No. 740,593. PATENTED OCT. 6, 1903.

G. W. SCHOCK.

PAPER FOLDING MACHINE.

APPLICATION FILED OCT. 13, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

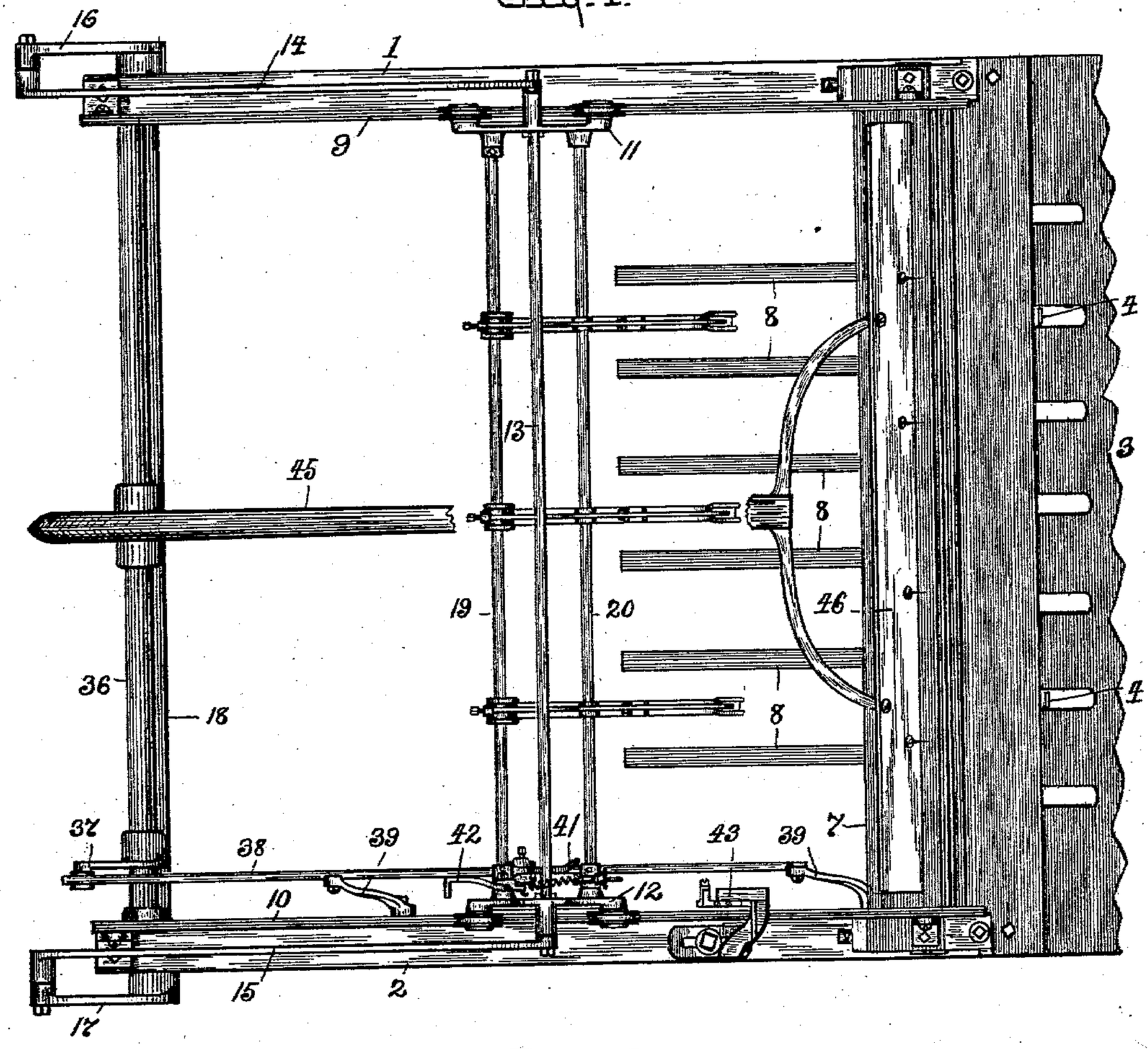
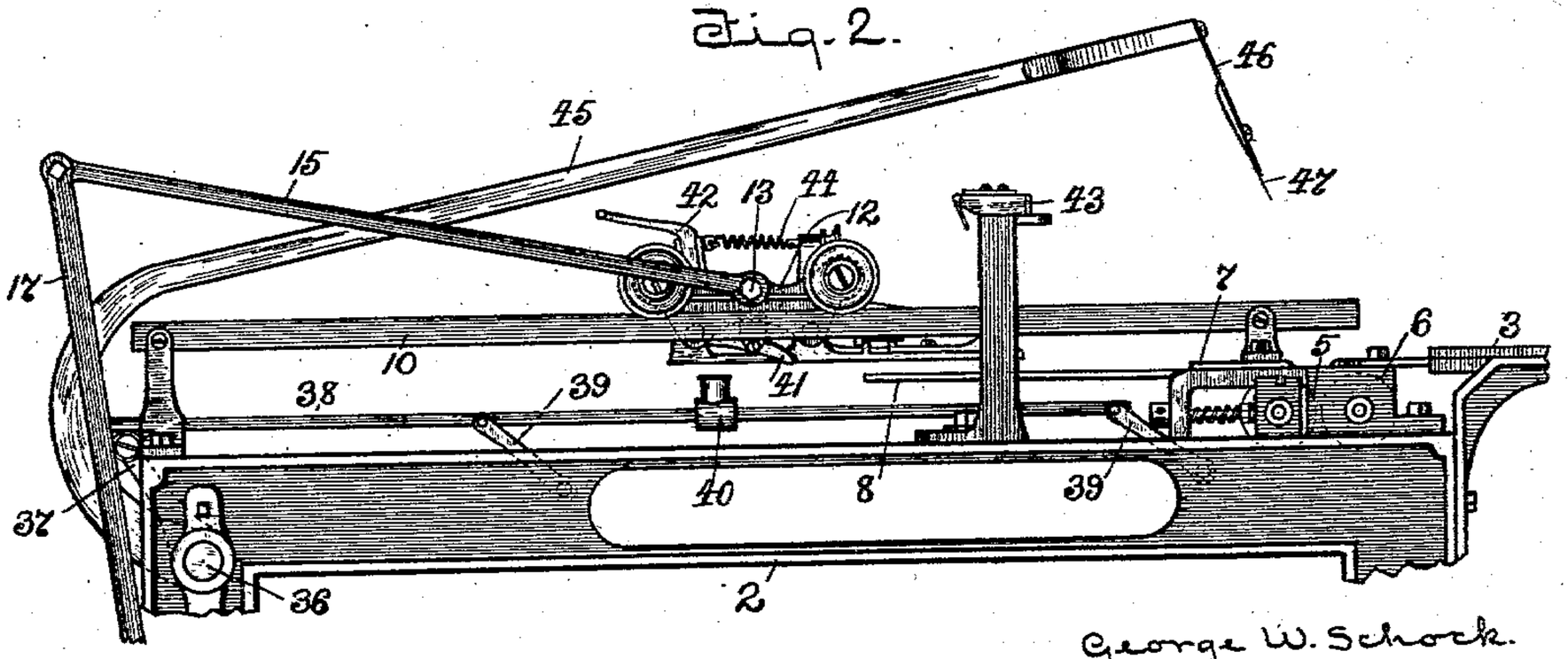


Fig. 2.



George Oltsch
Maggie Oltsch } Witnesses.

George W. Schock.
Inventor
By Lehmann & Dalton Attys.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.

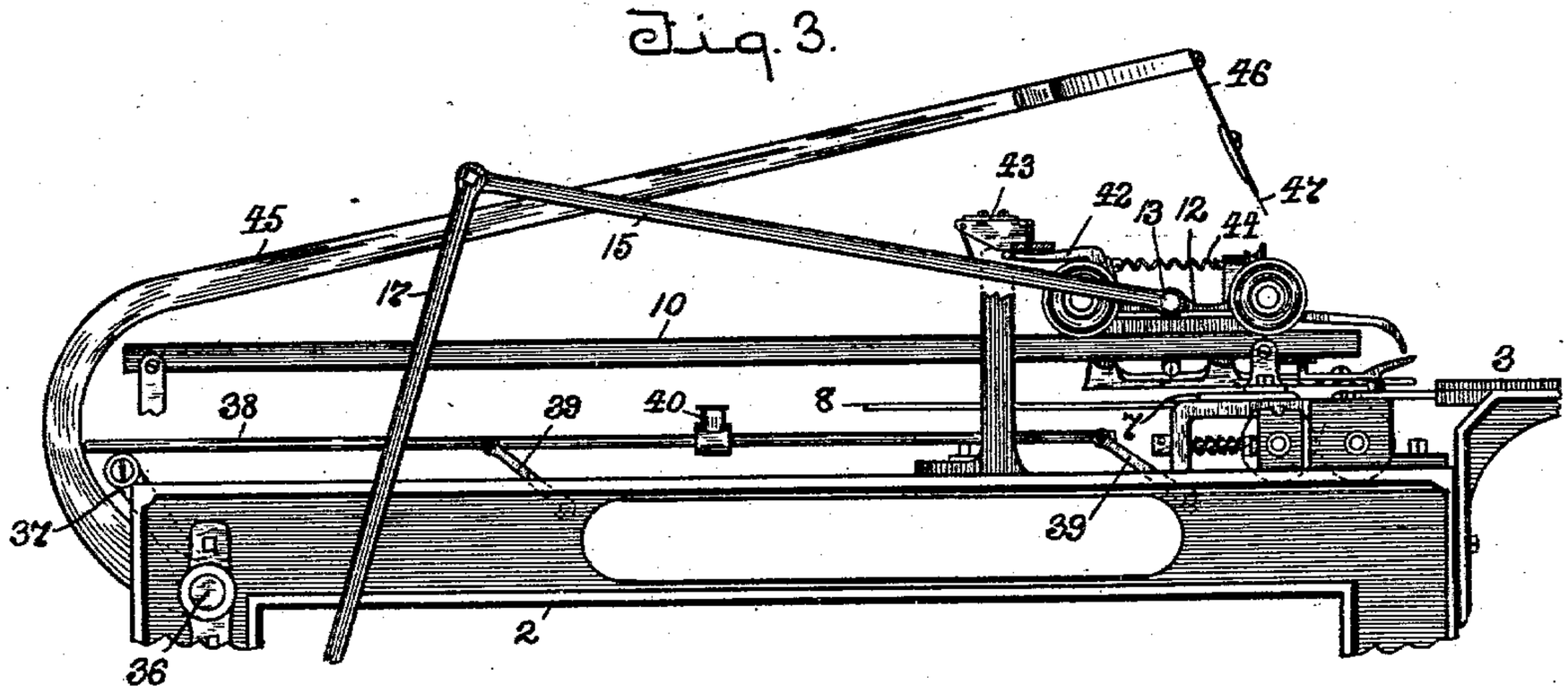

Fig. 4.

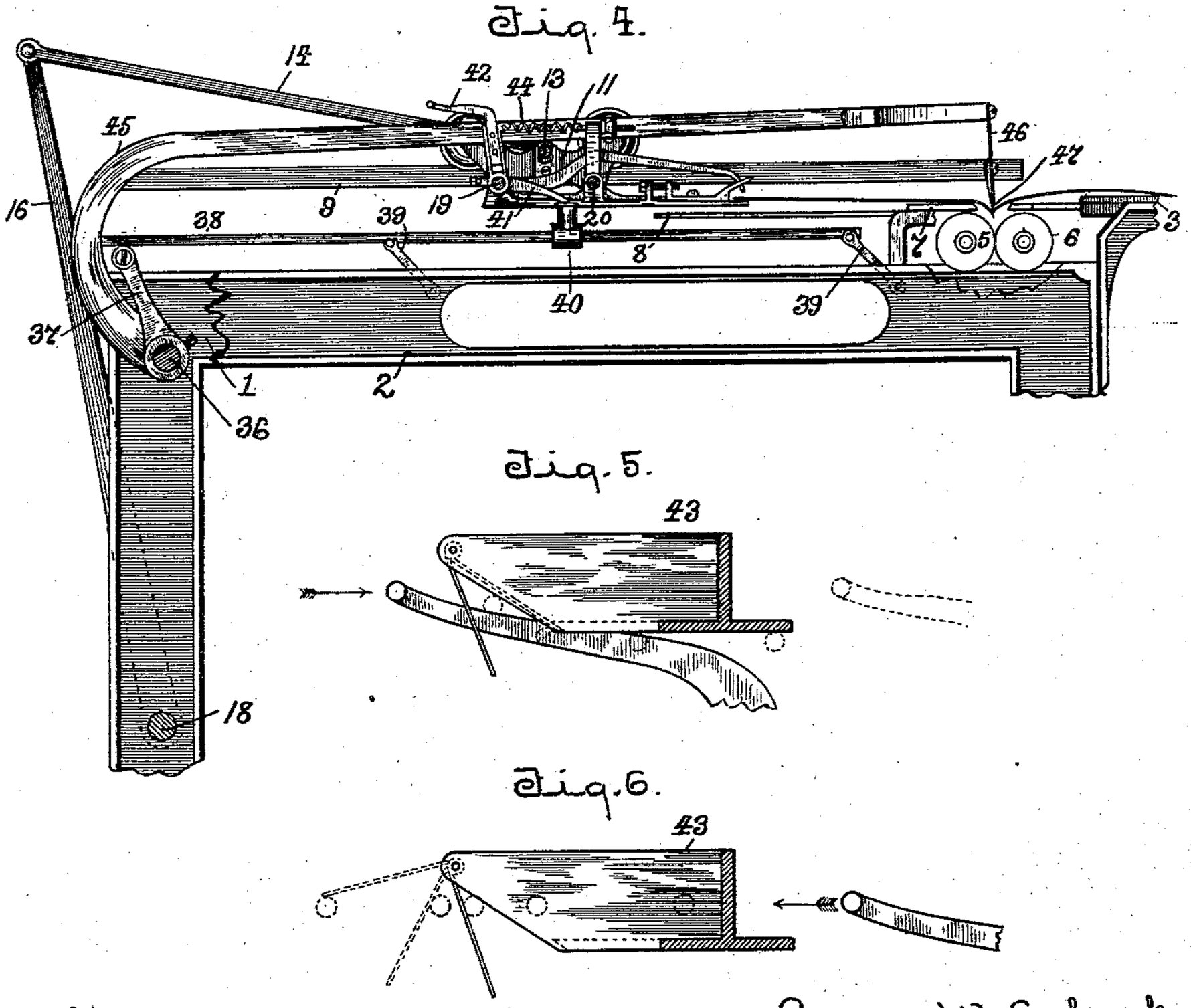

Fig. 5.

Fig. 6.

Witnesses:
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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 7.

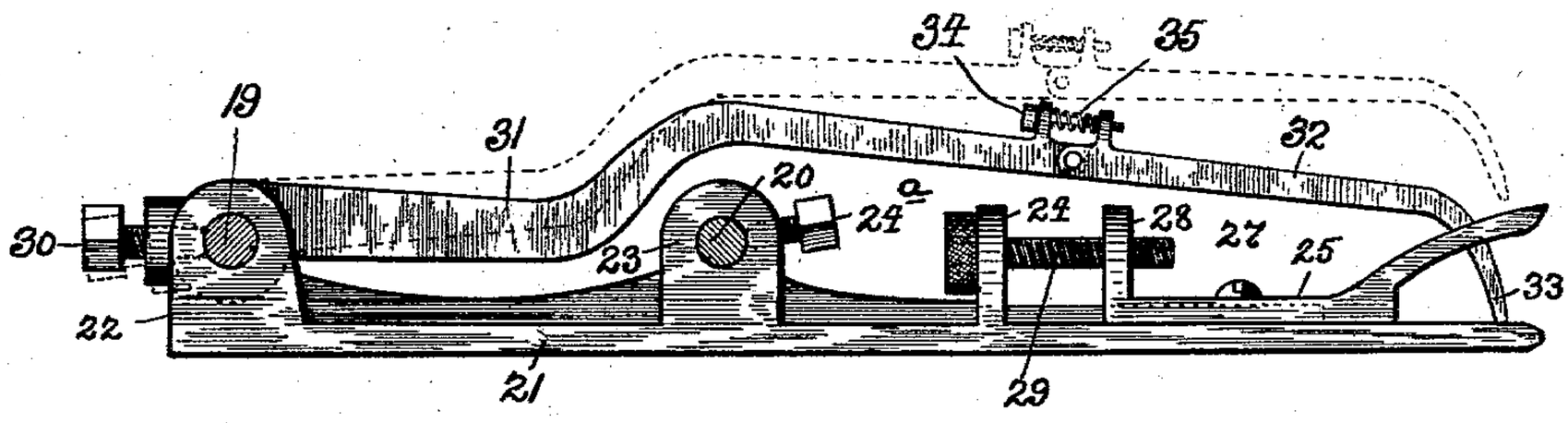

Fig. 8.

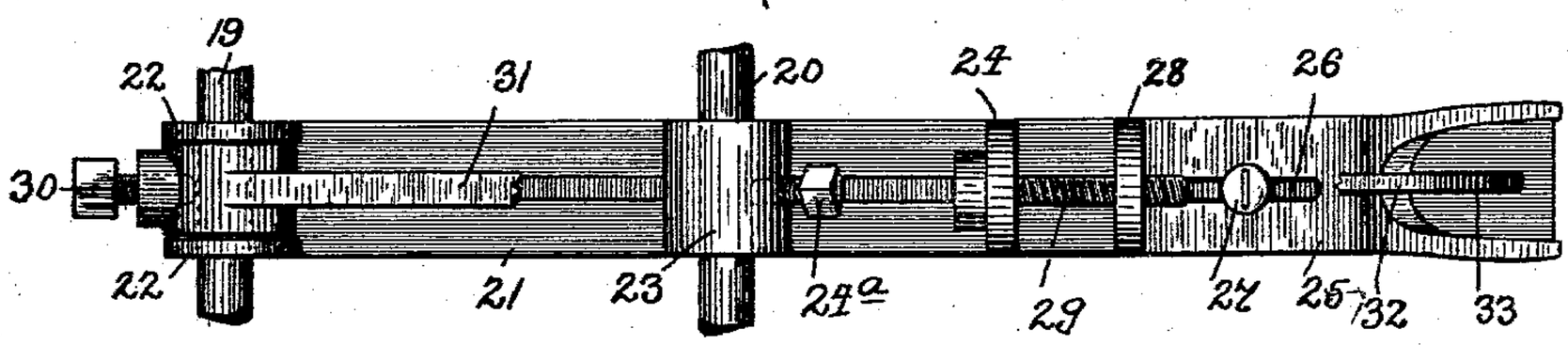

Fig. 9.

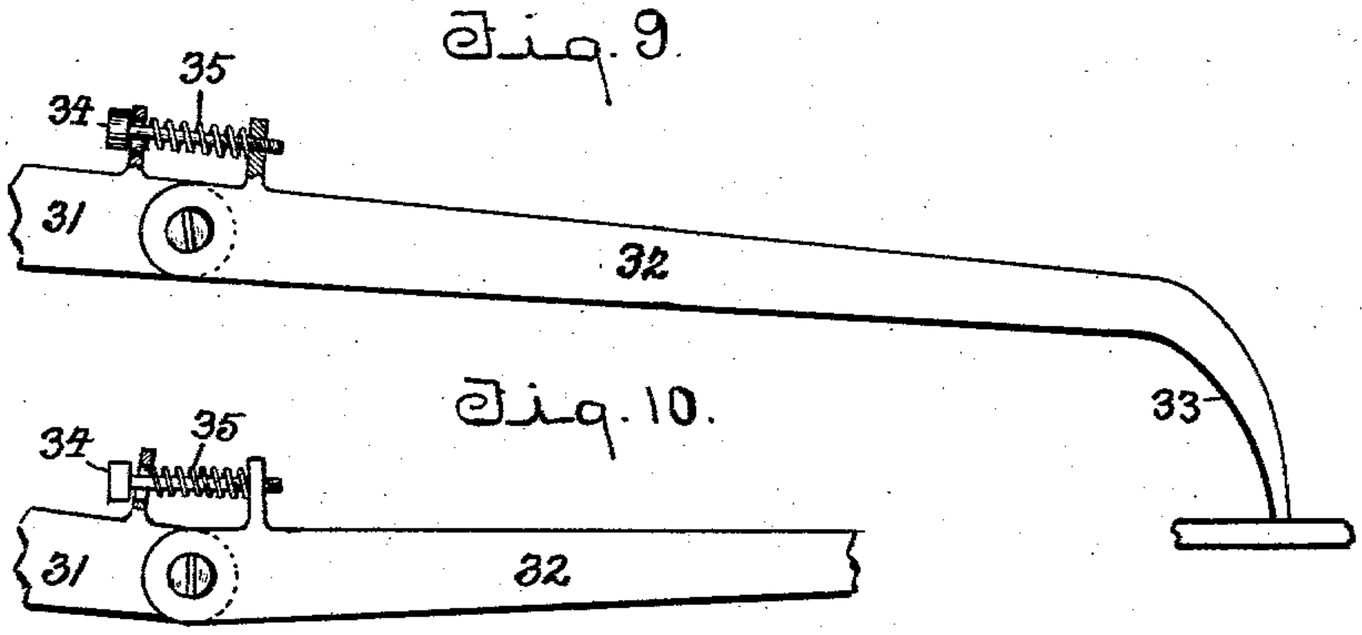

Fig. 10.

Witnesses:

George Altsch

Maggie Altsch

George W. Schock.

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No. 740,593. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

GEORGE W. SCHOCK, OF SOUTH BEND, INDIANA.

PAPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 740,593, dated October 6, 1903.

Application filed October 13, 1902. Serial No. 127,199. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. SCHOCK, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Paper-Folding Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has relation to improvements in paper-folding machines; and the object is to provide a machine of simple construction and efficient in operation wherein the usually-employed tapes are dispensed with and the paper is carried by improved gripping mechanism.

The invention embodies reciprocable carriers, paper-grippers carried thereby, means to open and close the grippers, and means for producing a fold in a sheet of paper and for holding the sheet against lateral displacement or movement when being creased and folded, all as will be hereinafter fully described, and the novelty particularly pointed out and distinctly claimed.

I have fully and clearly illustrated the invention in the annexed drawings, forming a part of this specification, wherein similar reference-notations designate like parts appearing in the several illustrations and reference being had thereto.

Figure 1 is a top plan view of a paper-folding machine wherein are embodied my improvements, the creasing-knife lever or arm being broken away at the middle portion to give full view of the carrier and grippers. Fig. 2 is a side elevation showing the carriage and grippers at the limit of their rear movement and in position to be carried forward. Fig. 3 is a view in side elevation, partly in section, showing the grippers as moved forward with the grippers in position to grip the paper and knife-lever at its upper position. Fig. 4 is a side view, partly in section, showing the grippers moved back and released from the paper and the knife down and in engagement with the paper. Figs. 5 and 6 are enlarged views of the tripping-dog for opening the grippers at their forward movement. Fig. 7 is a detail side view of the grippers closed and the upper position of the movable jaw or arm indicated in dotted lines. Fig. 8 is a top plan view of the grippers, the movable jaw being broken away at the middle portion. Figs. 9 and 10 are detail views showing the means for adjusting the front portion of the movable jaw of the grippers.

It is premised that in the illustrations I have shown only those elements and parts which enter into a machine for making a single fold in a sheet of paper; but it is apparent that if more than one fold is required a duplication of the disclosed constructions will be required.

Making renewed reference to the drawings, 1 2 designate side rails of a suitable supporting-frame whereon are mounted the elements of the mechanism. At the front of the frame is a feed-table 3, provided with clips 4, operating in a well-known manner. Adjacent to the front of the frame are journaled the paper-folding rollers 5 6, made adjustable to and from each other in a well-known manner. The housings or frames which support the rollers are connected by a plate or bar 7, to which are secured the ends of a suitable number of paper-supporting arms or bars 8, duplicates in construction and arranged on the same plane. To the side rails of the frame are secured parallel track-bars 9 10, on which the gripper-carriages are placed and operate. These track-bars are placed at such height as to bring the gripper-carriages at the proper plane to perform their movements relatively without detriment to the mechanism associated therewith.

11 12 designate the gripper-carriages, comprising suitable frames in the ends of which are journaled wheels, as shown, which are adapted to run on the track-bars. The frames of the opposite carriages are connected by a rod 13, the ends of which project beyond the carriages, and have pivotally connected thereto the ends of pitmen 14 15, the other ends of which are pivotally connected to the upper ends of vibrating levers 16 17, the lower ends of which are secured to a rock-shaft 18, as indicated in the drawings.

19 20 designate parallel bars arranged across the machine between the gripper-car-

riages and having their ends suitably secured to the frame-pieces of the carriages, as shown, and by these bars the grippers are carried.

The grippers comprise a relatively rigid jaw and a movable or pivoted jaw. The rigid jaws 21 are formed with duplicate vertical ears 22 at their inner ends and a sleeve 23, which ears have apertures through them to take in the supporting-bars 19 20, as shown, and are secured in any desired position by means of set-screws 24ª through the forward sleeve 23. The rigid jaw, as shown, consists of a plate mounted as stated and formed at a proper point with a vertical ear 24, having a threaded aperture, and at its outer end portion is secured a bracket 25, having a longitudinal slot 26, through which a clamping-screw 27 passes to adjustably secure the bracket to the plate. At the front end the bracket is forked, the limbs of the fork being inclined upward, so as to engage the edge of the sheet and direct downward. At the inner end of the bracket 25 is a vertical ear 28, having a threaded aperture in alinement with the threaded aperture in the ear 24, and in these apertures is an adjusting-screw 29, whereby the bracket may be adjusted as desired.

Between the ears at the inner end of the rigid jaw and on the bar 19 is mounted the movable jaw of the grippers, secured to the bar 19 by a set-screw 30, so as to be oscillated by the bar which constitutes a rock-shaft for the grippers. The movable jaw consists of a rear member 31, formed with a hub mounted on the bar 19, as stated, and an outer member 32, jointed to the rear member and curved downward at its free end, as at 33, to engage on the end of the plate between the fork of the bracket, as seen in the drawings. The part 32 is held yieldingly adjustable by means of a screw 34, let through ears adjacent to the joint, and a spring 35 on the body of the screw between the ears.

On a rock-shaft 36, mounted at the inner end of the machine and actuated by any suitable connection, is an arm 37, pivotally connected to a bar 38, carried on pivoted links 39, and at the determined point on the bar is adjustably mounted a trip-piece 40, which when raised engages a trip-arm 41, rigid on the bar 19, and thereby rocks the bar, and that in turn lifts the movable jaws from their engagement with the paper.

On the bar 19 is rigidly mounted a trip-arm 42, having its upper end portion turned into an inclined horizontal position, so that when the carriage is moved forward, as indicated in the drawings, the arm will pass under a trip 43 and lift the movable jaws to receive the paper. The arm 42 is connected to a contractile spring 44, which at all times tends to turn the shaft 19 on its axis to keep the movable jaws of the grippers in contact with the rigid jaws.

On the rock-shaft 36 is mounted a bar 45, reaching forward centrally over the machine formed with diverging arms at its free end, whereon is carried a creasing-knife 46, formed or provided with downward-extending pins 47, which when the knife is at its lower limit of movement pass through the paper and hold it from lateral displacement.

The functions of the respective parts and elements have been mentioned in connection with the description; but the operation may be stated as follows: First, it is apparent the respective elements must be relatively arranged and timed to perform their function at the time and place prescribed. Now the mechanism being in position indicated in Fig. 3, the paper is fed to the grippers, which stand open ready to grip it. Then as the backward movement of the grippers commences they engage the paper and carry it with them until they reach the position indicated in Fig. 4, where the trip-lug rises and opens the grippers. The knife now in sequence descends, carrying the paper into the bite of the rollers, and the fold is completed.

It will thus be perceived that the machine accomplishes the fold without the aid or presence of tapes usually employed.

Having thus described my invention, what I claim is—

1. In a folding-machine, the combination of reciprocable carriages, a cross-bar and a rock-bar connecting the carriages, a relatively fixed gripper member carried by the two bars, a swinging gripper member rigidly mounted upon the rock-bar, reverse trip-arms carried by the rock-bar, and opposite trip members in the paths of the respective trip-arms to oscillate the rock-bar thereby separating the gripper members.

2. In a folding-machine, the combination with a frame, of opposite tracks, carriages traveling upon the tracks, a rigid cross-bar and a rock-bar connecting the carriages, means for reciprocating the carriages, a lower rigid gripper member carried by the two bars, an upper swinging gripper member rigidly carried by the rock-bar, reverse trip-arms carried by the rock-bar, a front trip in the forward path of one trip-arm, a rear trip adjustable longitudinally of the path of the other trip-arm, and means for automatically bringing the rear trip into the path of said other trip-arm.

3. In a folding-machine, the combination of a reciprocable gripper having a pivotal gripper member, reverse trip-arms for the pivotal member, a front trip in the forward path of one trip-arm, a rear trip adjustable longitudinally of the path of the other arm, and means for bringing the rear trip into the path of the rearward travel of said other trip-arm.

4. In a folding-machine, the combination of a reciprocable gripper having a pivotal gripper member, reverse trip-arms for the pivotal gripper member, a front trip in the forward path of one of the trip-arms, a laterally-movable bar substantially parallel with the path

of the other trip-arm, a rear trip member adjustable longitudinally upon the bar, and means for automatically moving the bar laterally to bring the trip thereon into the path of the said other trip-arm.

5. A gripper for folding-machines, embodying a member having a slotted forked bracket adjustable thereon, an adjustable fastening piercing the slot and engaging the gripper member, an adjusting-screw carried by the member and engaging the bracket, and a pivotal member having its free end working between the arms of the forked bracket.

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

GEO. W. SCHOCK.

Witnesses:
GEORGE OLTSCH,
MAGGIE OLTSCH.