Feb. 26, 1957 F. B. FISHBURNE 2,782,710

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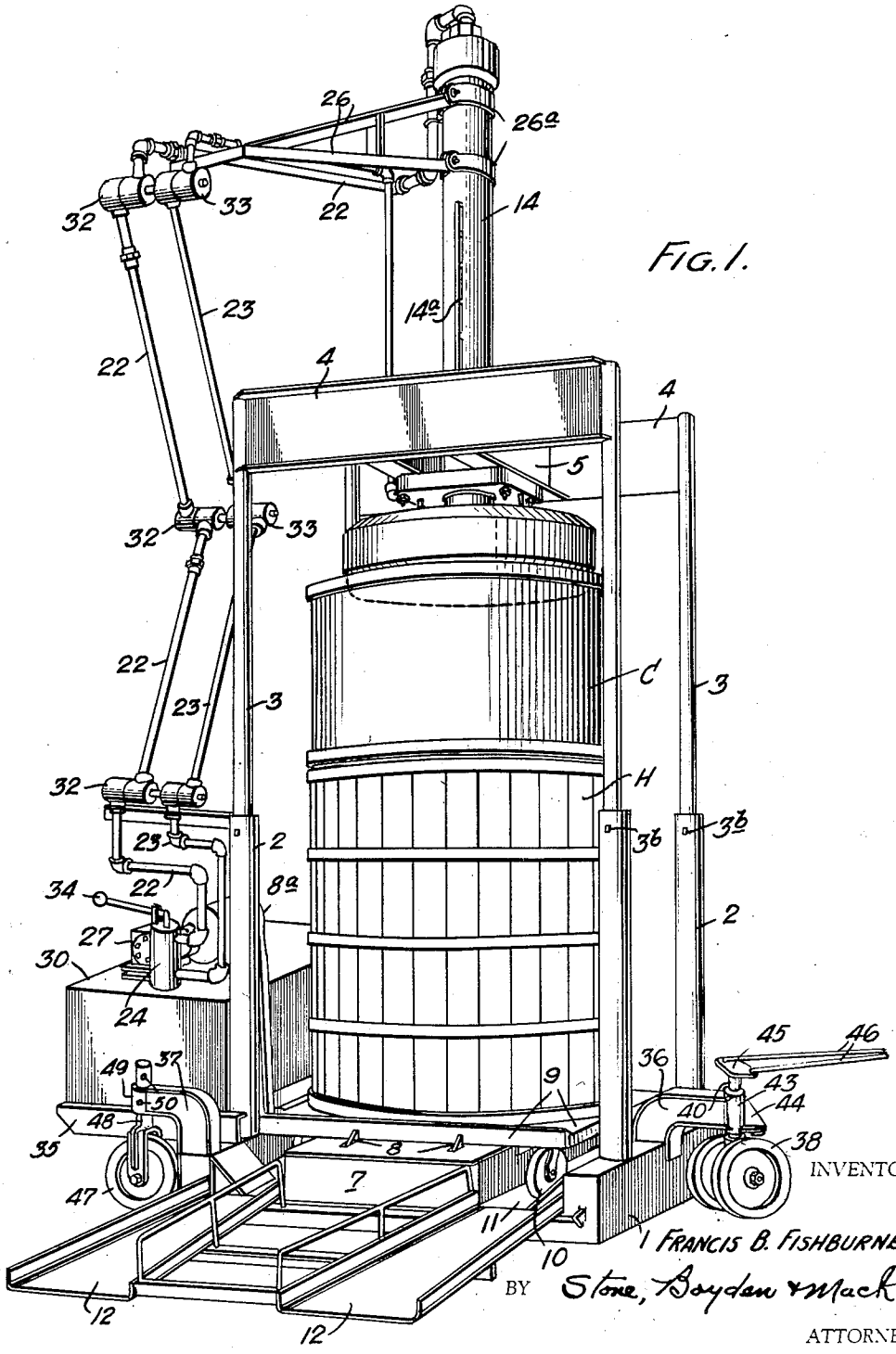


FIG. 1.

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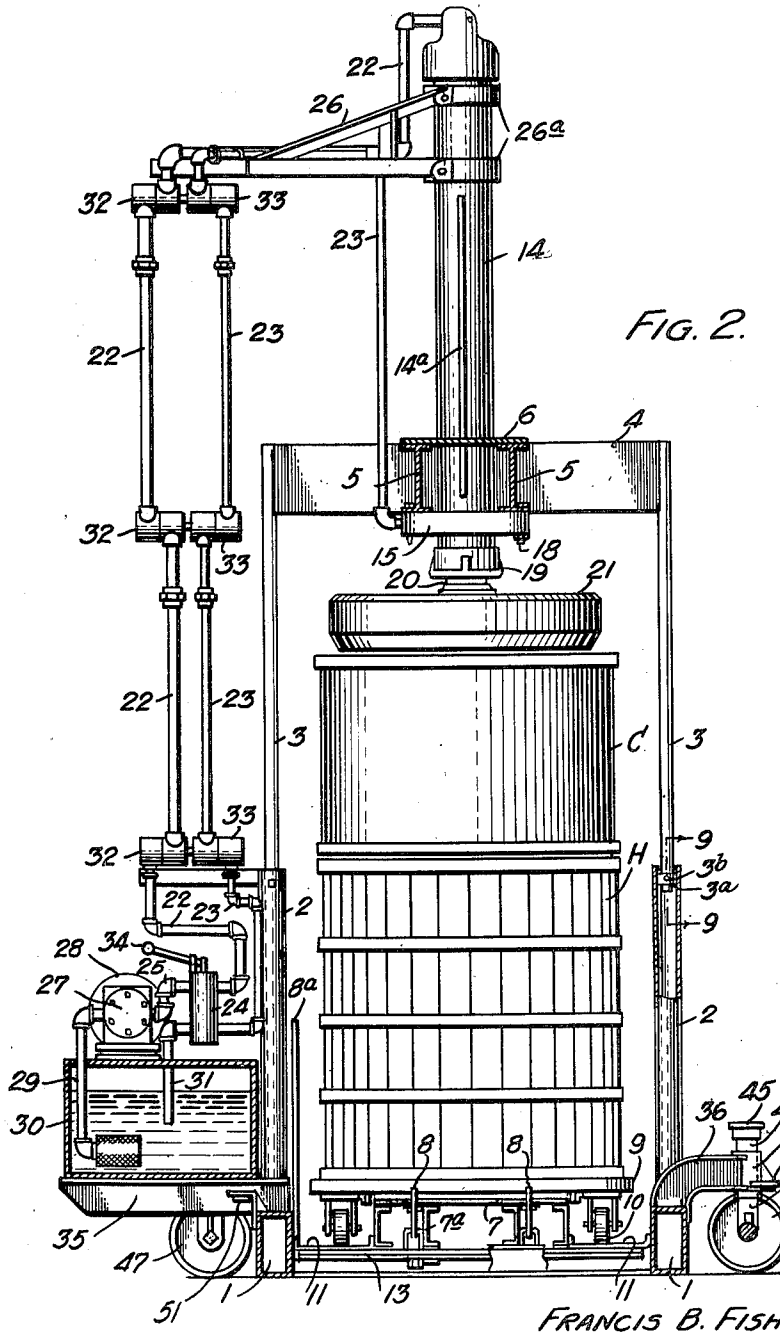


FIG. 2.

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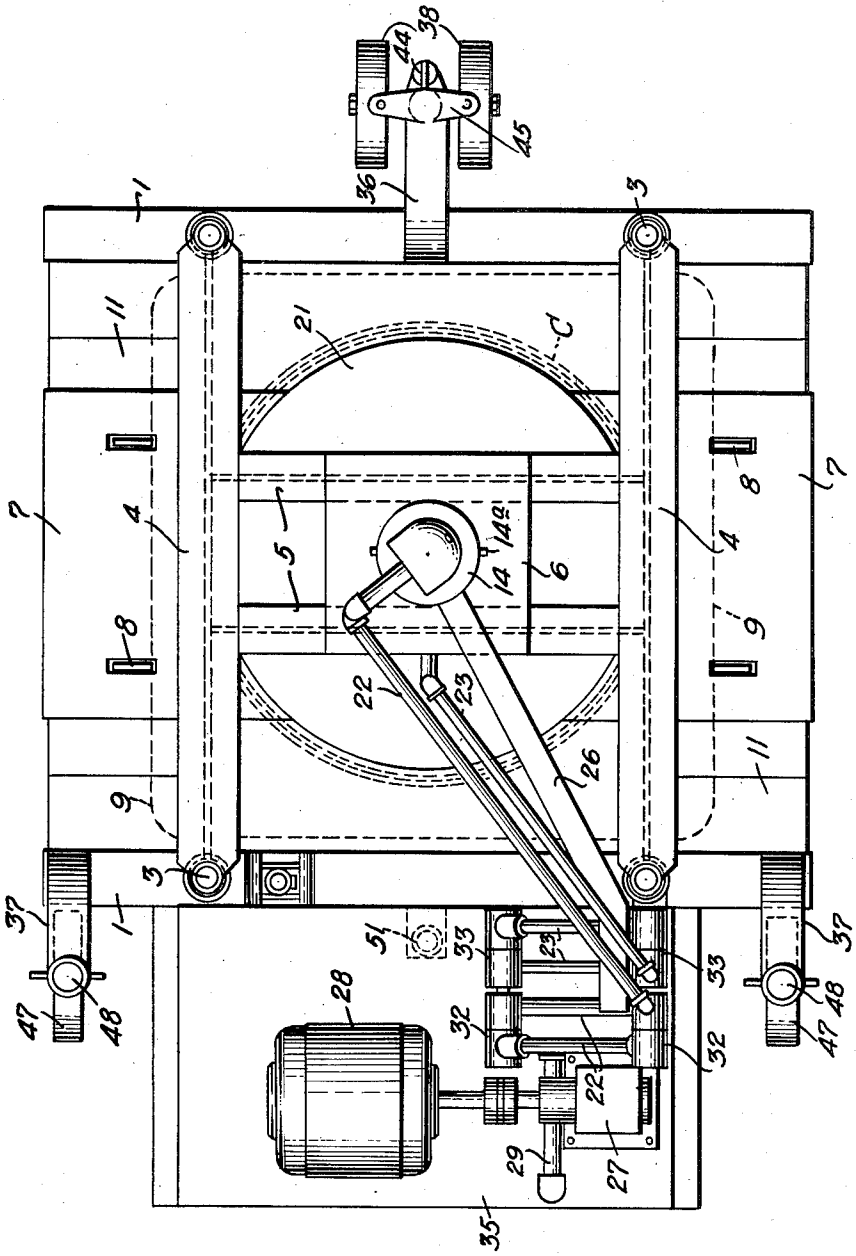


FIG. 3.

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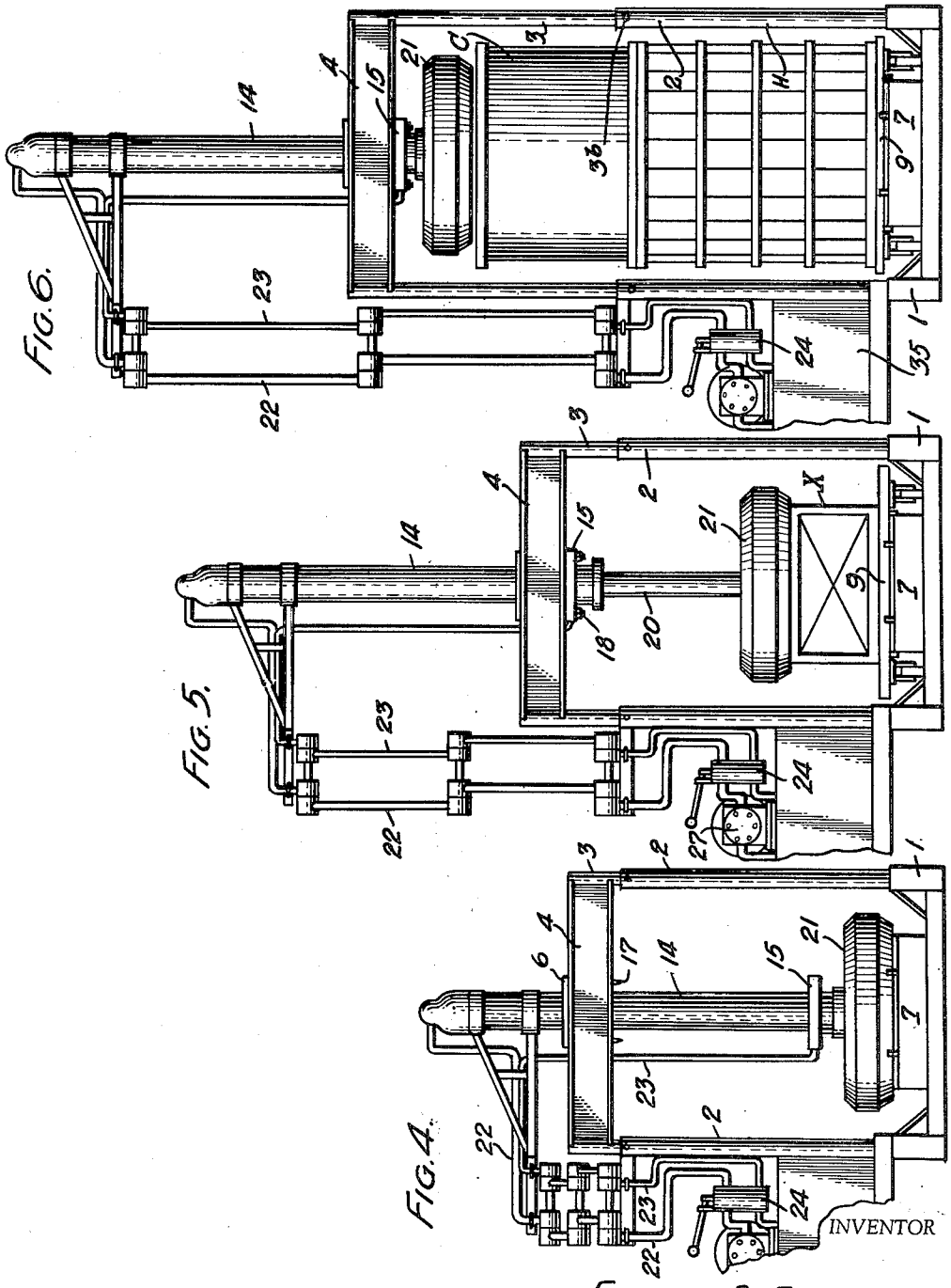
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FIG. 7.

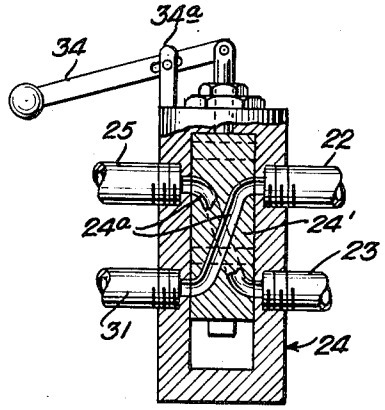


FIG. 8.

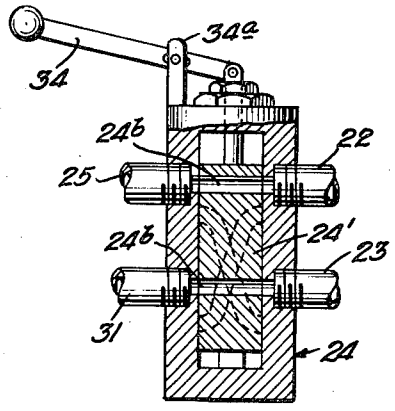
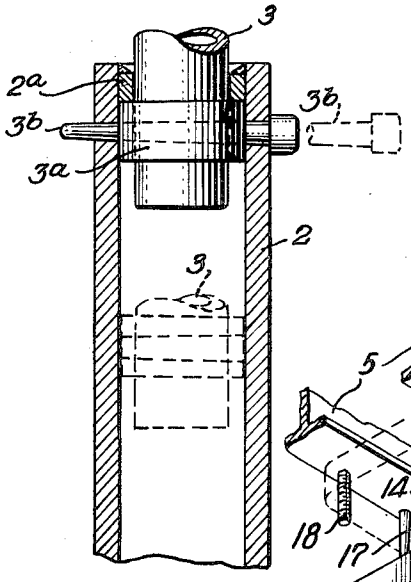


FIG. 9.



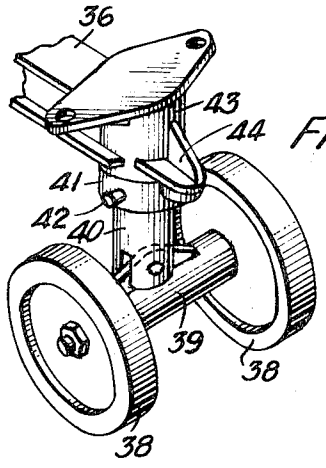


FIG. 10

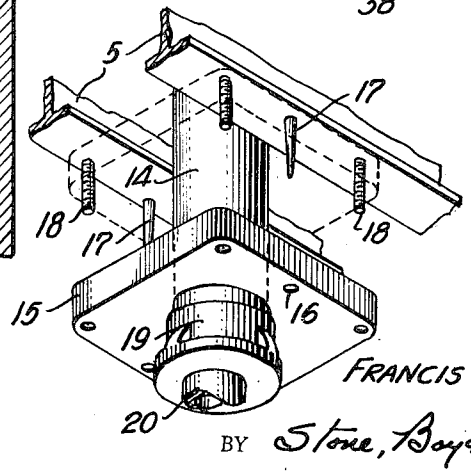


FIG. 11.

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United States Patent Office 2,782,710 Patented Feb. 26, 1957

2,782,710

PORTABLE PRESS

Francis B. Fishburne, Asheville, N. C.

Application July 21, 1952, Serial No. 299,999
10 Claims. (Cl. 100—100)

This invention relates to presses, and more particularly to presses of the overhead, vertical type for tobacco and the like.

One object of the present invention is to provide a completely self-contained, portable, power operated press, capable of being moved about on a warehouse floor to any desired position, and put into operation by simply plugging the extension cable into the nearest electric outlet.

A further object is to devise such a press capable of being transported, without dismantling, from one location to another, and so constructed that it may be collapsed to such a height as will enable it to pass through an ordinary doorway.

The present application is a continuation-in-part of my prior application Ser. No. 203,134, filed December 28, 1950, and now abandoned.

Said prior application disclosed a frame comprising upright columns supporting a vertically disposed hydraulic cylinder, and having means by which such cylinder could be raised and lowered relative to the frame.

The supporting columns in said prior application were rigid, one-piece elements, and it has been found in practice that, in some cases, it is not possible to make these columns of such height that they would be both low enough to permit the press to pass through a conventional doorway, and at the same time, high enough to provide sufficient space beneath the plunger for the reception of the usual hogshead and charger.

It is a still further object of the present invention, therefore to devise columns of extensible construction, so designed that they may be shortened or lengthened as required, and thus adapted, when shortened, to enable the press to pass through exceptionally low doorways, and when lengthened, to provide ample space beneath the plunger to receive hogsheads and chargers.

With the above and other objects in view, the invention comprises the combination and arrangement of parts hereinafter described and claimed, and illustrated in the accompanying drawings, forming part of this specification, and in which:

Fig. 1 is a perspective view of my improved portable press complete, the cylinder and frame being shown in their uppermost or raised position;

Fig. 2 is a side elevation thereof, parts being in section and parts broken away;

Fig. 3 is a plan view thereof;

Figs. 4, 5, and 6 are elevational views similar to Fig. 2, but on a smaller scale, and showing the parts of the press in three successive positions;

Figs. 7 and 8 are sectional detailed views showing more or less schematically the construction of the 4-way control valve, the two views illustrating the valve in two different positions;

Fig. 9 is a fragmentary vertical section on an enlarged scale taken substantially on the line 9—9 of Fig. 2;

Fig. 10 is a perspective view of one of the caster wheel arrangements for supporting the press; and

Fig. 11 is a fragmentary perspective view on an enlarged scale looking up underneath the lower end of the cylinder and showing the same as detached from the frame.

Referring to the drawings in detail, my improved press comprises a base 1, supporting four vertical posts or columns. Each of these columns is formed of a pair of telescoping tubular sections 2 and 3.

The four posts are arranged at the corners of a rectangle. The upper ends of the inner sections 3 of the pair of posts forming each of two parallel sides of the rectangle are united by cross-beams 4, and these beams in turn support a second pair of spaced cross-beams 5, disposed at right angles to the first, at approximately midway of the length thereof, and having their ends firmly secured thereto.

Positioned on the base between the posts is a rigid rectangular frame 7, which may conveniently be made of steel plate supported on channel beams 7a and which rigid frame I shall refer to as a "pressure pad." Its purpose is to sustain the pressure exerted by the press plunger, as will be hereinafter explained. Latches 8, releasable by means of a suitable foot pedal or a lever such as 8a are preferably provided to center the dolly, hereinafter described, on the pressure pad.

For supporting and transporting the tobacco being pressed, I employ a dolly, designated in its entirety by the reference numeral 9. This dolly comprises a rigid platform having near each and a pair of rollers 10. These rollers are spaced apart transversely to such an extent that they are adapted to straddle the pressure pad 7 and roll upon trackways 11, positioned at each side of the pressure pad. Ramps 12 are provided to enable the dolly wheels to roll from the floor up onto the tracks 11.

The tracks 11 are shown as resiliently supported on the ends of leaf springs 13, carried by the beams 7a, as shown in Fig. 2. This permits the tracks to yield, when pressure is applied to the dolly, until the dolly rests upon the pressure pad, in the same general manner and for the same purpose as described in my said prior application Ser. No. 203,134.

Supported by the cross-beams 5 is a vertically extending power cylinder 14. The lower end of this cylinder is welded to a block 15 having an opening therein through which the cylinder projects, which block extends between and is secured to the flanges of the I beams 5 by means of bolts 18 as best shown in Figs. 2 and 11. A pair of tapered pins 17 project downwardly from the beams 5 and are adapted to engage holes 16 in the block to guide it over the bolts. The cylinder passes freely through an opening in a guide plate 6, secured to the upper side of the beams 5, and the cylinder is provided with a pair of keys 14a, on its opposite sides, which keys slide through a pair of notches formed in the plate 6. This holds the cylinder from angular displacement.

A stuffing box 19 is carried by the lower end of the cylinder, and a piston rod 20 passes through this stuffing box up into the cylinder 14 and carries a solid piston (not shown) at its upper end.

Secured to the lower end of the piston rod 20 is a press head or plunger 21, as clearly shown in Figs. 1 and 2.

Suitable pipe lines 22 and 23 connect with the top and bottom of the cylinder 14, respectively, for supplying motive fluid thereto. These pipe lines connect with a four-way valve 24 (see Fig. 2) of the usual or any desired construction, and from the other side of this valve extend pipes 25 and 31. The pipe 25 is connected to the delivery side of a suitable pump 27 driven by a motor 28, the intake of such pump being connected with a pipe 29 which extends down into a tank 30 containing oil or other hydraulic fluid. The tank 30 may be supported in any suitable way, but is shown as carried by a platform 35, secured to the base 1.

The pipe 31, which is the exhaust pipe, also extends into the tank 30.

In view of the fact that, as hereinafter described, the cylinder 14 is intended to move vertically, the pipe lines 22 and 23 are constructed with a plurality of swiveled joints 32 and 33, as shown in Figs. 1 and 2, these joints permitting the pipes to bend as required. The pipes are supported by means of arms 26 secured to the cylinder 14 by means of clamps 26a. An operating lever 34 pivoted at 34a to a suitable bracket is provided for controlling the valve 24.

One detailed arrangement of the valve 24 is schematically shown in Figs. 7 and 8. The vertically shiftable valve member is provided with a pair of diagonal passages 24[a] and also with a pair of transverse passages 24[b], each pair of passages adapted to register with the pairs of ports to which the four pipes are connected.

From this it will be understood that by shifting this valve 24, motive fluid may be admitted to the upper end of the cylinder 14 through pipe line 22 and passage 24[b] for moving the plunger downward when the valve member is in the position shown in Fig. 8, while the fluid from the bottom of the cylinder is exhausted through the pipe line 23 and pipe 31 to the tank. Similarly, by changing the position of the valve to that shown in Fig. 7, motive fluid may be admitted through passage 24[a] and the pipe line 23 to the lower end of the cylinder to raise the plunger, while fluid is exhausted from the upper end of the cylinder through pipe line 22 and pipe 31 to the tank.

One of the principal objects of the invention is to devise a portable press which can be collapsed so that it can pass through an ordinary doorway and, when once inside the warehouse, can be erected by its own power to fully extended operative position. This is accomplished in the manner illustrated in Figs. 4, 5, and 6 which show the press in three successive positions.

Fig. 4 illustrates the press in its collapsed condition. This condition is brought about by first admitting fluid above the piston to lower the plunger until it rests on the pressure pad 7, and then releasing the block 15 from the bolts 18 and admitting fluid below the piston so as to move the cylinder downwardly. In this condition the pipe sections 22, 23 are collapsed or folded as shown, and it will be observed that the pipe 23 is so positioned as to be clear of the cross-beams when the cylinder moves downward.

After the press has been moved to the desired location and it is desired to extend or erect the same, the operator proceeds as follows:

The pump 27 is started and the valve 24 moved to the position shown in Fig. 8, admitting pressure through pipe line 22 to the upper end of the cylinder. Since the plunger 21 is rigidly supported and cannot move down, this pressure causes the cylinder body to move up. When it reaches the upper limit of its movement as shown in Fig. 5, the holes 16 slip over the guide pins 17, thus causing the bolts 18 to enter the holes provided for them, and the nuts are then placed on these bolts, thus firmly securing the block 15 and cylinder 14 to the cross-beams of the frame.

The valve 24 is then shifted to the position shown in Fig. 7, thus admitting pressure through pipe 23 to the lower end of the cylinder and causing the plunger to be raised.

A suitable supporting or erecting frame, as shown at X in Fig. 5 is then placed underneath the plunger, and the plunger lowered again. The reaction of the plunger pushing against this frame then serves to extend the columns, causing the inner sections 3 to be drawn up out of the outer sections 2. This operation continues until the columns have been fully extended as shown in Fig. 6. When this final position is reached, the tapered pins 3[b] are then driven through the mating holes in the two sections provided for them, thus locking the sections together in extended position.

By reference to Fig. 9, it will be particularly noted that when in final position the collars 3[a] on sections 3 engage the sleeves 2[a] at the top of the sections 2, thus constituting interengaging abutments which sustain the tension due to the reaction of the plunger against the material being pressed and relieve the pins 3[b] from excessive shearing stress. It will be further noted that as the sections 3 move upwardly from collapsed to extended position, the collars 3[a] slidably engage the inside of the sections 2 and thus act as guides to steady and aline the sections, so that the columns need no external bracing.

After the press has been extended to the operative position shown in Fig. 6, and in more detail in Figs. 1 and 2, the hogshead H to be packed is moved into position beneath the plunger by means of the dolly 9, the usual charger C being placed on top of the hogshead as shown. The charger and hogshead having been previously filled with loose tobacco, the valve 24 is then manipulated to cause the plunger 21 to descend into the charger and hogshead to compress the tobacco. As already explained, the initial pressure of the plunger on the dolly causes the resilient track supports 13 to yield, so that the dolly rests solidly on the pressure pad 7.

In order to facilitate moving the press from one location to another, suitable caster wheels are provided as above mentioned. In Figs. 1 and 3 the press is shown as provided at one side with a carriage comprising a pair of caster wheels 38, and at the other side with two separate single caster wheels 47. The caster wheels 38 and associated parts are best shown in Fig. 10. These wheels are journaled on an axle 39 to which the lower end of a post 40 is secured. This post extends upwardly and is journaled in a sleeve 43 rigidly carried at the end of a bracket 36, welded or otherwise secured to the frame 1. A ring 41 sourrounds and is freely movable vertically on the post 40, and a tapered pin 42 is provided by means of which this ring may be locked to the post in the raised position shown in Fig. 10. When in this position the sleeve 43 bears upon and rides on the ring 41, which may then sustain the weight of the press. A cross-head 45 is preferably secured to the upper end of the post 40 and to this cross-head a suitable tongue or handle 46 may be secured. From the opposite side of the base project a pair of spaced rigid brackets 37 and in each bracket is journaled a vertical post or trunnion 49 having at its lower end a fork 48 in which is journaled a caster wheel 47. The post or trunnion and the bracket are provided with holes 50 adapted, when moved into registry, to receive a suitable transverse pin to lock the parts together.

When in operative position the press rests on the warehouse floor as shown in Figs. 1 and 2. When it is desired to lift the press from the floor and shift its weight to the caster wheels, a suitable jack, similar to an ordinary automobile jack, is employed. The sleeve 43 carrying the caster wheels 38 is provided with a horizontally projecting bracket or jack pad 44, and by placing the jack under this bracket the sleeve 43 and associated parts may be lifted high enough to permit the ring 41 to be placed in position under it and pinned in place. When the jack is released, the weight of the press rests on this ring and is carried by the caster wheels.

At the other side of the press a jack pad 51 is provided midway between the two brackets 37 (see Fig. 3), and by placing a jack under this bracket both of the brackets 37 may be raised sufficiently to bring the holes 50 into registry so that transverse pins may be passed therethrough and the brackets locked in raised position. Thereafter the press may be moved around by means of the tongue or handle 46, the wheels 38, of course, being capable of swiveling so that the press may be guided in any desired direction.

What I claim is:

1. A portable press comprising a rigid frame, a vertical hydraulic cylinder and a pump carried by said frame, a plunger working within said cylinder and extending downwardly from the lower end thereof, and a support below said plunger for the material being pressed, said cylinder passing freely through said frame and being detachably secured at its lower end thereto, and means including said pump and a manually operated valve for occasioning movement of said cylinder vertically relative to said frame and plunger, when said cylinder is detached from said frame.

2. A portable press having a frame comprising a plurality of columns, each made up of a pair of tubular telescoping sections, a vertically disposed hydraulic cylinder

carried by said frame, a downwardly extending plunger working within said cylinder, hydraulic means, including said cylinder and plunger, by which said sections may be extended, and interengaging annular abutments carried by each pair of sections constructed to sustain the thrust of said plunger when the sections are in extended position.

3. A portable press comprising a frame made up of a plurality of columns and cross-beams carried by the upper ends thereof, a hydraulic cylinder mounted between said crossbeams and maintained in vertical position at all times, means for detachably securing the lower end of said cylinder to said cross-beams so that, when in operative position, it projects up above said frame, a downwardly extending plunger working within said cylinder, and fluid operated means, whereby said cylinder, when detached from said cross-beams, may be lowered relative thereto, said means including said plunger and a fluid conduit connected with the lower end of said cylinder and so positioned that said cross-beams are out of the path of movement of said conduit when the cylinder is lowered.

4. A portable press comprising a frame made up of a plurality of columns and cross-beams carried by the upper ends thereof, a vertical hydraulic cylinder freely movable between and with respect to said cross-beams, means for supporting said cylinder, when desired, in a position in which its lower end lies a substantial distance below said cross-beams, a downwardly extending plunger working in said cylinder, fluid operated means including said plunger for raising said cylinder relative to said cross-beam from the above-mentioned position to a position in which it projects for substantially its entire length above said cross-beams, and means for detachably securing the lower end of said cylinder, when in such raised position, to said cross-beams.

5. A self-contained portable tobacco press comprising a base, a frame carried by said base and including a plurality of extensible columns, cross-beams carried at the upper ends of said columns, a vertically disposed hydraulic cylinder carried by said frame and freely movable upwardly and downwardly with respect thereto, fluid operated means for raising and lowering said cylinder relative to said cross-beams, means for securing said cylinder, when raised, to said cross-beams, and a downwardly extending plunger working in said cylinder, the proportion of the parts being such that when said columns are shortened and said cylinder lowered, the press may pass through a doorway of conventional height, and when said columns are lengthened and said cylinder raised, its lower end stands at such height as to permit the usual hogshead and charger to be positioned beneath said plunger.

6. A portable press having a frame comprising a plurality of extensible columns, cross-beams carried at the upper end of said columns, a hydraulic cylinder disposed between said cross-beams and maintained in vertical position at all times, means for detachably connecting said cylinder to said cross-beams, a downwardly extending plunger working in said cylinder, means including said plunger for supporting said cylinder when detached from said cross-beams in a position in which the major portion of its length lies below the same, and fluid operated means including said plunger for first raising said cylinder to a position in which it projects for the major portion of its length above said cross-beams, and then raising said cross-beams and extending said columns, thus elevating said cylinder still further.

7. In a portable collapsible press comprising a rigid frame, a vertical hydraulic cylinder detachably connected at its lower end to said frame and normally projecting up above the same, a plunger carrying a piston working in said cylinder and extending downwardly from the lower end thereof, and a support below said plunger, the method of reducing the height of the press which

comprises first lowering said plunger until it rests on said support, and then detaching the cylinder from the frame and admitting motive fluid to the cylinder below said piston so as to cause the cylinder to telescope downwardly over said plunger.

8. In a portable collapsible press comprising a vertically extensible frame having a cross-beam at its upper end, a vertically disposed hydraulic cylinder mounted between and freely movable with respect to said cross-beam and having means at its lower end for detachably connecting it to said cross-beam, a plunger carrying a piston working in said cylinder and extending downwardly from the lower end thereof, said cylinder being capable of occupying an inoperative position in which its lower end lies a substantial distance below said cross-beam, the method of erecting said press into a fully operative position which comprises first supporting the lower end of said plunger and admitting motive fluid to said cylinder at a point above said piston, so as to move said cylinder upwardly relative to said cross-beam until it projects for substantially its full length above the same, rigidly connecting the lower end of said cylinder to said cross-beam, then shifting said plunger upwardly and supporting it at a higher level, and finally admitting motive fluid to said cylinder again at a point above said piston, so as to cause said frame to be extended upwardly until said cylinder is raised to the desired height.

9. A press comprising a plurality of columns, cross-beams carried at the upper end of said columns, a hydraulic cylinder detachably carried by said cross-beams and maintained in vertical position at all times, said cylinder being freely movable vertically with respect to said cross-beams, a plunger working within said cylinder and extending downwardly from the lower end thereof, a source of motive fluid under pressure, a manually operated valve for controlling the flow of fluid to and from said cylinder, and hydraulic means, including said source and valve, and conduits associated therewith, for raising and lowering said cylinder relative to said cross-beams.

10. A press comprising a plurality of extensible columns, a horizontal framework carried by the upper end of said columns, a hydraulic cylinder freely movable vertically with respect to said framework and capable of occupying a position in which a major portion of its length lies below said framework, means for detachably connecting the lower end of said cylinder to said framework when raised, a plunger working within said cylinder and extending downwardly therefrom, a source of motive fluid under pressure, a manually operated valve for controlling the flow of fluid to and from said cylinder, and hydraulic means, including said source and valve and plunger, for first raising said cylinder relative to said framework until its lower end is in a position to be connected thereto, and then extending said columns so as to bring said framework to the desired height.

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