(Model.)

2 Sheets—Sheet 1

J. LETZKUS.

Machine for Bending Truck Bars.

No. 241,228. **Patented May 10, 1881.**

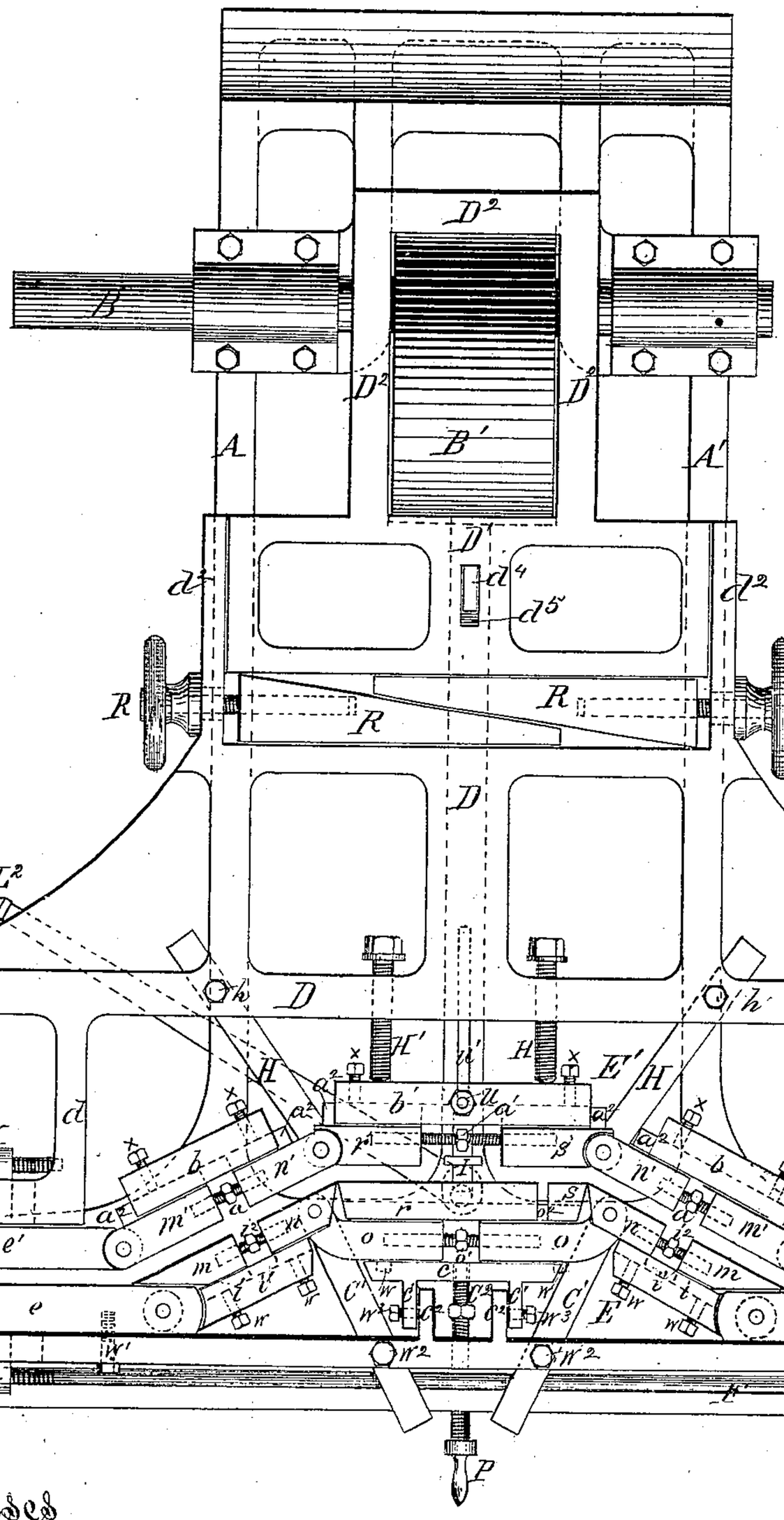

Fig. 1.

Witnesses
C. L. Parker
R. F. Whidden

Inventor John Letzkus
By Attorney George A. Christy

(Model.) 2 Sheets—Sheet 2.

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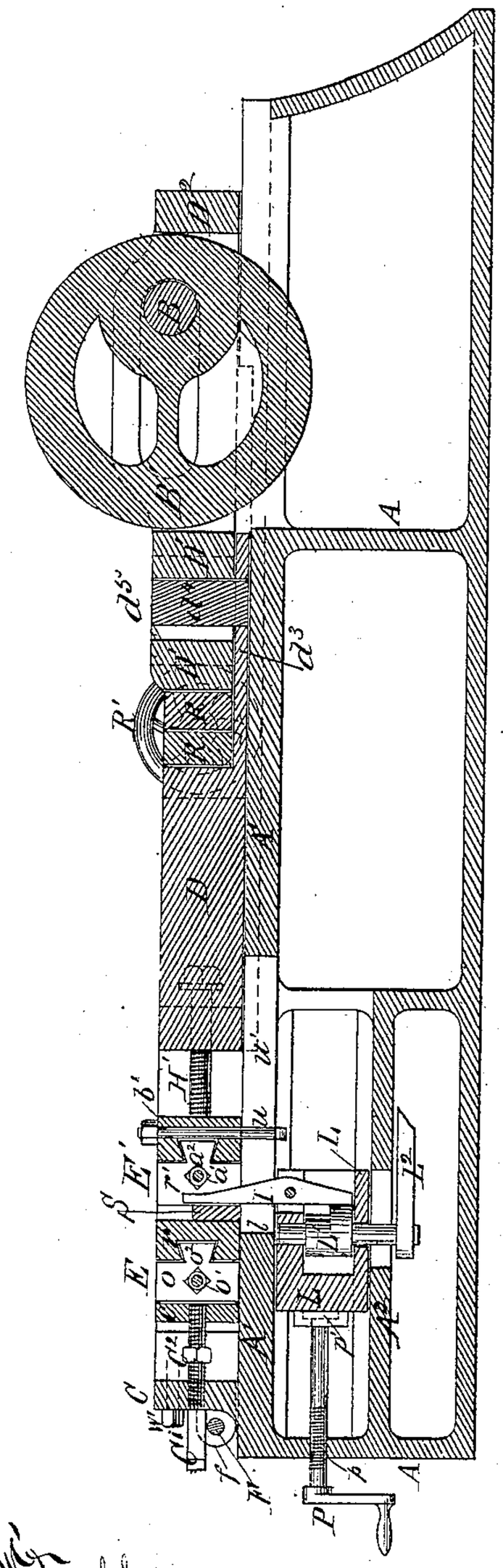

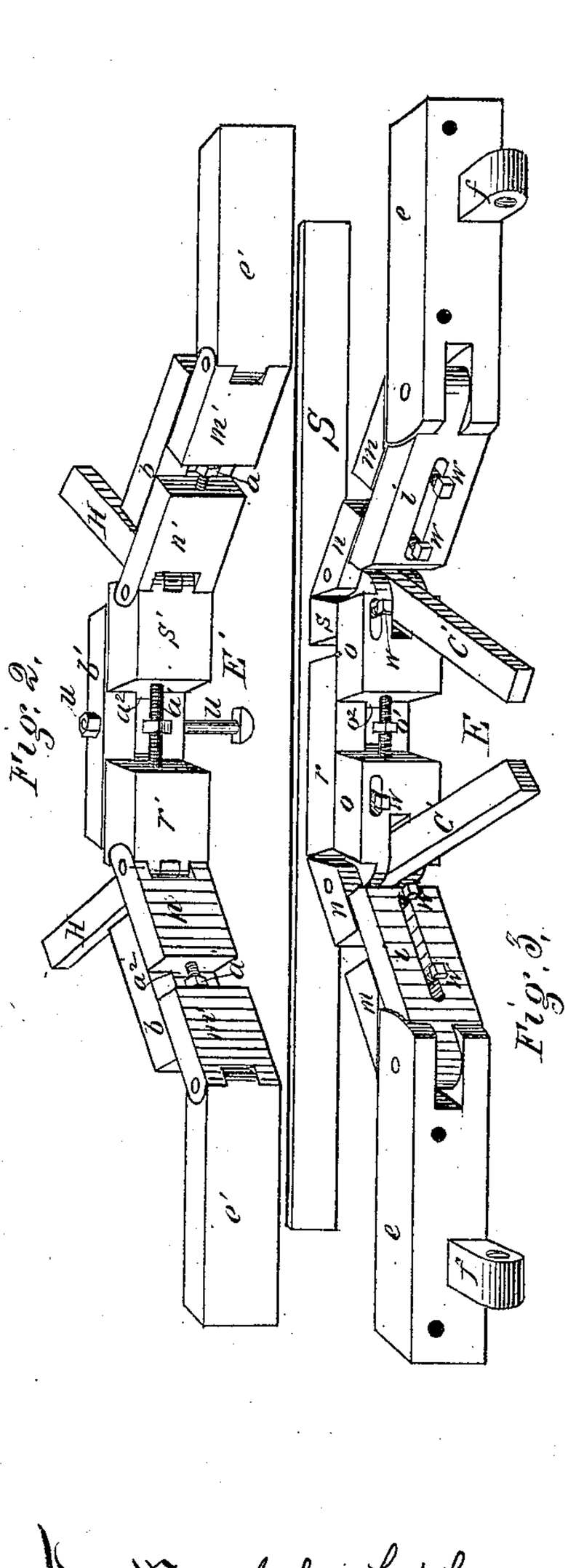

Fig. 2.

Fig. 3.

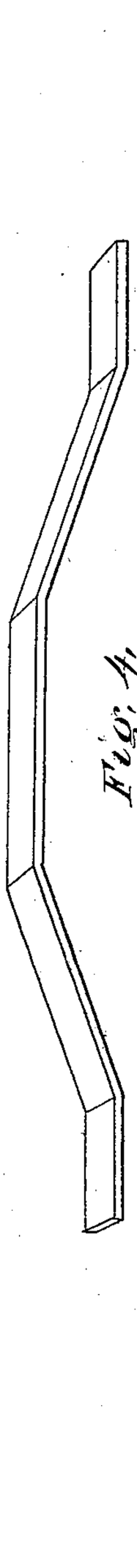

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN LETZKUS, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND EDWARD A. LETZKUS, OF SAME PLACE.

MACHINE FOR BENDING TRUCK-BARS.

SPECIFICATION forming part of Letters Patent No. 241,228, dated May 10, 1881.

Application filed October 25, 1880. (Model.)

To all whom it may concern:

Be it known that I, JOHN LETZKUS, of Allegheny, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Machines for Bending Truck-Bars; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1, Sheet 1, is a top-plan view of my improved bending-machine. Fig. 2, Sheet 2, shows a longitudinal vertical central section of the same. Fig. 3 is a detached view, in perspective, drawn to an enlarged scale, of the jointed adjustable bending-forms employed in my machine, and Fig. 4 is a perspective view of a truck-bar as bent or formed by my improved machine.

In order to meet the demands of railway-car construction and repair, truck-bars are required having considerable range of variation in length, height, and angle of bend, corresponding to the various forms, sizes, and kinds of truck-frames in use.

As heretofore made, a separate set of bending-forms have been required for each separate form or size of truck-bar. These forms have been made of heavy castings, and the necessity for a considerable number of them, in order to meet the requirements of use, has rendered these machines very expensive.

The purpose of my invention is to provide adjustable bending-forms in a machine adapted to this class of work, so that one set of forms can readily be adjusted to bend bars in different heights, lengths, and angles, within the range required by ordinary use.

My invention also relates to improved means for holding the blank in place between or within the forms, and in improved means for operating the movable form.

My improved machine is constructed as follows:

On a suitable frame, A, is supported a horizontal bed or table, A′. Across one end of the frame is journaled a drawing-shaft, B, and across the other end a raised block or barrier, C, is firmly secured to or cast upon the upper face of the table. This barrier forms a rest or support against which the bending-forms are pressed in the operation of bending. It should therefore be made strong, and, for convenience, I make its inner face straight and vertical, as shown in section, Fig. 2. A sliding frame or block, D D′, is also arranged to work in suitable ways on the upper face of table A′, and reciprocating motion is given to it by a cam-wheel, B′, or an equivalent crank on the driving-shaft. As shown, a rear projection, D^2, from the sliding frame incloses the cam-wheel and forms a yoke against which the wheel operates. The construction of this sliding frame will presently be described more in detail.

Between the adjacent edges or faces of this slide and of the barrier C are arranged the bending-forms, consisting of a rest or stationary form, E, and a movable form, E′.

I will first describe the construction and arrangement of the rest-form E. It consists of a series or number of expansible sections jointed and secured together as follows: The two end sections, *e e*, are arranged to bear against the inner face of barrier C, and each is connected by a knuckle-joint to a block or back section, *i*. Both of these back pieces *i* are grooved on their front or face edges, which grooves receive the tongues *i′* of two face-sections, *m n*. The two parts of each face-section are connected by a right-and-left screw, i^2, the ends of which work in nuts set in the adjacent ends of these parts, so that by turning the screw the two parts may be drawn together or forced apart, and thereby lengthen or shorten the length of the section as a whole. Both parts or pieces, *m* and *n*, are bound to the back by means of binding-screws *w*, which pass through slots in the back *i*, of proper length to give the desired range of slide to the parts *m* and *n*. The end of the piece *m* adjacent to the section *e* is mitered or beveled and laps onto the face edge of *e*, so as to form a smooth and practically continuous wall at the angle, and in adjusting the length and angle of inclination of these sections the point of *m* is brought against the face of *e*, and then the two parts are bound to the backs *i* by the set-screws.

The inner ends of the parts *n* are connected by knuckle-joints to the outer ends of a two-

part center back, *o o*, the parts of which are connected by a right-and-left screw, *o'*, for extending or shortening the back. On the face edge of the two parts of this back are tongues o^2, on which slide the grooved parts *r s* of the central section of this former. The outer ends of these pieces *r s* are beveled or mitered, as are also the adjacent ends of the pieces *n n;* and when the desired length of this central section is determined by adjusting the screw *o'* the two pieces *r* and *s* are set so that their outer points shall come close to the points of *n n* when that section is set at the desired angle, and thereby make practically continuous walls at these angles, as shown. When thus adjusted the parts of this central section are bound together by binding-screws *w*. This combination of parts in the former renders the sections adjustable both in length and position—that is, the central section may be placed at any desired distance from the line of the end sections, within certain limits, the intermediate sections, *m n*, varying their inclination with the change of position of the center, and also the end sections, *e e*, moving from or toward each other with such change. In order to effect this change of angle and position readily and accurately, I extend tapped lugs *f f*, Fig. 4, back through slots in the barrier C, through which works a right-and-left screw-rod, F, operated by a crank, F'. The binding-screws *w'* being loosened, the end sections may be moved toward or from each other by turning this screw-shaft, and with such movement the intermediate sections of the former will be shifted for bending a bar of greater or less height. In connection with this change the face-pieces of the several intermediate sections should be properly adjusted to make tight angles, as described, and also the screws i^2 and *o'* be adjusted to give the desired length of sections. This being done, and the desired shape or form given to the working face of the former, the several parts are bound rigidly by the binding-screws *w w'*.

In order to give the former the requisite rigidity and relieve the screws *w'* from strain, I make use of braces C' C', which are pivoted at their inner ends in the joints at the two ends of the central section, and extending backward are secured rigidly in mortises in the barrier C by binding screws or bolts w^2; also, as a further support to the central section, a rest-bar, *c*, is arranged to bear against the rear edge of back *o o*. This rest is guided by lapping lugs or arms *c' c²*, and it may be bound by screws w^3, though in order to secure strength and accuracy of adjustment, I make use of a screw, C^2, for operating and holding the rest.

The movable former E' is made as follows:

Two outer end sections, *e'*, are connected by knuckle-joints with the parts *m'* of the two intermediate inclined sections *m' n'*, and the parts *n'* are connected in like manner with the respective adjacent ends of the central section, *r' s'*. These intermediate sections are each made in two parts and connected by a right-and-left screw, *a a* and *a'*, whereby the length of each section can be adjusted. Tongues a^2 are made on the backs of the several pieces of these sections, which slide in grooves made in the respective backs *b b* and *b'*, and binding-screws *x x* serve to bind together the several parts of the separate sections when the desired lengths have been secured. The end sections, *e'*, of this former bear against the front edge of extensions *d*, which project forward from the body of slide, D, at either end. The intermediate sections occupy the space between these projections *d* and in front of the body D of the slide. They are supported by braces H H, which are pivoted in the joints at the ends of the central section, and at their rear ends they are bound by screws *h* to the slide. The central section is also supported by screws H' H', which work through the front rail or bar of D and bear against the back *b'*. The end sections *e' e'* are moved in line toward and from each other, and a corresponding change in inclination and position is given to the intermediate sections by means of tappet-lugs K, which extend backward from *e' e'* through slots in the front bar of extensions *d d* and screw-rods *k*, operated by cranks *k'*.

In order to prevent the central section of former E' from springing up from the table a T-bolt, *u*, is passed through it and through a slot, *u'*, in the bed or table A'.

It is desirable that the final forward movement of the former E', at and near the completion of the bending operation, should be given with great power—much greater than is required in the first part of the bending—in order that the blank may be set full into the angles and the several parts of the bar be made true and straight. This result I secure by the following means: The sliding frame D D' is made in two parts. From the front part, D, two edge bars, d^2 d^2, Fig. 1, and a bottom plate or tongue, d^3, Fig. 2, extend back toward the driving-shaft, forming between and upon them a way or box, in which the front part of the part D' rests, and within which it has a small range of motion. The two parts are connected by a stud, d^4, which extends upward from the plate d^3 through a short slot, d^5, in the part D'.

Between the adjacent edges of the parts D D' are arranged wedges R R, the points of which lap past each other, and their width and adjustment are such that when withdrawn or separated the stud b^4 is at or against the rear edge of slot d^5. Then, as the wedges are forced together by screws R', the part D will be moved forward a little distance with great power, sufficient to complete the bending operation, as desired.

It will be observed that the forward movement in the first part of the bending operation is imparted by the cam B', which may be done quickly and easily. When the cam reaches the limit of its forward throw it acts as a support or stop to prevent backward movement of the

part D′ of the slide, and thereby causes the wedges R to move the part D forward still farther and with much greater power, as before described. This arrangement affords increased economy, as the greater power is brought into use only during that part of the operation when it is required.

The wedges R may be operated either by hand or by machinery, and power may be applied in any convenient way to drive the shaft B.

The relative positions of the two formers and of the blank S at the beginning of the bending operation are illustrated in Fig. 4.

In order to keep the blank from being displaced, and to keep its center firmly against the middle section, *r s*, of the stationary former E, I employ a binding-lever, I, which is pivoted in a frame, L, below the table and extends upward through a slot, *l*, in the table, into the space between the central sections of the two formers. Within the frame L is also journaled a cam-shaft, L′, the cam of which is arranged to bear against the lower end of lever I, and by its movement and pressure to clamp and lock the lever against the blank S, and thereby hold it against *r s*. The cam L′ is operated by a hand-lever, L^2, which extends outward to a convenient position for the workman. In order to make this clamping-lever I adjustable to the different positions of the former E, I arrange its supporting-frame L to slide back and forth between the table A′ and a shaft or plate, A^2, and the frame is moved to and held in the desired position by means of a hand-screw, P, which works through a threaded nut, *p*, in the end of the frame A, and its inner end is swiveled to the sliding block or support L, as at *p′*.

From the foregoing description the operation of this machine will be readily understood by those skilled in the class of work to which it relates.

As hereinbefore described, the forms E and E′ can be adjusted to bend bars of different lengths, heights, shapes, or by adjusting them in straight lines the machine can be used for straightening bars or rods, though the principal purpose of the machine is for bending truck-bars, as before stated.

While I prefer to use both of the adjustable and extensible forms, E and E′, herein described, yet it is obvious that either one may be used with a counter-form of the ordinary or any suitable construction, and though such use would not secure all the advantages secured by using both forms, as I have described, yet I consider it as coming within my invention.

I claim herein as my invention—

1. In a machine for bending truck-bars, two bending-forms, one at least of which consists of a series of sections connected by joints, the intermediate sections being extensible in length, as described, in combination with suitable mechanism for moving the end sections in line toward and from each other, and with adjustable rests or braces for supporting the intermediate sections from the back, substantially as described.

2. As a form for bending and shaping the upper surface of truck-bars, the combination of end sections, *e′ e′*, the two-part inclined sections *m′ n′*, with connecting-screws *a a*, sliding backs *b b*, and means for binding the back and face parts at the desired point, the central two-part section, *r′ s′*, with connecting-screw *a′*, sliding back *b′*, and means for bending such back and face parts, the several face-sections being jointed together at their adjacent ends, substantially as and for the purposes described.

3. As a form for bending and shaping the under surface of truck-bars, the combination of two end sections, *e e*, back pieces, *i i*, jointed at one end to the end sections, the two-part face-pieces *m n*, and connecting-screws i^2, arranged to slide upon the backs *i i*, and form extensible inclined sections, as described, the two-part back *o o*, screw *o′*, and sliding face-pieces *r s*, forming an extensible center section, as described, the outer ends of the back being jointed to the face-pieces *n*, and the face-pieces *r s*, *n* and *m*, having mitered ends for lapping onto or against the adjacent section, and forming thereby smooth angle-walls, substantially as described.

4. In combination with the bending-forms E E′, the clamping-lever I, sliding support L, the lever being pivoted to the support, governing-screw P, cam-shaft L′, and suitable mechanism for operating such shaft, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand.

JOHN LETZKUS.

Witnesses:
R. H. WHITTLESEY,
C. L. PARKER.