2 Sheets—Sheet 1.

J. KULINSKI.

Car Bumper.

No. 15,699.

Patented Sept. 9, 1856.

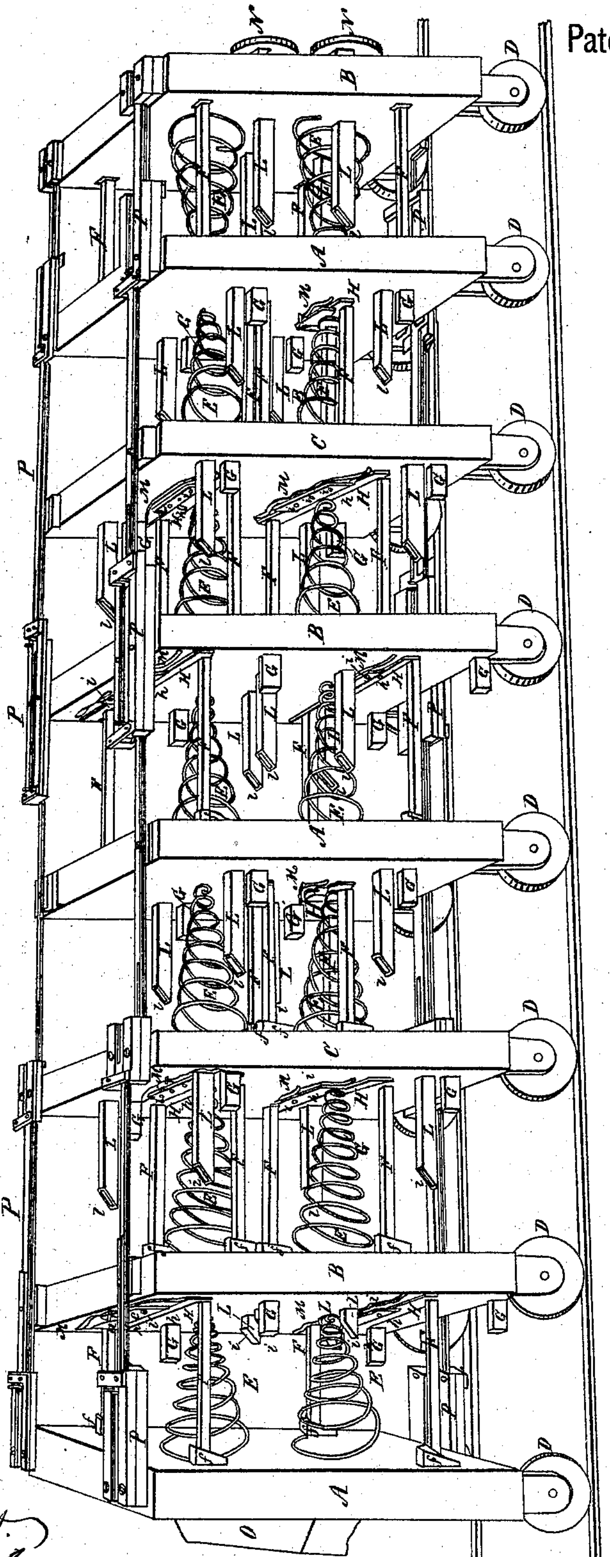


Fig. 1

Witnesses:

S. Dupont.

[illegible] Jr.

Inventor:

John Kulinski

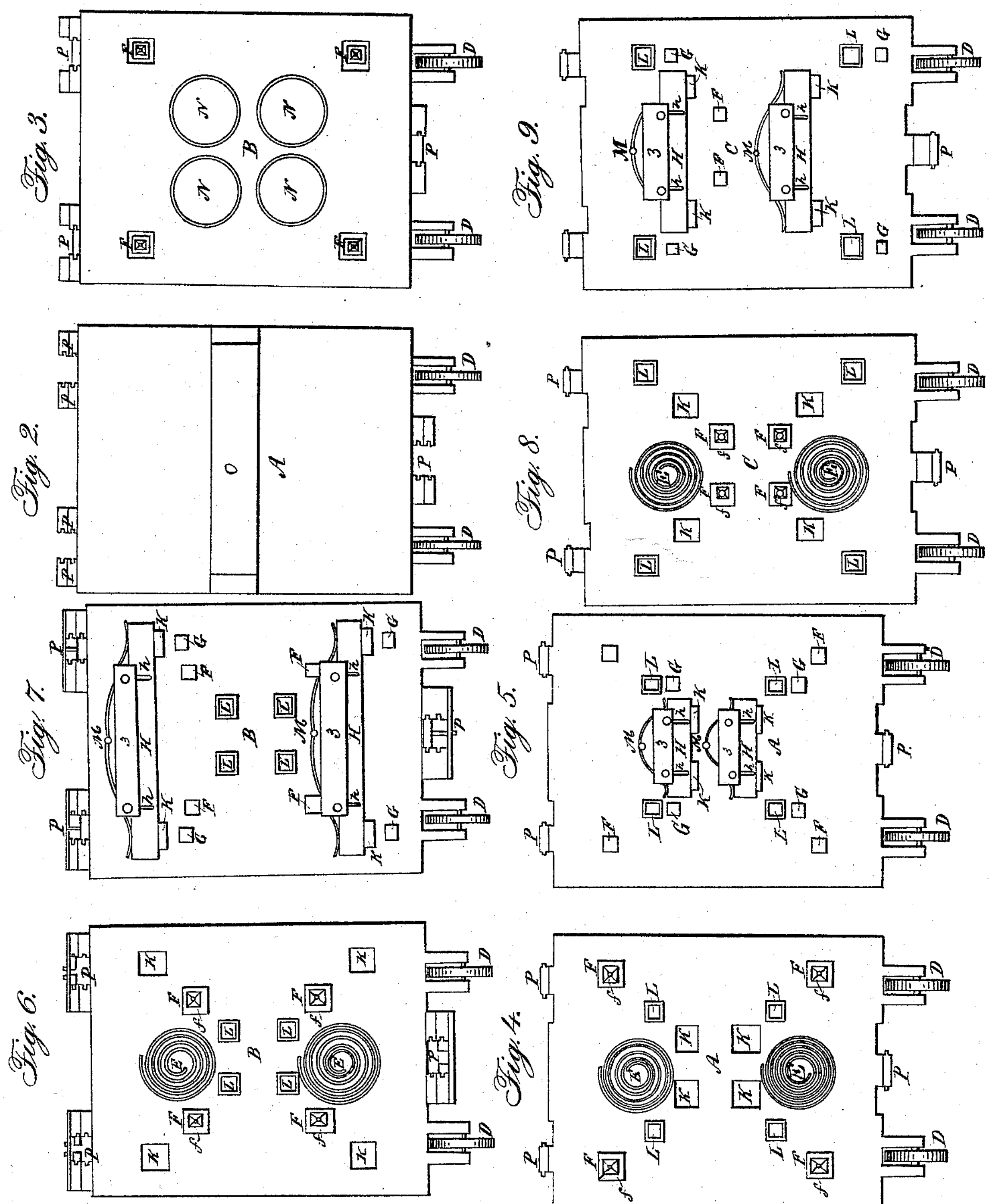
AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS.)

2 Sheets—Sheet 2.

J. KULINSKI.

Car Bumper.

No. 15,699. Patented Sept. 9, 1856.



Witnesses:

Inventor:

AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

JOHN KULINSKI, OF CHARLESTON, SOUTH CAROLINA.

COLLISION APPARATUS FOR RAILROAD-CARS.

Specification of Letters Patent No. 15,699, dated September 9, 1856.

To all whom it may concern:

Be it known that I, John Kulinski, of Charleston, in the county of Charleston, in the State of South Carolina, have invented a new and Improved Mode of Rendering Collisions of Trains on Railroads Harmless; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The nature of my invention consists in connecting to the front and rear of railroad trains a series of shields in such way that in the case of a collision the momentum imparted to the first shield shall pass successively from one shield to the other in an amount of time sufficiently long for the said momentum to be spent before it reaches the train itself.

The leading feature in the arrangement of the shields is the interposition between them of resistances of two distinct characters, viz., rigid and elastic, so combined with a series of locks and slides in each of the shields that while out of collision all the shields are thereby kept at a certain distance from each other and the collision having taken place the momentum imparted to the first shield is caused to unlock the rigid resistances and then to overcome the elastic resistances interposed between the shields successively and alternately one after the other and thus to be spent gradually on the harmless operation of throwing or drawing the shileds close to each other before it reaches the train.

In drawings Figure 1 represents a perspective view of an apparatus on the above principles. On a closer inspection of the drawing it will be perceived that the shields follow each other alternately in a series marked A, B, C, so that those marked with the same letters are furnished equally and the front furniture of the last shield and the rear furniture of the first shield being adapted to the place the said shields take in the series A, B, C. Fig. 2 is a front view of the rear side of the rearmost shield A; Fig. 3, a front view of the front side of the first shield. Fig. 4 is a front view of the front side and Fig. 5, a front view of the rear side of shields A. Fig. 6, is a front view of the front side and Fig. 7, a front view of the rear side of shields B, and Fig. 8, is a front view of the front side and Fig. 9, a front view of the rear side of shield C. The front side is understood to be the side off before or behind the train and the rear side that fronting the train.

Similar letters in the different figures refer to identical parts of the apparatus.

A, B, C, are upright shields constructed of strong and durable material and set upon wheels D, fitting the rails of the track upon which the apparatus is to be used. These shields are connected together and kept parallel to each other at any distance from each other they may assume by springs E and bars F. The greatest tension of the springs is calculated to keep the shields at a distance as shown in Fig. 1. Their greatest yielding goes to the length of the blocks G, which serve as rests for the shields at their closing upon each other. The bars F are of the length of the distances between the shields. Four of such bars proceed horizontally from the front side of each shield and meet on the rear side of the next shield slides H of the snap locks H I which prevents their passage through the holes K. In line with these bars F on each shield and the holes K, cut through the next shields, there are fixed to the rear sides of each of these shields horizontal tubes L of such shape and size as to pass easily through the holes K and to permit with equal facility the bars F to pass through them. The length of the tubes L, is so calculated that when passed through the holes K, and having received the bars F, within them and their beveled ends resting against the beveled heads *f*, of said bars F, the free ends of the blocks G, will come to rest against the opposite shields, and thus keep them in line when at their closest approach toward each other. The snap locks, two on each shield, consist of plates I permanently secured to the rear side of each shield with two rivets *i*, *i*, at such a distance as to permit of an easy movement of the slides H, between them and the shields, and upon the pins *i*, *i*, and for which purpose said slides are provided with slots *h*, *h*, through which the pins *i*, *i*, being passed the slides H are hanging upon them. Springs M secured on the top of each snap lock press down the slides H, and thus cause the latter to close the holes K, and consequently keep the bars F from passing through said holes. The slides

H however with the springs M, are so adjusted as to keep the holes K, not absolutely closed, but rather to keep the lower part thereof so much, opened as to permit the entrance into the fissure of the beveled edges i, of the pipes L, as represented in the drawing (rather in excess) by the spaces K, K, Fig. 5. Thus the pipes L when passed backward by their respective shields in consequence of a collision wedge under the slides H, and their backward progress lift said slides, and while they thus (the pipes) pass through the holes K they admit the bars F to pass freely through themselves until, as above mentioned, their beveled ends L, l, come to rest against the beveled bar heads f. The respective position of bars F, snap locks H, I, tubes L and blocks G on the shields A, B, C, is so calculated as to permit each bar to work freely through three shields in case of a collision, which is accomplished by an arrangement substantially as shown in the drawing.

O is the connection of the apparatus with the train.

P P are the slide and slide blocks keeping the shields in line and parallel to each other.

The operation of the apparatus is the following: As long as the train proceeds on the rail road, the apparatus, both the one that precedes and that which follows the train, remain undisturbed and in the position, as represented in Fig. 1. But upon a collision taking place the shock is first communicated through the bumpers N, to the foremost shield B. Then falling back upon the next shield A the interposed springs E, give way, all the balance of the shields retaining their distances because of the rigid obstructions of the bars F not being unlocked. But as soon as the pipes L of B have wedged up the slides H of A, the bars F of shield C cease to resist, pass through the pipes L of B and the shield A falls back upon the next shield C. The momentum of the shock turns now to overcome the springs of shield C until the pipes L of shield A, have wedged up in their turn the slides H of shield C, when in their turn the bars F of the next shield B cease to resist, pass through the pipes L of C and the shield C falls back upon shield B. The momentum of the shock turns now to overcome the springs of the next shield B and so forth in the same order from shield to shield alternately overcoming the elasticity of the springs E and unlocking the bars F until it reaches the spring of the rearmost shield A, when the whole momentum will be found either spent or so reduced as to be harmless to the train itself. At the first shock the least resistance is encountered by the force causing the collision; but in the same ratio as the force spends its momentum in its progress toward the train the resistance increases by all the elasticity of the springs coming into play one after the other. This effect is still more secure if as it is devised each train is protected in front and in the rear with the described apparatus. Wherever a collision happens the shock is given and received by a safety apparatus and its momentum is broken in both directions. The alternate and increasing work the force is caused to perform, that is to overcome elasticity and then friction and then increased elasticity and friction again and then again still increased elasticity as it is successively brought into play, together with the elasticity already acting and so forth onto the rearmost shield, involves the necessity of a considerable time even for the most extraordinary force of collision. If the whole resistance which the apparatus contains could be met by the force, the latter would act instantaneously and transmit instantaneously so much of the momentum as would remain thereof after breaking the resistance to the train. But by my apparatus the resistance contained in the apparatus is as if it were latent or kept in store and comes into play only successively and in distinct divisions of time, at the rate as one bar after another is unlocked and the springs permitted to oppose their elasticity to the shock. The momentum of the shock is thus forced to divide as many times as there are locks in its way and so to say be destroyed by piecemeal. If the force of a collision be 14 and the aggregate resistance of a bumping apparatus 7 the force acting instantaneously on the whole resistance would reach the train with a momentum of 7 and do all the havoc it may be capable of. But if the same force of collision 14 be supposed to meet the same force of resistance 7, yet the latter being equally subdivided as in the apparatus explained between each two shields the effects of the collision would be widely different. The shock arriving with a momentum of 14 at the bumpers would have a momentum of 13 when arriving at shield A. At this point it would have to overcome two sets of resistances in order to arrive at 6, that is the resistance between C and A and between A and B, and consequently reach the shield C with a momentum of 11. On its way to the next shield B, A has to overcome 3 sets of resistances B and C, between C and A and between A and B and consequently on reaching this shield B, it would have but a momentum of 8. In the same way, proceeding back to the next shield A, it would have to overcome 4 sets of resistances and therefore arrive at A reduced to a momentum of 4. Arrived at the shield C all its momentum would be exhausted and the shock by the only reason of being divided would instead of arriving with a momentum of 7 to the train not be able to arrive to the rearmost shield B and A.

Whatever ingenuity and attention may be employed to prevent collisions, the latter will happen as long as human devices will fail and human frailty remains human nature. Collisions can not be prevented. Let them be met. The best of the known bumpers are either a part of the train, being located under the cars and thus expose the latter, or if independent from and only attached to the train receive or resist instantaneously the whole shock and therefore afford no warning time to the passengers in the train. With my apparatus in the worst case the apparatus may be destroyed and the train still left unhurt and if enough momentum should be imparted to the train to become hurtful 3 minutes will pass between the first shock and its reaching the train, enough to warn conductors and passengers even if they were asleep and sufficient to enable them to look for their safety. The connection of the foremost shield with an alarm galvanic apparatus is an obvious means for the purpose and it is equally obvious that the foremost shield may by any of the known methods be caused to set to work a selfacting car brake in case of a collision.

Having thus fully set forth the nature of my invention and the operation thereof, I do not limit myself to 8 shields in the apparatus, the number thereof admitting of decrease or increase, provided the alternate arrangement of said shields by a constant series be preserved. Neither do I limit myself to a series of 3. This also may be less or more, provided the keeping of the distances between the shields and the throwing together of the latter after a collision be insured. Nor do I claim exclusively springs as elastic resistances. Any kind of bumpers may serve as their substitute. Nor do I claim exclusively the bar F as rigid resistances. Any kind of bolting may do in their place. Nor do I claim exclusively their combination with the tubes L and the snap lock H I, as the means of interrupting their resistance. Any other mechanical device proper to temporarily do away with the rigid resistances may be used. The slide and block arrangement P P on the top and under the bottom of the shields may be modified or transferred to the sides of the shields or even entirely dispensed with, provided other means be employed to keep the shields in line parallel to each other and to insure the action of the snap locks. The point of the invention is not in the individual mechanical devices as illustrated but in the general device to keep a series of shields at given distances from each other while ready for protection and a collision having taken place to bring alternately and successively out of action the rigid and into action the elastic resistances in the order as they are interposed and stored away between the shields from the fore to the rearmost of them in the apparatus.

What therefore I claim as my invention and desire to secure by Letters Patent is—

Protecting railroad trains against the injurious effects of collisions by the attachment to their front and rear of a series of shields A, B, C, kept at a distance from each other by elastic and rigid resistances E and F in such a way that a collision taking place said shields are to fall back successively upon each other from the fore to the rearmost, the resistances to yield to the shock alternately and in succession by the operation of tubes and snap locks H, I, or their equivalents being constructed arranged and operating substantially as and for the purpose specified.

JOHN KULINSKI. [L. S.]

In presence of—
J. SIEGLING, Jr., [L. S.]
F. DUPONT. [L. S.]