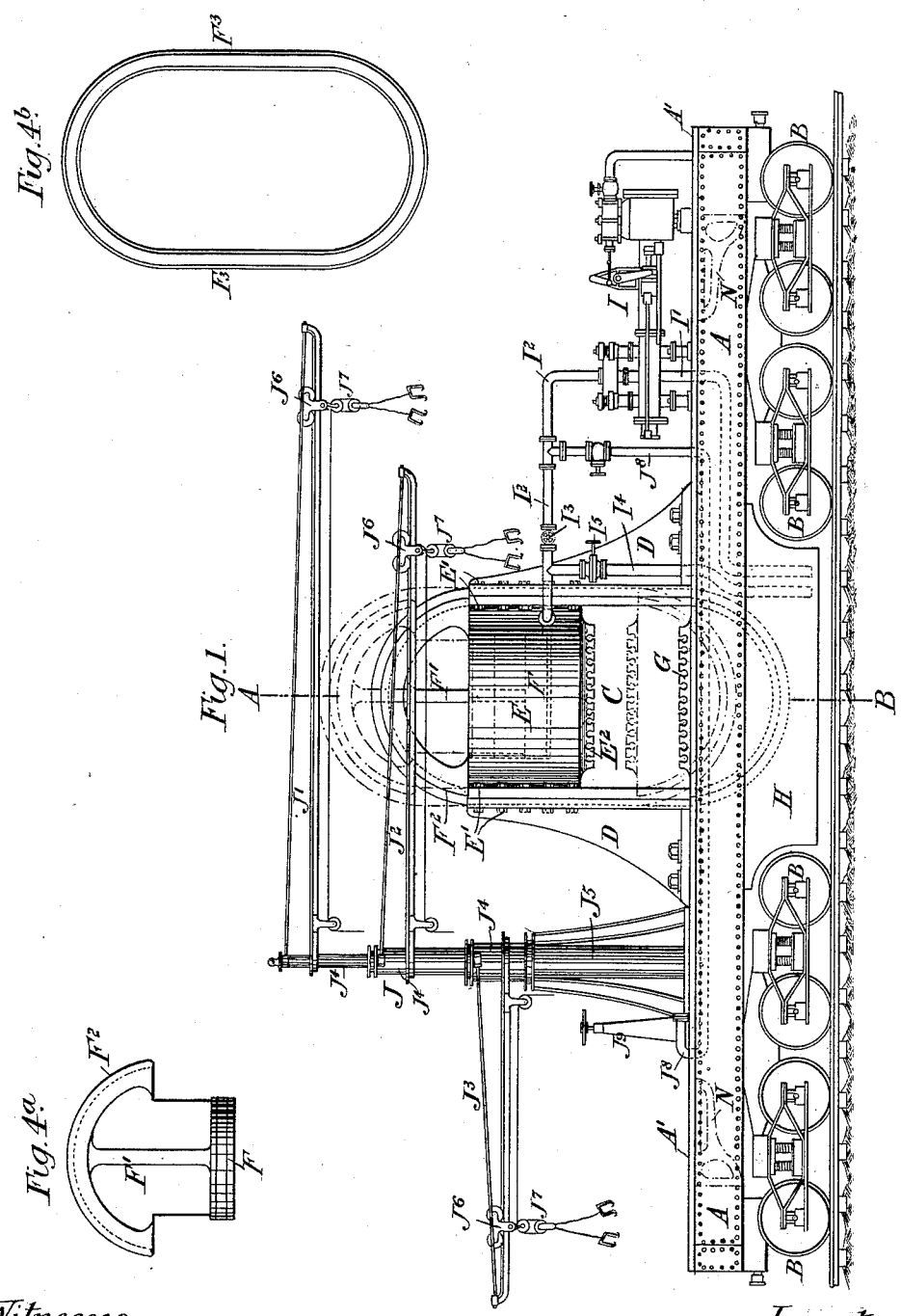


(No Model.)

4 Sheets—Sheet 1.

A. L. BLACKMAN.
APPARATUS FOR COMPRESSING COTTON OR OTHER FIBROUS MATERIALS.
No. 430,985. Patented June 24, 1890.



Witnesses
Harry B. Bridge
Haley Hart

Inventor
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(No Model.)

4 Sheets—Sheet 2.

A. L. BLACKMAN.

APPARATUS FOR COMPRESSING COTTON OR OTHER FIBROUS MATERIALS.

No. 430,985.

Patented June 24, 1890.

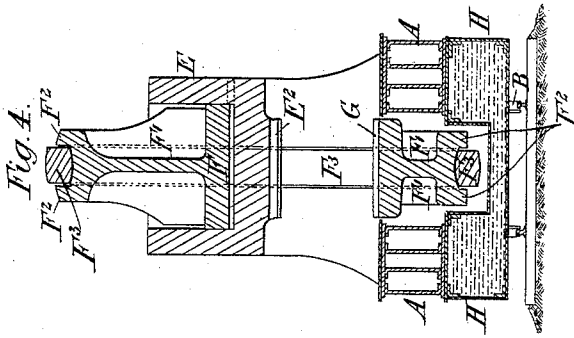


Fig. 2.

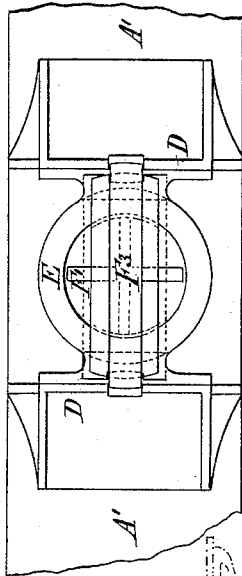
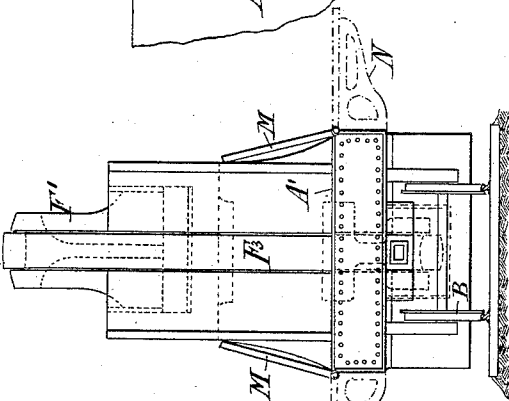


Fig. 3.



Witnesses
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4 Sheets—Sheet 3.

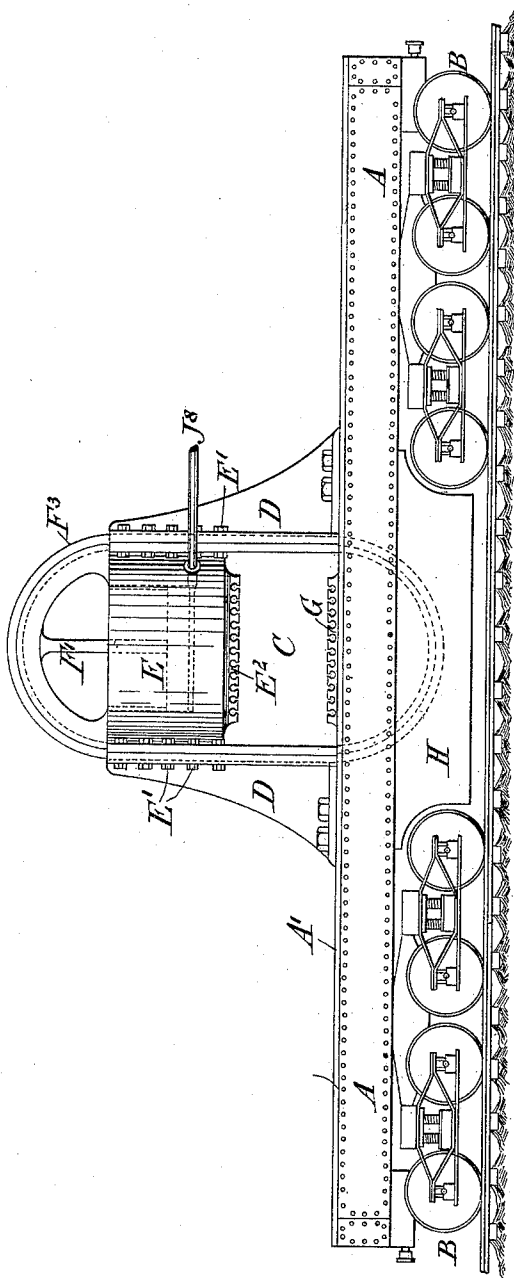
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APPARATUS FOR COMPRESSING COTTON OR OTHER FIBROUS MATERIALS.

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Patented June 24, 1890.

Fig. 4c.



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(No Model.)

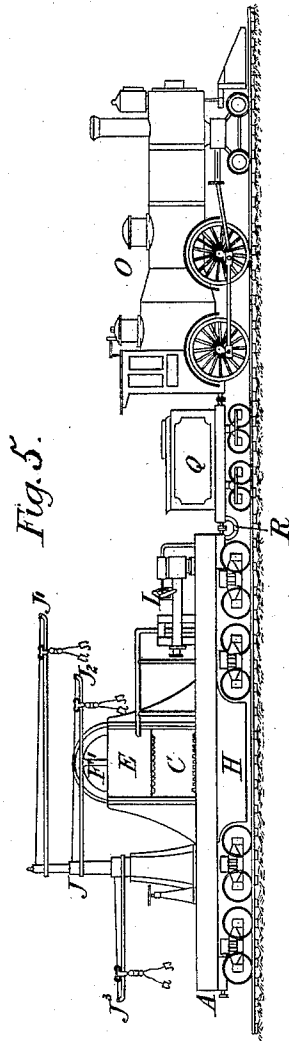
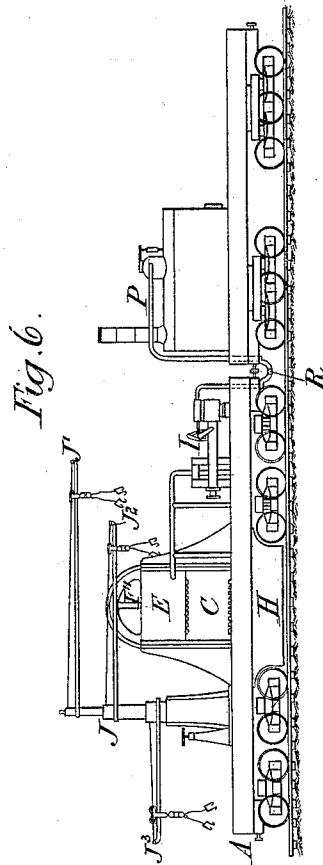
4 Sheets—Sheet 4.

A. L. BLACKMAN.

APPARATUS FOR COMPRESSING COTTON OR OTHER FIBROUS MATERIALS.

No. 430,985.

Patented June 24, 1890.



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UNITED STATES PATENT OFFICE.

ALBERT LIVINGSTON BLACKMAN, OF NASHVILLE, TENNESSEE.

APPARATUS FOR COMPRESSING COTTON OR OTHER FIBROUS MATERIALS.

SPECIFICATION forming part of Letters Patent No. 430,985, dated June 24, 1890.

Application filed January 10, 1889. Serial No. 295,980. (No model.)

To all whom it may concern:

Be it known that I, ALBERT LIVINGSTON BLACKMAN, of Nashville, Tennessee, United States of America, have invented certain new and useful Improvements in Apparatus for Compressing Cotton or other Fibrous Materials, of which the following is a specification.

My invention has relation to a portable apparatus for compressing bales of cotton or other fibrous material; and it consists in a combined bale-compress operating appliances and lifting and handling cranes mounted on trucks and adapted to run and be operated on railway-tracks.

The object of my invention is to provide an economical and powerful traveling combined compress and operating appliances, which may be moved from station to station, like a railway-car, for compressing bales of cotton and other materials, and which will so reduce the bales in size as to materially economize the cost of transportation from the original shipping-station to the trade centers and seaboard ports and save cost of handling, storage, and transshipping.

In the accompanying drawings, Figure 1 is a side elevation of my combined compress-car lifting and handling appliance and operating machinery adapted to be operated by hydraulic pressure. Fig. 2 is a plan of a fragment of the same. Fig. 3 is an end elevation of the combined compress-car, showing movable side platforms in dotted lines. Fig. 4 is a transverse section of the same cut down through the bale-compress. Fig. 4^a is a view of the piston detached. Fig. 4^b is a view of the stirrup detached. Fig. 4^c is a side elevation of a modification of the device shown in Fig. 1, adapted to be operated by steam. Figs. 5 and 6 are diagrammatic views illustrative of the manner of working my invention.

Like letters of reference indicate corresponding parts.

With reference to Figs. 1, 2, 3, and 4, A indicates the frame timbers or girders of a car-bed mounted on trucks B and adapted to run on a railway-track. The framing of the car is preferably constructed of steel or iron securely riveted, and may be advantageously constructed of hollow or of what are known as

"box-girders," and the flooring or platform A' should also be of iron or steel plates riveted or otherwise secured to the car-frame.

C is a hydraulic press, which may be constructed in various forms, as I have shown; but I prefer the following form of construction.

D are two strong brackets, which are rigidly bolted to the platform A' and girders A, and E is a cylinder supported by said brackets and preferably secured thereto by bolts E'.

E² is an upper stationary platen formed by the closed end of the cylinder E.

F is a plunger or piston working in the cylinder E, and is formed, preferably, in one piece and having approximately a grooved semicircular plunger-head F'. The plunger-head F' is formed with flanges F² in the groove between which the upper part of the oblong stirrup F³, Fig. 4^b, adjusts. The lower part of said stirrup F³ supports and carries the movable platen G. Platen G has a horizontal face and a grooved semicircular seat with projecting flanges F², adapted to engage with and adjust itself in the stirrup F³, and has indentations or incisions on the sides to prevent said platen from becoming displaced while allowing it to adjust its face to the inequalities of the bale being compressed. Platen G is adjusted and operated between the uprights or brackets D D by the action of the piston F' working in cylinder E on the stirrup F³, by which it is raised, in the process of compressing a bale, and lowered for discharging the same when compressed, attaining for the latter purpose the level of the car-bed A', whereby the handling of the bale is facilitated, as the bale may be readily moved on between the platens and off the lower platen when compressed.

Constructed between the trucks below the car-bed proper is a tank or reservoir H for containing a supply of water or other fluid for operating the hydraulic apparatus, and I is a pump by which the water is forced therein.

It will be observed by reference to Figs. 1 and 4 that there is a closed well-like recess in the platform of the car projected downward into reservoir H, to permit the lower part of

the stirrup F^3 and lower extension F' of the platen G to pass below the plane of the platform A .

J is a hydraulic telescoping adjustable crane consisting of a series of tubes having crane arms or jibs j' , j^2 , and j^3 , secured at the upper end thereof and adapted for mounting traveling trolleys j^6 thereon. The telescoping tubes are fitted internally as pistons, and so that each lower tube, when properly packed, will serve as a cylinder for the next upper one, each cylinder being connected with the supply pump or reservoir by suitable pipes, and are each being raised and lowered independently of each other by hydraulic pressure, and when in use may be turned in any direction and raised and lowered, as desired, each independent of the other. The traveling trolleys j^6 are provided with the usual lifting-tackle j^7 , and the whole is constructed and designed to lift and handle the bales to be compressed. Hydraulic crane J is connected with force-pump I by induction-pipe J^8 , through which the actuating-fluid is introduced. When not in use, these cranes may be lowered into the car-top.

I' is the suction-pipe of the pump I , and I^2 is the pipe by which the pump delivers water or other fluid to the cylinder E , and is fitted with a valve I^3 . I^4 is a pipe, also fitted with a valve I^5 , through which the water escapes to reservoir H when released from the cylinder E . If desired, a three-way valve or cock may be employed at the juncture of pipes I^2 and I^4 instead of the two valves I^3 and I^5 . Packing-rings of any suitable construction are fitted to the pistons or rams.

M , Fig. 3, are plates or the equivalent hinged to the longitudinal edges of the platform A' , which serve, when turned up, to form the sides of the car, and when turned in a horizontal position, as indicated in dotted lines, they extend said platform A' laterally, and afford more space for the persons employed to work upon. These plates are supported in their horizontal position by suitable brackets N , hinged to the side of the car-frame A , which latter, when not required, may be folded against the side of the car-frame.

The combined car-compress shown in Fig. 4^a is identical with that shown in Fig. 1, and hereinbefore described, omitting the pumps, which are not necessary, because the bale-compress here shown, while identical in other respects with the compress shown in Fig. 1, is adapted to be operated by steam introduced into the cylinder from any suitable source through pipe j^8 instead of by hydraulic power.

The cranes, &c., are omitted merely because it is not necessary to show them again.

It is to be understood that steam for operating the pump I may be derived from any suitable source; but in the diagrams shown in Figs. 5 and 6 I have shown two different arrangements well adapted to the purpose. In Fig. 5 the steam is supplied from the locomotive O , by which the apparatus is conveyed

from place to place, and which, it is to be observed, will not itself be working at the same time as the pump. The steam is conducted from the locomotive-boiler through a pipe connected by a flexible coupling R to the steam-inlet pipe of the pump.

In the apparatus represented in Fig. 6 a special steam-boiler P is provided for supplying steam to the pump I . This boiler P is mounted on a car arranged for traveling on rails in a manner similar to the hydraulic compress-car and the locomotive by which the whole installation of apparatus is drawn from place to place.

My compress is operated as follows: Having arrived at the point where the bales are to be compressed, the platforms M are lowered onto the brackets N , steam is introduced, and the pump I is started. The valve j^9 is then turned so as to let the water into the crane-cylinders, which are thereby raised into a position for use, as shown in Fig. 1. An uncompressed bale of cotton or other material is then lifted from the surrounding ground, platform, or wagon by the tackle j^7 of any crane, is swung into place on the platen G of the hydraulic press, the lifting-tackle is then released, the valve I^3 in induction-pipe I^2 is opened, the water is forced by the pump I into the hydraulic cylinder E , which forces the piston F upward, carrying with it the stirrup F^3 , which in turn forces the lower platen G and the bale resting thereon against the upper platen until the desired point of pressure is reached, valve I^3 is turned off, and pressure maintained. The bale is then securely tied with metal bands in the usual way. The valve I^5 is then turned, the water is permitted to flow into the tank or reservoir H , and the bale released and discharged. If desired, power other than hydraulic—such as steam—may be used for operating the compress.

Having now fully described my invention, what I desire to protect by Letters Patent is—

1. A bale-compressing car consisting of a substantially-built metal frame mounted on trucks, whereby it is adapted to travel on railways having a fluid-reservoir, side leaves and supporting-brackets for laterally extending the car-bed, and a central recess extending below the car-floor to allow the free passage of the movable platen in the platform and provided with a hydraulic bale-compress, hydraulic telescoping lifting-cranes and force-pump, and suitable connecting-pipes, all constructed, arranged, and adapted for compressing bales of cotton and other fibrous material, substantially as described.

2. A bale-compress car consisting of a frame provided with a cylinder and a fixed platen, said cylinder having a piston with a semi-circular recessed head for carrying a connecting-stirrup, a movable platen connected with the piston by a stirrup for drawing the lower platen toward the fixed platen, the car

being also provided with fluid-reservoir, force-pumps, and suitable pipes and valves connecting the pumps with said cylinder, discharge pipes and valves connecting the cylinder with the fluid-reservoir, and pipes connecting the fluid-reservoir with the pumps for operating the same, the whole mounted upon trucks adapted to travel on railways, for the purpose of compressing bales of cotton and other material, substantially as shown and described.

3. A bale-compress car consisting of a strong metal frame properly secured together and mounted on trucks, whereby it is adapted to travel on railways, having a central recess extending below the car-floor to allow the free passage of the movable platen and stirrup, a fluid-tank, side platen or pieces hinged to the sides for increasing the width of the bed, and brackets for supporting the side pieces, in combination with vertically-acting hydraulic bale-compress arranged between rigidly-secured vertical supporting-brackets and pipes having suitable valves connecting said hydraulic cylinder with suitable motor-generators, substantially as described.

4. A bale-compress car consisting of a strong metal frame properly secured together and mounted on trucks, whereby it is adapted to travel on railways, provided with a fluid-reservoir and welled recess in the center, in combination with adjustable pieces or plates hinged to the sides and supporting-brackets for increasing the width of the car, in combination with vertically-acting hydraulic compress arranged between two upright brackets, and suitable connecting-pipes provided with valves connecting said hydraulic compress with fluid-reservoir H and force-pump I, substantially as described.

5. A substantially-built car-frame mounted on trucks adapted to travel on railways and provided with a fluid-reservoir and side plates and supporting-brackets for widening the car-beds, in combination with upright brackets secured rigidly thereto, as well as to the stationary platen and hydraulic cylinder located in the upper end between said brackets, whereby a rigid frame is provided for the operation of a bale-compress, the endless lifting-stirrup and the movable compress-platen adjusted and operated between said upright brackets, and pipes having suitable valves connecting the said hydraulic cylinders and fluid-reservoir and pressure-pumps, the whole adapted to compress bales of cotton and other fibrous matter, substantially as described.

6. A substantially-built car-frame mounted on trucks adapted to travel on railways, having side extension-leaves and supporting-brackets and a fluid-reservoir, and provided with a centrally-located hydraulic bale-compress connected by suitable induct and educt pipes, respectively, with force-pumps and a fluid-reservoir, in combination with a hydraulic lifting-crane consisting of telescoping cylinders provided with crane-arms, carry-

ing trolleys secured thereto, and pipes connecting the same with the pressure-pumps and the fluid-reservoir for supplying and discharging the fluid used to operate the same, substantially as described.

7. A substantially-built car-frame mounted on trucks adapted to travel on railways provided with side extension-pieces and supporting-brackets therefor, a fluid-reservoir, a centrally-located hydraulic bale-compress, having a movable platen, a fixed platen, and hydraulic cylinder and connecting-stirrup, in combination with rigidly-secured pressure-pumps provided with pipes having suitable valves for connecting said force-pumps with the cylinders of said bale-compressor and the two with the fluid-reservoir, substantially as described.

8. In a bale-compress car, the combination of a strong metal car-bed mounted on trucks adapted to travel on railways and having a fluid-reservoir, and provided with extension side leaves and brackets for supporting the same, with a hydraulic bale-compress comprising a movable platen, a combined stationary platen, and pressure-cylinder and connecting-stirrup arranged in upright supports on and forming part of said car-bed, a forcing-pump rigidly secured thereto, and connecting-pipes between said pump and bale-compress cylinder and the said fluid-reservoir, and a hydraulic crane rising from and forming part of said frame, arranged and constructed substantially as described.

9. A portable bale-compress consisting of a strong metal frame having a fixed cylinder and compress-platen combined, the cylinder provided with a piston with grooved semi-circular head, a movable platen with semi-circular grooved seat, connected by a suitable stirrup adapted for drawing the platens together and having a laterally-curved bearing, whereby the movable platen is enabled to adjust itself in any direction to the irregularities of the bale being compressed, a fluid-reservoir and force-pump, and connecting-pipes having suitable valves for operating the bale-compress, the whole mounted on trucks adapted to travel on railways, substantially as described.

10. The combination, with a substantially-built metal compress-car body mounted upon trucks adapted to travel on railways and having upright brackets secured rigidly thereto, of the combined hydraulic cylinder and fixed platen connecting said brackets at the top and rigidly secured thereto, the piston working in said cylinder and carrying a stirrup, and the movable platen carried by said piston and stirrup, the said movable platen being drawn toward the fixed platen when compressing the bale of cotton, the said movable platen adjusted to fall to a point substantially on a level with the car-bed, whereby bales may be readily moved between the platens and on and off the movable lower platen, and the hydraulic cylinder,

connected by suitable induct-pipes with pump I and educt-pipes with the fluid-reservoir H, substantially as described.

11. The combination of a substantially-built metal compress-car adapted to travel on railways, having a fluid-reservoir, a central recess and upright brackets rigidly secured thereto on opposite sides of said recess, the cylinder and stationary platen uniting said brackets at the top, the piston having a piston-rod with a semicircular grooved head working in said cylinder, the stirrup connected by one end to said piston-rod head and extending downward and carrying the movable platen, the movable platen having a semicircular grooved seat for resting in said stirrup, and adjusted and operated between said brackets, the hydraulic force-pumps, and pipes connecting said pumps, the pressure cylinder and reservoir, all constructed, arranged, and adapted to move from point to point to compress bales of cotton or other materials, substantially as described.

12. In combination with a substantially-built metal compress-car body mounted on trucks adapted to travel on railways, having a central recess, upright brackets rigidly secured thereto on opposite sides of said recess, combined stationary platen and pressure-cylinder secured to and between the upper ends of said brackets, a movable platen carried by a stirrup secured by the upper end to the head of a piston-rod working in said cylinder adjusted and operated between said brackets, force-pumps, and pipes provided with suitable valves connecting said pumps with the pressure-cylinder and fluid-reservoir for operating the bale-compress, of the fluid-reservoir connected by suitable pipes with the hydraulic cylinder and force-pumps, the brackets hinged to the sides of said car-bed, and the longitudinally-hinged adjustable platform supported by said brackets, whereby the floor-space on top of the car-frame may be increased to afford room for workmen when operating the compress, substantially as described.

13. In a hydraulic compress of the character specified, the combination, with the rigidly-secured vertical brackets, the combined stationary platen and cylinder, the latter having a piston and piston-rod provided with a semicircular grooved head for engaging

with a stirrup, movable platen having the curved grooved seat on the outer surface, and the piston-rod having the semicircular grooved head, of the single oval stirrup having a laterally-curved bearing-surface passing around said platens and engaging at one end with the grooved head of the piston-rod and at the other with the grooved seat of the movable-platen, whereby the movable platen may adjust itself to the inequalities of the bale being compressed in any direction, and the whole forming part of a substantially-built car-bed mounted on trucks adapted to travel on railways, substantially as described.

14. A substantially-built car-frame having side plates and brackets for widening the car-bed, and provided with strong vertical brackets rigidly secured at their lower end to the car-framing, and at their upper end secured to and carrying a cylinder and fixed upper compress-platen, also provided with a lower movable platen, a piston having a semicircular head working in said cylinder, a connecting-stirrup carrying the lower movable platen, which stirrup upon its upper end is supported and carried upon the head of the piston for the purpose of drawing the lower platen toward the upper fixed platen when operating, and also provided with fluid-reservoir and force-pumps, and having suitable connecting-pipes and valves for operating the compress, the whole providing a portable bale-compress mounted upon trucks adapted to traveling upon railways, substantially as shown.

15. A substantially-built car-frame mounted upon trucks adapted to travel on railways, provided with a fluid-reservoir, a centrally-located bale-compress having a movable platen, a fixed platen and cylinder, and connecting-stirrup, in combination with rigidly-secured pressure-pumps provided with pipes having suitable valves for connecting said pumps with cylinder of said bale-compress, and fluid-reservoir for operating the same, substantially as described.

In testimony whereof I have hereto set my hand in the presence of the two subscribing witnesses.

ALBERT LIVINGSTON BLACKMAN.

Witnesses:

W. J. NORWOOD,
P. WOODWARD.