

(No Model.)

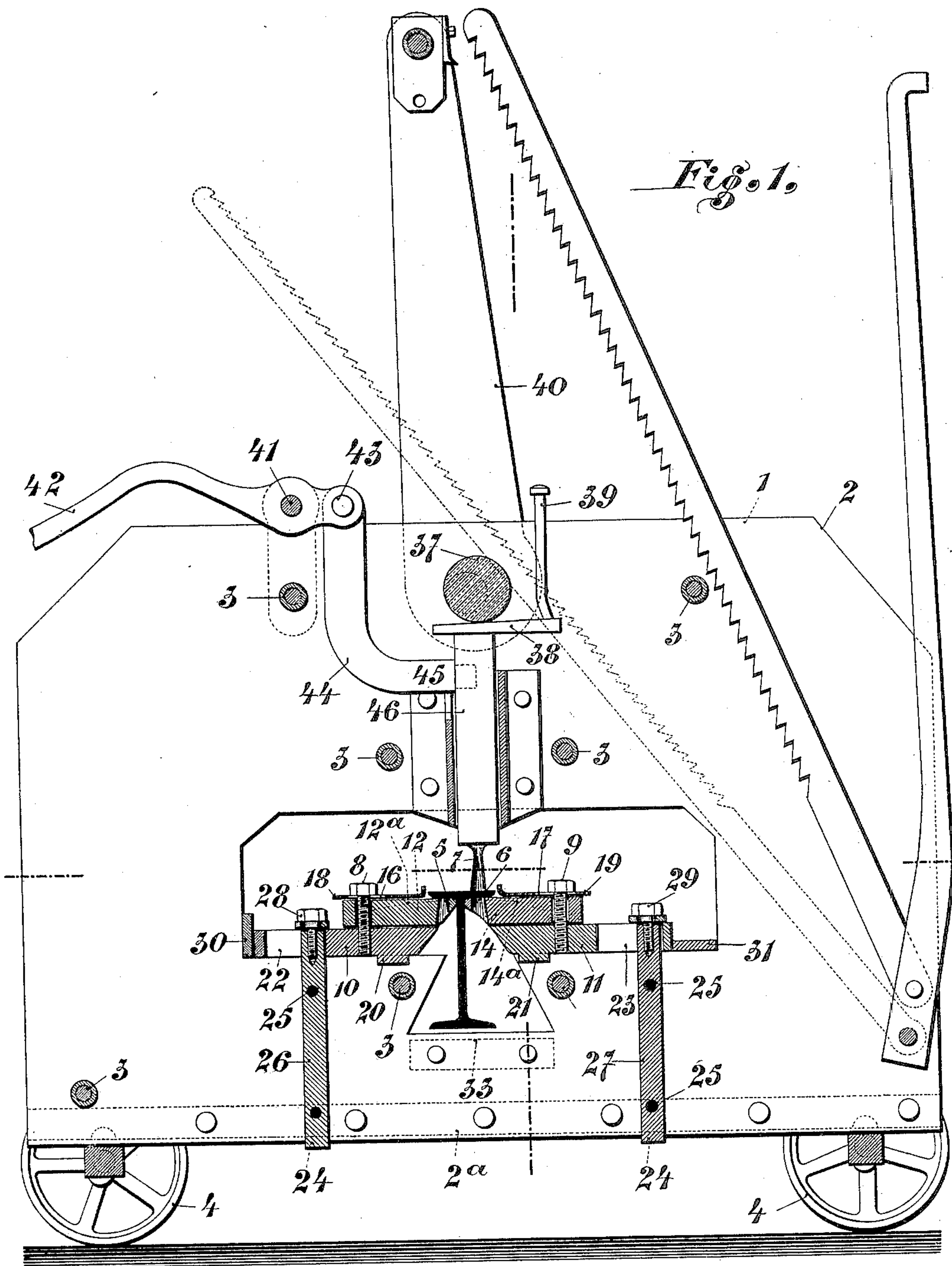
2 Sheets—Sheet 1.

W. WERNER.

MACHINE FOR MAKING HOLES IN BARS OR GIRDERS.

No. 599,276.

Patented Feb. 15, 1898.



Witnesses

W. B. Steyer
Vinton Cosmbs

Inventor

Wilhelm Werner

By

James L. Norris
Att'y

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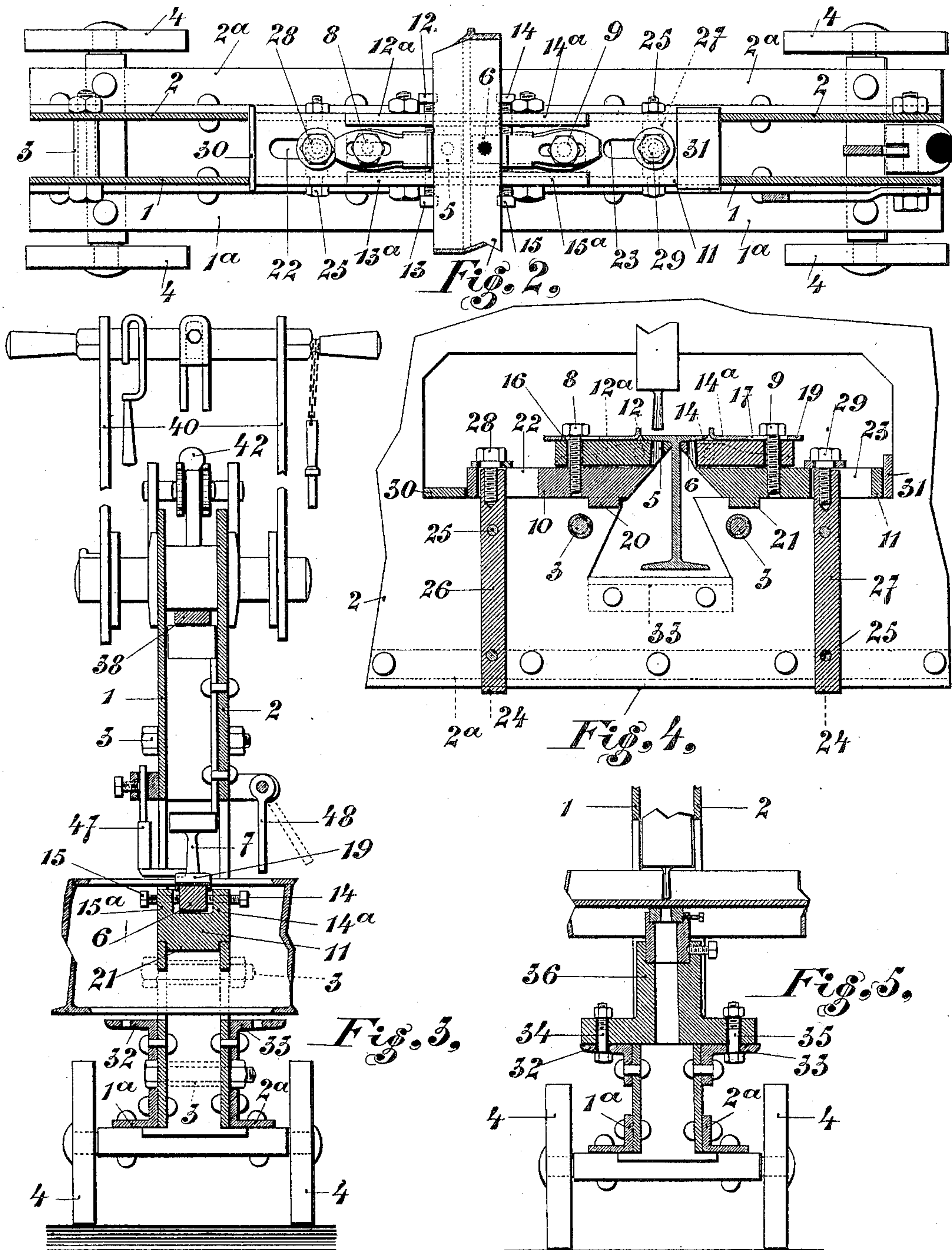
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MACHINE FOR MAKING HOLES IN BARS OR GIRDERS.

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UNITED STATES PATENT OFFICE.

WILHELM WERNER, OF ERFURT, GERMANY, ASSIGNOR TO HUGO JOHN, OF
SAME PLACE.

MACHINE FOR MAKING HOLES IN BARS OR GIRDERS.

SPECIFICATION forming part of Letters Patent No. 599,276, dated February 15, 1898.

Application filed August 16, 1897. Serial No. 648,445. (No model.)

To all whom it may concern:

Be it known that I, WILHELM WERNER, gentleman, a subject of the King of Prussia, residing at Erfurt, in the Kingdom of Prussia and German Empire, have invented new and useful Improvements in Machinery for Making Holes in Bars or Girders, of which the following is a specification.

My invention relates to apparatus by which the flanges of bars or girders (hereinafter called "girders") can be punched with holes at all desired points, the arrangement being such that the webs of the girders may also be punched in the way usual heretofore.

The new apparatus consists, essentially, of two matrices, which are arranged to be movable and adjustable horizontally with relation to each other and which receive between them and guide the web of the bar to be punched, so that the flanges of said bar lie upon the matrices, one of which always corresponds with the punch. If the right flange of the girder is to be punched, the right matrix is pushed and fixed under the punch, and if the left flange is to be punched then the left matrix will in like manner be moved and fixed under the punch. This shifting of the matrices is effected by simply loosening screw-studs, moving the matrix-sliding carriages horizontally, and again fastening the whole device by means of screw-studs.

Figure 1 of the annexed drawings illustrates a longitudinal section through a hole-punching machine constructed according to this invention. Fig. 2 is a horizontal section taken immediately beneath the punch; and Fig. 3 is a cross-section of the same, taken through the matrix 6. Fig. 4 is a longitudinal sectional view illustrating the parts in position for punching the left flange of a girder. Fig. 5 is a cross-sectional view illustrating the machine adapted for punching the web of the girder.

1 and 2 are plates connected together by means of stay-bolts 3 and resting on the wheels 4. In the center of said plates is a T-shaped opening for the passage of the girders, the plates receiving in this opening between them the matrices 5 and 6, which are mounted on sliding carriages 10 and 11.

The top of each of these matrices is beveled at its free end (through such beveled part being formed a hole for the passage of the punch 7) to correspond with the inclination of the inner surface of the girder-flanges, (about fourteen per cent. in the case of standard sections,) so that the girder will have a firm bearing and will not tip during the punching operation.

The matrices 5 and 6 are adjustably fixed by means of screw-studs 8 and 9 on their sliding carriages 10 and 11, so that the matrices can move on the carriages when the screw-studs 8 and 9 have been loosened. By this means the fitting of the punch 7 in the matrix-holes is facilitated, the adjustment of the matrices being effected by means of laterally-arranged screw-studs 12 and 13 and 14 and 15, respectively. These screws are fitted in threaded apertures in the upwardly-directed cheeks 12^a 13^a and 14^a 15^a, respectively, of the carriages 10 and 11, said cheeks receiving the matrices 5 and 6 between them. The screw-studs 8 and 9 also serve to guide the stop-plates 18 and 19, which are provided with longitudinal slots 16 and 17 and are situated on the outer parts of the matrices. The said plates are capable of being adjusted in the longitudinal direction and have the office of guiding the girder to be punched.

The carriages 10 and 11, mounted between the plates 1 and 2, are provided, for the purpose of better guidance and for preventing lateral movement, with downwardly-directed shoulders 20 and 21 and also with longitudinal slots 22 and 23. Through these longitudinal slots extend cross-pieces 26 and 27, which bear at their lower part with their shoulders 24 against the plates 1 and 2 or their angle-bars 1^a and 2^a and are fastened between the plates 1 and 2 by means of cross-bolts 25. These cross-pieces receive at their upper ends the screw-studs 28 and 29, which serve for the attachment of the carriages 10 and 11. In order to further insure the carriages against longitudinal movement, there are arranged laterally between these and the plates 1 and 2 distance-pieces 30 and 31, which are placed flat or on edge, according as the right-hand or the left-hand flange of a girder

is to be punched. Thus, for example, in Fig. 1, where the right-hand flange of an I-girder is to be punched, the left-hand distance-piece 30 is placed on edge, while the right-hand piece 31 is placed flat; but in Fig. 4, where the left-hand flange of an I-girder is to be punched, the left-hand distance-piece 30 is flat, while the right-hand piece is placed on edge.

Fig. 5 is a partial cross-section through my new hole-punching machine, showing how the webs of the girder are to be punched. For this purpose there are riveted to the lowermost end of the opening or T-shaped aperture in the plates 1 and 2 the outwardly-projecting angle-pieces 32 and 33, in the horizontally-situated legs of which there are holes which allow of fixing the cylindrical matrix 36 by means of screw-bolts 34 and 35. In this case the carriages 10 and 11 must be removed with the matrices 5 and 6, after loosening the screw-studs 8 9 and 28 29, together with the distance-pieces 30 and 31.

Between the steel support 46, that carries the punch 7, and the eccentric 37 there is inserted each time before the punching operation the wedge 38, which has a shank or handle 39, which wedge is removed again after the punching.

The raising of the punch 7 after the punching operation and after the return of the eccentric-lever 40 into the position of rest is effected by means of a two-armed lever 42, which is pivoted at 41 between the plates 1 and 2, said lever 42 being movably connected or pivoted at 43 to a downwardly-leading angle-piece 44. This angle-piece 44 engages with its free end 45 in an opening in the support 46 and raises the latter when the handle 42 is depressed, the arrangement being such that strippers 47 and 48, Fig. 3, prevent the punched girder from rising up as well.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a machine for punching girders, the combination with the frame comprising the parallel plates 1 and 2 provided with T-shaped apertures registering with each other, of the punch, the sliding carriages 10 and 11 adjustably mounted on the lower walls of the horizontal portions of said apertures in the plates 1 and 2 and between the latter, means for fixing said carriages, matrices 5 and 6 adjustably mounted on the carriages and arranged to support the flanges of the girder to be punched, and means for adjusting the matrices on the carriages and for holding them

in their adjusted positions, substantially as described.

2. In a machine for punching girders, the combination of the frame comprising the parallel plates 1 and 2, the punch, the vertical cross-pieces 26 and 27 bolted to the plates 1 and 2, the sliding carriages 10 and 11 adjustably mounted on the frame and having slots 22 and 23 into which the upper ends of the cross-pieces project to guide the carriages, screw-studs 28 and 29 arranged in the cross-pieces and engaging the carriages to hold the latter in their adjusted positions, matrices 5 and 6 adjustably mounted on the carriages, and screw-studs 8 and 9 carried by the carriages and engaging elongated slots in the matrices for fixing the latter to the carriages, substantially as described.

3. In a machine for punching girders, the combination with the frame comprising the parallel plates 1 and 2 provided with T-shaped apertures registering with each other, of the punch 7, the sliding carriages 10 and 11 adjustably mounted on the horizontal walls of the said apertures in the plates 1 and 2, shoulders 20 and 21 formed on the under side of the carriages and depending between the plates 1 and 2 to guide the carriages in their movements, means for fixing said carriages, matrices 5 and 6 adjustably mounted on the carriages and arranged to support the flanges of the girder to be punched, and means for adjusting the matrices on the carriages and for holding them in their adjusted positions, substantially as described.

4. In a machine for punching girders, the combination with the frame comprising the parallel plates 1 and 2 provided with T-shaped apertures registering with each other, of the punch, the sliding carriages 10 and 11 adjustably mounted on the horizontal walls of the said apertures in the plates 1 and 2, means for fixing said carriages, matrices 5 and 6 adjustably mounted on the carriages and arranged to support the flanges of the girder to be punched, means for adjusting the matrices on the carriages and for holding them in their adjusted positions, and distance-pieces 30 and 31 adapted to be placed flat or edgewise on the horizontal walls of the T-shaped apertures between the ends of the latter and the carriages, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILHELM WERNER.

Witnesses:

MAX MEYER,
FRIEDRICH BECK.