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T. L. McKEEN.

FRICTION DRAFT AND BUFFING GEAR.

APPLICATION FILED SEPT. 7, 1905.

Fig. 1.

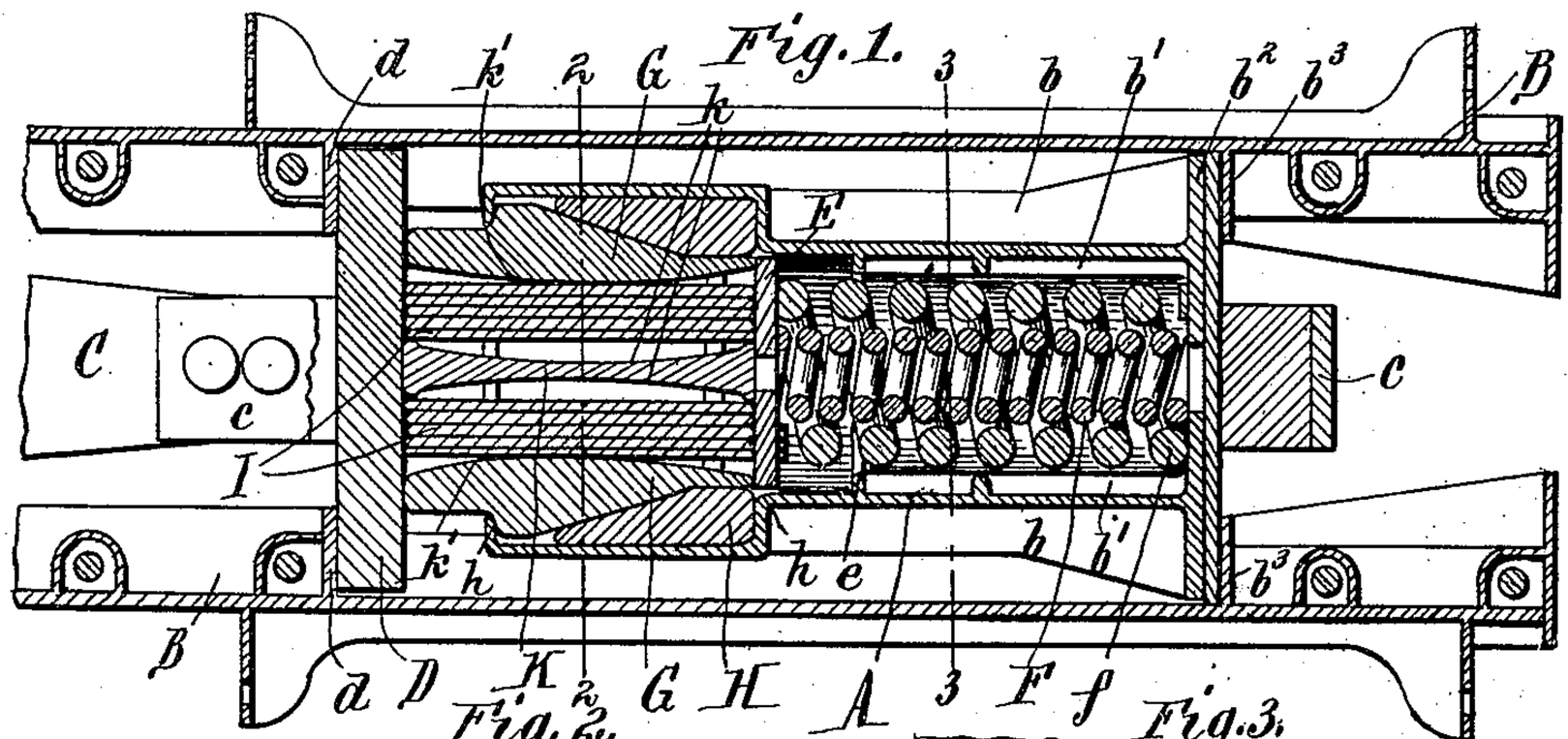


Fig. 2. Fig. 3.

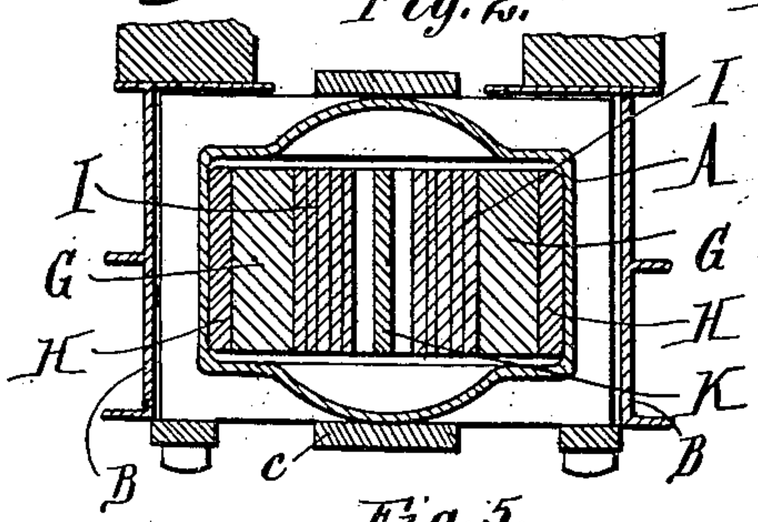


Fig. 5.

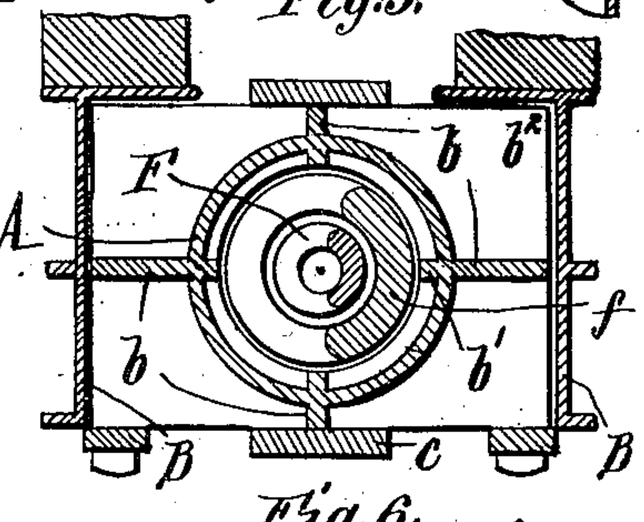


Fig. 6.

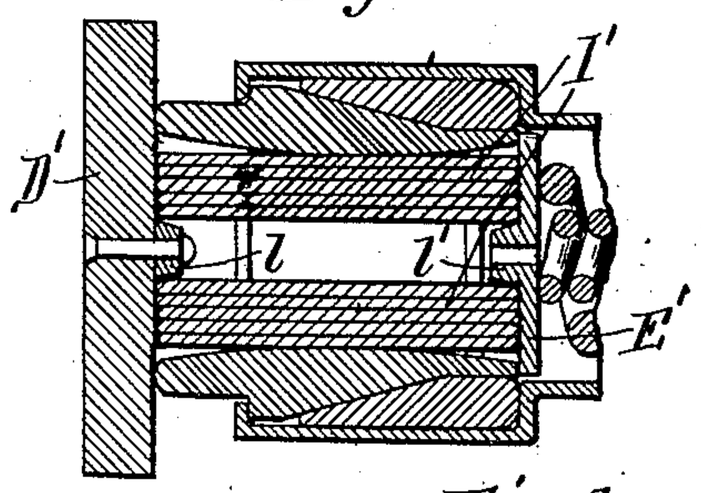
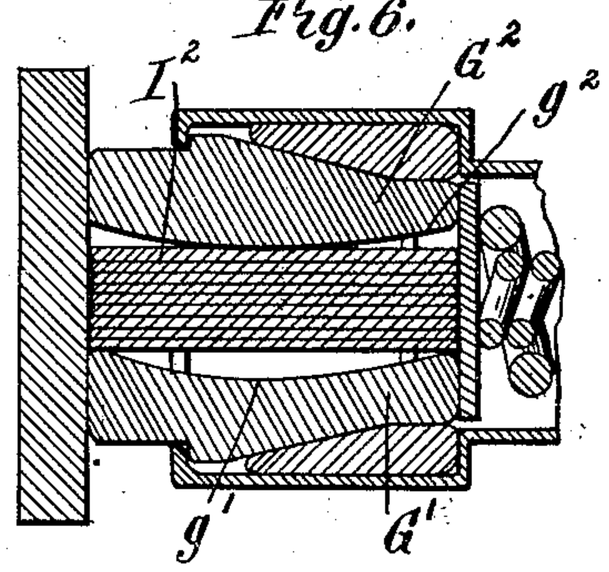
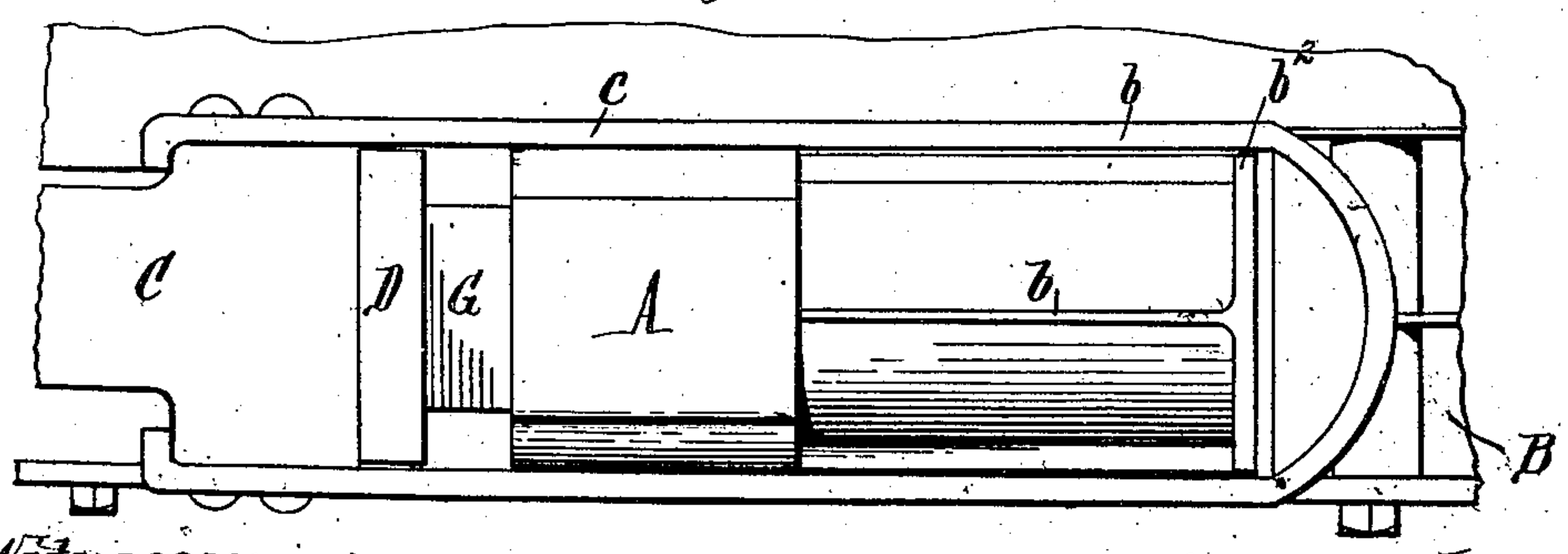


Fig. 4.





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UNITED STATES PATENT OFFICE.

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FRICTION DRAFT AND BUFFING GEAR.

No. 848,260. Specification of Letters Patent. Patented March 26, 1907.

Application filed September 7, 1905. Serial No. 277,402.

To all whom it may concern:

Be it known that I, THOMAS L. McKEEN, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Friction Draft and Buffing Gears, of which the following is a specification.

This invention relates more particularly to friction draft and buffing gears for railway-cars of that type comprising coöperating friction-surfaces, one of which is movable longitudinally relative to the other under draft and buffing strains and which are pressed together in a lateral direction by leaf-springs or spring-plates to create friction between said surfaces to resist such relative longitudinal movement of the surfaces and cushion the strains or shocks to which the draft and buffing device is subjected.

While the improvements are especially intended for combined draft and buffing gears, they are also applicable to other analogous devices, such as car-platform buffers and siding-buffers.

The primary object of the invention is to produce a friction draft and buffing gear enabling the use of flat or straight leaf-springs or plates as contradistinguished from the bowed or curved springs heretofore employed. Straight or flat springs are less expensive to manufacture than curved springs, which require special bending and tempering appliances. In making the curved springs the fibers of the metal are strained more or less in bending the heated metal, and the curved springs therefore have less capacity and are less durable than straight springs, the fibers of which are not ruptured or distorted in making and tempering. As the camber or curvature of the bowed springs is not always precisely the same, it is difficult to get the springs to always nest or fit one in the other perfectly, and consequently more or less difficulty is experienced in fitting the springs in the space provided for them in the draft-gear. For such reasons the flat spring-plates are a marked improvement over the curved spring-plates.

Other objects of the invention are to utilize the straight leaf-springs in a friction-gear of compact, strong, and practical construction, in which the spring and friction devices are inclosed in a barrel or casing by which they are protected from the weather and from dust and dirt, and to improve friction draft and buffing gears in the respects hereinafter specified, and set forth in the claims.

The flat spring-plates can be utilized in draft and buffing gears having various different arrangements and constructions of the parts, and in the drawings several different constructions are illustrated as examples.

In the accompanying drawings, Figure 1 is a horizontal section, partly in plan, of a friction draft and buffing gear embodying my invention and the guides therefor. Fig. 2 is a transverse section thereof in line 2 2, Fig. 1. Fig. 3 is a similar section in line 3 3, Fig. 1. Fig. 4 is a side elevation thereof, one of the cheek-plates being removed. Figs. 5 and 6 are fragmentary views of modified forms of construction.

Like letters of reference refer to like parts in the several figures.

In the construction of the draft and buffing gear shown in Figs. 1–4, which show the preferred arrangement of the parts, A represents a barrel or casing in which the springs and other parts of the gear are inclosed and protected and which is mounted to slide horizontally in ways in suitable stationary guides or check-plates B, fixed to the draft-sills of the car. The barrel is preferably of the shape shown in the drawings, having a cylindrical inner or rear portion strengthened by longitudinal external and internal ribs *b b'* and an outer or front portion providing a substantially rectangular cavity. The barrel is provided with lateral projections b^2, which engage rear stops or abutments b^3 on the guides B to prevent the rearward movement of the barrel beyond the position shown in Fig. 1. The draw-bar C of the coupler is connected with the barrel in any suitable way—for instance, by the usual yoke *c*, secured to the draw-bar and passing around the rear end of the barrel, so that the barrel will be drawn forward with the draw-bar by draft on the latter.

D represents a front end follower, which passes through the draw-bar yoke and slides in the ways of the guides B and normally bears against front stops or abutments *d* on the guides, which prevent the forward movement of the follower beyond the position shown in Fig. 1. The rear end of the draw-bar bears against the front follower and pushes the latter rearwardly in buffing. The rearward movement of the follower is limited by the follower striking the front end of the barrel. The barrel constitutes in effect and

acts in the same manner as the usual rear or end follower.

E represents a center or intermediate follower arranged to slide in the central portion of the barrel. Its rearward movement is limited by an internal stop or abutment *e* on the wall of the barrel. The central abutment is preferably so located as to allow about the same movement of the intermediate follower that the front follower has between its abutments and the front end of the barrel. The abutment *e* is braced by the internal ribs on the barrel.

Ordinary inner and outer coil draft and bulling springs F and *f* are located in the cylindrical portion of the barrel and bear at opposite ends, respectively, against the rear end of the barrel and the intermediate follower. The location of the central abutment *e* is such that the rearward movement of the intermediate follower E will be arrested before the coil-springs are compressed solid, thereby preventing injury to the springs. The friction devices, which act in conjunction with or supplement the action of the coil-springs F *f*, are located in the barrel between the front end and intermediate followers and are preferably constructed and arranged as follows:

G represents friction plates or wedges which move rearwardly with the front follower in bulling, and H represents coöperating friction plates or wedges which move forwardly with the barrel under draft on the draw-bar. The friction-plates G will be hereinafter termed "wedges" to distinguish them from the other friction-plates H. The wedges G are oppositely arranged in the barrel and have inclined outer friction-surfaces which bear against coöperating inner friction-surfaces on the friction-plates H. The wedges bear at their outer and inner ends, respectively, against the front and intermediate followers, whereby they and the intermediate follower are pushed rearwardly with the front follower in bulling, and the friction-plates H bear at their inner and rear ends against internal shoulders *h* on the barrel, whereby they are drawn forwardly with the barrel and draw-bar. A relative longitudinal movement of the wedges and friction-plates will cause the wedges to move laterally in the barrel on account of their inclined faces bearing against the friction-plates, and such lateral movement of the wedges is opposed by leaf-springs or spring-plates I, arranged longitudinally in the barrel between the front and intermediate followers and bearing against the inner sides of the wedge-plates. The spring-plates are normally flat or straight and act by their tendency to resist flexure to press the wedge-plates forcibly outward against the friction-plates. In the preferred construction (shown in Figs. 1–4) the spring-plates are arranged in two sets on opposite sides of a centering-block K, arranged longitudinally between the front and intermediate followers. The centering-block has concaved opposite faces *k* or is reduced in thickness between its ends, so that the leaf-springs bear at their ends only on the centering-plate, and the inner faces *k'* of the wedge-plates are convexed, so as to bear on the spring-plates only between their ends. As the wedges bear centrally on the leaf-springs, which are supported at their ends, the lateral movement of the wedges will flex or strain the leaf-springs, and the pressure of the wedges on the friction-plates, and consequently the friction between the same, will depend upon the resistance to flexure offered by the leaf-springs. This resistance will be lessened or increased with leaf-springs of the same strength accordingly as the springs bear nearer to or farther from their ends on the thickened ends of the centering-block K, and consequently the capacity of the springs can be regulated within limits by changing the shape of the centering-block to vary the distance between the bearing-points of the springs. The concavity of the faces of the centering-block is preferably somewhat greater than the convexity of the inner faces of the wedges, so that the spring-plates can be bent to the maximum extent without being pinched or clamped between the wedges and centering-block.

The operation of the draft and buffing gear described is as follows: When the draw-bar is pulled forward in drawing the car, the barrel and friction-plates H are carried therewith by the yoke, while the front follower is held stationary by its abutments and holds the wedges G and intermediate follower from movement. The coil-springs F *f* are thus compressed, and the wedges are moved laterally inward by reason of the engagement of their inclined faces with the wedge-plates and flex the straight leaf-springs. The friction between the wedges and friction-plates due to the pressure of the leaf-springs thereon supplements the coil-springs in resisting the longitudinal movement of the draw-bar and barrel, and when the barrel is relieved from draft the coil-springs will restore the parts to normal position. In buffing the barrel and friction-plates are held stationary by the engagement of the barrel with the rear abutments on the guides B, while the front follower, wedges, and intermediate follower are pushed rearwardly by the draw-bar, thereby in a similar manner compressing the coil-springs and forcing the wedges laterally inward against the resistance of the leaf-springs.

The flat or straight leaf-spring acting to resist the lateral movement of wedges or friction-pieces in a similar manner can be used with various other arrangements and constructions of the parts of the gear. The

rigging as a whole could be reversed end for end, so that the barrel would act as the front follower, in which case the so-called "front" follower would act as the rear follower. Another reversal would be to make the opposite faces of the centering-block convexed and the coöperating inner faces of the wedges concaved.

Fig. 5 shows a construction similar to that described with the exception that the centering-block K is omitted and the bearings for the ends of the leaf-springs I′ are formed by central lugs or supports *l l′* on the front and intermediate followers D′ and E′, respectively.

In Fig. 6 is illustrated a draft and buffing gear similar to that described except in the following respects: The leaf-springs I^2 are all arranged in one set and bear at their ends on the ends of one of the wedges G′, which has a concaved inner face *g′*. The other wedge G^2 has a convexed inner face g^2, which bears centrally on the leaf-springs. The action of this gear is analogous to the others described; but all of the leaf-springs are flexed in one direction. With this arrangement of the leaf-springs they occupy less space transversely of the barrel, and as all of the springs can be flexed by a corresponding movement of the wedges to the same extent as each set of half the number of springs in the other constructions this arrangement gives nearly double the capacity of the two set arrangements of the other constructions and it also involves fewer parts.

While all of the constructions above described are intended for combined draft and buffing gears, it will be apparent that the described arrangements of the straight leaf-springs and friction-plates could be employed in platform and siding buffers or other devices intended to resist movement in one direction only.

I claim as my invention—

1. In a friction-gear, the combination of two friction plates or pieces having coöperating friction-surfaces, one of which plates is movable longitudinally and one of which is moved laterally by the longitudinally-movable plate, and straight leaf-springs which are movable longitudinally with the longitudinally-movable plate and are flexed by and oppose the lateral movement of the laterally-movable plate, substantially as set forth.

2. In a friction-gear, the combination of two friction plates or pieces which have coöperating friction-surfaces and are movable longitudinally in opposite directions relative to each other, and one of which is also movable laterally, and straight leaf-springs which are flexed by and oppose the lateral movement of said laterally-movable plate, substantially as set forth.

3. In a friction-gear of the character described, the combination of friction-plates having coöperating inclined friction-surfaces whereby a relative longitudinal movement of said plates causes a lateral movement of one of the plates in a direction transversely of the direction of said longitudinal movement, straight leaf-springs which are movable longitudinally and oppose said lateral movement of said friction-plate, and means whereby the lateral movement of said friction-plate flexes said leaf-springs, substantially as set forth.

4. In a friction-gear of the character described, the combination of friction-plates having coöperating inclined friction-surfaces whereby a relative longitudinal movement of said friction-plates causes a lateral movement of one of the plates in a direction transversely of the direction of said longitudinal movement, straight leaf-springs which are movable longitudinally and bear between their ends against a part movable with said laterally-movable plate, and bearings for the ends of said springs, substantially as set forth.

5. In a friction-gear of the character described, the combination of a wedge and friction-plate provided with coöperating friction-surfaces, said wedge being movable longitudinally of the friction-plate and being caused to move laterally by engagement with said friction-plate, straight leaf-springs which are movable longitudinally with said wedge and oppose the lateral movement thereof, said wedge bearing against said leaf-springs between their ends only, and bearings for the ends of the leaf-springs, substantially as set forth.

6. In a friction-gear of the character described, the combination of a longitudinally-movable wedge having an inclined friction-surface, a friction-surface against which the inclined surface of the wedge slides, whereby the wedge is moved laterally, straight leaf-springs which move longitudinally with said wedge and oppose the lateral movement of the wedge, and means coöperating with said wedge and leaf-springs whereby the lateral movement of the wedge flexes the leaf-springs, substantially as set forth.

7. In a friction-gear of the character described, the combination of a longitudinally-movable wedge having an inclined friction-surface, a friction-surface against which the inclined surface of the wedge slides, whereby the wedge is moved laterally, straight leaf-springs which move longitudinally with said wedge and oppose the lateral movement of the wedge, means coöperating with said wedge and leaf-springs whereby the lateral movement of the wedge flexes the leaf-springs, and one or more springs for restoring the parts to normal position, substantially as set forth.

8. In a friction-gear of the character described, the combination of oppositely-arranged longitudinally-movable wedges hav-

ing inclined outer friction-surfaces and convexed inner faces, friction-surfaces against which the inclined surfaces of the wedges slide, whereby the wedges are moved laterally toward each other, two sets of straight leaf-springs arranged between said wedges, each set bearing centrally against the convexed face of one wedge, means between said sets of leaf-springs on which they bear at their ends, and one or more springs for restoring the parts to normal position after movement, substantially as set forth.

9. In a friction-gear of the character described, the combination of oppositely-arranged longitudinally-movable wedges having inclined outer friction-surfaces and convexed inner faces, friction-surfaces against which the inclined surfaces of the wedges slide whereby the wedges are moved laterally toward each other, two sets of straight leaf-springs arranged between said wedges, each set bearing centrally against the convexed face of one wedge, and a centering-block between said sets of leaf-springs having ends thicker than its central portion against which ends the ends of the leaf-springs bear, substantially as set forth.

Witness my hand this 2d day of September, 1905.

THOMAS L. McKEEN.

Witnesses:
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