

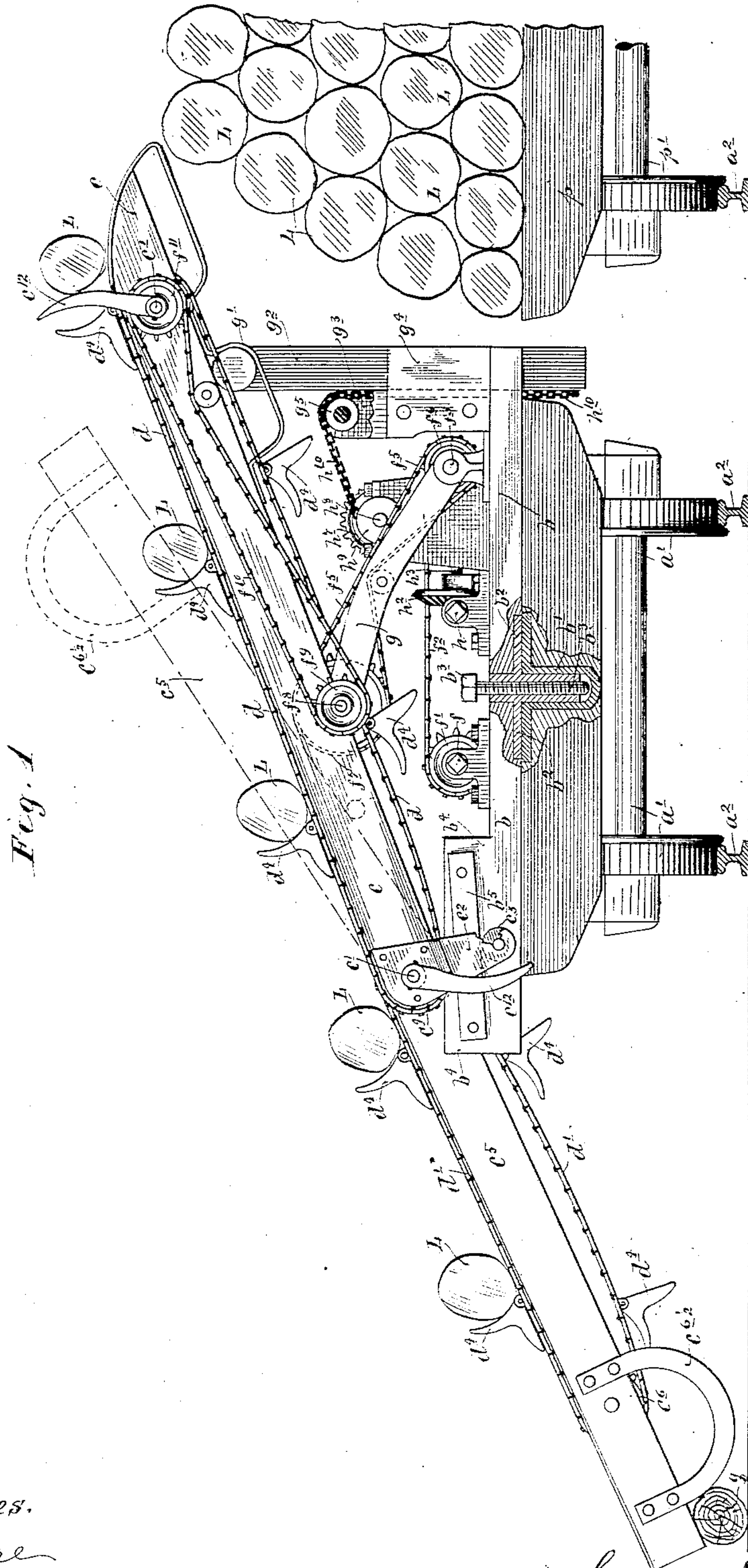
(No Model.)

5 Sheets—Sheet 1.

G. S. KAIME.
LOADING OR PILING MACHINE.

No. 504,589.

Patented Sept. 5, 1893.



Witnesses.
E. F. Elmore
A. W. Opsahl

Inventor
George S. Kaime
By his Attorney
Jas. P. Williamson

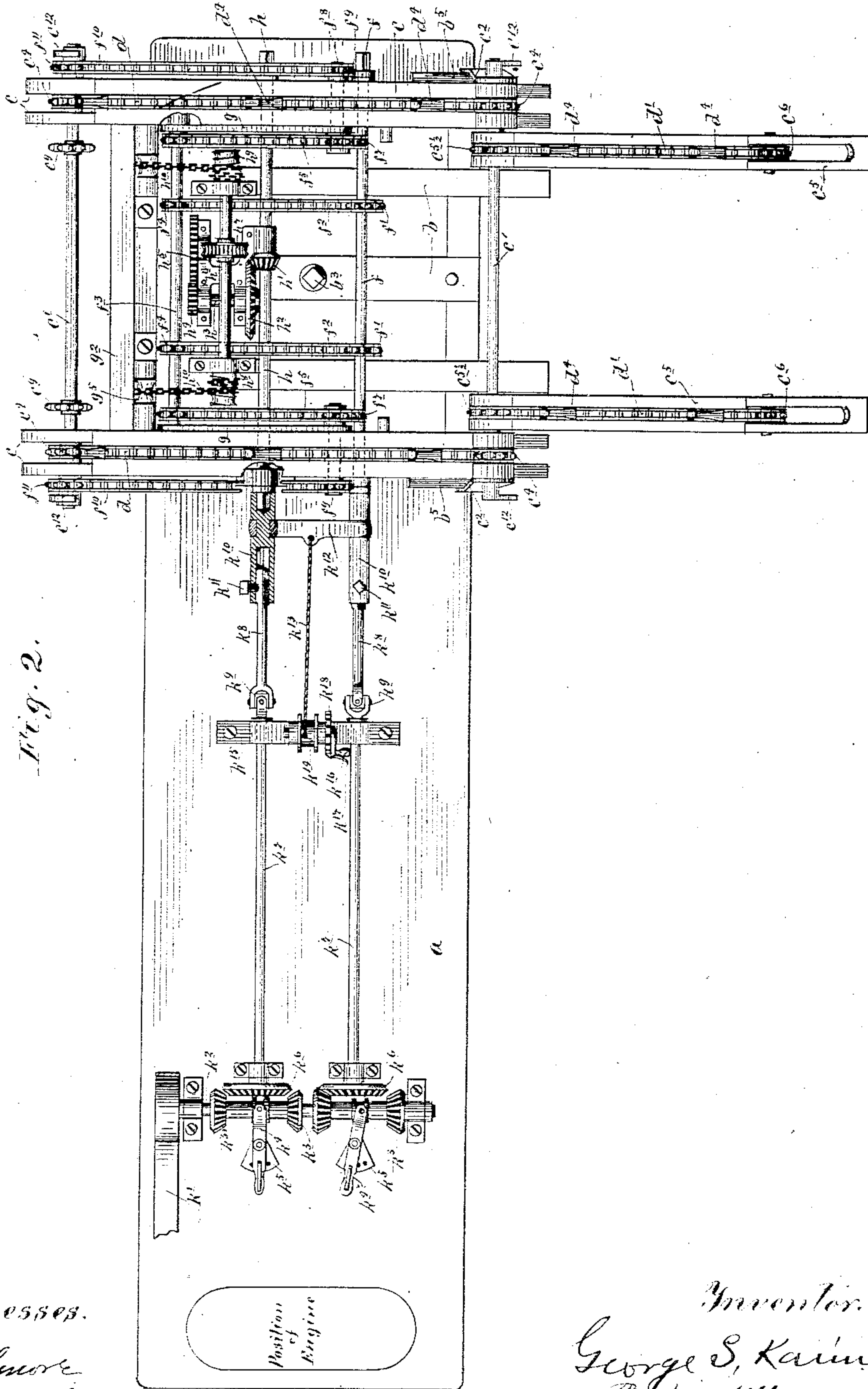
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Witnesses.
C. F. Elmore
A. B. Cpsahl.

Inventor.
George S. Kaime
By his attorney,
Jas. F. Williamson

(No Model.)

5 Sheets—Sheet 3.

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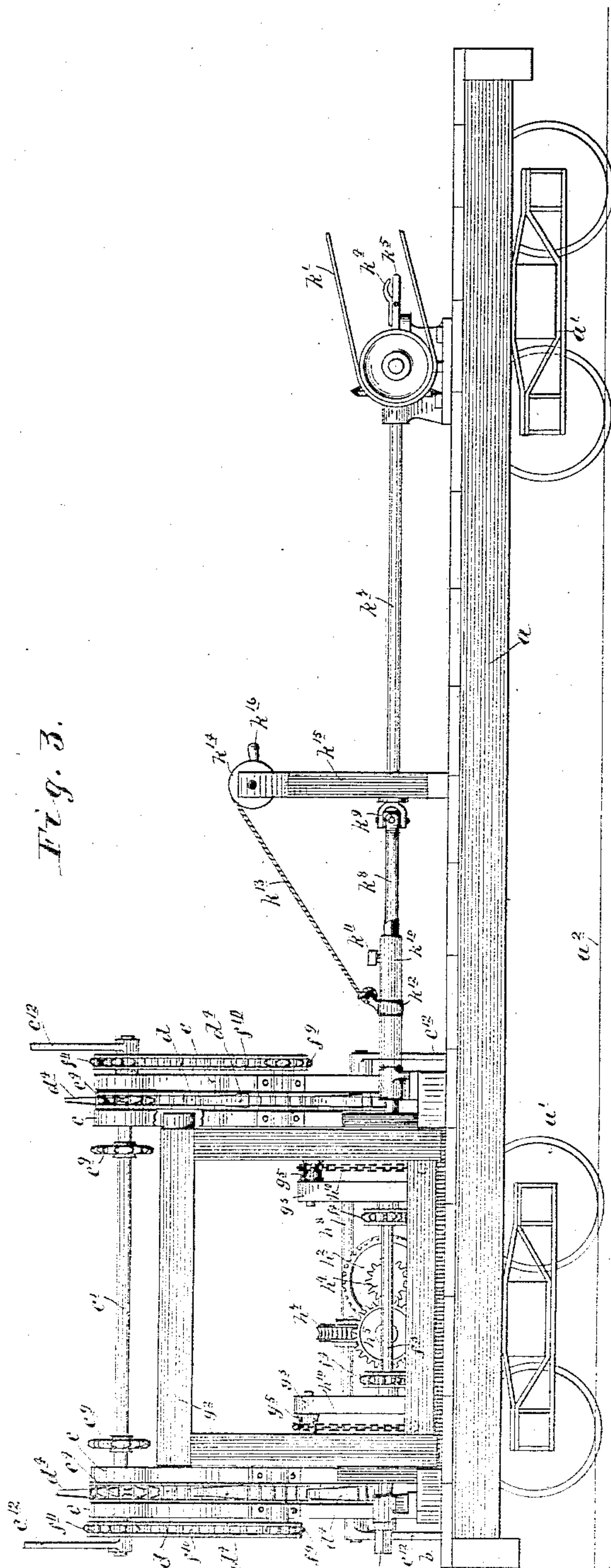


Fig. 3.

Witnesses,
E. F. Elmore,
A. H. Opsahl.

Inventor,
George S. Kaine
By his attorney
Jas. P. Williamson

(No Model.)

5 Sheets—Sheet 4.

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Fig. 4.

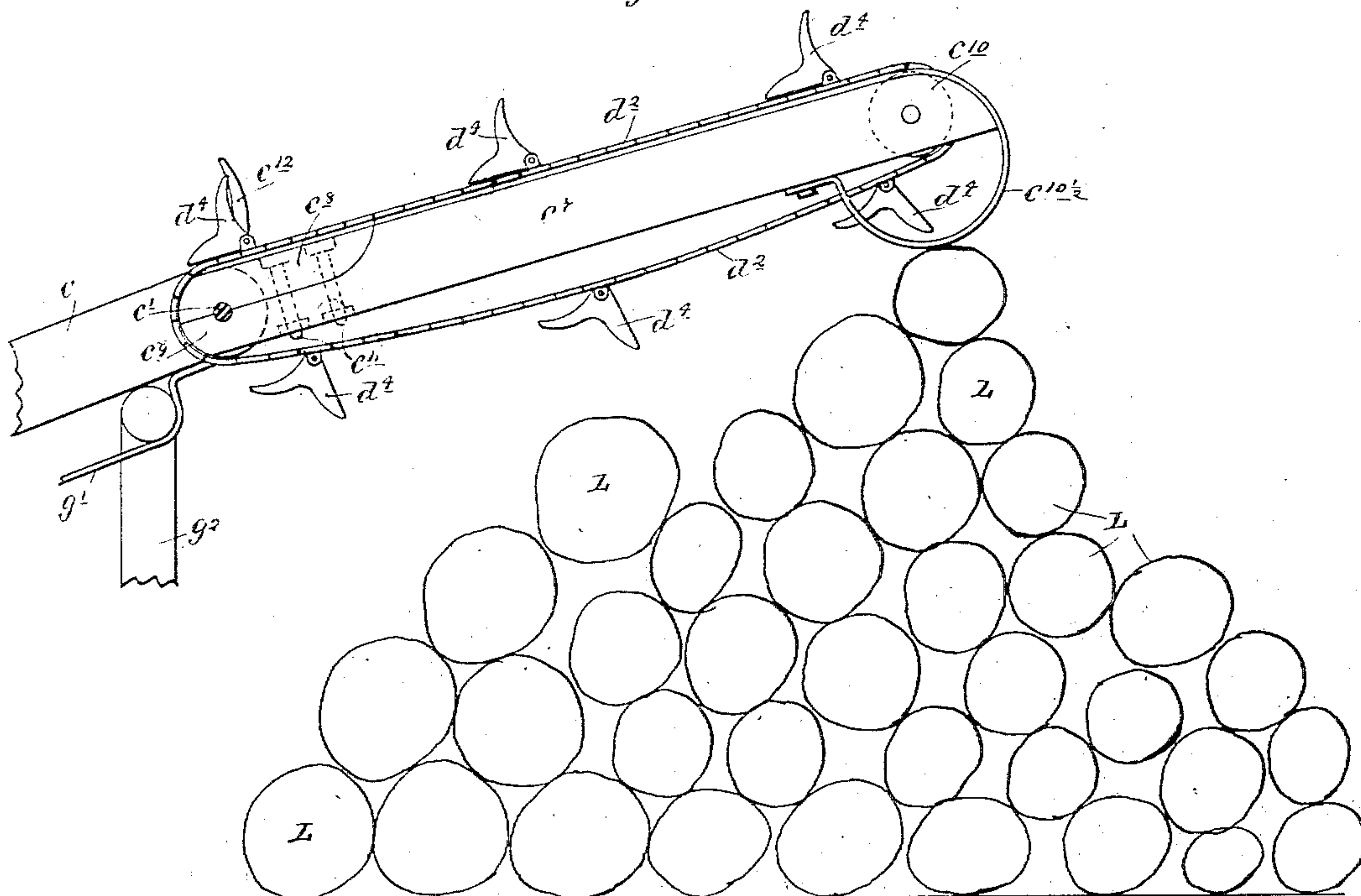
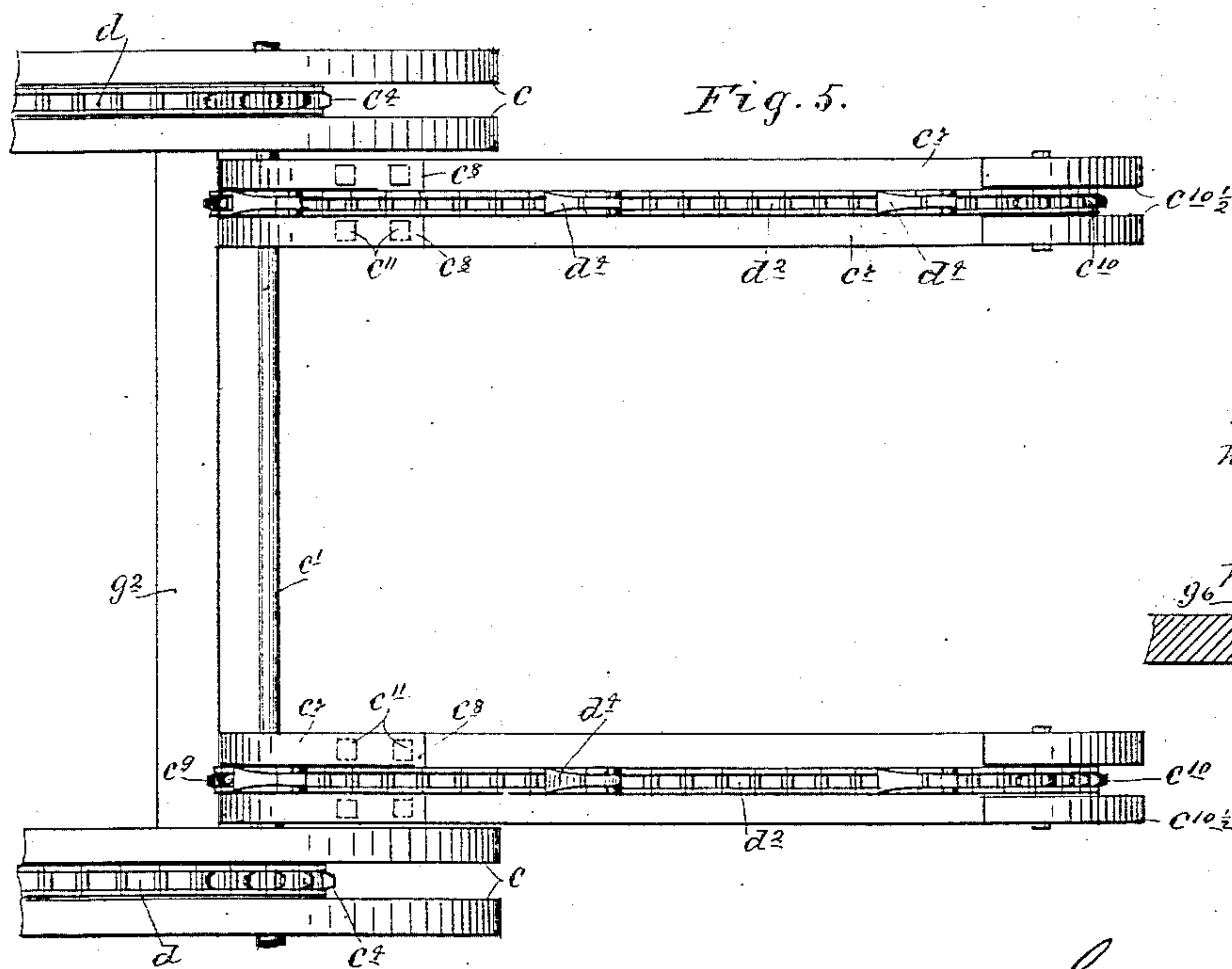


Fig. 5.

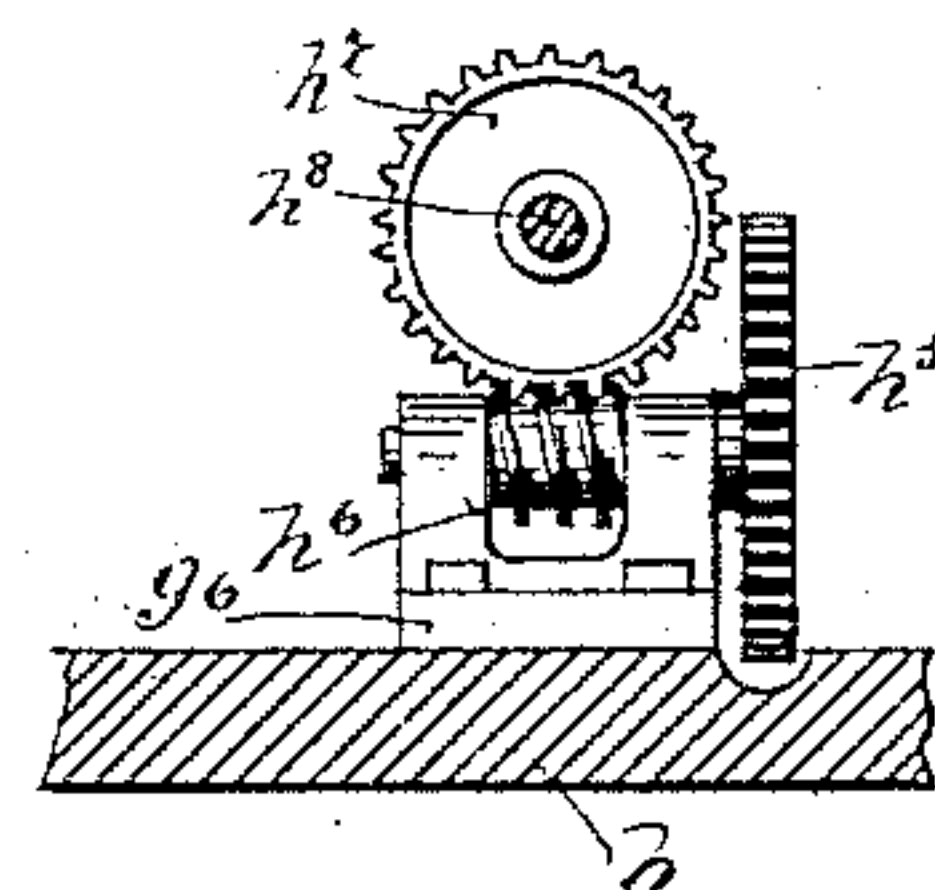


Witnesses.
E. F. Elmore.
A. H. Opsahl.

Fig. 7.



Fig. 6.



Inventor.
George S. Kaine
By his Attorney:
Jas. F. Williamson

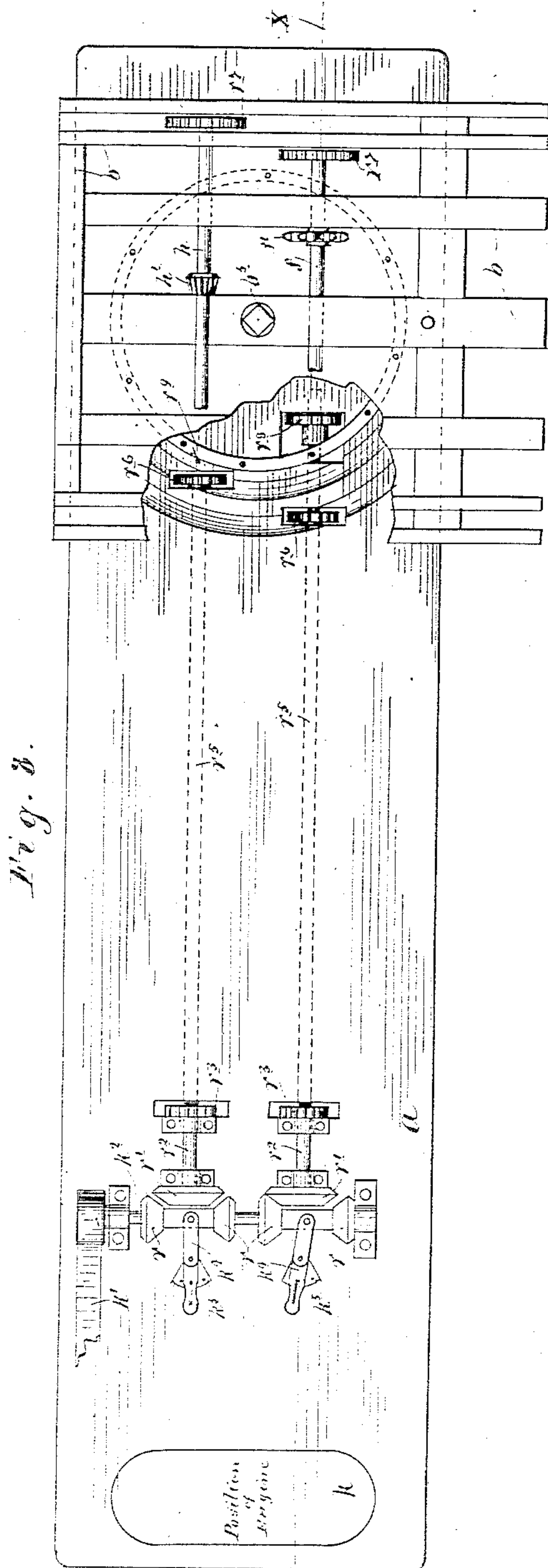
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5 Sheets—Sheet 5.

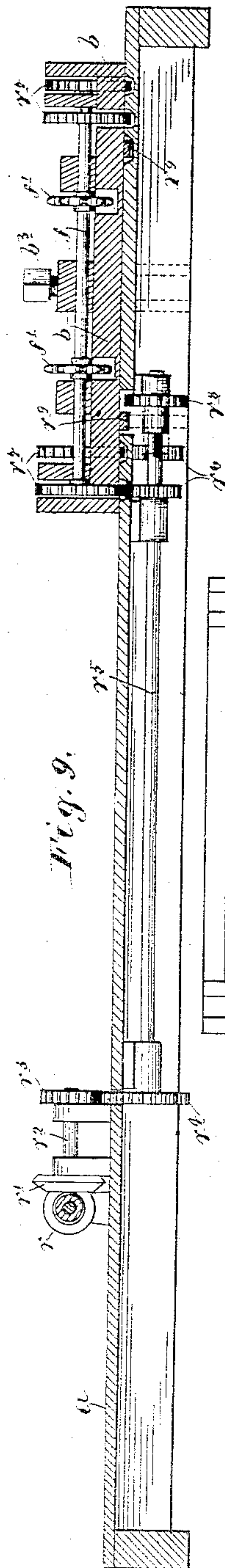
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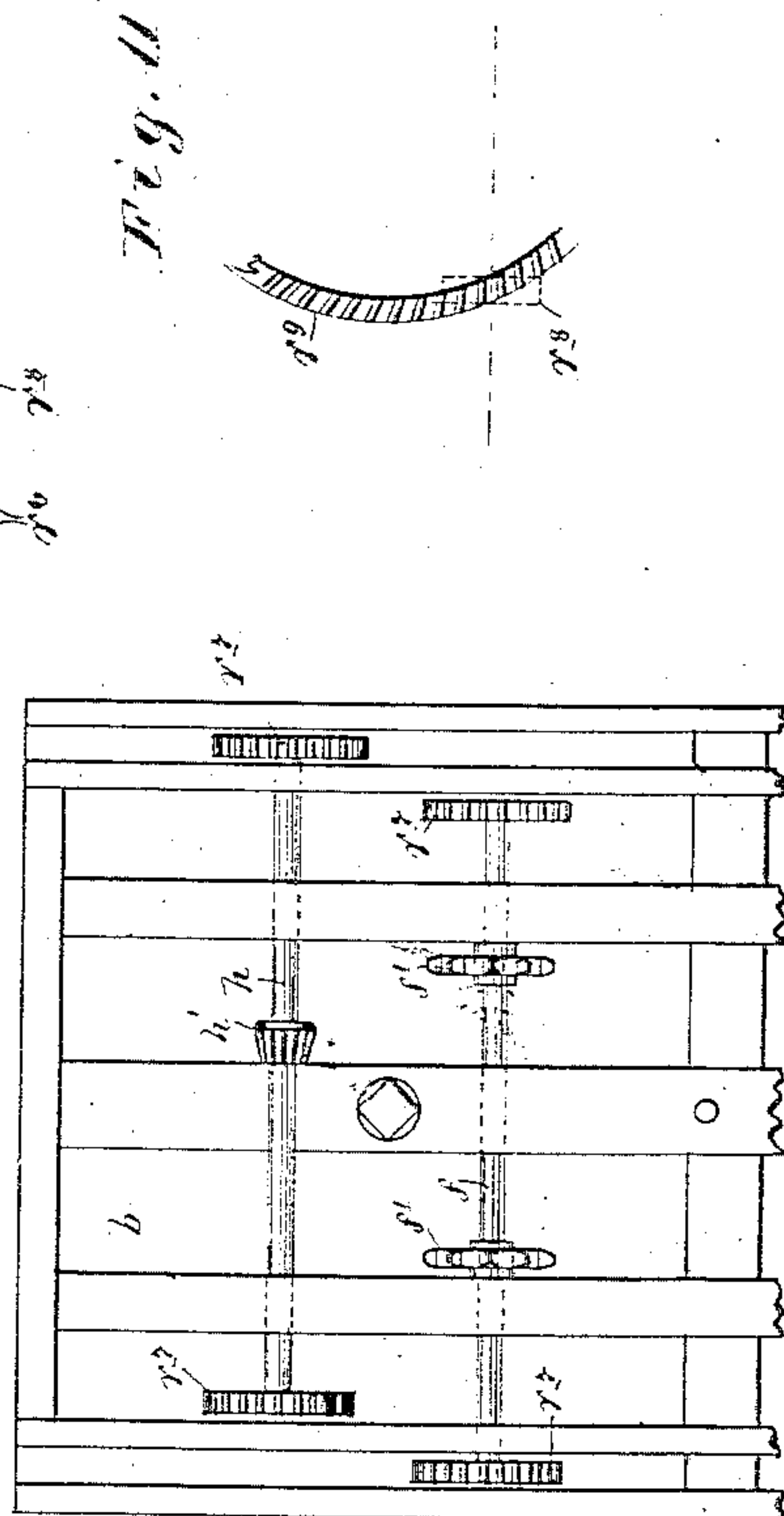
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Fig. 10.

Witnesses
E. F. Elmore
A. W. Osahl.

Inventor,
George S. Kaine
By his Attorney,
Jas. F. Williamson

UNITED STATES PATENT OFFICE.

GEORGE S. KAIME, OF NECEDAH, WISCONSIN

LOADING OR PILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 504,589, dated September 5, 1893.

Application filed December 8, 1892. Serial No. 454,474. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. KAIME, a citizen of the United States, and a resident of Necedah, in the county of Juneau and State of Wisconsin, have invented a certain new and useful Improvement in Loading or Piling Machines, of which the following is a specification, reference being had to the accompanying drawings.

My machine was especially designed for use in loading or piling logs; but it is equally applicable, for loading and piling all kinds of timber, such as piling or telegraph poles, and other long pieces of heavy material, such as railway-rails, I-beams, and other pieces of structural iron.

In carrying out the invention, I employ a suitable supporting frame or platform, which is preferably made portable, in the form of a car, wagon or sled; a turn-table mounted on the said supporting frame or platform; adjustable skids on the turn-table, provided with pivoted extensions, which fold inward over the table skids; traveling chains or other suitable carrying mechanism supported and guided by the said skids; a hoisting device on the turn-table, for effecting the angular adjustment of the skids; independent driving connections on the turn-table, for operating the traveling chains and the hoisting device respectively, and a pair of reversible independent shafts, or other forms of driving mechanism on the platform, running at equal speeds applicable to the driving connections on the turn-table in either of two extreme positions of said table.

Other minor features of the invention will appear in the detailed description.

The features of novelty, which I claim as my invention will more fully hereinafter appear, and will be defined in the claims.

My machine is illustrated in the accompanying drawings.

Like letters refer to like parts throughout the several views.

Figure 1 is a rear end elevation, with some parts broken away, showing the machine as applied for loading cars. Fig. 2 is a plan view of the machine, the driving engine not being shown. Fig. 3 is a right side elevation, directions being taken, with reference to an observer, facing Fig. 1. Fig. 4 is a rear eleva-

tion of a part of the machine showing the pivoted or extension skids, at the delivery end of the turn-table. Fig. 5 is a plan view of the same. Fig. 6 is a detail, showing the worm and worm-gear for operating the skid-hoisting device. Fig. 7 is a detail, showing a clamping block used to secure the extension skids to the sprocket-shaft of the skids on the turn-table. Fig. 8 is a plan view, showing modification of the driving shafts and their connections, on the platform and turn-table, some parts being broken away, and the parts above the floor of the turn-table removed. Fig. 9 is a longitudinal vertical section on the line X X' of Fig. 8. Fig. 10 is a plan view of a part of the turn-table detached; and Fig. 11 is a detail in bottom plan, showing a part of the turn-table-rack.

The supporting frame or platform *a*, is shown as in the form of a car-body, with its truck-wheels *a'* running on track-rails *a''*.

The turn-table *b* is located at one end of the platform *a*, and is pivotally connected thereto, in any suitable way. The means which I have shown for the purpose, are a bearing socket *b'*, embedded in the platform, a hollow screw-threaded pintle-head *b''*, fixed to the turn-table and a screw-threaded center or pivot-pin *b'''*, working through the pintle head as a nut, and capable of bearing against the lower end of the socket, to raise the turn-table clear of the platform, when it is desired to turn the same. The center or pivot-pin *b'''* has a head of angular form, for the application of a wrench.

c are the pair of adjustable skids on the turn-table and overreaching the same, which are connected at their opposite ends, by cross-shafts *c'*. The said skids *c*, at their receiving ends, rest with freedom for a sliding motion, on bearing-blocks *b''''*, secured to the turn-table; and are held from raising away from the blocks, by hanger-arms *c''* having rollers *c'''*, which engage under retaining guides *b''''''* secured to the blocks *b''''*. The cross shafts *c'* are provided with sprockets *c''''*, seated between cut away portions of the skids, for holding and operating a pair of traveling chains *d*.

c'''' are a pair of pivoted skids pivoted to the lower cross-shafts *c'*, and provided with traveling chains *d'*, operated by sprockets *c''''''*, on the lower cross-shaft *c'* and by idlesprockets *c''''''''*,

seated between the lower ends of the said skids. The pair of skids c^5 form what might be called the ground members or receiving end extensions and are provided at their lower ends with

5 combined bearing and guard pieces $c^{6\frac{1}{2}}$.

Referring to Figs. 4, 5 and 7, c^7 is a pair of skids applicable by means of removable clamping blocks c^8 , to the upper cross shaft c' , and provided with traveling chains d^2 , which are driven, when the said skids are in use, by sprockets c^9 , seated between cut away parts of said skids on the said upper end shaft c' , and guided by idle sprockets c^{10} on the outer ends of said skids. When the skids 15 c^7 are applied to the shaft c' , they have a pivotal bearing thereon and form upper end extensions to the same. At their outer ends, the skids c^7 are provided with combined bearings and guards $c^{10\frac{1}{2}}$ for resting on the pile of logs, or other suitable temporary support. The sprockets c^9 are carried permanently on the shaft c' ; but the skids c^7 are in the nature of a supplemental attachment, which are only applied, when required. The connecting ends of the said skids c^7 and the removable clamping block c^8 , are formed with half bearings, and the parts are held together and to the shaft c' by bolts and nuts c^{11} . All the traveling chains d^2 are provided with pivoted carrying fingers d^4 , which are spaced 30 apart from each other on the chains uniform distances, equal to the circumferences of their driving sprockets. The pivoted carrying fingers d^4 are formed with rearwardly extended tail-pieces or bearing bases, which rest on several links of the chain, when in their carrying position, thereby distributing the strain from the logs over a wide surface and preventing the buckling of the chain. The sprocket-bearing, chain-driving shafts c' , 40 carry at their opposite ends revolving arms c^{12} , which assist to receive and discharge the logs, or other materials, from the turn-table skids. The fact that the carrying fingers b^4 are spaced apart on the chains, at distances equal to the circumferences of the driving sprockets c^4 , &c., cause the arms c^{12} , when properly spaced on the shafts c' , to come into action at the proper times, relative to the 50 movement of the chains to do their work.

All the traveling chains are driven from a shaft f , located on the turn-table through the following connections, to-wit:—a pair of sprockets f' on the shaft f , corresponding 55 chains f^2 running to a counter-shaft f^3 , engaging with sprockets f^4 fixed thereon; a pair of chains f^5 , running over sprockets f^6 on the counter-shaft f^3 , and thence to inside sprockets f^7 on idle shafts f^8 , journaled in the turn-table skids c , and provided on their outer ends with sprockets f^9 ; and chains f^{10} , passing over the sprockets f^9 , and over sprockets f^{11} located on the outer ends of the upper cross-shafts c' . Motion is imparted to the 65 chain-driving shaft f , by means which will be hereinafter described.

Referring now to the means for adjusting

the skids c on the turn-table, the skids are connected to the delivery end of the turn-table, by means of pivoted arms g , rising from 70 the counter-shaft f^3 , and connected to the idle shafts f^8 , which are journaled in the skids intermediate the opposite extremities of the same, and at a point below the center of the skids. The skids c , have at their upper end, a pair of hangers g' , in which is pivoted a frame g^2 , the foot portion of which works against the delivery end of the turn-table, and vertical standards g^3 rising therefrom, and is held from lateral displacement 80 by projecting guide plates g^4 , fixed to the turn-table or standards g^3 . The hoisting is effected from a shaft h , located on the turn-table, parallel with the chain-driving-shaft f , the two shafts f and h being at equal distances on opposite sides of a common center, to-wit: from the center pin of the turn-table. The hoisting shaft h has a bevel pinion h' , engaging a bevel gear h^2 , on a short shaft h^3 ; which, in turn, is provided with a pinion h^4 , engaging a gear h^5 on a worm shaft h^6 . The worm 90 on the shaft h^6 , engages a worm-gear h^7 , on a drum or windlass shaft h^8 , having drums or spools h^9 , at its opposite ends, with chains h^{10} , extending therefrom over guide-rollers g^5 and connected to the lower end of the pivoted frame g^2 . The entire nest of gearing, applied to operate the drum-shaft h^8 , is mounted in suitable bearings on a common bed-plate g^6 . 95

It is obvious, that if the drum-shaft be turned 100 in one direction, the skids will be raised; and if turned in the other direction, the skids will be lowered. The worm and worm-gear will hold the same, in whatever position they may be set. When the skids c , are thus raised or lowered, by the hoisting device, in virtue of the pivoted arms g , and the sliding connections c^2 c^3 b^5 with the turn-table, at their receiving ends, they will also have a sliding motion, which will compensate for their pivotal movement, so that the delivery ends of the skids will rise or fall in a common vertical plane. This is desirable, in order that the delivery from the skids may be in a common plane, at the center of the car or a pile of logs. 115

The turn-table b , is made oblong of a length greater than the width of the supporting platform a , and of a width not greater than the width of the platform. The adjustable skids c , are also oblong, of a width not greater than 120 that of the platform, and may be of a length greater than the length of the turn-table, so as to overreach the same when in use and project therefrom at the delivery end. The ground skids c^5 and the upper end extension 125 skids c^7 , are also oblong and of a width not greater than the width of the platform a ; and both sets will turn or fold inward on their pivotal bearings, so as to overlie the turn-table skids. By this construction and arrangement of the turn-table and the skids, 130 the skids may be made of any desired length required for overreaching the platform without rendering the angle or incline too great

for the convenient handling of the logs. Nevertheless, when the ground and upper end members (if used) are folded inward over the turn-table skids, the turn-table may be given
 5 a one quarter or three quarter turn, thereby bringing the turn-table and skids in line with the supporting platform or car lengthwise; and when in this position, the turn-table and all the loading mechanism will be wholly
 10 within the side lines of the car platform. In height, the adjustable skids c , when at their greatest elevation will pass, wherever a box car will pass; but the same may be lowered, if desired, after being brought into line with
 15 the car platform, by swinging outward the pivoted frame g^2 . In this way, all the skids may be made to lie nearly flat on the turn-table. The machine has therefore both the side and top clearance needed for free move-
 20 ment over a railway, wherever an ordinary car can go.

All the mechanism carried by the turn-table has now been specified; but before leaving the same, it should be noted that the chain
 25 driving shaft f and the hoisting-shaft h , which for convenience of reference, may be called the turn-table shafts, are exactly alike at both ends, being formed for interchangeable connection with a corresponding pair of
 30 driving shafts located on the platform.

Referring now to the driving mechanism on the platform, as shown in Figs. 1, 2 and 3, k indicates the position, which would be occupied by a suitable driving engine, not shown.
 35 k' represents part of the driving belt from the engine to a power-shaft k^2 , arranged cross-wise of the platform in suitable bearings secured thereto. k^3 represent two pairs of bevel pinions, each pair of which are formed on the
 40 opposite ends of a common sleeve or extended hub, which is mounted to turn with the power-shaft k^2 , but is free to slide thereon. The bevel pinions k^3 may be shifted and held in any one of three positions, by ordinary spring-
 45 pawl shifting levers k^4 , the pawls of which engage with fixed lock-plates k^5 . k^6 is a pair of bevel gears, co-operating one with each of the pairs of bevel pinions k^3 , and carried on the longitudinally fixed sections k^7 , of what I
 50 call the reversible driving shafts. k^8 are pivoted sections, connected to the sections k^7 , by knuckle-joints k^9 , or in any other suitable way, and having their outer ends rectangular in cross section. k^{10} are sliding or coupling
 55 sections, which are formed hollow and of rectangular form in cross section at each end. The coupling sections k^{10} telescope on the outer ends of the pivoted sections k^8 , and may be secured thereto, in any desired position, by
 60 set-screws k^{11} . The outer ends of the sliding or coupling section k^{10} , are adapted to engage with the ends of the turn-table shafts f and h , which are of corresponding shape, and thereby connect the same to the reversible driving shafts. As before stated, the turn-table
 65 shafts f and h , may thus be coupled to the reversible driving shafts on the platform, at

either end. The bevel pinions k^3 on the power shaft k^2 , and the bevel gears k^6 are of the same relative sizes; so that the reversible driving
 70 shafts on the platform, both run at the same speeds. Hence, it is a matter of indifference, as to which particular member of the driving shafts on the platform is connected with
 75 either of the shafts, f or h , on the turn table. This arrangement is necessary, in view of the fact, that, when the turn-table is shifted from one extreme position to the other, the turn-
 80 table shafts will be shifted, in respect to their coupling, so as to interchange with the corresponding driving shafts on the platform. The sliding or coupling sections k^{10} are connected
 85 by a common cross-tree or bar k^{12} , to which the cable or rope member k^{13} of a windlass or hoisting device is attached, the drum member
 90 k^{14} of which is mounted on a standard k^{15} and provided with a hand-crank k^{16} . The crank k^{16} is provided with a spring-pawl k^{17} , which engages with a fixed locking plate k^{18} , to hold
 95 the crank and drum in whatever position it may be set. With this hoisting device k^{13} and k^{14} and k^{16} , the sliding sections k^{10} , together with the pivoted sections k^8 , when the former have been uncoupled from the turn-
 100 table shafts, may be raised upward out of the road, so as to give the necessary clearance for the rotation of the turn-table and the mechanism carried thereby.

The machine is represented as in use for loading logs L , onto a car p , standing on the
 105 main line or a switch track p' . The ground skids c^5 , are shown as resting on a chuck log q .

Referring now to the modification shown in Figs. 8, 9, 10 and 11, pairs of friction be-
 110 veled wheels r , are substituted for the beveled pinions k^3 , on the power-shaft k^2 ; and corresponding relatively large beveled friction wheels r' are carried on shaft-sections r^2 , on
 115 the top of the platform a , which co-operate with the small friction wheels r . The shaft sections r^2 , have spur-gears r^3 , which engage with spur-gears r^4 on shaft-sections r^5 , located under the platform a . The platform is cut
 120 away to permit the engagement of the gears r^3 and r^4 . The shaft-sections r^5 extend under the turn-table b , and are provided with spur gears r^6 , which are offset, with respect to each other, or located at different distances
 125 from the center of the turn table. The turn-table shafts f and h , instead of having rectangular ends, for engaging with the sliding couplings k^{10} , as shown in Figs. 2 and 3, are provided with spur-gears r^7 , at their opposite ends; and the said shafts, though of
 130 equal length, are so arranged on the turn-table b , that the said gears r^7 , on the opposite ends of the said shafts are offset from each other. The turn-table and the platform are cut away to permit the engagement of the
 135 gears r^6 and r^7 . The offset relation of the gears r^7 , on the respective shafts f and h , permit the same to interchangeably engage with the gears r^6 on the shaft sections r^5 , in either

of the two extreme positions of the turn-table. One of the shaft-sections r^5 is also provided with a sliding or shiftable pinion r^8 , adapted to be thrown into and out of engagement with the annular gear r^9 , fixed to the under side of the turn-table, for swinging or turning the table by power, whenever so desired. The platform is cut away or recessed, to form a seat for the gear r^9 , and is entirely cut away to give room for the engagement and sliding movement of the shiftable pinion r^8 . The pinion r^8 will be shifted by an ordinary shipper-fork or other shifting lever (not shown) of any suitable construction. It is of course obvious, that either the pinion r^8 or the gear r^9 , must have teeth cut askew. As shown, the gear r^9 has teeth of this kind, as illustrated in Fig. 11.

The driving mechanism shown in Figs. 8, 9, 10 and 11, is in several respects superior to the driving mechanism shown in the other views. All necessity, for pivoted shaft sections or sliding couplings, is obviated, inasmuch as the gears r^7 and r^6 will come directly into engagement, whenever the turn-table is given a half turn. The gear r^9 and the pinion r^8 on one of the shaft-sections r^5 , is of course a convenience for rotating the turn-table, as this requires considerable power. Otherwise, than in the respects noted, this driving mechanism would operate on the loading mechanism, in exactly the same way as the construction shown in the other views.

Operation: It is contemplated that, when using the machine for loading cars, a side track will generally be available for the machine. If not a temporary track will be laid for the purpose. The car to be loaded will stand on the main or other adjacent side track, as shown in Fig. 1. The logs will be rolled on to the ground skids, sidewise from a pile, sleds or wagons, and will be carried up by the traveling chains and delivered sidewise over the upper ends of the turn-table skids to workmen located on the car. Whenever necessary, the delivery ends of the turn-table skids will be raised, by throwing into action the hoisting device on the turn-table. When one car is loaded, the pile of logs thereon will be bound together and to the car, in the customary or any suitable way, and another car be brought into loading position; and so on until the entire train is loaded. If it is desired to move the machine, the end skids are turned inward over the turn-table skids, the frame g^2 is raised upward to its limit, and the turn-table is given a quarter or three-quarters turn, bringing the turn-table and skids into line lengthwise, with the platform, and affording all necessary clearance. If it is desired to load from the other side of the track, without reversing the platform or supporting car, the turn-table may be given a half turn. To do this, the turn-table is first raised onto the center-pin b^3 , by applying a wrench thereto. If the construction shown in Figs. 1, 2 and 3, be used, it will also be neces-

sary to shift the sliding couplings k^{10} and raise the pivoted shaft section k^9 out of the way, and then turn the table by hand. But, if the construction shown in Figs. 8, 9, 10 and 11, be employed, the shifting pinion r^8 is simply thrown into engagement with the annular gear r^9 and the table is turned by power from the engine. When in use for loading, as shown in Fig. 1, the particular member of the driving shafts on the platform, then in use for operating the traveling chains, will be in continuous action. The other member of the driving shafts on the platform, then connected up to the hoisting shaft h on the turn-table, will be normally idle and run at the will of the operator, whenever necessary to raise the delivery end of the skids c , as required by the height of the load or pile of logs. This adjustment of the skids c to the heights required does not interfere with the continuous action of the traveling chains d d' d^2 . When it is desired to stop both of the driving shafts on the platform, together with all the mechanism on the turn-table, the same may be done without stopping the engine, if so desired, by simply shifting the pairs of pinions k^3 or pairs of friction wheels r into their central or idle positions. When using the machine to load cars, as shown in Fig. 1, it would seldom be necessary to employ the upper end extensions c^7 ; but when using the machine to stack or pile logs, or other similar materials on the ground, as shown in Fig. 4, the said upper end extensions or skids c^7 with their traveling chains d^2 , would need to be employed, if the pile be run to any considerable height. Of course, it would be possible, to employ two or more sets of extension skids and chains, so as to conduct the logs or other materials to any desired distance from the machine. It should be noted, that the location of the turn-table at one end of the car or platform a , enables the loading mechanism to be applied centrally of comparatively long logs, timbers, rails, or other materials, without interference with the driving engine. The car platform a a' , will generally be found the most convenient support for the machine; but in some cases, it might be supported in other ways, as by wagon-trucks, sleds, a frame on rollers, or, by a stationary platform or frame.

It should be noted, that the word "skids" as used throughout the specification and claims is intended to cover and include any and all kinds of supports or frames for upholding and guiding the traveling chains or other forms of carrying mechanism, which in co-operation with the chains or carrying mechanism will sustain and guide the logs or other materials to be handled. For example, instead of being made of parallel pairs of pieces, they might be made of three or more parallel pieces; or they might be made of continuous decks of the requisite width. Likewise, instead of two parallel chains, three or more, or a continuous apron might be employed. It is equally obvious that the connections from the

driving shaft *f*, on the turn-table to the shafts *c'*, which support and operate the traveling chains, might be varied at will. Likewise, the connections from the shaft *h*, on the turn-
 5 table, to the worm-shaft *h'*, for operating the skid hoisting device might be of any other suitable kind.

Many other changes or substitutions might be made in the minor features or details of
 10 the mechanism herein shown and described, without departing from the spirit of my invention.

It is obvious that the only limit to the speed of this machine lies in the number and abil-
 15 ity of workmen who can supply to and take the logs from the same. In its application for loading cars, a large item of economy lies in the increased haulage secured from any given logging train.

20 What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a machine of the class described, the combination with the supporting frame or platform and the turn-table thereon, of the
 25 carrying mechanism, the skids on said table, for supporting and guiding the carrying mechanism, said skids having their receiving ends secured to said table with freedom for a sliding movement thereon, and a hoisting device
 30 applied to the delivery ends of said skids, whereby under the adjustment effected by said hoisting device, the delivery end of the skids will rise, substantially in a straight line, thereby maintaining the delivery, in the same
 35 vertical plane, substantially as described.

2. The combination with a turn-table, of the adjustable skids, having their receiving ends connected to the turn-table, with freedom for a sliding motion, the hoisting device
 40 on the turn-table, applied to the delivery ends of the skids, and the pivoted arms, rising from the delivery end of the turn-table, and connected to the said skids, intermediate the extremities of the same, substantially as de-
 45 scribed.

3. The combination with the adjustable skids, with traveling chains, on the turn-table, of the hoisting device on the turn-table, applied to the delivery end of the said skids,
 50 and consisting of a windlass and a worm and worm-gear, for operating said windlass and holding the skids in whatever position the same may be set, substantially as described.

4. In a machine of the class described, the
 55 combination with the skids and traveling chains, of the revolving discharge arms at the ends of the skids, substantially as and for the purpose set forth.

5. In a machine of the class described, the
 60 combination with the adjustable skids and their traveling chains on the turn-table, of an extra pair of sprocket-wheels on the upper end member of the chain driving shafts, and skids detachably pivoted to said upper end
 65 shaft, and traveling chains, driven from said extra pair of sprocket wheels, said skids adapted to effect an extension at the delivery end

of the turn-table skids, substantially as described.

6. The combination with the skids, of the
 70 traveling chains, and the sprockets for driving the same, the pivoted carrying fingers spaced apart from each other on the said chains, at distances equal to the circumfer-
 75 ences of the said sprockets, and revolving arms on the said sprocket-shafts at the ends of the skids, for assisting in receiving and dis-
 charging the logs, substantially as described.

7. The combination with the pair of reversi-
 80 ble driving shafts on the platform, running at equal speeds, spaced apart from each other, at equal distances on opposite sides of a com-
 mon center, of a pair of shafts on the turn-
 table spaced apart at equal distances on op-
 85 positesides of a common center, drivable from either end, by the said reversible driving
 shafts on the platform, whereby the speeds of the turn-table shafts may remain the same,
 regardless of the particular member of the
 90 driving shafts, by which the same may be driven, substantially as described.

8. The combination with the pair of reversi-
 ble shafts on the platform, running at equal
 speeds, of the pair of turn-table shafts, the
 members of both sets of said shafts being
 95 spaced apart equal distances on opposite sides of a common central line, and driving devices
 carried by the platform shafts and applicable
 to either end of said turn-table shafts, where-
 by the turn-table shafts are interchangeably
 100 connectible to either of said platform-shafts, substantially as described.

9. The combination with the reversible driv-
 ing shafts on the platform, having gears ad-
 105 jacent to the turn-table offset or staggered in respect to each other, of the shafts on the
 turn-table having gears at both extremities
 offset or staggered with respect to each other,
 and interchangeably engageable with the off-
 110 set gears on said driving shafts, substantially as and for the purpose set forth.

10. The machine for the purpose named,
 comprising a supporting car or other portable
 frame, the turn-table on the car, the adjust-
 115 able skids, with pivoted extensions, on the turn-table, the traveling chains with carrying
 fingers, guided and supported by said skids,
 the hoisting device on the turn-table applied
 to the delivery ends of the skids, the pair of
 120 shafts on the turn-table, one having connections to said traveling chains, and the other,
 connections to said hoisting device, and the
 pair of reversible driving shafts on said car
 or portable frame, running at equal speeds,
 and applicable to said turn-table shafts at
 125 either end, substantially as and for the purpose set forth.

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

GEORGE S. KAIME.

Witnesses:

H. R. A. BAUGHMAN,
 J. H. SPENCER.