WITNESSES.

A. F. Hood.
M. A. Atwood.

Thomas Henry Naughton
By his Atty.
Henry Williams

INVENTOR.

No. 815,463.

T. H. NAUGHTON.

PATENTED MAR. 20, 1906.

APPARATUS FOR RECOVERING WASTE ALCOHOL FROM LIQUOR CASKS
AND BARRELS.

APPLICATION FILED JAN. 11, 1905.

2 SHEETS—SHEET 2.

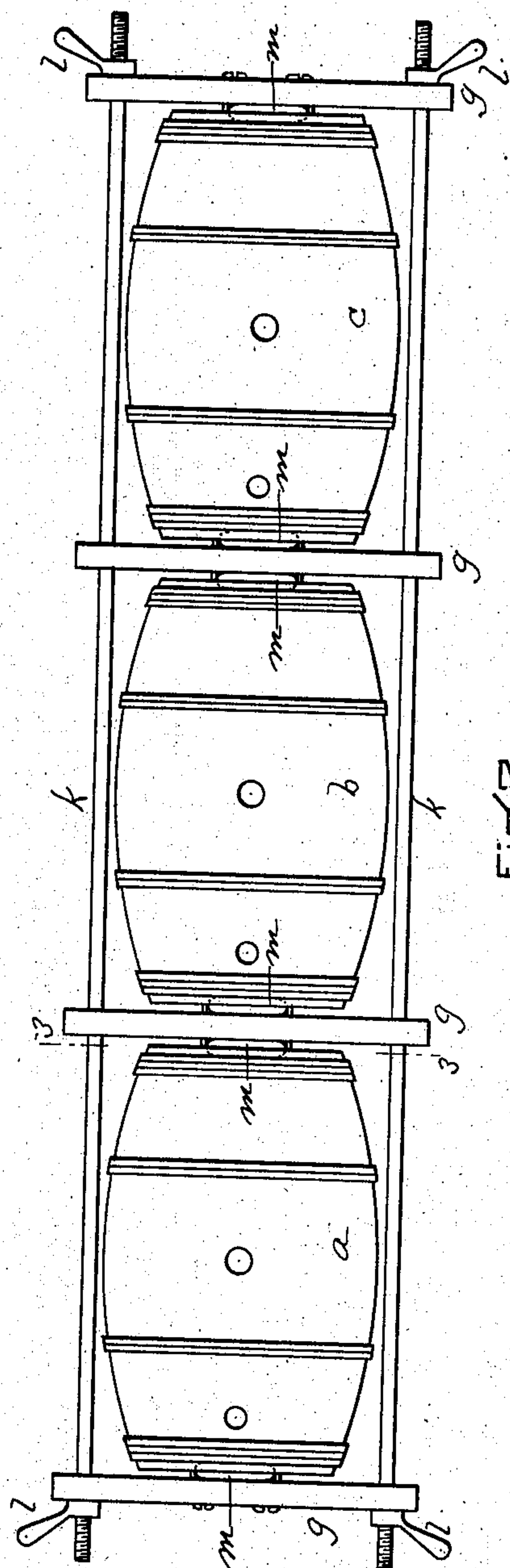


Fig. 2.

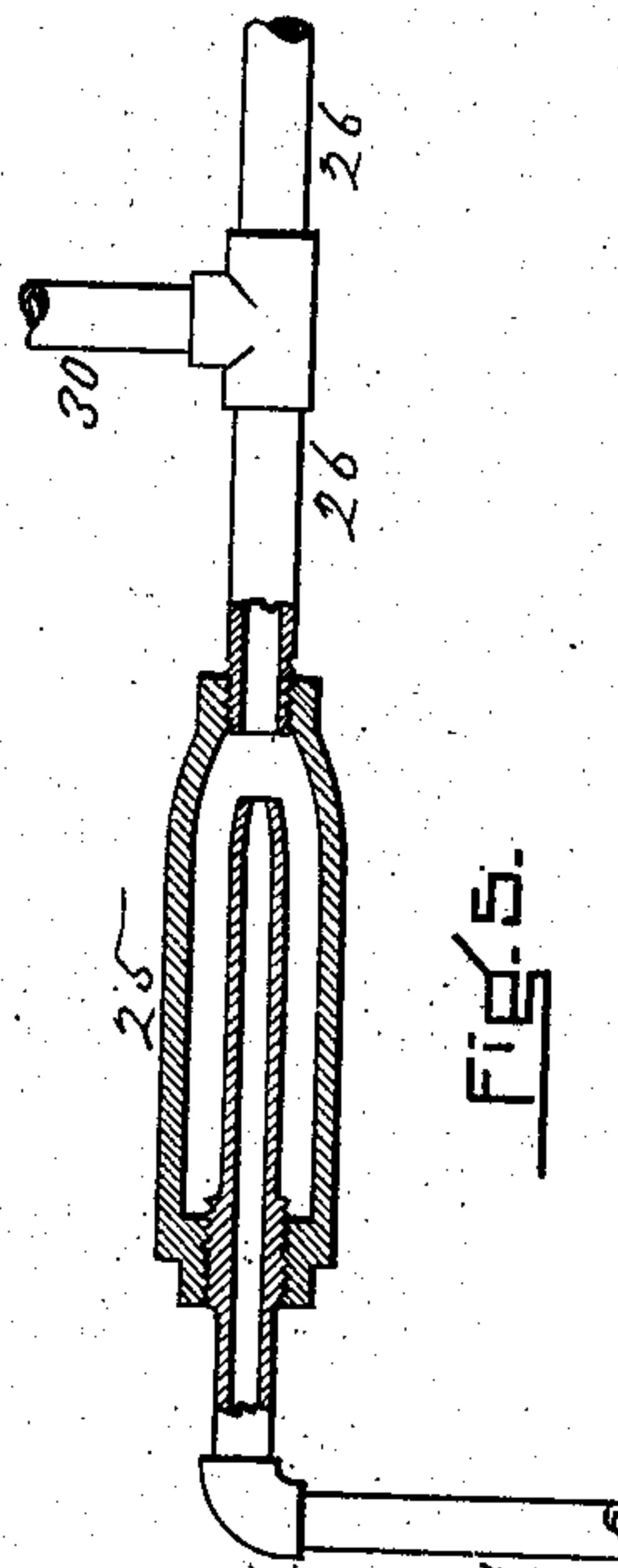


Fig. 5.

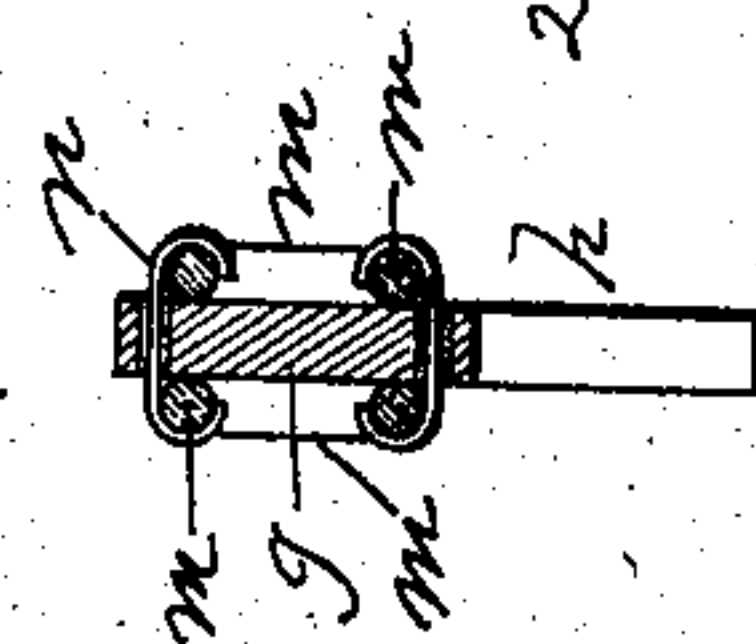


Fig. 4.

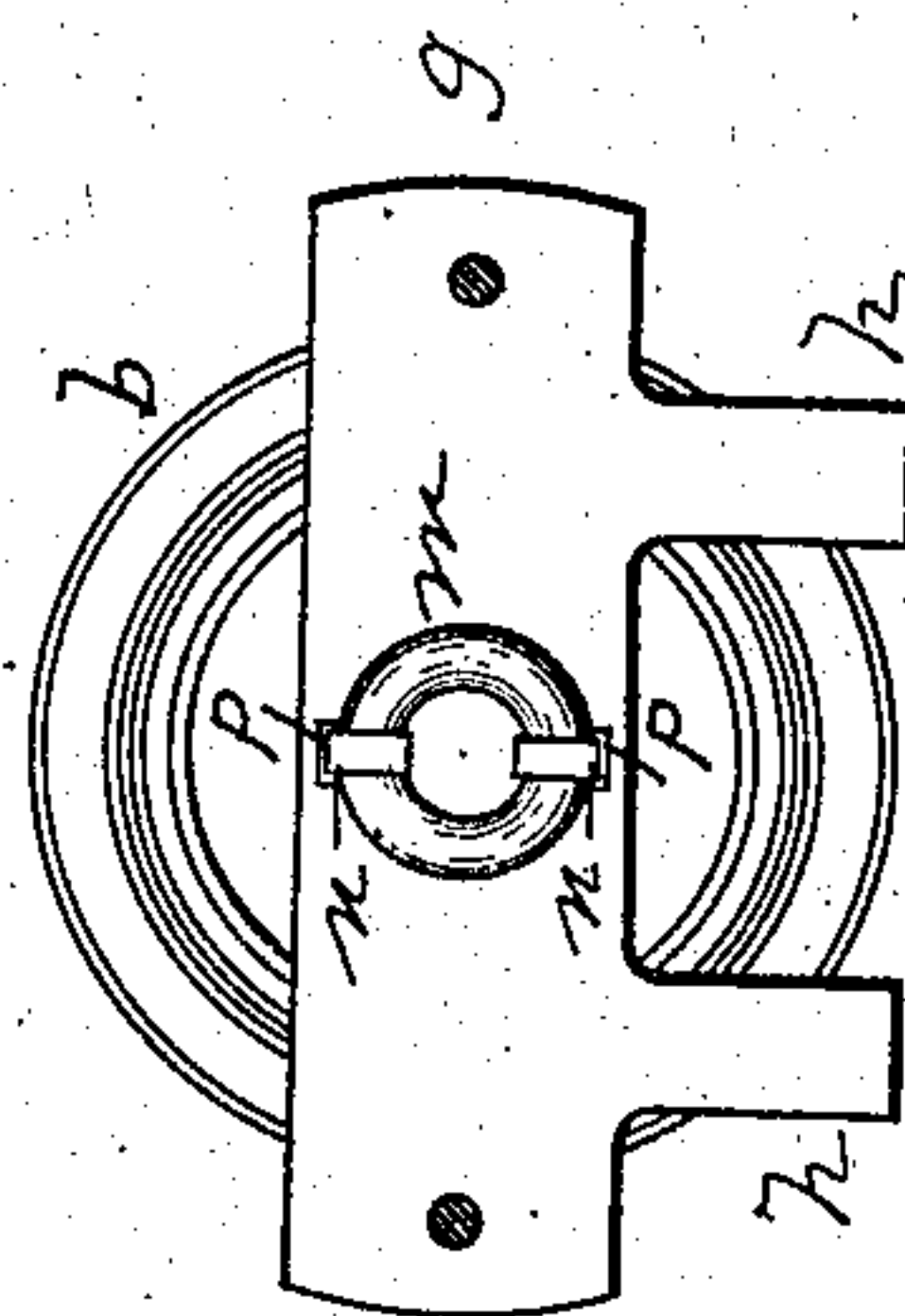


Fig. 3.

WITNESSES.

A. L. Hood.

M. A. Atwood

INVENTOR.

Thomas Henry Naughton
By his Atty.

Henry Williams

UNITED STATES PATENT OFFICE.

THOMAS HENRY NAUGHTON, OF BOSTON, MASSACHUSETTS, ASSIGNOR,
BY MESNE ASSIGNMENTS, OF ONE-HALF TO MARY A. NAUGHTON, OF
BOSTON, MASSACHUSETTS, AND ONE-HALF TO MICHAEL DUNN, OF
SPRINGFIELD, MASSACHUSETTS.

APPARATUS FOR RECOVERING WASTE ALCOHOL FROM LIQUOR CASKS AND BARRELS.

No. 815,463.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed January 11, 1905. Serial No. 240,555.

To all whom it may concern:

Be it known that I, THOMAS HENRY NAUGHTON, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Recovering Waste Alcohol from Liquor Casks and Barrels, of which the following is a specification.

After barrels and casks containing liquors and wines have been emptied as far as possible or as far as practicable of their contents there almost always remains some liquor in the barrel or cask which has not been drawn off and which is wasted. Moreover, there is quite a percentage of the contained alcohol which has been absorbed by the wood of which the barrels are made.

My invention has for its object to extract the liquor thus remaining in the receptacles and the alcohol remaining in the wood and to reclaim this product by means of a condenser to obtain alcohol of a high proof.

In my present invention the circulation through the barrel is established by the employment of the mechanism below described, with the result that a large number of barrels may be connected in line and subjected at the same time to one operation, the circulation and vaporization taking place immediately. By means of mechanism applied to the barrels and between their adjacent heads the heads are effectually prevented from being blown out or injured, and the barrels are thereby enabled to sustain a great pressure, whereby correspondingly prompt and efficient results are obtained.

My invention therefore consists in the apparatus for accomplishing the above results, the method or process therefor being made the subject of a separate application for Letters Patent, filed June 5, 1905, Serial No. 263,730, fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation showing a number of barrels being subjected to the operation of the invention, the condenser being located on a floor above. But five barrels are shown in line, although a much larger number in practice are connected and treated at the same operation. Fig. 2 is an enlarged

plan view of a horizontal row of barrels secured together by the same means illustrated in Fig. 1 for the purpose of preserving the heads from displacement or injury. Fig. 3 is a cross vertical section taken on line 3 3, Fig. 2. Fig. 4 is a cross vertical section of one of the barrel-supports. Fig. 5 is a detail in plan and section of the steam-injector 25.

Similar characters of reference indicate corresponding parts.

a, b, c, d, and *e* represent liquor or wine barrels which have been emptied as far as practicable of their contents and which are to be subjected to the operation of my apparatus. Three of these barrels are represented as in a horizontal row and two in a vertical row, supported by a suitable bench *f* in order to show the method of connecting horizontally and vertically placed casks. The barrels *a, b,* and *c* may rest on the floor without the employment of cradles, and as many barrels may be contained in a row and as many rows connected together as desired or deemed practicable, as in practice a large number of barrels or casks may be treated at the same time. At the opposite ends of each row of barrels, whether horizontal or vertical, there is placed a head-block consisting of the strong horizontal cross-bar *g* (see Figs. 2, 3, and 4) and the supporting-legs *h*. Between the adjacent ends or heads of the barrels in a row there are similar head-blocks, and all these blocks are connected by horizontal rods *k*, which extend through the portions *g* near their opposite ends, as shown. The opposite ends of these rods *k* are screw-threaded and are provided with nuts *l*. The inner surfaces or faces of the horizontal portions *g* of the end head-blocks and both faces of the intermediate head-blocks are provided with elastic cushions *m*, preferably pneumatic rubber ring-shaped cushions. These pneumatic cushions are secured by suitable hooks or clamps *n*, Figs. 3 and 4, which extend through openings *p* in the portions *g* of the head-blocks, the pneumatic cushions being centrally located on said portions *g* and the head-blocks being of such a height as to enable the cushions to be pressed centrally against the barrel-heads. By operating the nuts *l* the barrels are held tightly against the cushions, whereby the

heads are enabled to sustain great pressure without any danger of their being blown out, strained, or injured. The rubber cushions readily adapt themselves to inequalities or
 5 irregularities in the barrel-heads, and the legs *h* prevent the barrels from rolling.

s represents a steam-boiler, and *t* a receiving-tank, both preferably located on the same floor with the barrels, and *u* represents
 10 a series of condensers in a condensing-tank *v*, provided with the overflow and supply pipes *w* and *z*, the condenser being located, preferably, on a floor *y* above the barrels.

A supply-pipe 10 leads from the boiler *s* to
 15 the steam-pipe 11, which leads to the steam-injector 12, (constructed like that illustrated in Fig. 5,) provided with a pressure-gage 13. From the opposite end of the injector 12 a pipe 14 leads to the interior of the first barrel
 20 *a*. The pipes 11 and 14 are provided, respectively, with suitable valves 15 and 16. A pipe 17 leads from the injector 12 to a pipe 18, which connects with the interior of the last barrel *e*, said pipe being provided with a
 25 thermometer 19. The pipes 16 18 17 constitute the circulation-pipes through which the steam enters the first barrel and leaves the last barrel. The adjacent barrels are connected by tubular connections 20, extending
 30 through the farther head of the first barrel and through the side of the next barrel, and so on, except where the last horizontal barrel is connected with the first vertical barrel, in which case it is more convenient
 35 to extend both ends of the connections 20 through the barrel-heads. Each of these tubular connections is provided with a gate-valve stop-cock 21 and an injecting-pipe 22,
 40 which extends into the farther barrel, said pipe 22 being perforated and having its end capped, as shown at 23. By means of these connections a complete circulation through the barrels is established.

A pipe 24, provided with a suitable valve
 45 24^a, extends from the steam-supply pipe 10 to one end of the steam-injector 25, Figs. 1 and 5, and from the opposite end of the injector a pipe 26 extends and bends upward, as shown in Fig. 1, and makes suitable con-
 50 nections with the condensers *u* in the condensing-tank *v*, said pipe being provided with an ordinary gage or water glass 27. A pipe 28 leads from the condensers to the receiving-tank *t*. The upper end of the pipe 18
 55 leads to a stop-cock or blow-off cock 29, which is connected by the discharge-pipe 30 with the pipe 26. A chain 31, provided at one end with a ball 32, extends over a pulley
 33, sustained, preferably, by the ceiling, said
 60 chain being connected with the lever 34, which extends from the blow-off cock. The chain is provided at its opposite ends with hooks 35, whereby the weight may be applied to either
 65 end of the chain. On each barrel is a water-cock 36, from which a tube 37 extends down

into the barrel close to the lower portion of its interior, the tube 37 being straight when it is to be applied to a barrel which lies on its side and being bent when it is to be applied to a barrel on its end.

In operation, the condensers *u* being ready
 70 for use and provided with a sufficient quantity of cold water, the automatic blow-off cock 29 is set at the desired pounds pressure. The valves in the connections 20 are then
 75 opened, and the valve 16 or any other valves which there may be in the pipes 14, 17, 18, and 24. The water-cocks 36 should be closed. Then the valve 15 should be opened,
 80 letting the steam pass through the pipe 11 into the injector 12, and circulation begins immediately, the pipe 17 carrying the air and fumes from the barrels by means of the pipe
 85 18 to the injector 12 and vaporizing the contents of the barrels. The vapor and steam are then carried to the barrel *a*, vaporizing its contents and the contents of the pores of
 90 the wood, and thence through the connections 20 to all the barrels in turn, heating and vaporizing the contents of every barrel until a satisfactory degree of heat is reached as indicated
 95 by the thermometer 19 to allow the full opening of the blow-off stop-cock 29, thereby allowing the vapor to pass through the branch vapor-pipe 30 to the main vapor-
 100 pipe 26 and thence to the condensers *u*. The recovered alcohol is thence conducted through the outlet-pipe 28 to the receiving-tank *t*. During this operation the injector
 105 25 is receiving steam from the pipe 24 and conducting it into the vapor-pipe 26, with the effect of materially assisting in drawing the vaporized contents of the barrels from the
 110 last barrel and through the pipes 18 and 30 to the pipe 26, thus assisting the circulation. It will be seen, therefore, that the circulation
 115 is assisted by both steam-injectors 25 and 12, the former being located in the path of the vapor which has been withdrawn from the barrels and is on the way to the condensers
 120 and the latter in the path of the steam which is on the way to the barrels, carrying with it the air and fumes which leave the barrels at the beginning of the circulation.

By means of this apparatus in the above op-
 125 eration circulation through all the barrels begins as soon as the steam is turned on, and the barrels become quickly heated. Hence the vaporization is quickly and thorough and the alcohol contained in the barrels and in the
 130 wood of which they are composed is quickly and thoroughly removed. Moreover, a large number of barrels may be placed in line or in connected lines, either horizontal or both, and operated at the same time.

In order to remove the water (or the
 135 greater part of it) remaining in the barrels after the completion of the above-described process, the blow-off cock 29 is closed and the valves 15 and 16 are opened, thus driving the

steam into the barrels and forcing the greater portion of the water therein out through the tubes 37 and water-cocks 36.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for the purpose specified, a steam-generator; tubular connections between the barrels or casks; a tubular connection between the generator and the first barrel or cask to be treated; a steam-injector in said tubular connection between the generator and the first barrel; and tubular connections between said injector and the last barrel, substantially as set forth.

2. In an apparatus for the purpose specified, a steam-generator; tubular connections between the barrels or casks; a tubular connection between the generator and the first barrel or cask to be treated; a condensing apparatus; tubular connections between the last barrel and the condensing apparatus; a tubular connection between the main steam-supply and the connections between the last barrel and the condensing apparatus; and a steam-injector in said tubular connections between the steam-supply and the connections between the last barrel and the condensing apparatus; substantially as described.

3. In an apparatus for the purpose specified, a steam-generator; tubular connections between the barrels or casks; a tubular connection between the generator and the first barrel or cask to be treated; a condensing apparatus; tubular connections between the last barrel and the condensing apparatus; a tubular connection between the main steam-supply and the connections between the last barrel and the condensing apparatus; a steam-injector in the tubular connection between the generator and the first barrel; a tubular connection between the said injector and the tubular connection leading from the last barrel; and a steam-injector in said tubular connection between the steam-supply and the connection between the last barrel and the condensing apparatus, substantially as described.

4. In an apparatus for the purpose specified, a steam-generator; tubular connections between the barrels or casks; the tubular connections 10, 11 and 14 between the generator

and the first barrel; tubular connections 10, 24, 26, 30 and 18 between the generator and the last barrel; the tubular connection 17 between the pipes 18 and 14; steam-injectors between the pipes 14 and 17 and the pipes 24 and 26; a condensing apparatus connected with the pipe 26; a blow-off cock connected with the pipes 18 and 30; and an automatic regulator connected with said blow-off cock, substantially as described.

5. In an apparatus of the character described, in combination with a plurality of barrels arranged end to end, head-blocks comprising cross-bars *g* and suitable supports, elastic pneumatic cushions secured to said cross-bars between them and the barrel-heads, and mechanism for connecting the head-blocks and forcing them against the barrel-heads, for the purpose described.

6. In an apparatus of the character described, in combination with a plurality of barrels arranged end to end, head-blocks comprising cross-bars *g* and suitable supports, elastic pneumatic ring-shaped cushions, mechanism for securing said cushions to the head-blocks between them and the central portions of the barrel-heads, and mechanism for connecting the head-blocks and forcing them against the barrel-heads, for the purpose set forth.

7. In an apparatus of the character described, in combination with a plurality of barrels arranged end to end, head-blocks comprising cross-bars *g* and suitable supports, elastic pneumatic ring-shaped cushions, mechanism for securing said cushions to the head-blocks between them and the central portions of the barrel-heads, rods *k* extending through the head-blocks near their opposite ends on opposite sides of the barrels, and mechanism intermediate of said rods and the head-blocks at the opposite ends of the line of barrels for forcing said head-blocks against the barrel-heads, for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS HENRY NAUGHTON.

Witnesses:

HENRY W. WILLIAMS,
A. K. HOOD.