

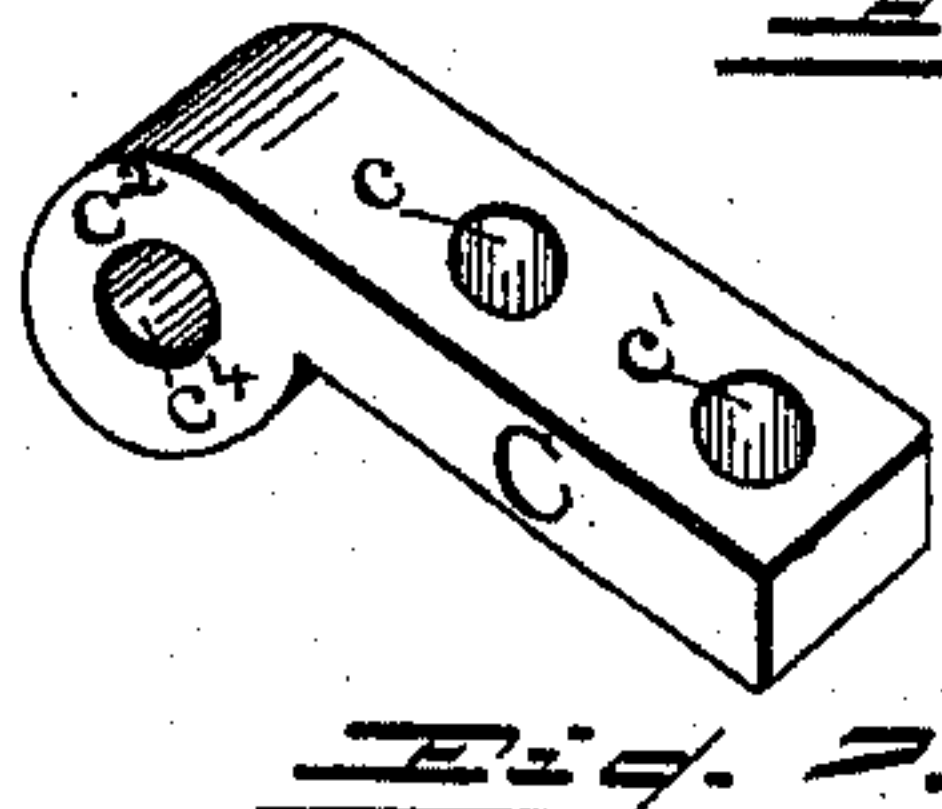
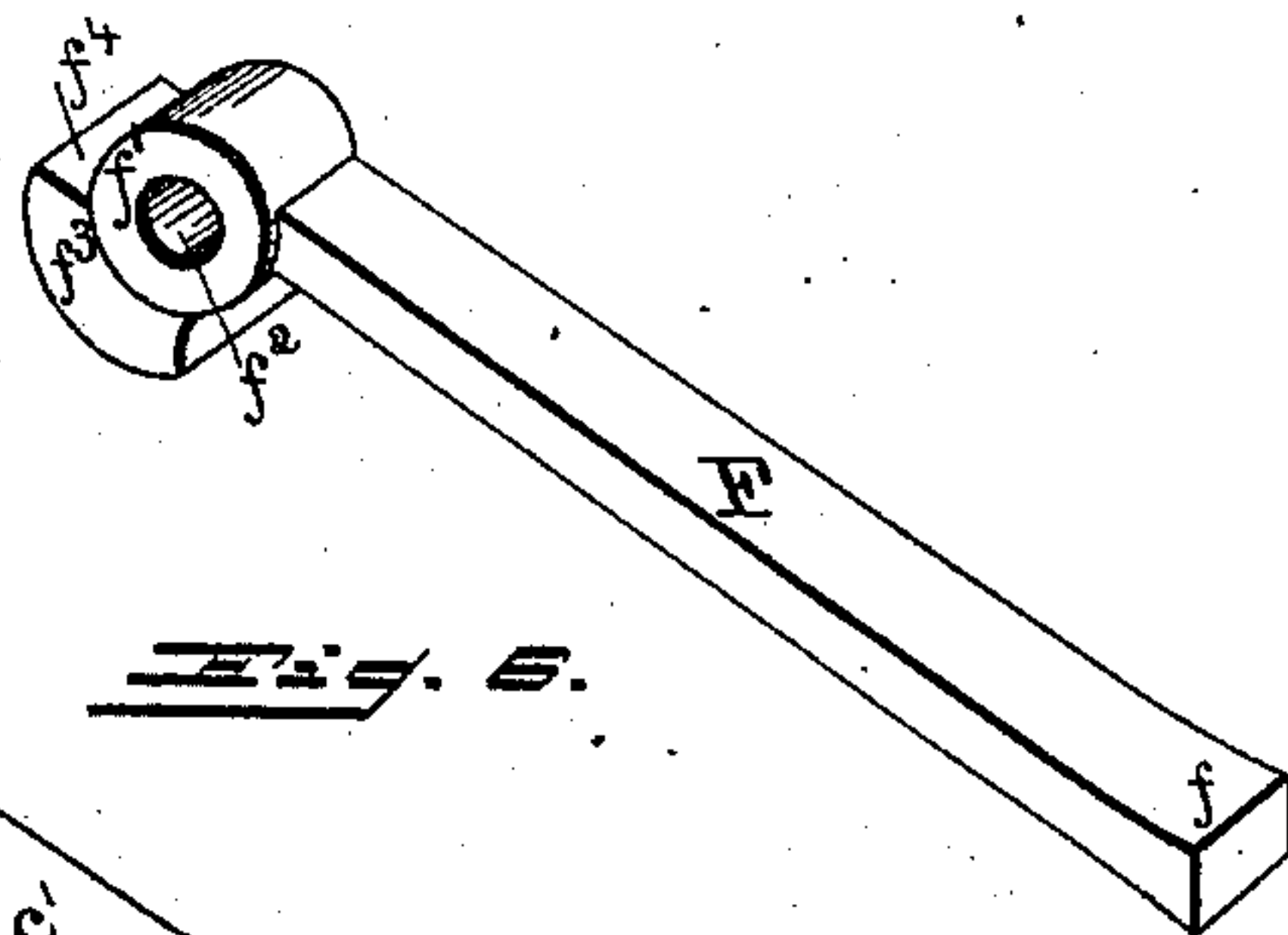
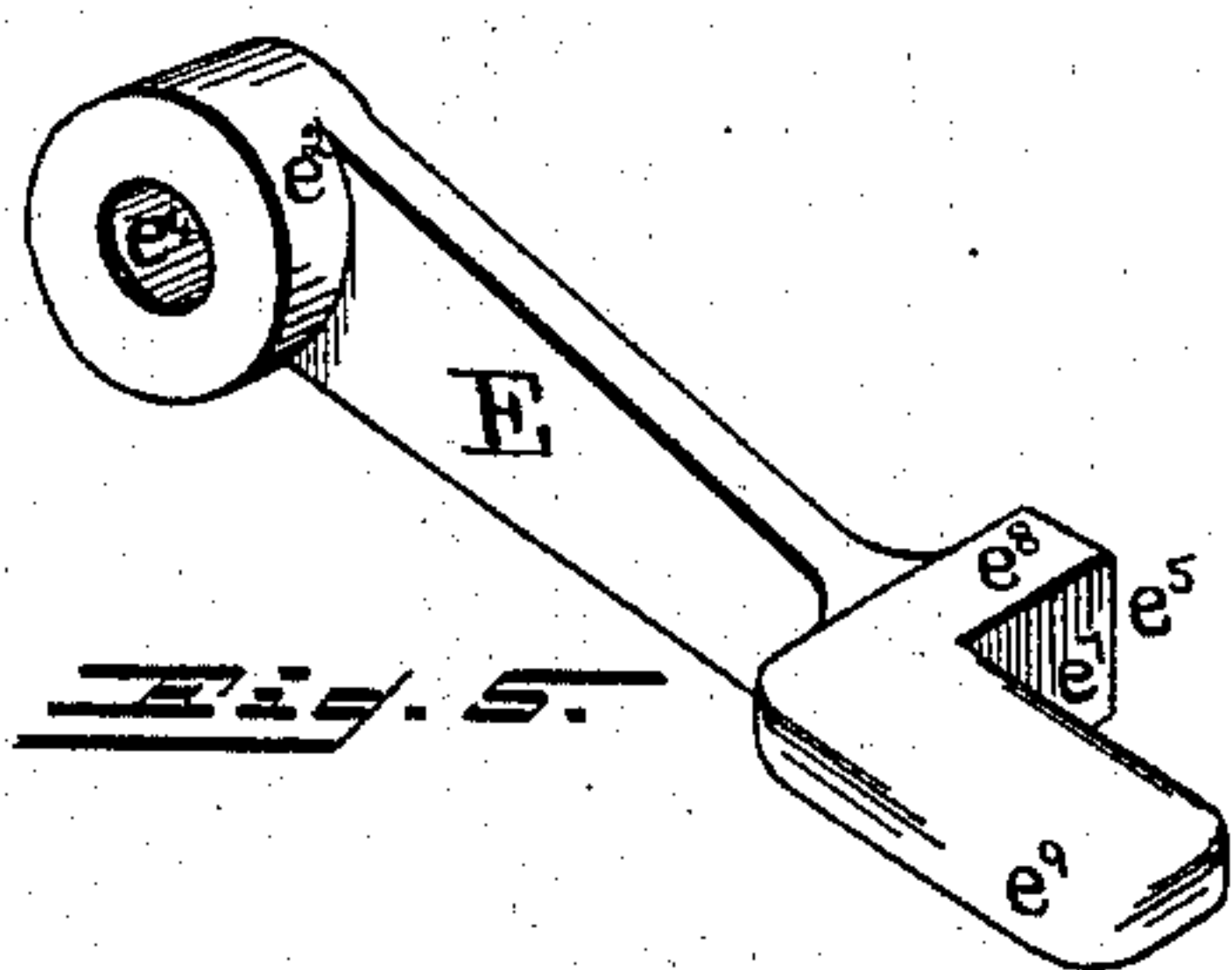
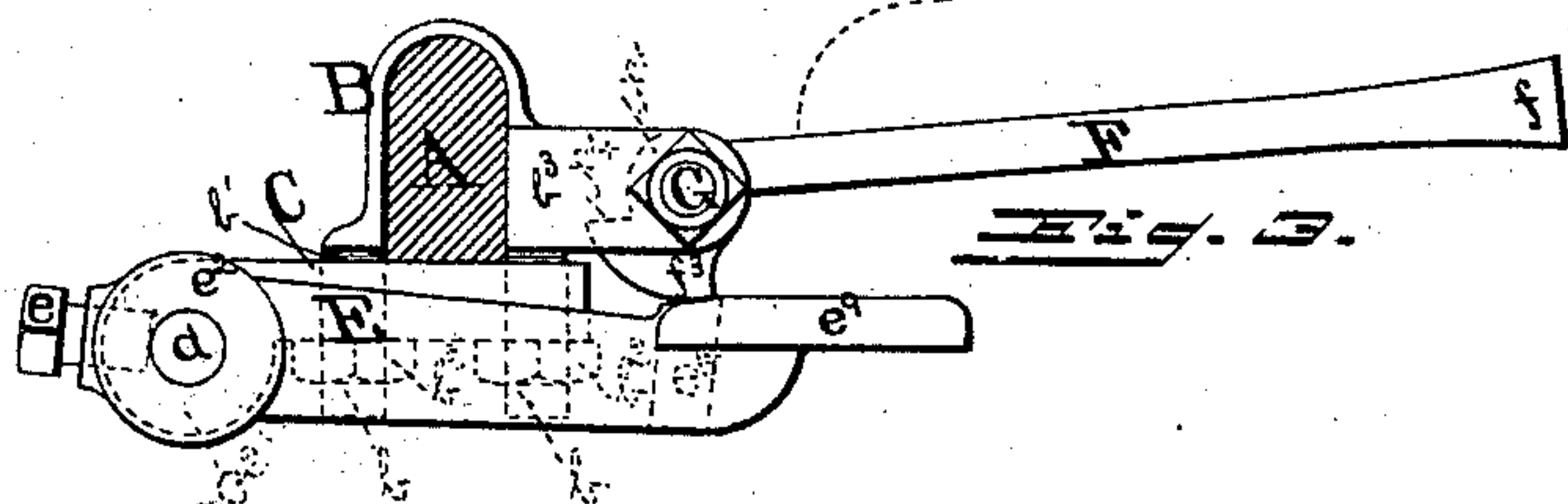
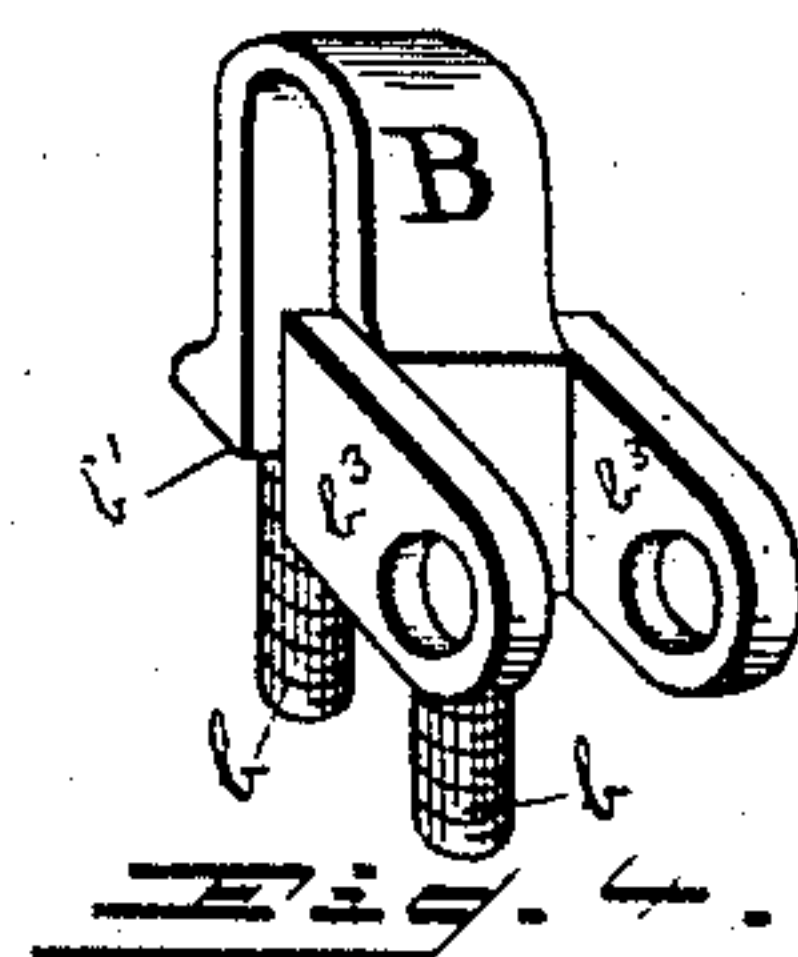
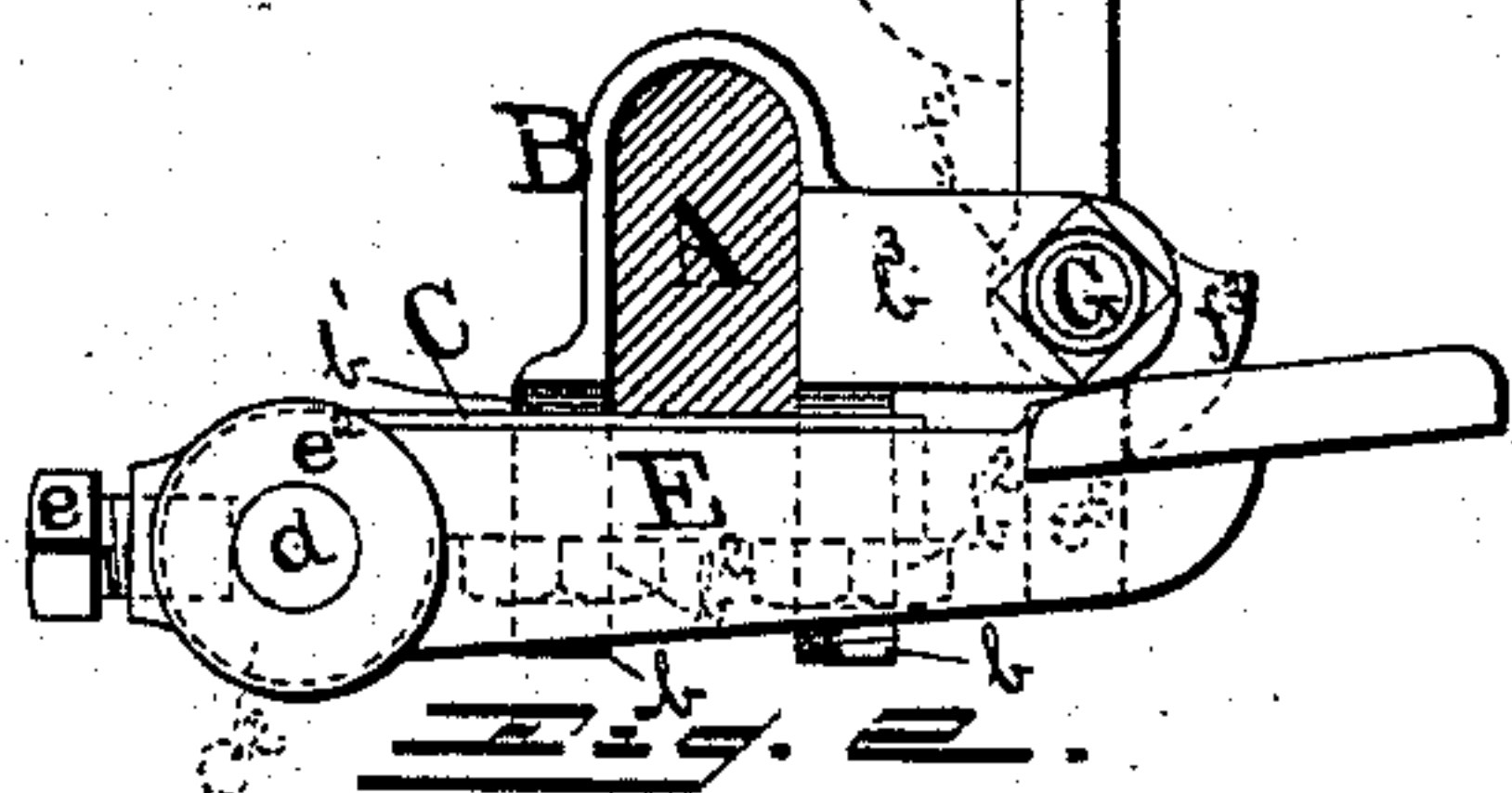
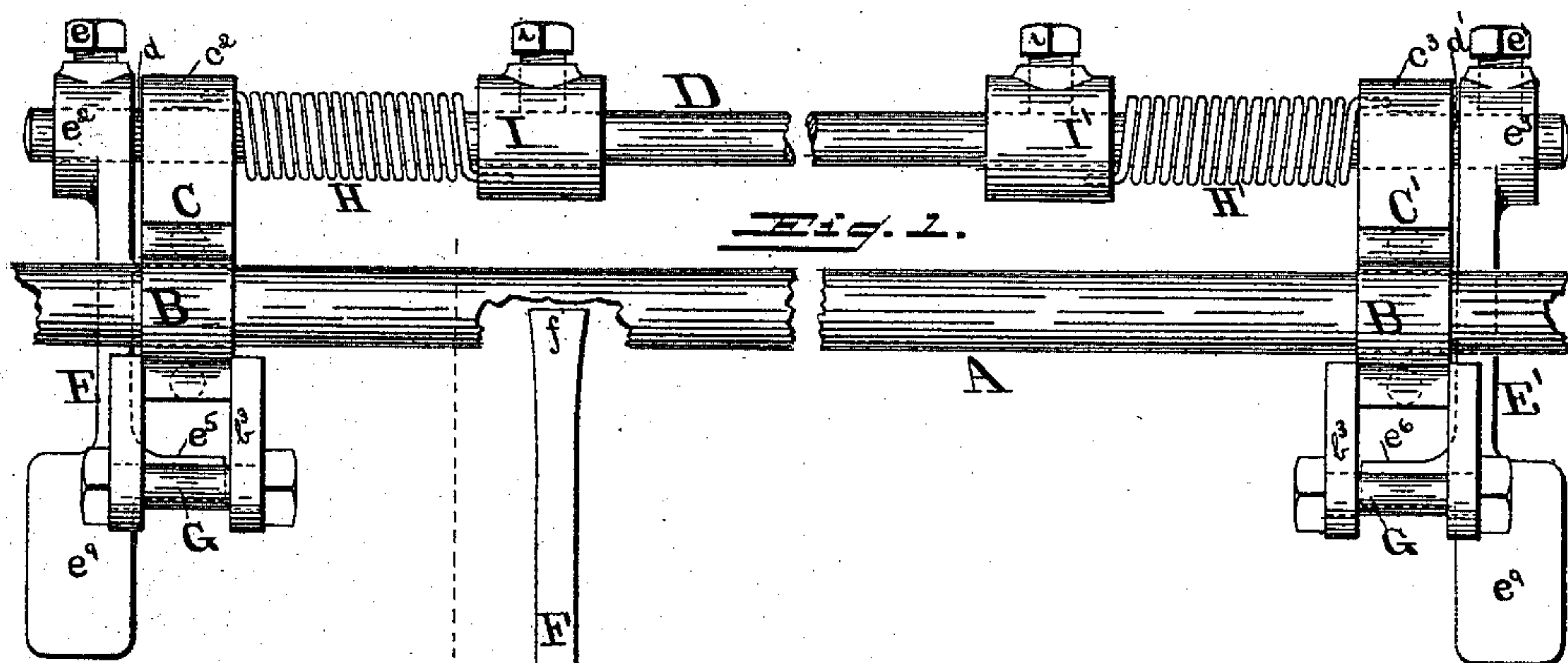
(No Model.)

G. A. SMITH.

THILL SUPPORT.

No. 412,679.

Patented Oct. 8, 1889.



WITNESSES

*J. J. Hartmann.*  
*A. H. Dicks*

INVENTOR  
George A. Smith  
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Wm. S. Powell.



# UNITED STATES PATENT OFFICE.

GEORGE A. SMITH, OF NORRISTOWN, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WILLIAM H. KNEAS, OF SAME PLACE.

## THILL-SUPPORT.

SPECIFICATION forming part of Letters Patent No. 412,679, dated October 8, 1889.

Application filed August 5, 1889. Serial No. 319,728. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. SMITH, a citizen of the United States, residing at Norristown, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Thill Couplings and Supporters; and I do hereby declare that the following is a full, clear, and exact description of the invention.

My invention has relation to thill couplings and supports, or couplings and supports for the shafts of carriages, wagons, and other vehicles, and has for its object to improve the construction and increase the efficiency of such devices.

My invention consists in the provision of a novel construction of shaft or thill supporter and utilizing the old form of shaft-coupling as an adjunct of said construction, being in reality a combined shaft coupling and supporter.

My invention further consists in the formation on the plate which receives the bolts of the clip or strap of the ordinary form of thill-coupling of an enlargement or boss depending from one of its ends, said boss having an opening therein for the passage of and in which is journaled one end of a spring-controlled rod, so that this plate serves the double purpose of securing the shaft-coupling in its proper place on the axle of the vehicle and affording a support for said rod. This rod projects a sufficient distance beyond the edge of the boss on the plate to permit of the securing thereon of an arm with a thumb-piece and a lateral projection or shoulder on its free end, there being one such arm on each end of the rod, and said rod is similarly supported at each of said ends and extends parallel with and to the rear of the axle of the vehicle and is encircled near its ends by a spiral spring. One end of each said spring is secured to the boss on the clip-plate and the other end is secured to a collar rigidly secured on the rod. In place of the ordinary form of shaft-iron with a boss on one end, with an opening therein for the passage of the bolt which secures said iron in the wings of the clip on the axle, I form a concentric lug or cam-like projection on the said boss, one end of said cam projection terminating in a shoul-

der, so that owing to there being a boss and cam on each side of the shaft, and the projections on the hereinbefore-mentioned arms projecting inwardly and in the path of travel of the cams on the shaft-irons when the shafts are raised until the rounded portions of said cams clear the projections on the arms, the shoulders of said cams and projections will automatically spring into engagement and the spring-pressure will prevent accidental disengagement thereof. This spring-pressure also, when the shafts are lowered, causes the edges of the projections on the arms to press tightly against the rounded portions of the cams on the shaft-irons and prevents rattling of said irons on their bolts without interfering with the swinging of the shafts in response to the movements of the animal in said shafts.

All of the features of my invention will be more specifically described hereinafter, and will be clearly understood upon reference being had to the accompanying drawings, wherein—

Figure 1 is a plan view of my improvements applied to an axle, or so much of said axle as is deemed necessary to illustrate my invention, said axle and the rod being shown broken away and the shaft-irons not shown. Fig. 2 is a side elevation of my improvements complete, with the axle shown in vertical section and the inner end of the shaft in dotted lines, the shaft-iron being shown as elevated. Fig. 3 is a side elevation of my improvements complete, with the axle in vertical section and the shaft in dotted lines, the shaft-iron being shown as lowered. Fig. 4 is a detached perspective view of the old form of clip or strap for the thill-coupling. Fig. 5 is a similar view of the arm with the shouldered projection thereon. Fig. 6 is a like view of the axle-iron with the concentric lug thereon, and Fig. 7 is a similar view of the plate for the reception of the bolts of the clip and having the boss in which the spring-controlled rod is journaled.

A represents the axle of the vehicle, which is embraced near its outer ends by the clips or straps B, provided with the dependent threaded projections *b* and having the shoulders *b'*, against which bear the plates C C',



said shoulders being flush with the lower edge of the axle and said plates having the openings  $c\ c'$ , for the passage of the projections  $b$ , and against the lower surfaces of which plates bear the nuts  $b^2$ , which keep said projections in said plates.

Plates  $C\ C'$  have formed on their inner or rear ends (which ends extend to the rear of and below the lower edge of the axle) the depending circular enlargements or bosses  $c^2\ c^3$ , provided with the transverse openings  $c^4$ , for the reception of and in which are journaled the outer ends  $d\ d'$  of the rod  $D$ , said ends projecting sufficiently beyond the outer edges of said bosses to allow of the securing thereon, through the employment of the bolts  $e\ e'$ , of the arms  $E\ E'$ , said plates thus serving to keep the clips of the shaft-couplings in their proper positions on the axles and at the same time afford journal-bearings and supports for the rod  $D$ . As will be observed, the arms  $E\ E'$  have formed on their inner ends circular enlargements or bosses  $e^2\ e^3$ , extending laterally from one of their sides and having therein transverse openings  $e^4$  for the passage of said rod. Said arms taper slightly toward their outer ends, which have formed thereon and extending laterally from one of their sides opposite to that upon which are the bosses  $e^2\ e^3$  the projections  $e^5\ e^6$ , with the vertical flat portions or shoulders  $e^7$  and the flat edges  $e^8$ . Said outer ends are also provided with the broad flat portions or thumb-pieces  $e^9$ , which are in the same plane as the edges  $e^8$ .

$F\ F$  represent the shaft-irons, provided with the enlarged outer ends  $f$  for facilitating their welding to the shafts, and having also the bosses  $f'$ , with the transverse openings  $f^2$  therein for the passage of the bolts  $G$ , which secure the shafts, when the irons are secured thereto, in the wings  $b$  of the clip or strap  $B$ . These bosses have formed on a portion of their peripheries the concentric enlargements or cam projections  $f^3$ , with the squared ends or shoulders  $f^4$ , of a width equal to the length of the projections  $e^5\ e^6$  and for engagement therewith.

$H\ H'$  represent the spiral springs which encircle rod  $D$  inside the lines of the inner edges of the bosses of the clip-plates  $C\ C'$ , and are secured at one of their ends to said bosses by said ends passing into suitable sockets. The other ends of said springs are secured in sockets in the edges of collars  $I\ I'$ , which are secured in such positions on the rod by bolts  $i$  as to keep the ends of the springs in the sockets and maintain the proper tension in said springs, so as to attain a constant upward tendency of the arms  $E\ E'$ , in one case to secure the engagement of the cam-shoulders when the shafts are elevated, and in the other case to secure a pressure of the edges  $e^8$  against the rounded portions of the cams when the shafts are lowered, for the purpose hereinbefore stated. Thus, on account of the spiral springs being secured at one end to the rod  $D$  and at the other ends

independently thereof, the said rod is controlled in its operation by the tension of the springs, which tension can be and is diminished or increased by twisting or turning and again securing the collars on the shaft, as is well understood.

The operation is as follows: When the shafts are in the position shown in dotted lines in Fig. 3 of the drawings, the shaft-irons  $F$  will be in a similar position, with the round portion of the cam projections  $f^3$  in close contact with the edges  $e^8$  of the arm projections  $e^5$ , the arms  $E\ E'$  being slightly depressed against the resistance of the springs  $H\ H'$  on the rod  $D$ , in which position the tension of said springs will cause said arms to press tightly against the round surfaces of the cams and prevent rattling of the bosses of the shaft-irons  $F$  on their bolts, notwithstanding the fact that the openings in said bosses may have worn larger than the diameter of the bolts, thus overcoming the objectionable noise due to looseness in the shaft or thill coupling. When it is desired to raise the shafts and have them supported in their elevated positions without recourse to the common means of propping or otherwise, the shafts are swung on the bolts  $G$  until they reach the position shown in Fig. 2, where the round surfaces of the cams  $f^3$  will have cleared the edges  $e^8$  of the arm projections and the spring-pressure caused the arms to move upwardly slightly, so as to bring the shoulders  $f^4$  and  $e^7$  into engagement, when the shafts will be secured against accidental lowering by the resistance offered by the arm projections to the cam projections, as will be clearly understood by reference to said Fig. 2. When it is desired to lower the shafts, the same can be accomplished by simply depressing the arms  $E\ E'$ , through the medium of their thumb-pieces, until the shoulders of the cam and arm projections clear each other.

While I have shown the use of a pair of supporters for the shafts which are practically catches or latches, with their outer ends projecting forwardly outside the shafts and the projections on said arms facing or oppositely disposed, it is obvious that where the shafts are not heavy, as in the case of a carriage or other light vehicle, it will only be necessary to employ a single support at one side of the shafts. The placing of the catches or arms as shown in the drawings renders them easy of access and their manipulation a matter of little exertion.

Having fully described my invention, what I claim is—

1. The combination, with the axle of a vehicle, of a spring-controlled arm or arms supported in bearings on said axle, and a projection or projections on the shafts for engagement with said arm or arms, substantially as shown and described.

2. The combination, with the axle of a vehicle and the clips thereon for the shaft-coup-



lings, of a plate or plates through which project the clip-bolts provided with a boss or bosses in which are journaled a spring-controlled arm or arms, and a projection or projections on the shafts for engagement with said arm or arms, substantially as shown and described.

3. The combination, with the axle of a vehicle, of a spring-controlled rod parallel with and journaled in bearings on said axle, a catch or catches secured on said rod, and a suitable projection or projections on the shafts for engagement with the catch or catches, substantially as shown and described.

4. The combination, with the axle of a vehicle, of a rod parallel with and journaled in bearings on said axle, a pair of helical springs encircling the rod and secured at one end to said bearings, a pair of collars secured on said rod and receiving the other ends of the springs, and a catch on each end of the rod for engagement with projections on the shafts, substantially as shown and described.

5. The combination, with the axle of a vehicle, of a spring-controlled rod parallel with, at the rear of, and journaled in bearings on said axle, and an arm or arms secured on said rod, the outer ends of said arm or arms extending forwardly of the axle and provided with a lateral projection adapted to engage with projections on the shafts, substantially as shown and described.

6. The combination, with the axle of a vehicle, of the arms  $E E'$ , provided with the projections  $e^5 e^6$  and the thumb-pieces  $e^9$  on their outer ends, each said arms being supported in bearings on said axle and controlled by a spring and adapted to engage with a projection on the shafts, substantially as shown and described.

7. The combination, with the axle of a vehicle, of the plates  $C C'$ , through which pass the bolts of the shaft-coupling clips, the bosses  $c^2 c^3$  on said plates, with the openings  $c^4$  therein, the arms  $E E'$ , journally supported in said openings, and springs for the control of and projections on the shafts for engagement with said arms, substantially as shown and described.

8. The combination, with the axle of a ve-

hicle, of a rod  $D$ , journaled in suitable bearings on said axle, the springs  $H H'$ , encircling said rod, a socket in said bearings for the reception of one end of said springs, the collars  $I I'$ , secured on said rod by bolts  $i$ , a socket in said collars for the reception of the other ends of the springs, and a catch secured on each end of the rod and adapted to engage with projections on the shafts, substantially as shown and described.

9. The combination, with the axle of a vehicle, of a spring-controlled rod parallel with and journaled in bearings on said axle, the arms  $E E'$ , provided with the bosses  $e^2 e^3$ , with the openings  $e^4$  therein and secured on said rod, the bolts  $e e'$ , the projections  $e^5 e^6$ , and the thumb-pieces  $e^9$  on the outer ends of said arms, said projections being adapted to engage with suitable projections on the shafts, substantially as shown and described.

10. The combination, with the axle  $A$ , of the clips  $B$ , the plates  $C C'$ , the bosses  $c^2 c^3$ , with the openings  $c^4$  therein, the rod  $D$ , the springs  $H H'$ , the collars  $I I'$ , the bolts  $i$ , the arms  $E E'$ , the bolts  $e e'$ , the bosses  $e^2 e^3$ , the openings  $e^4$  in said bosses, the projections  $e^5 e^6$ , provided with the shoulders  $e^7$  and the edges  $e^8$ , the thumb-pieces  $e^9$ , the shaft-irons  $F$ , secured to the shafts, the bosses  $f'$ , provided with the openings  $f^2$  for the passage of the bolts  $G$ , the wings  $b^2$ , the cam projections  $f^3$ , and the shoulders  $f^4$ , substantially as shown and described.

11. The combination, with the axle of a vehicle, of a spring-controlled rod parallel with and journaled in bearings on said axle, the arms  $E E'$ , the bolts  $e e'$ , securing the arms on the rod, the bosses  $e^2 e^3$ , with the openings  $e^4$  therein, the projections  $e^5 e^6$ , the thumb-pieces  $e^9$ , the bosses  $f'$ , the cam projections  $f^3$ , the bolts  $G$ , and the wings  $b^2$  of the clip on the said axle, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of August, A. D. 1889.

GEORGE A. SMITH.

Witnesses:

WM. H. POWELL,  
T. C. WARNER.