

and bending bars and levers, and a sliding bar operating the spreader and bending bars and levers to press the shafts to the formers, substantially as specified, of a rack on the wedge bar, a shaft I^1 , carrying a pinion r , engaging said rack, and also carrying gear wheels R^1 , R^2 , substantially as and for the purpose specified. 28th. In a shaft bending machine, the combination, with the formers, spreader bars, and bending bars and levers, and a sliding bar operating the spreader and bending bars and levers to press the shaft to the formers, substantially as specified, of a rack on the sliding bar, a shaft R , carrying a pinion r , engaging said rack, and also carrying gear wheels R^1 , R^2 , a shaft carrying a pinion r^1 , and pulley t^1 , a pinion r^2 , engaging the pinion r^1 , and the wheel R^1 , a shaft carrying a pinion t^1 , engaging the wheel R^2 , and also carrying a pulley t^2 , a driving shaft T , carrying pulleys t^2 , t^3 , loose belts S^2 , S^3 , connecting the pulleys t^2 , t^3 , and t^4 , respectively, a sliding bar S^1 , and tighteners, as s^1 , s^2 , on the bar S^1 , for the belts S^2 , S^3 , all arranged for operation substantially as herein set forth. 30th. In a shaft bending machine, the combination, with a segmental rack operating the shaft heel bending device, of a crank arm on the segment shaft, a pulley driving the gearing actuating said segment, a lever, a shaft carrying a cam or eccentric sustaining one end of said lever, a crank arm on the cam shaft, a friction wheel supported by or from said lever and adapted to the driving pulley of the segmental rack, and rod connections from the cam shaft crank arm to the segment shaft crank arm, substantially as described, whereby as the segmental rack is raised to give the heel bend to the shafts the lever friction wheel will be moved toward the rack driving pulley and as the rack is lowered the friction wheel will be moved from the rack driving pulley, as and for the purposes set forth. 31st. In a shaft bending machine, the combination, with a segmental rack operating the shaft heel bending device, of a crank arm on the segment shaft, a pulley driving the gearing actuating said segment, a lever, a shaft carrying a cam or eccentric sustaining the free end of the lever, a crank arm on the cam shaft, rod connections from the cam shaft crank arm to the segment shaft crank arm for raising the lever as the segment is raised, and *vice versa*, a slide on the first named lever, a cam journaled in the slide and bearing on the lever, and a friction wheel on the slide adapted to the driving pulley of the segmental rack, substantially as described, whereby as said rack is raised both lever and slide will be raised to move the slide friction wheel part way to the rack driving pulley and said wheel will be pressed to the pulley by subsequent operation of the slide cam on the lever, and both lever and slide, with the friction wheel, will be carried from the rack driving pulley automatically as the rack is lowered or retracted, as and for the purposes herein set forth. 32nd. In a shaft bending machine, the combination, with the machine bed and frame, of a flexible device bending the heel of the shafts, a segmental rack V^1 , connected to said flexible device for operating it, a crank arm w^2 , on the segment shaft, a lever W^1 , fulcrumed at w^3 , to the machine frame, a shaft w^4 , on the frame, and cam W^2 , on the shaft w^4 , and under the free end of the lever W^1 , a slide W , on the lever W^1 , a friction wheel W^3 , on the lever W^1 , adapted to the driving pulley of the segmental rack, a cam 36 , journaled in the slide W , and bearing on the lever W^1 , a pulley w , revolving with wheel W^3 , a pulley t^3 , on a main driving shaft, and a loose belt T^2 , connecting the pulleys t^3 , w , all arranged for operation, substantially as described, for the purposes set forth. 33rd. In a shaft bending machine, the combination, with the machine bed and frame, bend formers, and devices clamping the shafts to said formers, a shaft, a lever thereon, tappet arms on the shaft, and connections from said arms to the shaft bending bars, formers, and levers for unclamping the bent shafts from the formers, of a driving pulley actuating the heel bend forming device, a slide carrying a friction pulley adapted to said driving pulley, a cam on the friction wheel slide, and a rod connecting the cam with the lever on the shaft carrying the tappet arms, substantially as described, whereby as the tappet arm shaft is rocked by its lever to free the bent shafts from the formers the driving wheel of the shaft bending device will be engaged by the friction wheel on the cam lever for retracting the shaft heel bending device, as herein set forth. 34th. In a shaft-bending machine, the combination, with the machine bed and frame, body, point, and heel formers thereon, of flexible bars and levers pressing the shafts to these formers, a shaft I^1 , provided with arms 6 , 11 , 26 a rod 5 , connecting the arm 6 , with the endwise-movable bending-bars through the arm 4 , segmental rack 3 and block e^1 , to which the bars E are suitably connected, levers B^2 , behind the body-formers, bars B^1 , connecting said levers B^2 with the shaft arms 11 , latches P , holding the bending-bars to the point-formers and adapted for operation by the shaft arms 12 , a lever I , on the shaft I^1 , a segmental rack V^1 , connected to the heel-bending device, a crank arm w^2 , on the segment-shaft, a lever W^1 , fulcrumed at w^3 to the machine-frame, a shaft w^4 , on the frame, a cam W^2 , on the shaft w^4 , and under the free end of the lever W^1 , a slide W , on the lever W^1 , a friction wheel W^3 , on the slide W , adapted to the driving pulley of the segmental rack, a cam 36 , journaled in the slide W , and bearing on the lever W^1 , and a rod W^5 , connecting the cam 36 with the lever I , all arranged for operation, substantially as described, for the purposes set forth. 35th. In a shaft-bending machine, the combination, with a lever sustained at its free end by a cam and carrying a friction-wheel and driving pulley, and the wheel adapted for contact with the driving pulley of the shaft-heel bend-forming devices, substantially as specified, of a driving shaft, a pulley thereon, a loose belt running from said pulley to the pulley of the lever friction wheel, and a tightener for the belt, substantially as herein set forth. 36th. In a shaft-bending machine, the combination, with the heel-bending chain and the segmental rack operating it, of a pin on the outer

box-link of the chain adapted for projection through the wall of said link into an aperture in the strap-box of the heel-clamp, substantially as herein set forth. 37th. In a shaft-bending machine, the combination, with the outer link of the heel-bending chain provided with a stem or projection, and the segmental rack operating said chain and provided with a lug having a slot receiving the stem of the outer chain-link, of a pin fitted to the chain-link and a spring normally forcing the pin outward, substantially as described, whereon the pin will be withdrawn from the strap-box of the heel-clamp on the chain as the chain is raised by the segmental rack, and will be projected to engage the clamp-strap box as the chain is lowered, as and for the purposes set forth. 38th. In a shaft-bending machine, the combination, with the segmental rack V^1 , having a lug V^2 , slotted at v^1 , and the heel-bending chain having an outer link h , provided with a stem h^1 , entering said slot, of a pin Z , fitted to slide on the stem and to be pushed inward by the lug V^2 as the rack and chain are lowered, and a spring normally moving the pin Z outward as the rack and chain are raised, substantially as herein set forth. 39th. In a shaft-bending machine, the combination, with the first-bend formers B , of the presser bars E , so connected to the frame of the machine as to be adjustable closer to or farther from the formers B , to suit different thicknesses of shafts, substantially as and for the purpose specified. 40th. In a shaft-bending machine, the combination, with the first-bend formers B , of the bending bars E , nuts c , block e^1 , right and left hand threaded screw L , operated in any suitable way, substantially as and for the purpose specified. 41st. In a shaft-bending machine, the combination, with the point formers C , of the presser bars G , operated by levers having adjustable arms to regulate the inward throw of the presser bars C , for different thicknesses of shafts, when said levers are operated by the wedge J^2 , substantially as and for the purpose specified. 42nd. In a shaft-bending machine, the combination, with the point formers C , of the presser bars G , operated by levers O , having a lower arm 19 , in two parts, one rigid with the upper arm 18 , and the other engaging with the wedge J^2 , adjustable on it by means of set screw 21 , substantially as and for the purpose specified. 43rd. In a shaft-bending machine, a sliding bar J , having a lug 56 , in combination with a shaft 52 , having stops 57 , substantially as and for the purpose specified. 44th. In a shaft-bending machine, a sliding bar J , having a lug 56 , in combination with a shaft 52 , stops 57 , and spring stop 59 , substantially as and for the purpose specified. 45th. In a shaft-bending machine, a sliding bar J , in combination with spring stop 59 , rod 61 , tappet arm 60 , and shaft T , substantially as and for the purpose specified. 46th. In a shaft-bending machine, the segmental rack V , arranged to press a brake 3 , against the pulley t^2 , substantially as and for the purpose specified. 47th. In a shaft-bending machine, the combination, with the segmental rack V^1 , having an adjustable lug 31 , thereon, of an arm 32 , shaft 33 , arm 34 , and ratchet brake 35 , substantially as and for the purpose specified. 48th. In a shaft-bending machine, a latch 40 , pivoted on the segmental rack, V^1 , in combination with machine bed A , substantially as and for the purpose specified. 49th. In a shaft-bending machine, a latch 40 , pivoted on the segmental rack V^1 , in combination with machine bed A , crank-shaft 42 , connected by a rod to arm 44 , shaft t^2 , and foot lever T^2 , substantially as and for the purpose specified. 50th. In a shaft-bending machine, the combination, with a heel-bending device, of a former D , hung from a movable block whose vertical movement is limited by an adjustable stop to allow shafts of different thicknesses to be bent, substantially as and for the purpose specified. 51st. In a shaft-bending machine, the shaft-releasing rods 67 , suitably supported in the frame of the machine, combined with suitable means to give them vertical motion, substantially as and for the purpose specified. 52nd. In a shaft-bending machine, the rods 67 , and cross-head 68 , in combination with pivoted lever 69 , and springs 70 , substantially as and for the purpose specified. 53rd. In a shaft-bending machine, a heel-bending chain, the joint between the outer two links of which is stiffened by a spring, substantially as and for the purpose specified. 54th. In a shaft-bending machine, the shipper bar S , having a lug formed thereon, in combination with a shaft fast to the frame of the machine, carrying springs bearing on the said lug, and designed to keep the bar S in a normal position, substantially as and for the purpose specified. 55th. In a shaft-bending machine, the heel-bending chain H , its outer link provided with a stem h^1 , in combination with lug V^2 and segmental rack V^1 , the said stem h^1 , being provided with a spring 39 , so arranged as to tend to keep the stem h^1 and lug U^2 in a normal position as regards one another, substantially as and for the purpose specified. 56th. In a shaft-bending machine, the combination, with a heel-bending device, of a trough 82 , fitted to the bed of the machine, and an adjustable block 64 , substantially as and for the purpose specified.

No. 36,528. Cravat. (*Cravate*.)

James Alexander Sword, Toronto, Ontario, Canada, 4th May, 1891, 5 years.

Claim.—As an improved article of manufacture, a flat cravat made in two pieces and provided with means for detachably connecting them together.

No. 36,529. Knee for Sleighs.

(*Courbe de traineau*.)

Seth C. Doane, Englewood, Illinois, U.S.A., 4th May, 1891, 5 years.

Claim.—1st. The combination, with the runner A , and beam D , of the socket B , having flanges a , and provided with the spherical cavity b , the knee C having flanges c , d , and the bolts f , substantially as specified. 2nd. The combination, with the runner A , and beam D of the socket B , having flanges a , and provided with the spherical cavity b , the knee C having a spherical end, the bolts f , the bolts e , and the rave E , substantially as specified.

No. 36,530. Heater for Sad Irons.

(*Poêle de chauffage des fers à repasser*.)

James Gage Bailey, New Glasgow, Nova Scotia, Canada, 4th May, 1891, 5 years.