(No Model.) 2 Sheets—Sheet 1.

G. TAYLOR.

COTTON PRESS.

No. 541,795. Patented June 25, 1895.

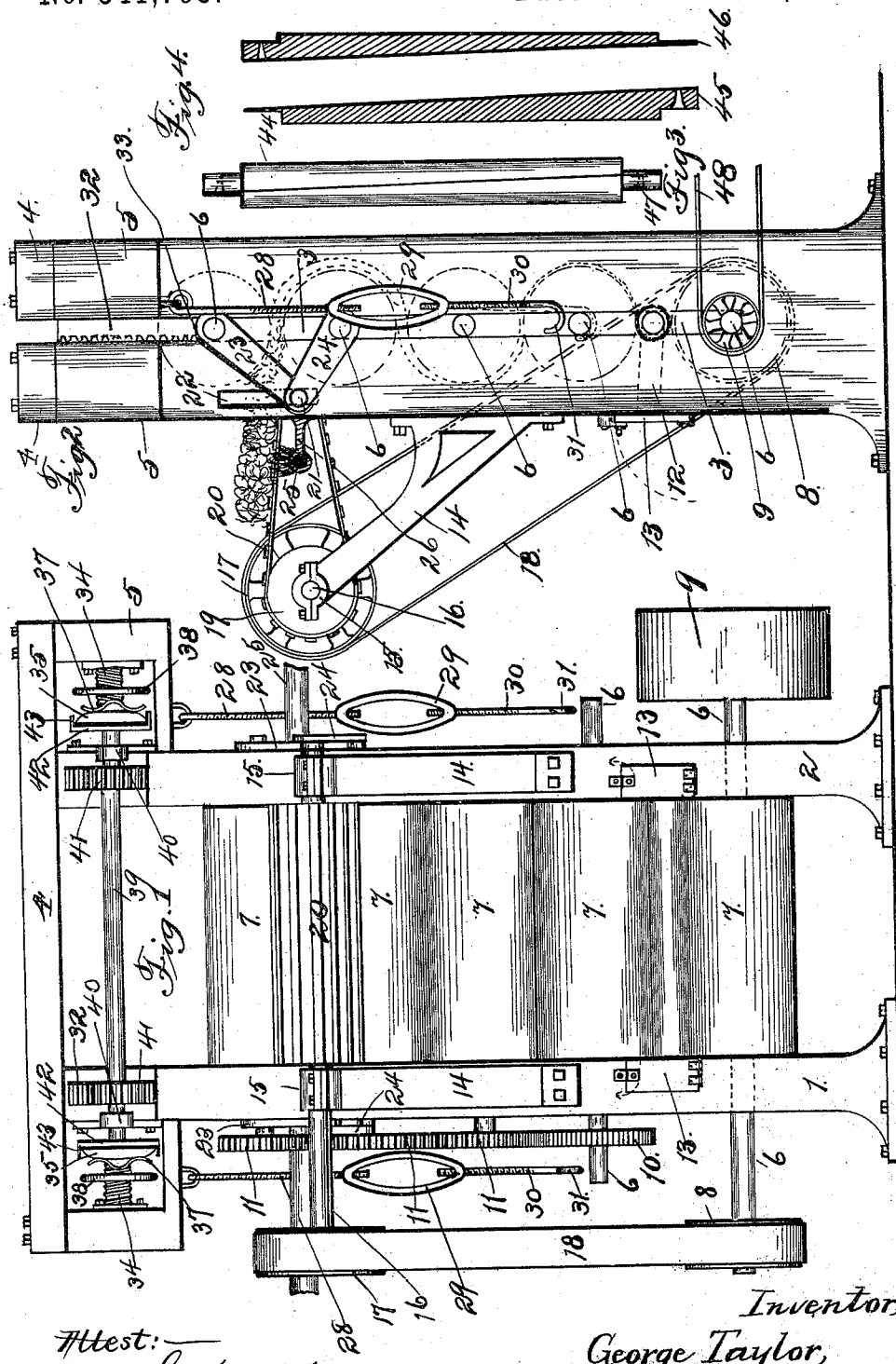

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

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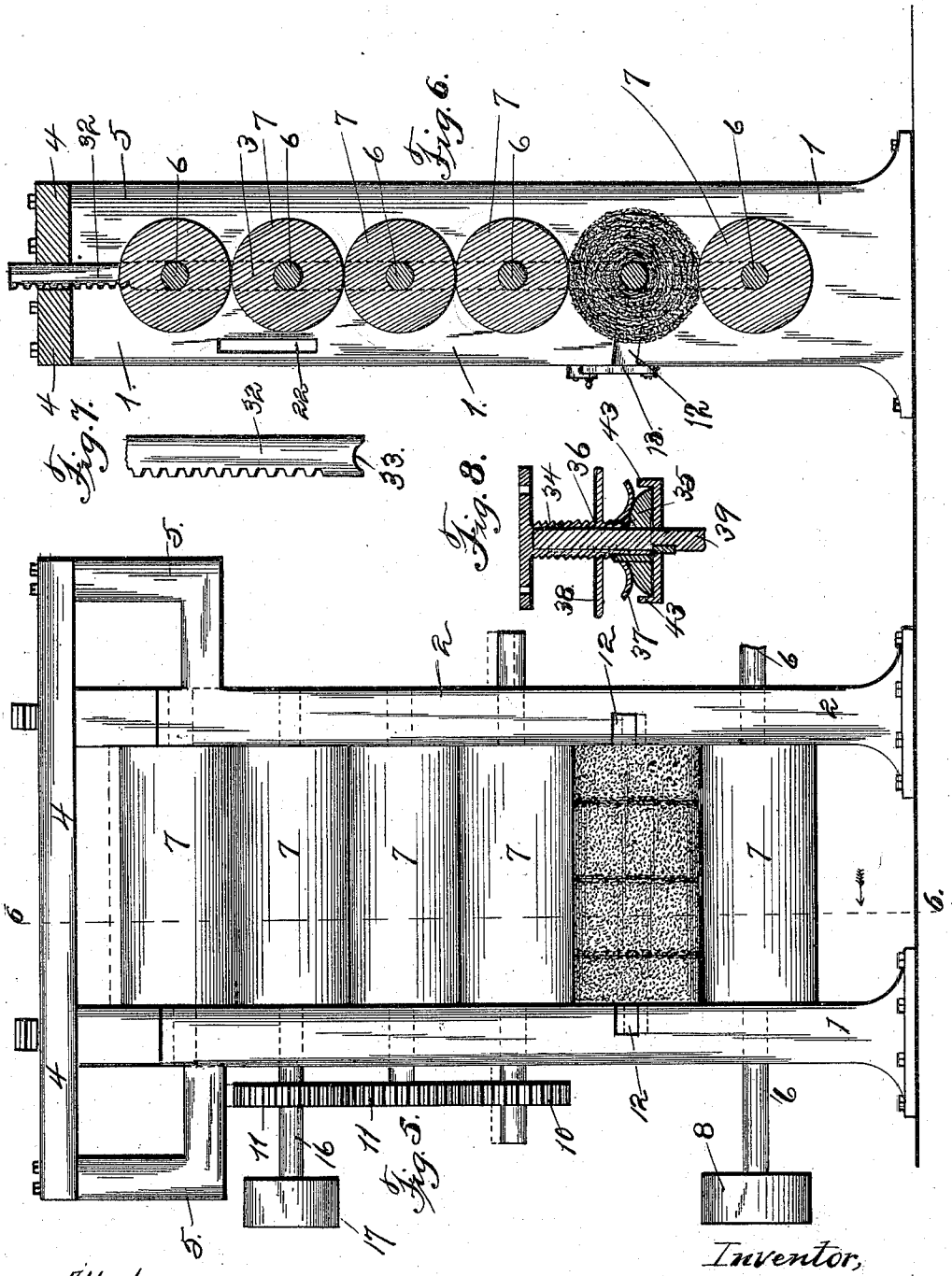

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UNITED STATES PATENT OFFICE.

GEORGE TAYLOR, OF DALLAS, TEXAS, ASSIGNOR OF ONE-HALF TO JOSEPH H. HOOPES, OF CHICAGO, ILLINOIS.

COTTON-PRESS.

SPECIFICATION forming part of Letters Patent No. 541,795, dated June 25, 1895.

Application filed October 22, 1894. Serial No. 526,544. (No model.)

To all whom it may concern:

Be it known that I, GEORGE TAYLOR, of the city of Dallas, Dallas county, State of Texas, have invented certain new and useful Improvements in Cotton-Compresses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to cotton compresses, and its object is to provide a cotton compress of novel and improved construction for compactly compressing cotton as it is delivered from the gin into convenient shape and size of bundle, for facilitating the transportation thereof.

The invention consists substantially in the construction, combination, location and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally specifically pointed out in the appended claims.

Reference is had to the accompanying drawings, and to the various views and reference signs appearing thereon, wherein—

Figure 1 is a view in front elevation of a cotton compress embodying in its construction the principles of my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a detached detail view of the sectional core for the bale. Fig. 4 is a longitudinal sectional view of the same, showing the sections of the core separated from each other. Fig. 5 is an elevation of my improved compress, showing a formed bale therein. Fig. 6 is a sectional view of the same, on the line 6—6, Fig. 5, looking in the direction of the arrow. Fig. 7 is a detached detail view of a portion of the tension rack. Fig. 8 is a detached detail view in central section of the tension device.

The same reference signs indicate the same parts wherever they occur throughout the several views.

In carrying out the principles of my invention I provide a suitable framework, comprising standards, 1, 2, which, if desired, may be of metal or other suitable material in order to secure strength and rigidity, and which may be suitably bolted or otherwise secured to the floor or other suitable support. Each standard is provided with an extended slot 3, of suitable size, to receive the ends of a series of shafts, 6. Arranged between the standards and mounted upon said shafts to rotate therewith are a series of compressing rolls 7. Upon one of said shafts 6, and preferably the one adjacent to the ends of supporting standards, 1, 2, and which I shall denominate the drive shaft, is mounted suitable pulleys 8, 9, the pulley 9 adapted to receive rotary motion through belt 48 from any suitable source of power, and to transmit rotary motion to other parts of the machine, as will more fully hereinafter appear. If desired, intermeshing gears, 10, 11, may be mounted upon the projecting ends of shafts 6 of the rolls 7 in order to secure positive rotation of said rolls.

I have shown a construction of cotton compress adapted to form a cylindrical bale of cotton, although the principles of my invention may be applied to forming bales of other shapes if desired.

I will now describe the construction of the core upon which the bale of cotton is wound, particular reference being had to Figs. 3 and 4. In making provision for a core upon which the bale is wound, it is important to provide for the easy withdrawal of the core from the bale when formed. I have shown an exceedingly simple means for accomplishing this result, wherein the core, 44, comprises wedge-shaped sections, 45, 46, the sections when assembled forming a cylindrical or other suitably shaped core, each section being provided at the ends thereof with projections, which, when assembled, form gudgeons, adapted to be received loosely in the extended slot, 3, in standards 1 and 2 when the core is in position to receive thereon a bale of cotton. When a bale is formed and is removed from the machine, a few sharp blows upon the small ends of the sections 45, 46 of the core will effect a collapsing of the core, thereby permitting the easy withdrawal thereof, as will be readily understood.

In practice I prefer to mount the drive shaft 6 in stationary bearings and arrange the core between the roll mounted on said drive shaft and the next adjacent roll, 7, as shown, the drive roll 7 thereby acting as a rigid base for the bale during the process of its formation. It will be understood that as the bale increases in size, the series of the compressing rolls 7,

and also the core and bale, gradually move away from the base or drive roll, the extended slots 3 in the standards 1, 2, permitting the compressing rolls and core to freely slide therein.

In order to place the core roll in position with its gudgeons arranged in slots 3, and in order to remove said core, and hence, the bale from the machine when the bale is formed, I provide on the inner faces of standards 1, 2, the grooves 12, communicating with slots 3, through which the core may be passed laterally into or out of position, suitable coverings, as at 13, being provided for said grooves.

In order to facilitate the removal of the finished bale from the machine, it is necessary to relieve the bale from the pressure exerted thereon by the series of compressing rolls 7. I have provided an exceedingly simple mechanism for accomplishing this purpose, comprising a pair of screw-threaded bolts, 28, and a pair of screw-threaded hooks, 30, the members of each pair connected together by ordinary turn buckles, 29. The hook bolts, 30, are provided with hooks 31, arranged in position adjacent to the projecting ends of the shaft of compressing roll 7, next adjacent to the bale and the opposite ends of bolts 28, suitably secured as at 27, in a suitable manner. By suitably operating the turn buckles, 29, the hooks, 31, may be brought into position to engage the projecting ends of shafts, 6 (see Fig. 1) and by manipulating the turn buckle, said shaft and the roll carried thereby is withdrawn from engagement with the formed bale, thereby relieving said bale of pressure and permitting its easy withdrawal from the machine.

I will now describe the construction whereby the amount of compression exerted upon the cotton may be suitably controlled and regulated.

The ends of standards 1, 2, are connected by transverse bars or braces 4 to the respective ends of which are secured brackets 5. Suitably journaled in the ends of the standards is a shaft 39, upon which are mounted suitable gears, 41, arranged to engage sliding racks, 32, said racks arranged in the slots 3, in standards, 1, 2, and formed upon the end thereof, as at 33 to engage and bear against the shaft 6 of the first compression roll 7. It will be seen that as the bale increases in size the series of shafts 6, carrying the compressing rolls are moved in slots 3 and away from the drive or base roll. This movement is transmitted to racks 32 which, in turn, effects a rotation of shaft 39. Any resistance that may be arranged to oppose the rotation of shaft 39 will also oppose the movement of racks 32, and hence, of the series of compressing rolls. I have provided an exceedingly simple and efficient friction device for resisting the rotary movement of shaft 39, and means for controlling said resistance, whereby the resistance to the separation of the series of compression rolls from the base or drive roll is controlled and regulated. This friction device comprises disks, 42, mounted upon shaft 39 to rotate therewith, a friction disk, 35, mounted to slide upon a rigidly supported screw-threaded sleeve 34. A wheel, 38, internally screw-threaded, mounted upon the sleeve 34, is arranged to engage the disk 35, and force the same into frictional contact with the disk 42. In order to secure sufficient resilience, I may, if desired, interpose between disk 35 and operating wheel 38, a suitable spring, 37, as shown. The operation of this part of my invention is exceedingly simple. By suitably manipulating the wheel 38 any desired degree of resistance to a rotary movement of shaft 39 may be provided, and hence the pressure upon the forming bale of cotton may be easily and effectively controlled and regulated.

It will be observed that the lint cotton is fed from the gin directly between the contiguous points of the first and second compressing rolls, thence partly around the second roll and between the second and third rolls, thence partly around the third roll and between the third and fourth rolls, thence partly around the fourth roll and upon the core, the core being interposed between the fourth and the base roll. Of course, any desired number of compressing rolls may be provided, and I do not desire to be limited or restricted to any exact number. Inasmuch as the series of compressing rolls are moved away from the base roll as the size of the bale increases, it is important that provision be made to automatically adjust the feeding-in mechanism, whereby the lint cotton may always be delivered to the desired point between the first and second compressing rolls. I will now describe a form of mechanism embodying this idea: In bearings 15, formed in suitable brackets 14, formed on or suitably secured to standards 1, 2, is journaled a shaft 16, upon which is mounted a suitable drive drum 19. Loosely held in slots 22, formed in standards 1, 2, is a roll 21, connected by links, 23, 24, to the shafts 6 of the first and second compressing rolls respectively, thereby forming in effect toggle levers. Mounted upon the drive drum 19 and shaft 21 is a feed belt 20. Shaft 16 is adapted to receive rotary motion from drive shaft 6, through the medium of the drive belt 18, mounted upon pulleys 8 and 17, carried by shafts 6 and 16 respectively. From this construction it will be observed that as the compressing rolls are moved away from the base roll and bale as the bale increases in size, the feed belt supporting shaft 21 is simultaneously and automatically moved therewith, so as to retain the delivery end of the feed belt in proper relative position to always deliver the lint cotton to the proper point between the first and second compressing rolls.

It will be observed that after the cotton passes between the first and second compressing rolls, it is formed into a sheet or thin web, and as this web is fed between the succeed-

ing rolls it is continually subject to increasing pressure and hence is successively compressed until it reaches the core, and there again it is subjected to heavy pressure while being wound on the core by reason of the resistance offered to the separation of the series of compressing rolls and the stationary or base roll. In this manner I am enabled to impart a greater degree of compression to a bale of cotton than has heretofore been possible, and hence, I am enabled to produce a bale of cotton containing a greater weight of cotton to its size than has ever before been done. This important result I attribute largely to imparting successive increasing compressions to the sheet or web of cotton as it is fed to the core upon which the bale is wound. I have also found that by moistening the lint cotton before it is fed into the compressing rolls, I am enabled to more efficiently and perfectly compact and press the sheet or web of cotton, and hence of the bale, and I have shown an arrangement whereby the lint cotton may be moistened, which consists in providing a suitable steam pipe 25, suitably perforated and supported in brackets 26, upon standards 1, 2, and adjacent to the feed belt 20. Steam may be supplied to said pipe from any suitable source, whereby the lint cotton is moistened as it is fed to the compressing rolls. It will be understood that this steaming operation involves and constitutes merely moistening the cotton, and this step should not be carried to the point of saturation. I have demonstrated in practice that it is exceedingly desirable to slightly moisten the cotton, especially where it is subsequently subjected to successive and increasing pressure, as the moisture imparts to the fibers of the lint the property of being closely compacted and condensed. Moreover, the presence of slight moisture assists the compressing mechanism to a remarkable degree in expelling the air which, in all compressing mechanism is the end or result sought for. In fact, by the use of this step in the process of baling cotton I am enabled with the mechanism shown and described to compress and condense into a bale of given diameter and only about thirty-six inches in length what heretofore has required a roll or bale of the same diameter, but from sixty to seventy inches in length.

While I have shown a construction wherein the standards 1, 2, comprise upright standards, and while for many reasons I prefer this construction, I do not desire to be restricted or limited thereto.

It will be observed that when an upright framework is employed merely the weight of compressing rolls 7 may be sufficient to effect a sufficient compression of the sheet or web of cotton and of the bale; for, as will be readily seen, the web or sheet of cotton is subjected to an increasing pressure as it approaches the core roll, due to the increase in weight on account of each succeeding roll, thereby condensing and empacting the cotton to an enormous extent and degree.

Many variations and alterations in the details of construction and arrangement of parts would readily suggest themselves to persons skilled in the art, and still fall within the spirit and scope of my invention. I do not desire, therefore, to be limited or restricted to the exact details, form, and proportion of parts shown and described; but,

Having now fully ascertained the object and nature of my invention, and having set forth and described a form of mechanism embodying the same and explained its function and mode of operation, what I claim as new and my invention, and desire to secure by Letters Patent of the United States, is—

1. In a cotton compress, standards having a base roll, and a series of compressing rolls arranged therein, a core upon which the bale of cotton is formed, arranged between said base roll and said series of compressing rolls, said compressing rolls movably mounted and adapted to feed the cotton to and upon said core in a sheet or web, and to subject said sheet or web to increasing pressure as it is fed to and wound upon said core; as and for the purpose set forth.

2. In a cotton compress, standards, a base roll mounted therein, a series of compressing rolls also mounted in said standards, a core, upon which the bale of cotton is formed, arranged between said base roll and said series of compressing rolls, said compressing rolls and core movably mounted in said standards, whereby they are permitted a movement away from said base roll as the bale increases in size, said compressing rolls arranged to feed the cotton to said core in a sheet or web, and to subject said web to increasing compression and to compress said web upon said core, and means for controlling the resistance to said series of compressing rolls and core away from the base roll as the bale increases in size, whereby the amount of compression exerted upon the bale is controlled and regulated; as and for the purpose set forth.

3. In a cotton compress, standards, a base roll mounted therein, a series of feed and compression rolls and a core movably mounted in said standards, said core arranged between said base roll and compressing rolls, whereby said compressing rolls and core may be moved away from the base roll as the bale increases in size, means for resisting such movement, comprising racks, a shaft mounted in said standards, having gears adapted to be engaged by said racks, and means for imparting frictional opposition to the rotation of said shaft comprising a friction disk mounted upon said shaft, and an adjustable friction device arranged to engage said disk; as and for the purpose set forth.

4. In a cotton compress, standards, a base roll mounted therein, a series of compressing rolls and a core, said core arranged between said base roll and said compressing rollers,

said compressing rolls and core movably mounted in said standards, whereby they are permitted movement away from said base roll as the bale increases in size, said compressing rolls adapted to feed the cotton to said core, feeding devices for delivering the cotton to be compressed to said feeding and compressing rolls, and means for retaining fixed relation between the feeding end of said delivery devices and the first pair of said pressing rolls; as and for the purpose set forth.

5. In a cotton compress, standards, a base roll mounted therein, a series of feeding and compressing rolls, and a core loosely mounted in said standards, and adapted to be moved in said standards as the bale of cotton increases in size, an endless belt, band or carrier arranged to deliver the cotton to be compressed to said compressing rolls, and means for retaining fixed relation between the delivery end of said endless belt, band or carrier and the first two rolls of said series of compressing rolls, comprising links connected respectively with the shafts of said first pair of compressing rolls, and said feed mechanism supporting shaft; as and for the purpose set forth.

6. In a cotton compress, standards, provided with slots therein, a base roll, a series of feed and compressing rolls and a core, said compressing rolls and core movably mounted in said standards, whereby they are permitted movement away from said base roll as the bale increases in size, an endless belt, band or carrier, a drive shaft therefor, a guide shaft for said carrier mounted in slots in said standards, and connections between said guide shaft and the first pair of feed and compressing rolls, whereby said guide shaft is moved simultaneously with the movement of said compressing rolls to maintain a fixed relation between the delivery end of said carrier and said first pair of compressing and feed rolls; as and for the purpose set forth.

7. A cotton compress, comprising a pair of vertical standards, having vertical slots therein, shafts transversely positioned between said standards, and operating in the vertical slots, rolls mounted upon said shafts, a split roll interposed between the two lowermost rolls, an endless carrier, discharging at a point between the two uppermost rolls, operating mechanism for the rolls and endless carrier, a pair of racks, or teeth bars, having concaved lower ends that are adapted to engage with the shaft of the uppermost roll, a shaft transversely positioned in the framework above the standards, pinions mounted upon said shaft and meshing with the racks or teeth bars, friction devices for the ends of said shaft, said friction devices comprising disks, bow, or leaf springs, and hand wheels, said hand wheels operating upon exteriorly screw-threaded sleeves that are bolted to the framework; as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEO. TAYLOR.

Witnesses:
MAUD GRIFFIN,
JNO. C. HIGDON.