Nov. 2, 1926. 1,605,659

E. H. KIDDER

CLAMPING DEVICE FOR CAR UNLOADERS

Original Filed March 19, 1925 3 Sheets-Sheet 1

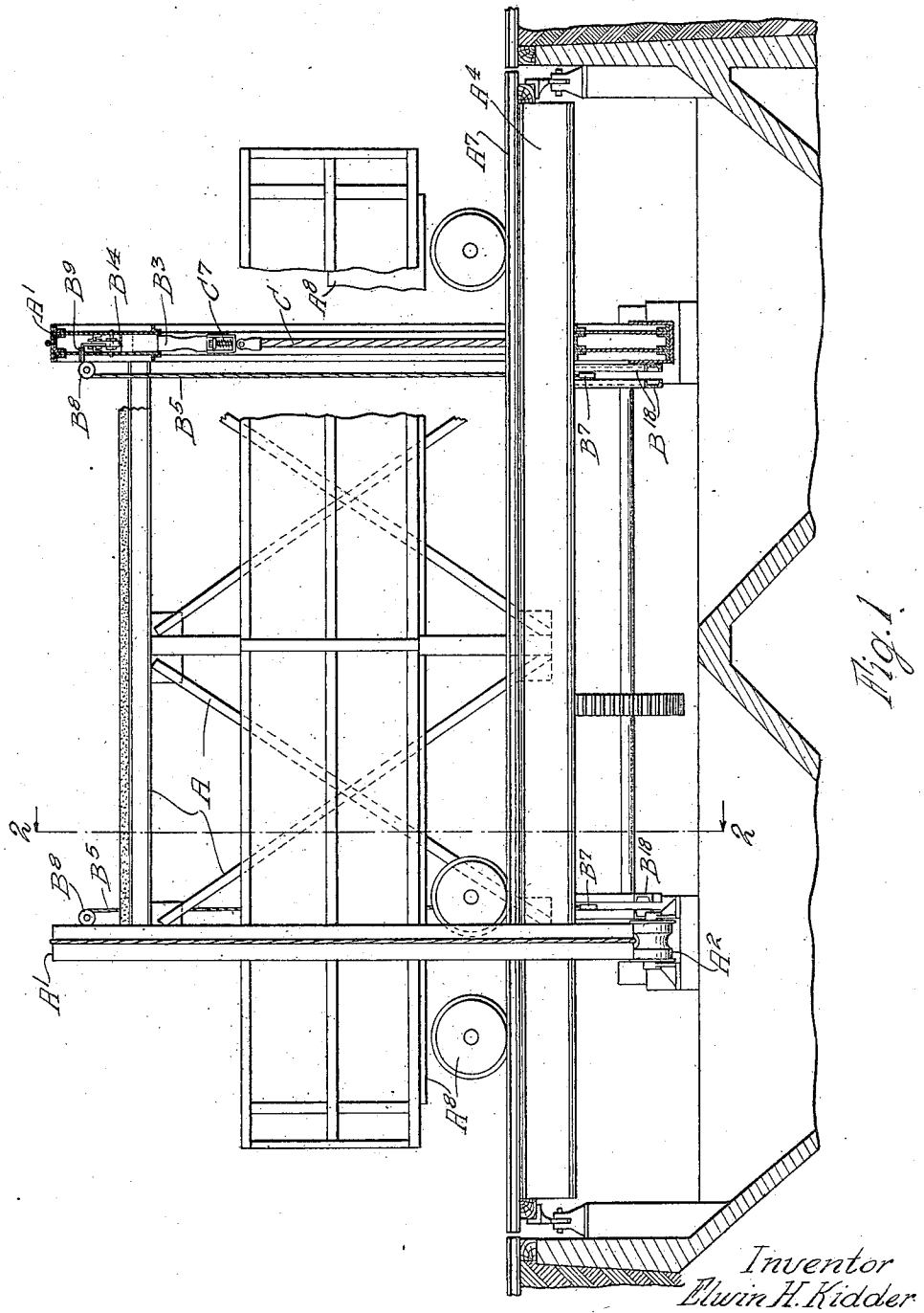


Fig. 1.

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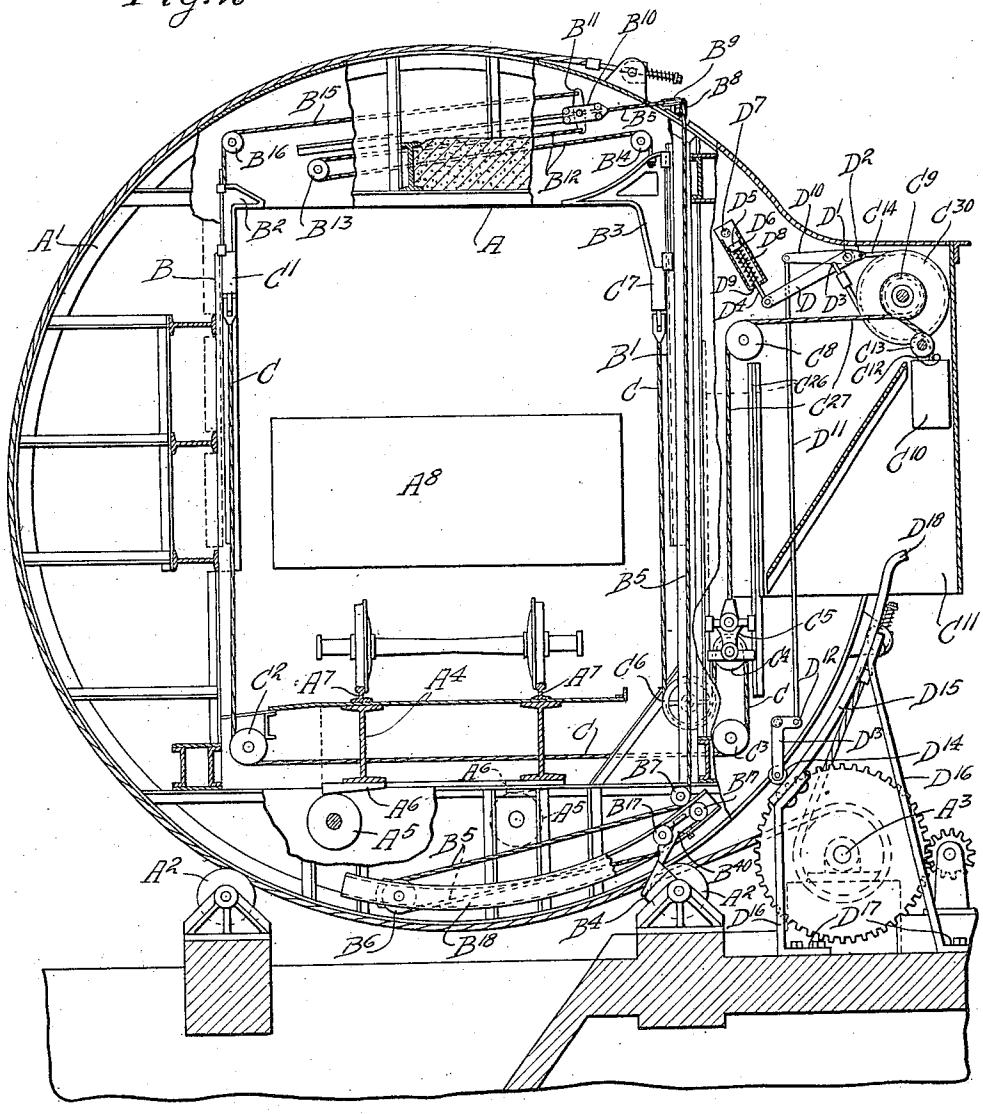
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Fig. 2



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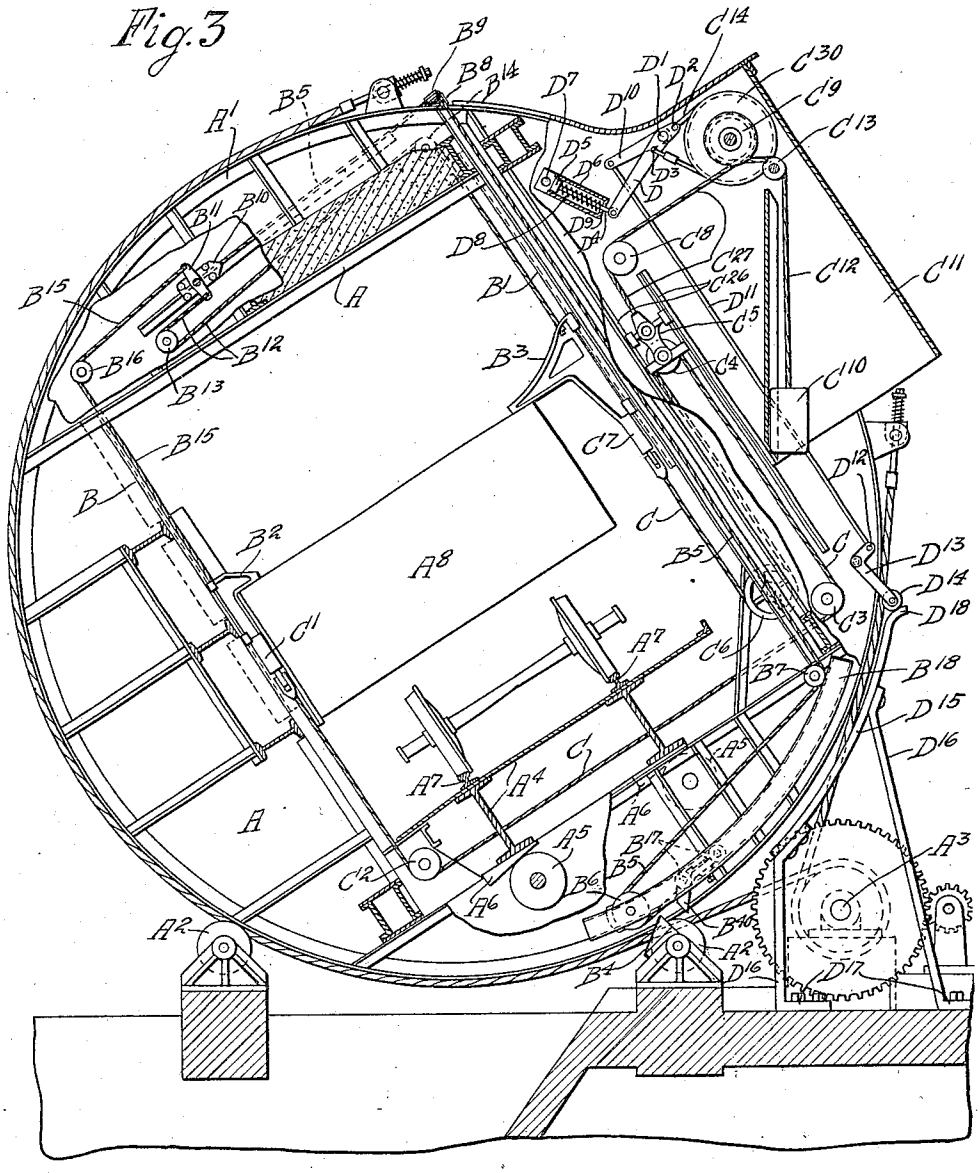
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Original Filed March 19, 1925 3 Sheets-Sheet 3

Fig. 3



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UNITED STATES PATENT OFFICE.

ELWIN H. KIDDER, OF CHICAGO, ILLINOIS, ASSIGNOR TO LINK-BELT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CLAMPING DEVICE FOR CAR UNLOADERS.

Application filed March 19, 1925, Serial No. 16,617. Renewed September 24, 1926.

My invention relates to improvements in clamping device for car unloaders and embodies a clamping device which will operate automatically to clamp a car on the unloading frame when the frame or cradle rotates to dump the car. One object of my invention is to provide such a device as will be easily and conveniently operated, will be automatic in its operation and will always exert a sufficient amount of power to insure proper functioning of the apparatus. Other objects of my invention will appear from time to time in the specification and claims.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a side elevation of the unloader;

Figure 2 is a section along the line 2—2 of Figure 1 showing the clamp mechanism in elevation; and

Figure 3 is a view similar to Figure 2 showing the unloader in partly rotating position with the clamp in operation.

Like parts are indicated by like characters throughout the specification and drawings.

A is a cradle mounted on a plurality of ring frames A^1, which frames travel on rollers A^2 adapted to be rotated to rotate the ring frame and cradle by means of power applied through a drive shaft A^3. A^4 is a transfer table supported on rollers A^5, A^5 by means of inclined wedge blocks A^6, A^6 on the cradle. A^7 A^7 are car tracks on the transfer table adapted to support a car A^8.

There may be two or more of the ring frames, depending on the length of the cradle and the length of the cars to be dumped thereby. Associated with each of these ring frames is an automatic clamping device which forms the subject matter of the present invention. This automatic clamping device is adapted to come down and grip the top of the car body and hold it on the tracks so that when the cradle is rotated and the car is turned upside down with the dumping, the car will be held in place without leaving the rails. The clamping arrangement is the same for each ring frame and a description of one, of course, suffices for all.

B B^1 are guide tracks. Slidable on the track B is a short jaw clamp B^2 and slidable on the track B^1 is a long jaw clamp B^3. Associated with the bracket for one of the rollers A^2 is a stop bracket B^4 adapted to be engaged by a lifting carriage B^{40} floating on the ring frame. B^5 is a lifting rope extending from the lifting carriage B^{40} over sheaves B^6 B^7 at the bottom of the ring frame and B^8 B^9 at the top and terminating in an equalizer carriage B^{10}. Extending from the lever B^{11} on the equalizer carriage is the long clamp lifting rope B^{12} which passes over a sheave B^{13} and a sheave B^{14} and is anchored on the long jaw clamp B^3 B^{15} is a short jaw clamp lifting rope extending from the end of the lever B^{11} over a sleeve B^{16} to the short jaw clamp B^2. Thus when the cradle is in the upright position, the lifting carriage will have engaged the stop bracket and will have been held against further movement so as to draw out the lifting rope and lift both the long and short jaw clamp. When the cradle is rotated in a counter clockwise direction, the lifting carriage B^{40} will travel on its rollers B^{17} along the track B^{18} toward the sheave B^6 and permit the clamps to descend under the force of gravity until they engage or rest upon the top of the car, the parts being so positioned that this descent of the clamps and their engagement with the car will have been completed before the cradle rotates far enough to unseat the car from the track rails on which it stands.

C is the clamp holding rope. It is anchored at one end through a relieving spring C^1, and to the short jaw clamp B^2. It passes over the sheaves C^2 and C^3 to a sheave C^4 on an equalizer sheave carriage C^5, thence over a sheave C^6 to an equalizer spring C^7 anchored on the long jaw clamp B^3. The equalizer carriage C^5 is slidable along the tracks C^{26} and a rope C^{27} leads from this carriage over a sheave C^8 and is wound about a drum C^9. C^{10} is a lowering counterweight adapted to travel in the counterweight housing C^{11}. It is suspended by a counterweight rope C^{12}, which passes over a sheave C^{13} and is wound about the drum C^9. C^{14} is a brake band wound about a brake drum C^{30}, on the same shaft as the drum C^9, and adapted to be gripped upon

the brake drum by means of the lever D which is pivoted as by means of the shaft D^1.

One end of the brake band is secured as at D^2 to the short arm of the lever and the other is secured as at D^3 to the opposite arm of the lever. Secured to the outer end of the lever is a pin D^4 the inner end of which is formed with a plug D^5 adapted to move longitudinally within the cylindrical spring casing D^6 which is pivoted to the frame as at D^7. D^8 is a spiral spring coiled within said casing and compressed between the plug D^5 and the lower end D^9 of the spring casing. D^{10} is a secondary lever also in rigid relation with the shaft D^1. Pivoted to its outer end is the elongated link or rod D^{11}, the opposite end of which is pivoted as at D^{12} to one arm of the bell crank lever D^{13}. The opposite end of the bell crank lever carries a roller D^{14} which normally engages a cam track D^{15} mounted on any suitable frame members D^{16} which are secured to the foundations as at D^{17}. The upper end of the cam track is curved or inclined outwardly as at D^{18}.

The purpose of this counterweight and drum is to draw the holding rope tight when the rotation of the cradle permits the clamps to descend. The arrangement is such that as the cradle rotates after the clamps have been drawn down against the top of the car, and as soon as the roller D^{14} rides over the end of the cam track D^{15}, the spring D^8 is released and moves the lever D in clockwise direction, as shown in Figure 2 and thereby creates a tension in the brake band and holds the drum against rotation. The clamps B^2 B^3 are thus held in holding position against the weight of the car when it turns over. The relieving springs C^1 and C^7 permit a sufficient amount of play and resiliency to insure smooth operation and protect the apparatus from shock.

It will be evident that while I have shown in my drawings an operative device, still many changes might be made in the size, shape and disposition of parts without departing materially from the spirit of my invention and I wish, therefore, that my showing be taken as in a sense diagrammatic.

The use and operation of my invention are as follows:

A gondola car to be dumped is run onto the tracks on the transfer table while the cradle and associated parts are in the upright position. The cradle is then rotated in a counter clockwise direction and the car and transfer table will move to the left through a limited excursion with respect to the cradle when it comes to rest against the side thereof. This rotation will continue with the lifting carriage remaining at rest with respect to the stop but moving in the cradle until the clamps have travelled down to engage the car as the sheave at the bottom of the ring frame approaches the stop carriage. This downward movement of the clamps will be assisted by the pull on the counterweight which winds up the holding rope on the drum so that this rope is taut at all times. As soon as the clamps settle down on the top of the car, they can move no further and the cradle will continue to rotate, and the holding rope will be held tight. Upon further rotation the roller D^{14} rides beyond the end of the cam track D^{15} and the spring D^8 rotates the brake lever D in clockwise direction about its pivot and exerts a tension on the brake band C^{14}. This tension will be exerted before the cradle has turned far enough to cause the weight of the car to be lifted from the rails. As the rotation continues the car will gradually turn over until practically its entire weight is carried by the clamps, the brake band holding the drum against rotation. The parts remain in this position until the car has gone around far enough to be dumped.

The car after being dumped will be returned by a return rotation of the cradle. As it rotates back, and when the roller D^{14} engages the inclined portion D^{18} of the cam track D^{15} the bell crank lever D^{13} will be rotated, exerting a downward pull on the rod D^{11}, and through the lever D^{10}, depressing the lever D in opposition to the spring D^8. The tension on the brake band D^{14} is thereby relieved. Then the lifting carriage will engage its stop and a tension will be exerted on the clamp lifting ropes and the clamps will finally be raised to the top of the cradle, drawing in on the brake drum and raising the counterweight and freeing the car. The car can then be removed from the transfer table and the cradle is ready for the next dumping operation.

I claim:

1. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, and clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, and a brake adapted to lock the drum, a brake actuating lever pivoted on the cradle, spring means adapted normally to move said lever into brake actuating position, and means for resisting said movement when the cradle is in car receiving position.

2. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, and clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, and a brake adapted to lock the drum, a brake actuating lever pivoted on the cradle, spring means adapted normally to move said lever into brake actuating position, and means

for resisting said movement when the cradle is in car receiving position, comprising a cam member associated with said lever and an opposed cam member mounted adjacent said cradle.

3. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, and clamp supporting means comprising a drum, a cable leading from the clamp and wound about the drum, a brake adapted to lock the drum, a brake controlling mechanism adapted normally to hold said brake in operative position, and means adapted to resist the action of said mechanism when the cradle is in or near car receiving position.

4. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, a brake band adapted to surround said drum, a lever to which said band is secured, yielding means adapted normally to rotate said lever into tension exerting position, and means for resisting said movement of the lever when the cradle is in or near car receiving position.

5. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, a brake band adapted to surround said drum, a lever to which said band is secured, yielding means adapted normally to rotate said lever into tension exerting position, and means for resisting said movement of the lever when the cradle is in or near car receiving position, comprising a cam member associated with said lever and an opposed cam member positioned adjacent the cradle.

6. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, a brake band adapted to surround said drum, a lever to which said band is secured, yielding means adapted normally to rotate said lever into tension exerting position, and means for resisting said movement of the lever when the cradle is in or near car receiving position, comprising a bell crank lever mounted on the cradle, a connection between one arm of said bell crank lever, and the brake band lever, and a cam member mounted adjacent the cradle and adapted to engage the opposite arm of said bell crank lever.

7. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, a brake band adapted to surround said drum, a lever to which said band is secured, yielding means adapted normally to rotate said lever into tension exerting position, and means for resisting said movement of the lever when the cradle is in or near car receiving position, comprising a bell crank lever mounted on the cradle, a tension connection between one arm of said bell crank lever and the brake band lever, a cam track mounted adjacent the cradle, and a roller on the other arm of the bell crank lever adapted to engage said cam track.

8. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, a brake band adapted to surround said drum, a lever to which said band is secured, a cylindrical guide pivoted adjacent said spring, a stem axially movable along said guide, a connection between said stem and the brake lever, and yielding means adapted normally to move said stem along said guide, to rotate said lever into braking position.

9. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, a brake band adapted to surround said drum, a lever to which said band is secured, a cylindrical guide pivoted adjacent said spring, a stem axially movable along said guide, a connection between said stem and the brake lever, and yielding means adapted normally to move said stem along said guide, to rotate said lever into braking position, and means for resisting said movement of the lever when the cradle is in or near car receiving position.

10. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon, clamp holding means comprising a drum, a cable leading from the clamp and wound about the drum, a brake band adapted to surround said drum, a lever to which said band is secured, a cylindrical guide pivoted adjacent said spring, a stem axially movable along said guide, a connection between said stem and the brake lever, and yielding means adapted normally to move said stem along said guide, to rotate said lever into braking position, and means for resisting said movement of the lever when the cradle is in or near car receiving position, comprising opposed cam members, one mounted on the cradle and associated with said lever, and the other positioned adjacent said cradle.

11. In a rotary car dumper, a rotary car supporting cradle, a clamp adapted to hold a car thereon and clamp holding means comprising a drum, a cable leading from the

clamp and wound about the drum, a counterweight cable wound about the drum, a counterweight carried thereby and adapted to rotate the drum to keep the clamp cable tight, a brake adapted to lock the drum, a brake actuating lever pivoted on the cradle, spring means adapted normally to move said lever into brake actuating position, and means for resisting said spring means when the cradle is in car receiving position.

Signed at Chicago, county of Cook and State of Illinois, this 10th day of March, 1925.

ELWIN H. KIDDER.