

No. 690,477.

Patented Jan. 7, 1902.

H. B. SPERRY.
GRAIN BINDER.

(Application filed Nov. 30, 1900.)

(No Model.)

2 Sheets—Sheet 1.

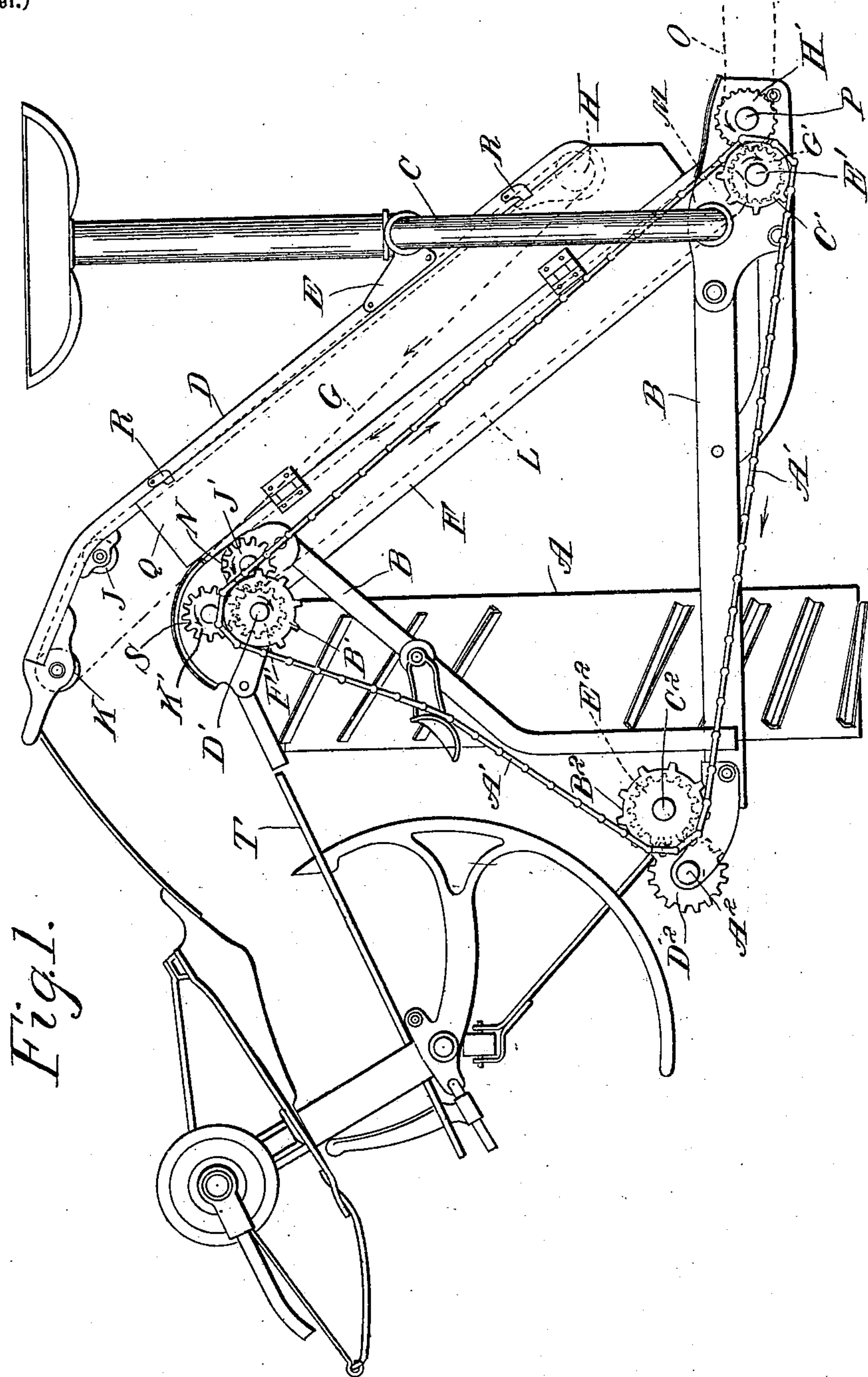


Fig. 1.

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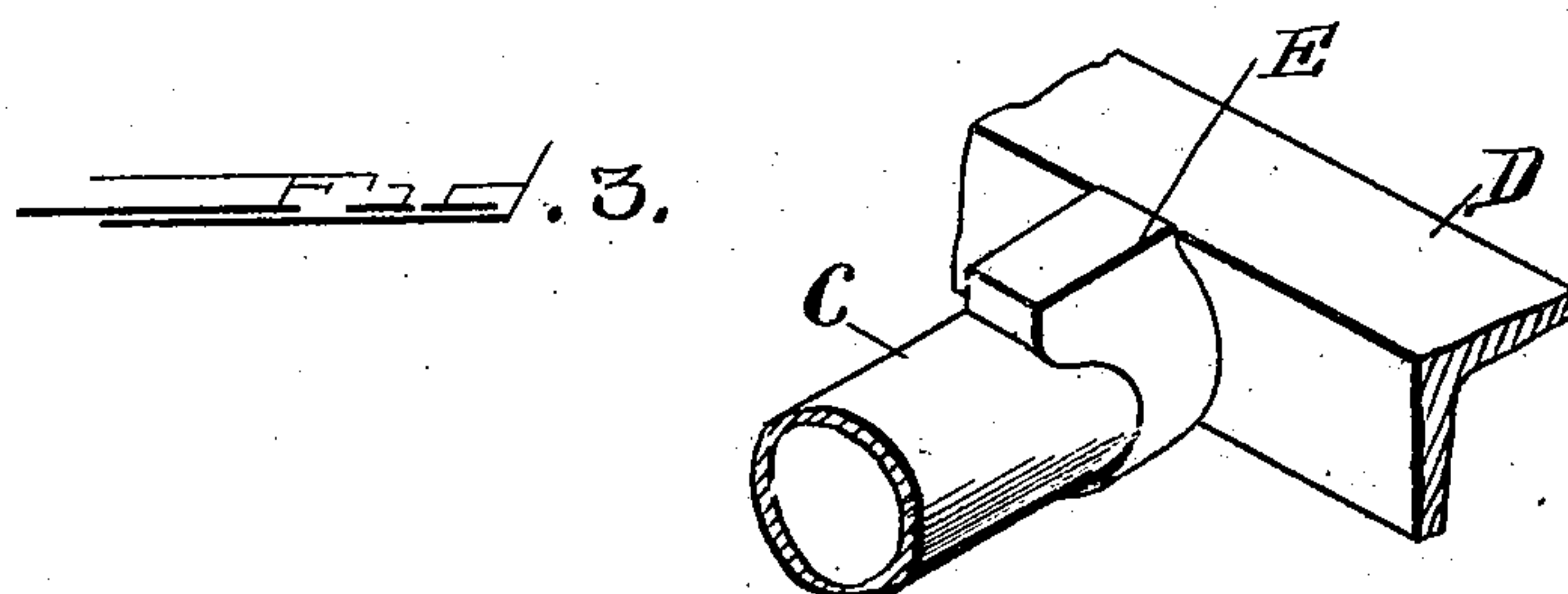
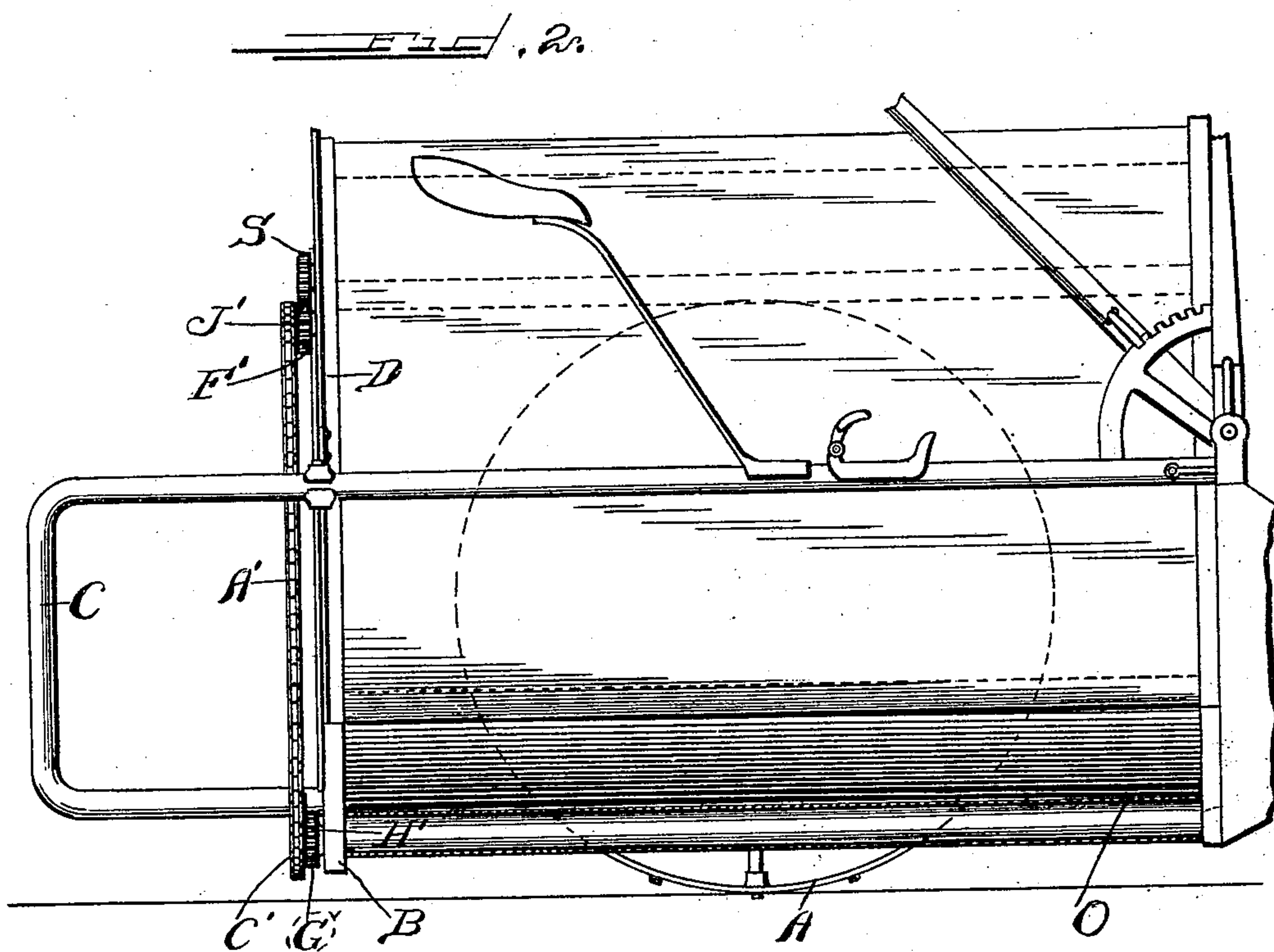
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2 Sheets—Sheet 2.



WITNESSES
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UNITED STATES PATENT OFFICE.

HERBERT B. SPERRY, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE WARDER, BUSHNELL & GLESSNER COMPANY, OF SPRINGFIELD, OHIO, AND CHICAGO, ILLINOIS, A CORPORATION OF OHIO.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 690,477, dated January 7, 1902.

Application filed November 30, 1900. Serial No. 38,109. (No model.)

To all whom it may concern:

Be it known that I, HERBERT B. SPERRY, a citizen of the United States, and a resident of Springfield, in the county of Clark and State of Ohio, have invented a new and useful Grain-Binder, of which the following is a specification.

This invention relates to grain-binding machines.

The object of the invention is to provide the construction of machines of this class and to render the same more efficient in operation.

A further object of the invention is to provide means whereby the sprocket or other chain employed for positively driving the elevator and platform-carrier may be so placed as to lie below or beneath the line of travel of the carrying-surface of the elevator.

Other objects of the invention will appear more fully hereinafter.

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

Figure 1 in the accompanying drawings illustrates in rear elevation a portion of a grain-binding machine, showing the application thereto of a construction and arrangement embodying the principles of my invention. Fig. 2 is a view in side elevation, taken from the right-hand side of Fig. 1. Fig. 3 is a broken detached detail view showing the manner of supporting the upper-elevator frame.

Heretofore in the construction of grain-binding machines of the type to which my invention relates it has been the custom to drive the lower-elevator apron and also the platform carrier or apron through the medium of a sprocket-chain arranged to engage over a gear on the actuating-roller of the lower-elevator apron, located at the upper end of the latter, or else over a sprocket which drives through an interposed idler of said actuating-roller and over a gear on the actuating-roller of the platform carrier or apron, the last-

mentioned roller being located adjacent to but on the grainward side of the guide-roller of the elevator-apron, at the lower end of the latter. The result of this construction and arrangement is to cause the leg or run of the drive-chain, which extends between its sprocket-gear at the upper end of the lower-elevator apron and the gear on the actuating-roller of the platform carrier or apron, to extend above the surface of the lower-elevator apron and to intersect or cross the space between the lower-elevator and the upper-elevator aprons. This arrangement is objectionable for the reason that such location of the drive-chain interferes with any extension of the surface over which the grain is carried by the elevator-aprons. Such arrangement is also objectionable for the reason that the danger is incurred when unusually long grain is being harvested of the heads of such grain becoming entangled or engaged with the chain during the elevation of such grain to the binder-deck of the machine. It has been endeavored to avoid these objections by depressing this leg or portion of the drive-chain under a guide-roller, so as to deflect the same beneath the surface of the lower-elevator apron. Such expedient, however, while possibly avoiding the objections above noted, introduces another and possibly an equally serious objection—namely, an increased friction in the operation of the sprocket-chain, requiring greater power to actuate the same and imposing undue wear and strain upon the parts.

It is the purpose of my invention to provide a construction and arrangement of drive mechanism whereby the objections above noted are avoided, and I accomplish the desired result by providing such an arrangement of the gearing that the drive-chain or that portion thereof which extends between the driving-gear for the lower-elevator apron, and that of the platform carrier or apron and which operates beneath the upper surface of the lower-elevator apron may be used without the necessity for employing an auxiliary deflecting guide-roller, thereby enabling said

portion of the drive-chain to operate in a line which will remove said chain from danger of becoming entangled or engaged with the grain while being elevated and enabling it also to operate in a position to avoid interference with the use of an extension of the lower-elevator frame to accommodate long grain. Moreover, in apparatus of this class it is desirable to apply the driving power of the sprocket-chain as nearly directly to the actuating-roller of the lower-elevator apron as possible, and heretofore it has been usual to drive said chain directly from the main binder drive-shaft of the machine by arranging said chain to operate over a sprocket-wheel mounted on said shaft. Such arrangement necessitates the placing of the drive-chain upon a sprocket-wheel mounted either directly upon the shaft of the drive-roller of the lower-elevator apron or else upon a sprocket-wheel mounted upon some other shaft or a stud and geared to the drive-roller of the upper-elevator apron through an intermediate idler. The former arrangement is objectionable, as above indicated, because it brings that portion of the chain which extends from the drive-roller of the lower-elevator apron to the driving means for the platform carrier or apron above the top surface of the lower-elevator apron, and the latter arrangement is objectionable, because the power of the drive-chain is applied indirectly to the actuation of the lower-elevator apron.

In carrying out my invention, therefore, I propose to drive the sprocket-chain from a sprocket-gear mounted on a shaft or stud which is independent of but geared to and driven from the main binder-shaft. This arrangement causes that portion of the drive-chain which extends from the drive mechanism of the lower-elevator apron to the drive mechanism of the platform carrier or apron to travel in a direction opposite to that of the line of travel of the upper surface of the lower-elevator apron, and consequently opposite to the direction in which such chain ordinarily travels; but my arrangement, wherein this portion of the drive-chain lies below the upper surface of the lower-elevator apron, enables me to drive said chain in a direction opposite to the direction of travel of the effective or upper surface of the lower-elevator apron, and said arrangement also enables me to drive the actuating-roller of the lower elevator directly from the sprocket gear or wheel over which the drive-chain operates and without the interposition of an intermediate idler, thereby securing a more direct application of the power of the drive-chain to the work of actuating the lower-elevator roller. By reason of this reversal in the direction of actuation of the drive-chain said chain cannot be operated over a sprocket mounted directly upon the actuating-roller of the platform carrier or apron. Therefore in my invention I arrange said drive-chain to operate over a sprocket-wheel which is

directly geared to and drives the roller which actuates the platform carrier or apron. This arrangement of the drive-chain to operate over a sprocket-wheel which is not mounted on the actuating-shaft of the platform carrier or apron enables me to so locate said sprocket-wheel with reference to the sprocket-wheel at the upper end of the lower elevator as that the portion of the chain which extends between said sprocket-wheels may lie entirely beneath the upper surface of the lower-elevator apron.

Having now explained generally the purposes and arrangements embodying the principles of my invention, I will describe a construction and arrangement embodying the same, reference being had to the accompanying drawings, in which is illustrated in rear elevation that portion of a grain-binding machine to which my invention is applied, and wherein reference-sign A designates the main or traction wheel of the machine; B, the main frame, which includes a U-shaped beam C, the legs of which extend horizontally and in the line of draft of the machine.

D is the upper-elevator frame, which may be supported in the usual or any convenient manner at its front edge and is supported at its rear edge, as at E, upon the frame-beam C.

F designates the frame of the lower-elevator apron.

G is the upper-elevator apron, operating over the guide-rolls H, J, and K in the usual manner.

L is the lower-elevator apron, arranged to operate over the guide-roller M, at the lower end thereof, and over actuating-roller N, at the upper end thereof.

O designates the platform apron or carrier, operating over the actuating-roller P, at the delivery end thereof.

S is what I shall term a "force-feed roller" and is suitably journaled in the lower-elevator frame, adjacent to the upper or delivery end of the lower-elevator apron and which serves to facilitate the feed and delivery of the grain from such apron over the highest part of the main frame from such apron to and upon the binder-deck T of the binder attachment.

A' designates the drive-chain, through which the platform carrier or apron O, the lower elevator L, and force-feed roller S are actuated.

A² designates the main binder-shaft, and said shaft is driven in the usual or any ordinary or convenient manner.

Instead of arranging the drive-chain over a driving-sprocket mounted directly upon shaft A² in the usual manner I arrange said chain over a driving-sprocket B², mounted upon or carried by a stud or other support C² and driven from shaft A² by the intermeshing gears D² E², and instead of arranging said chain over sprocket-gears on the axes of rollers P and N, I arrange said chain to pass over sprockets B' C', respectively, arranged adja-

cent to said rollers N, S, and P, but in such relative position with respect to said rollers that the portion of said chain which extends between sprockets B' and C' will lie and operate below the upper or effective surface of elevator-apron L, and hence below the space between said elevator-apron and the under surface of upper-elevator apron G, said sprockets B' and C' being mounted upon studs D' E', respectively, said studs being suitably mounted in the frame. Associated with each sprocket B' C' is a pinion F' G'. The pinion G' meshes with and drives a pinion H' on the axis of roller P, and the pinion F' directly meshes with and drives pinions J' K', respectively mounted on and connected with rollers N and S. By this arrangement of the gearing I not only secure the desired direction of feed of the aprons O and L, as clearly indicated by the arrows, but I also at the same time secure such an arrangement of the drive-chain that the portion thereof which extends between sprockets B' C' lies or operates below the upper surface of the lower-elevator apron, and consequently is removed from danger of engagement with the heads of the grain while being elevated to the binder-deck, and, in addition, by such arrangement I am enabled to cause the said chain to travel in a direction opposite to that in which the upper surface of the lower elevator travels, and hence I am enabled to drive the roller J' by means of a direct engagement with a gear or pinion connected to sprocket B', and similarly I am enabled to drive the force-feed roller S by a direct engagement of a gear or pinion connected to or associated with sprocket B' and still secure the proper direction of actuation of said rollers N S, thus securing a direct application of the power of the chain to the actuation of said rollers without the interposition of an intermediate idler. Moreover, by the arrangement above described, wherein that portion of the drive-chain which extends between sprockets B' C' operates below or beneath the upper surface of the lower-elevator apron, I permit of the employment of a plate or board Q, which may be suitably hinged to the lower-elevator frame L and adapted to be swung or rocked up against the rear edge of the upper-elevator frame D, in which position it may be held by suitable catches R to form an inclosure for the space between the upper and lower elevator aprons when the machine is operating on comparatively short grain or to be swung or rocked down into position to form an extension-surface to accommodate exceptionally long grain while being elevated.

Having now set forth the object and nature of my invention and an illustration embodying the principles thereof, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent, is—

1. The combination with the lower-elevator apron and an actuating-roller therefor, of a gear on the shaft of said roller, a driving-gear meshing therewith and a chain-driven

sprocket-wheel mounted on the shaft of and connected to said driving-gear, said sprocket being located below the surface of said apron as and for the purpose set forth. 70

2. The combination with the upper roller of the lower-elevator apron and an auxiliary or force-feed roller arranged adjacent thereto, of gears mounted on said rollers and a driving-gear directly meshing with each of said gears, and a chain-driven sprocket-wheel mounted on the shaft of said driving-gear and connected to or forming part of said driving-gear, as and for the purpose set forth. 80

3. The combination with the upper roller of the lower-elevator apron, of a gear on the shaft of said roller, a stud arranged adjacent to said roller, a drive gear and sprocket mounted on said stud, said drive-gear meshing with and driving a gear on said roller, a platform-carrier, a drive-gear therefor and a sprocket-chain and means for actuating the same, said sprocket-chain arranged to actuate said drive-gears as and for the purpose set forth. 85 90

4. The combination with the upper roller of the lower-elevator apron and an auxiliary or force-feed roller arranged adjacent to the delivery end of said elevator-apron, and gears mounted on the shafts of said rollers, of a stud arranged adjacent to said shafts, a chain-driven sprocket-wheel and a drive-gear connected therewith, said wheel and gear mounted on said stud and said drive-gear meshing directly with the gears of said rollers, a platform-carrier, said chain also arranged to actuate said carrier as and for the purpose set forth. 95 100

5. The combination with the main drive-shaft having a gear thereon, an independently-journalled driving-sprocket, a drive-gear connected thereto and meshing with the gear on said drive-shaft, a drive-chain operating over said drive-sprocket, an elevator-apron, a platform-carrier arranged to deliver to said apron and gearing actuated by said drive-chain for driving said apron and carrier, as and for the purpose set forth. 105 110

6. The combination with a lower-elevator apron and a platform-carrier arranged to deliver thereto, a drive-chain for actuating said apron and also carrier, a sprocket-wheel for driving said chain, a main drive-shaft, a drive-gear mounted thereon and a gear meshing with said drive-gear and connected to said sprocket-wheel for actuating the latter, as and for the purpose set forth. 115 120

7. The combination with a platform-carrier and a lower-elevator apron, actuating-rollers for said carrier and apron, a gear mounted on the shaft of each of said rollers, a stud arranged adjacent to each of said roller-shafts respectively, a drive-gear and a chain-actuated sprocket-wheel mounted on each of said studs, said drive-gears being connected to rotate with said wheels and directly meshing with the gears of said rollers respectively, as and for the purpose set forth. 125 130

8. The combination with a platform-carrier

and a lower-elevator apron, actuating-rollers
for said carrier and apron, and a force-feed
roller arranged adjacent to the delivery end
of said elevator-apron, a gear mounted on the
5 shaft of each of said rollers, a chain-driven
sprocket-wheel mounted adjacent to said ele-
vator-apron-actuating roller and said force-
feed roller, a second chain-driven sprocket-
wheel mounted adjacent to said platform-car-
10 rier-actuating roller, a drive-gear connected
to and driven by each of said sprocket-wheels,
one of said drive-gears directly meshing with
and driving said force-feed roller and said
elevator-apron-actuating roller, and the other
15 drive-gear meshing with and driving the gear
on the platform-carrier-actuating roller, as
and for the purpose set forth.

9. The combination of a platform-carrier, an
elevator-apron to which said carrier delivers,

actuating-rollers for said carrier and apron, 20
sprocket-gears mounted adjacent to each of
said rollers, a driving-gear connected to each
of said sprocket-wheels, said driving-gears
meshing with and driving said actuating-roll- 25
ers respectively; a chain operating over said
sprocket-wheels, a driving-sprocket for said
chain, a main drive-shaft, a driving-gear
mounted thereon, said drive-gear arranged
to actuate said driving sprocket-wheel, as and
for the purpose set forth. 30

In witness whereof I have hereunto set my
hand, this 22d day of November, 1900, in the
presence of the subscribing witnesses.

HERBERT B. SPERRY.

Witnesses:

WM. H. GUTHRIE,
CHAS. L. BAUER.