

No. 687,056.

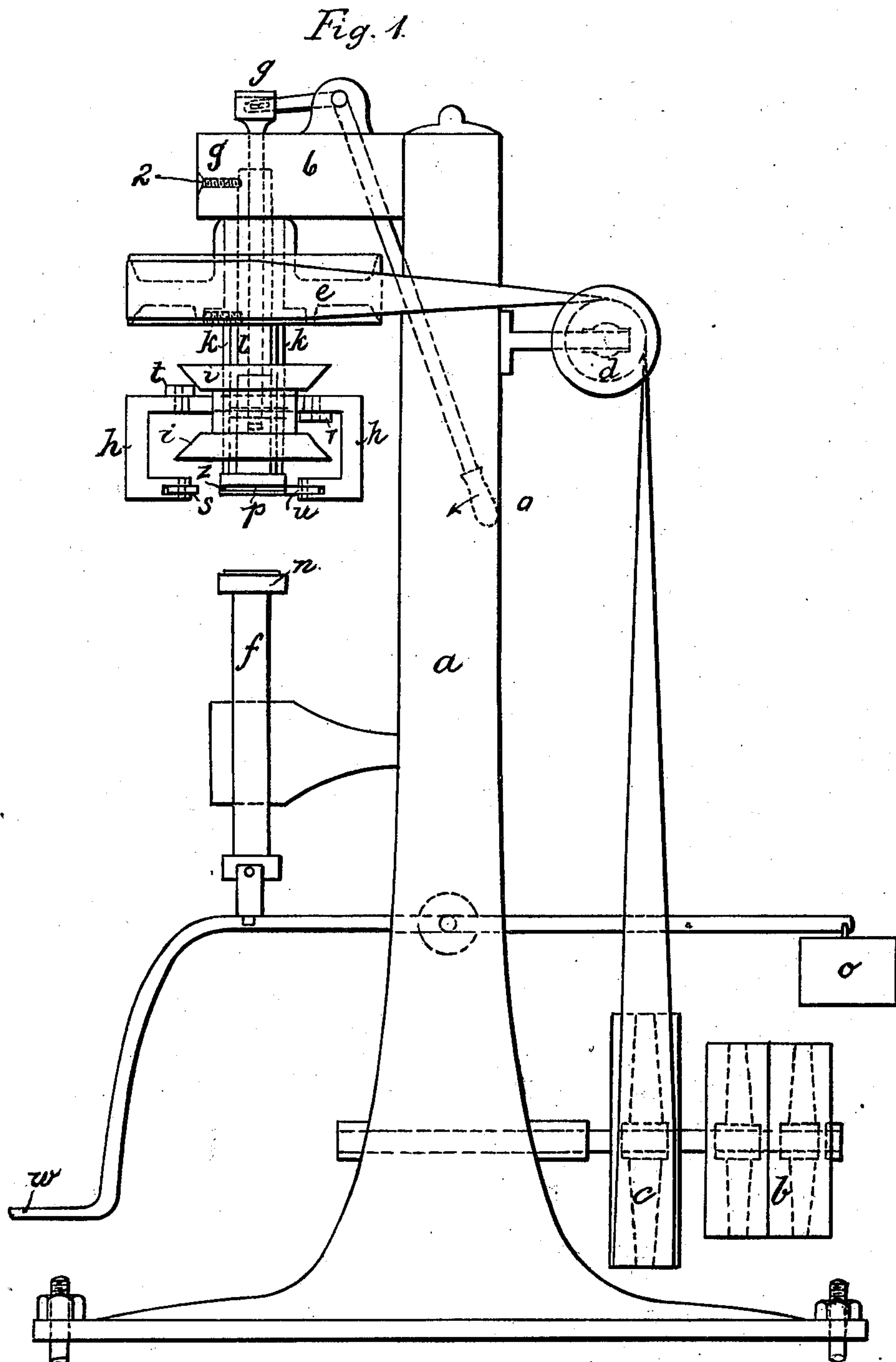
Patented Nov. 19, 1901.

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FOLDING MACHINE FOR TIN BOXES.

(Application filed Dec. 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
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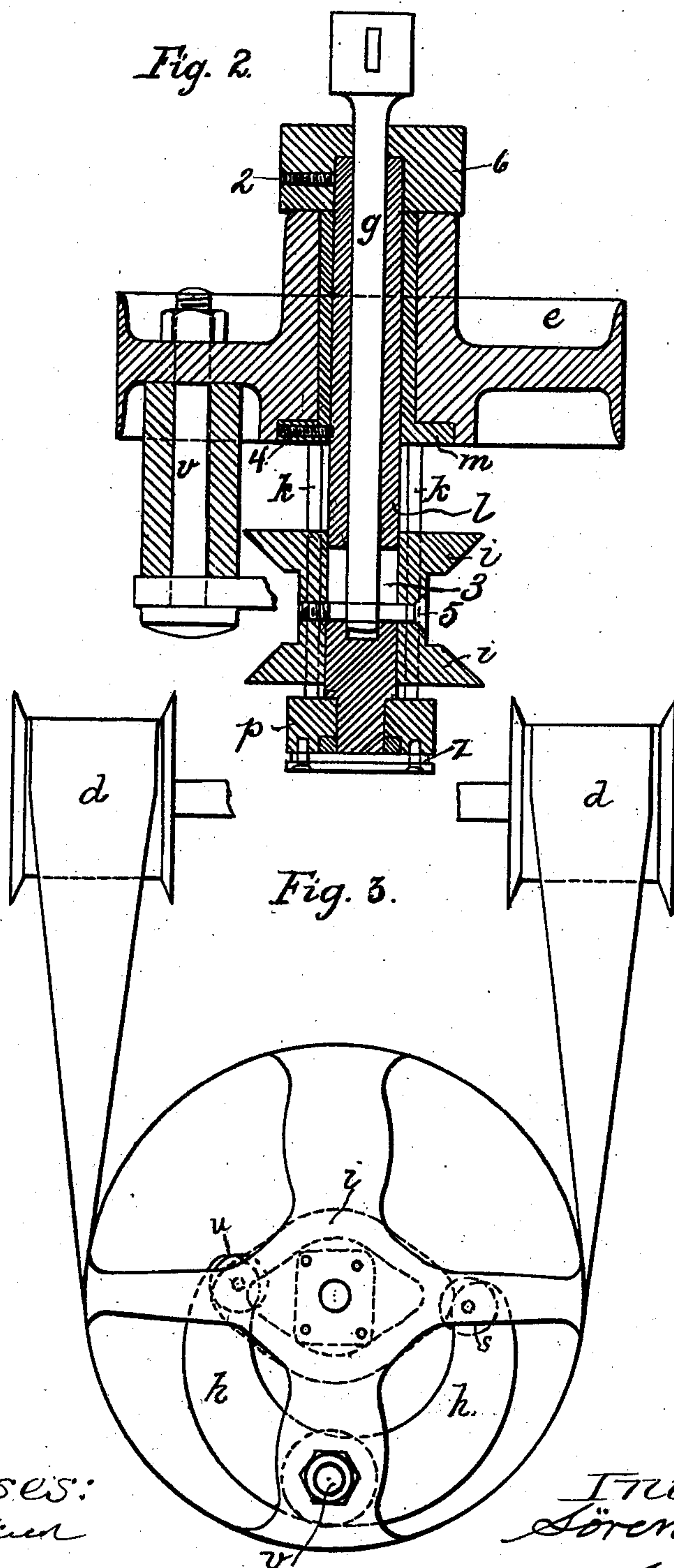
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# UNITED STATES PATENT OFFICE.

SÖREN OPSAL, OF STAVANGER, NORWAY.

## FOLDING-MACHINE FOR TIN BOXES.

SPECIFICATION forming part of Letters Patent No. 687,056, dated November 19, 1901.

Application filed December 24, 1900. Serial No. 41,002. (No model.)

*To all whom it may concern:*

Be it known that I, SÖREN OPSAL, a citizen of the Kingdom of Norway, residing at Stavanger, Norway, have invented new and useful Improvements in Folding-Machines for Tin Boxes, of which the following is a specification.

This invention relates to machines for the manufacture of metal boxes from tin-plate or other sheet metal by uniting the parts thereof by interfolding the borders thereof; and the invention consists in the peculiar construction and arrangement of a machine which is adapted to hold said box parts and while so held to effect the union of said border parts by interfolding the same, all as hereinafter fully described, and more particularly pointed out in the claim.

In the drawings forming part of this specification, Figure 1 is a side elevation of a machine for folding tin boxes constructed according to my invention. Fig. 2 is a vertical sectional view of the tool-carrying head of the machine and a side view of the central tool-moving shaft, which is hereinafter described. Fig. 3 is a plan view of certain parts shown at the upper end of Fig. 1.

Referring to the drawings, *a* indicates the frame of the machine, which comprises a vertical standard, a suitable base, and a bracket part *b*, extending at right angles from said standard, near the upper end thereof. The tool-carrying head comprises a central cylindrical sleeve *l*, the upper end of which enters a socket in the under side of said bracket part and is there retained in a pending position, as shown, by a screw *2*, entering the end of said bracket. Said sleeve *l* is tubular from its upper extremity nearly to its lower end, as shown in Fig. 2, and has there a transverse slot *3* through it from side to side, and the end below said slot is solid, as shown, to provide for securing thereon certain operative parts, as below described. A second sleeve *m*, having a flange around its lower end, is secured on said sleeve *l* by a screw *4*, which passes from the border of said flange through the latter and engages in a socket in the surface of said sleeve, as shown, thereby holding said two sleeves operatively in the united relations shown. The upper end of said sleeve *l* abuts the under side of said bracket,

as shown. A head *p* is suitably secured on the lower extremity of said cylindrical sleeve *l*, which head forms an upper abutment against which a box is held while being operated upon for folding the corners thereof, a groove *z* around said head serving to facilitate said folding. A series of vertical guide-rods *k* have their upper ends fixed in the under side of the flange of said sleeve *m* and pass freely through the body of a cylinder having two beveled-edge guide-disks *i i* thereon and have their lower ends secured to the upper surface of said head *p*. Thus said guide-disk cylinder is free for vertical movements, guided and supported by said rods on the lower end of said cylindrical sleeve, and is given said movements by connection with the vertically-movable central connecting-rod *g* by means of a screw *5*, passing transversely through the body of the cylinder and through said slot *3* and said rod *g*, whereby vertical movements imparted to the latter cause like movements of said guide-disk cylinder. The pulley *e*, which imparts movements to the above-described head parts of the machine, is supported and rotates on said sleeve *m*, as clearly shown in Fig. 2, and is driven, as shown, by a belt driven by a pulley *c*, carried on a shaft running in the lower part of said frame *a* and running over two idler-pulleys *d d* and thence around the pulley *e*. Said last-named shaft carries the usual tight and loose pulleys *b*, which are driven by any convenient power connection. The said rod *g* and the said parts connected thereto are moved vertically by means of a lever *q*, Fig. 1, pivoted on said frame-bracket and having a downwardly-extending handle by which it may be operated by hand. A shaft *f* is supported in a lateral projection on the upright part of the frame *a* for free vertical movements and has a head *n* thereon, operating opposite and under said head *p* by a lever *w*, connected to said shaft and pivoted on said frame *a*, a weight *o*, hung on said lever, serving to automatically carry said shaft and head *n* upwardly against a box placed between said two heads and operative by foot or other action to move said lower head *n* away from the upper head *p*.

A folding-wheel carrier *h* is pivotally hung on the bolt *v*, (see Fig. 2,) and its extremities have a limited swinging movement in a hori-



zontal plane, and they carry on said extremities the folding-wheels *s* and *u*. Said carrier *h* is carried around with the pulley *e*, to the end that the said folding-wheels may operate  
 5 against the box parts for folding the same, as below described. Said carrier *h* is pivotally connected with said pulley *e* by means of the headed bolt *v*, passing upwardly through a  
 10 tubular sleeve and one of the arms of said pulley *e* and is there secured by a nut, as shown, said carrier being hung on said bolt, between the head thereof and the lower end of said sleeve, for swinging movements in a horizontal plane. On said folding-wheel car-  
 15 rier *h* are two freely-rotating friction disks or pulleys *t* and *r*, one on the upper and one on the under side, (see Fig. 1,) which pulleys are engaged alternately by the upper and lower bevel-edge guide-disks *i*, hereinbefore  
 20 referred to, and through such engagement said carrier is swung to carry the folding-wheels *s* and *u* alternately against the parts of a box which are to be folded, as below described.

25 If the tin box to be operated upon be round, oval, or angular, the heads *n* and *p* and guide-disks *i* are made of corresponding forms.

The operation of the machine in folding box parts is as follows, the machine having been  
 30 started and the pulley *e* thereby given a rotary movement: The tin box, the cover and bottom of which are to be folded, is placed on said lower head *n* and is then by the action of said weight *o* on the lever *w* carried up-  
 35 ward and pressed between the latter-named head and said upper head *p*, after which by grasping the handle of the lever *q*, operating the shaft or rod *g*, and moving it in the direc-

tion indicated by the arrow in Fig. 1 the lower guide-disk *i* will be lifted and forced against 40 the guide-roller *r*, thereby swinging the carrier *h* and pressing the folding-wheel *s* against the box parts, thus effecting the primary folding of said parts, and then said lever *q* is  
 45 moved in an opposite direction, thereby carrying the upper guide-disk *i* against the guide-roller *t*, thereby forcing the folding-wheel *u* against the edge of the box and completing the folding operation, it being understood that with the rotary movement of said pulley 50 the ends of the carrier *h* and the folding-wheels *s* and *u* are caused to move in a circle around the box parts held between said heads *p* and *n*.

Having thus described my invention, what 55 I claim, and desire to secure by Letters Patent of the United States, is—

In a machine of the class described, a suitable frame, means on said frame for holding metal box parts in position for mutual union 60 by folding their borders, a folding-wheel carrier having a folding-wheel on each extremity, means for supporting and for moving said carrier and folding-wheels in a horizontal plane around said box-holding devices, and for 65 effecting the alternate engagement of said folding-wheels with said box parts during the movement thereof around said parts, substantially as described.

In testimony whereof I have signed this 70 specification in the presence of two subscribing witnesses.

SÖREN OPSAL.

Witnesses:

FRED. WATTNE,  
 J. NÆRUM.