

No. 630,528.

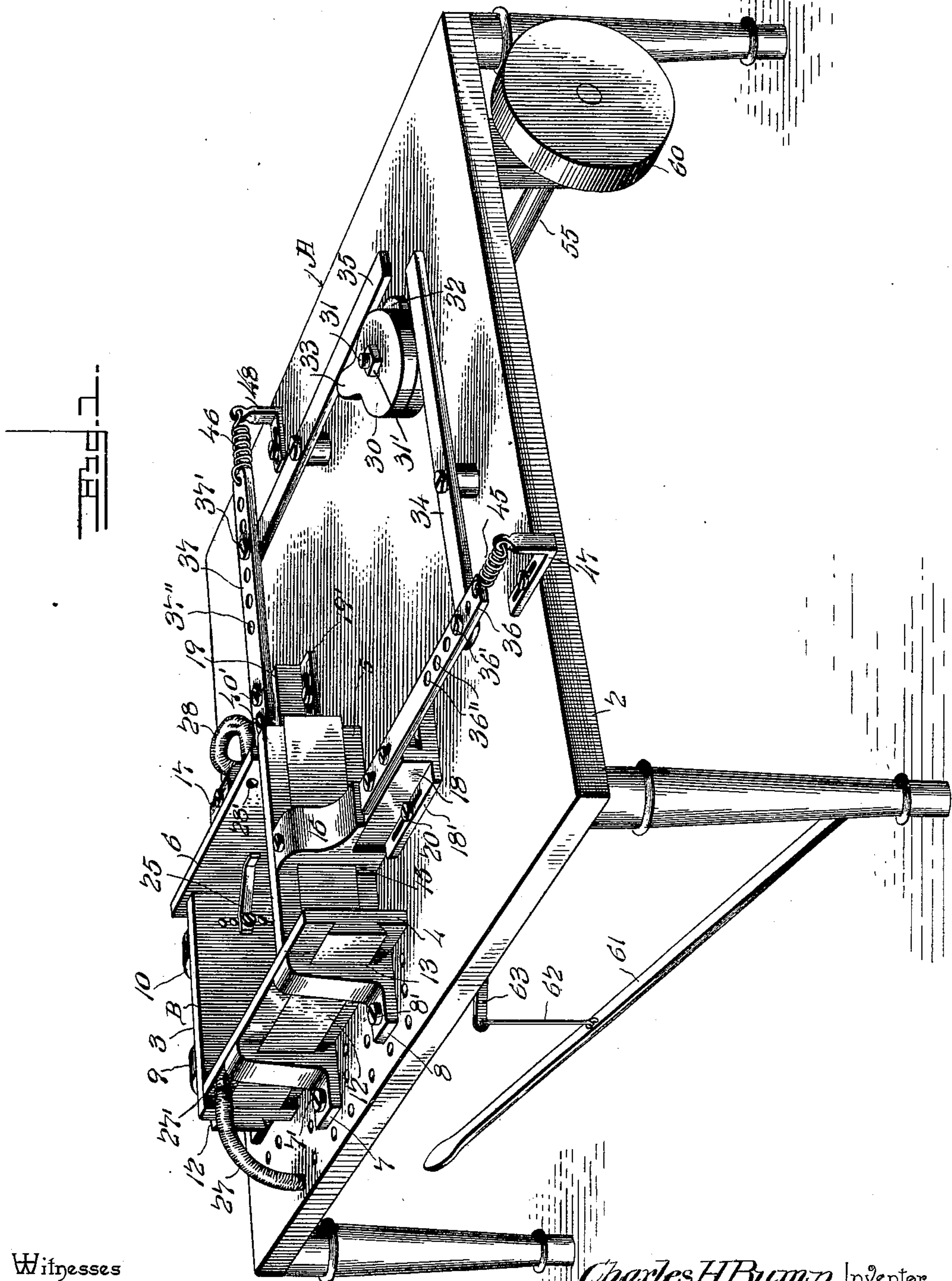
Patented Aug. 8, 1899.

C. H. BUMP.
BOX MACHINE.

(Application filed Jan. 30, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

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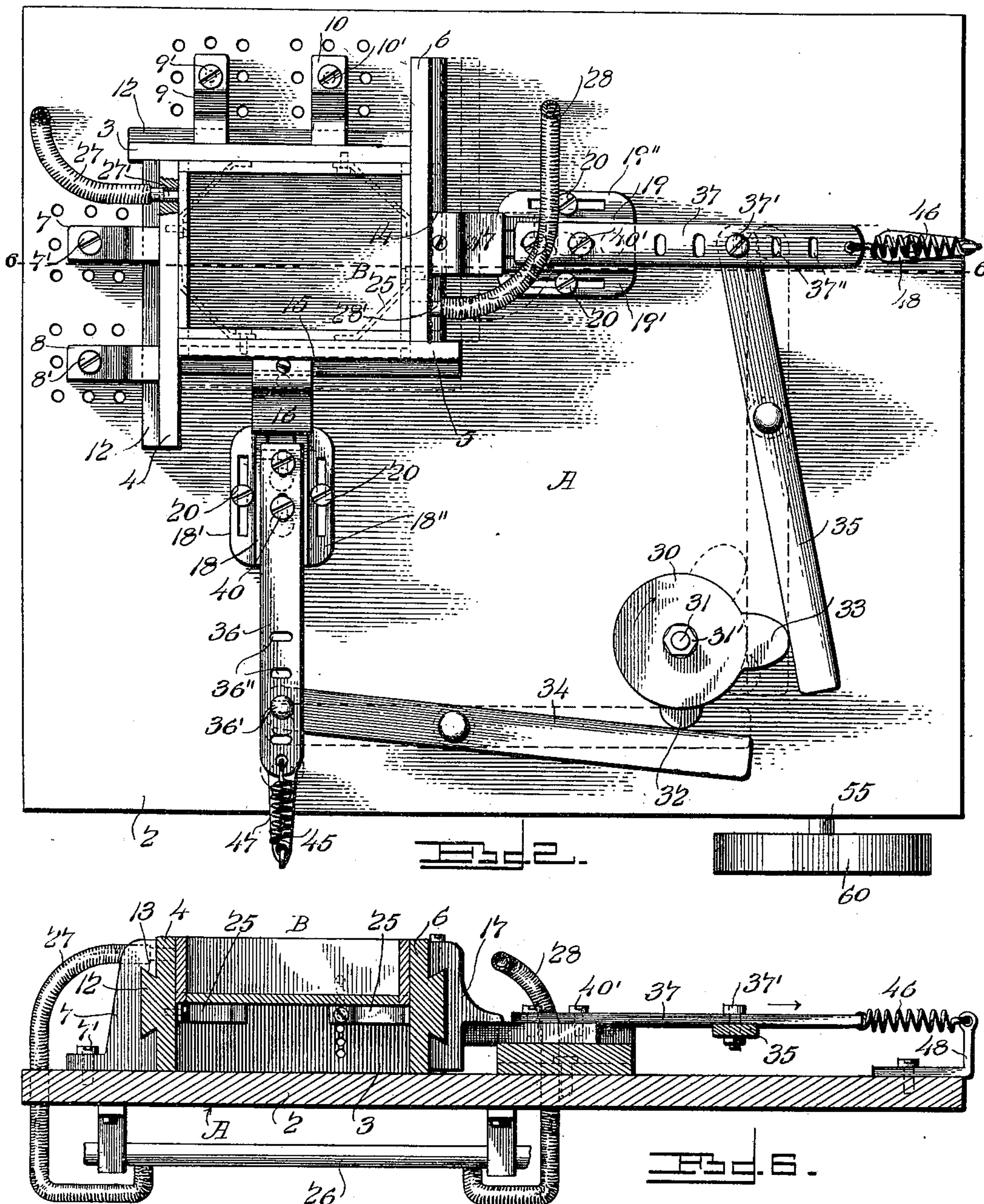
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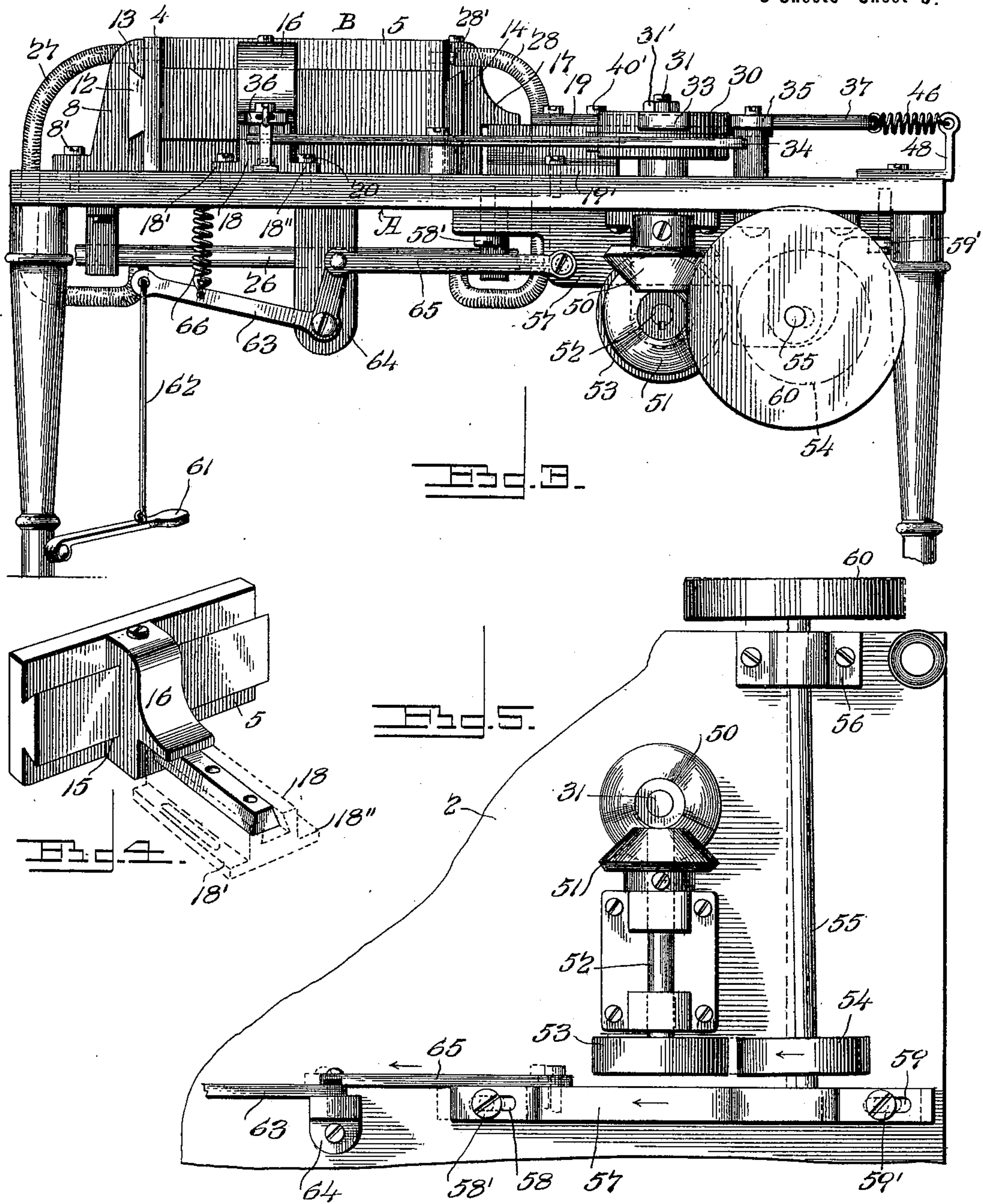
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UNITED STATES PATENT OFFICE.

CHARLES H. BUMP, OF BRANDON, VERMONT.

BOX-MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,528, dated August 8, 1899.

Application filed January 30, 1899. Serial No. 703,858. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. BUMP, a citizen of the United States, residing at Brandon, in the county of Rutland and State of Vermont, have invented a new and useful Box-Machine, of which the following is a specification.

This invention relates to box-machines, and the improvements relate more especially to simple and efficient mechanism for jointing with rapidity the corners of dovetailed box-sections.

My improved machine includes as one of its essential features and in connection with a former a suction apparatus serving to hold a box-section in position to be connected with another box-section, both of which parts may be of any convenient character.

In the present embodiment of the invention the former consists of four plates disposed in pairs and in parallelism, one plate of each pair being fixed and the other movable, and suitable mechanism will be provided for reciprocating the movable plates toward and from the complemental plates. In conjunction with a movable plate and a fixed plate the suction apparatus will operate, and it acts to positively retain two sections of a box against these parts, by reason of which an attendant can properly position the two remaining sections of the box, so that on the operation of the machine the several box parts can be accurately connected. Usually that movable plate which is connected with the suction apparatus is pushed forward first, thereby joining three sections of the box, and subsequently the other movable section is advanced, thereby joining the last section of the box with the others, and this final operating-plate serves also to press the several sections into firmer contact and also accurately squares the same, the product being as nicely formed as hand-made boxes.

In the drawings accompanying and forming part of the specification, Figure 1 is a perspective view of my improved machine, showing the forming-plates in their retracted positions. Fig. 2 is a plan view of the same, showing said plates in their advanced positions. Fig. 3 is a side elevation. Fig. 4 is a detail view, on an enlarged scale, of a portion of the box-former and certain adjacent

parts. Fig. 5 is a bottom plan view of the driving mechanism, showing the same in its active and inactive positions, respectively. Fig. 6 is a sectional side elevation of the upper part of the apparatus, the section being on the line 6 6, Fig. 2.

Similar characters designate like parts in all the figures of the drawings.

The several parts of the machine may be mounted for coöperation in any suitable manner, a table A being represented for this purpose, upon the top 2 of which the box-former is sustained.

My invention involves as one of its advantageous features a box-former and a suction apparatus, which parts may be of some convenient construction; but in the present instance I employ a former of peculiar construction, it being designated by B, and it is substantially in the form of a clamp-like structure consisting of four plates, two of which, as 3 and 4, are fixed, while the remaining two plates, as 5 and 6, coöperate and are disposed, respectively, in parallelism with said first-mentioned plates.

On an inspection of Fig. 2 it will be seen that the fixed plates 3 and 4 and 5 and 6, respectively, are disposed approximately at right angles to each other, this being the construction employed in manufacturing rectangular boxes, although other types of formers might be used without departing from the scope of the invention. The fixed plates 3 and 4 are each maintained in position by a pair of brackets, the respective brackets of each pair being designated by 7 and 8 and 9 and 10, and said brackets are secured to the top 2 of the table by screws 7', 8', 9', and 10', passing through holes in the feed-table, and by removing which the position of the brackets can be changed for adjusting the former to make boxes of different sizes, and in addition to this adjustment the plates are connected to their brackets for longitudinal movement, said plates being furnished with tongues, as 12, fitting in grooves, as 13, on the brackets, by reason of which the plates can be slid back and forth on the table.

The reciprocatory plates 5 and 6, coöperating, respectively, with the plates 3 and 4, move in transverse directions and are connected by tongue-and-groove joints, as 14 and

15, with the slides 16 and 17, supported upon the blocks 18 and 19, adjustably secured to the table-top 2, said blocks having side flanges, as 18' and 18'' and 19' and 19'', through which
 5 screws 20 pass, this construction permitting the adjustment of the blocks. By reason of the joint hereinbefore described between the two plates 5 and 6 and the slides 16 and 17 said plates can be moved longitudinally thereof
 10 for purpose of adjustment.

In connection with the plates 4 and 6, respectively, I employ a suction apparatus operative to hold what may be termed the "ends" of a box against said plates, so that an attendant can place by hand the remaining
 15 portions of the box against the plates 3 and 5 and accurately locate the same.

After the several parts of the box are in position the two plates 6 and 5 are successively advanced to press the sides and ends of the box into firm engagement.

The several plates have on their inner faces suitable rests, as the resilient brackets 25, upon which the box-sections are sustained or
 25 can support the bottom of the box.

The suction apparatus includes in its construction a main supply-pipe, as 26, communicating with a suitable pumping device, (not shown,) and two branch pipes, as 27 and 28,
 30 preferably made flexible and connected, respectively, with the main supply-pipe 26 and the clamp-plates 4 and 6, the upper ends of said pipes fitting over nipples, as 27' and 28', passing through said plates. The pumping
 35 device being in action and two box-sections being placed against the plates 4 and 6, the suction created will serve to firmly retain said sections against said plates.

By making the pipes 27 and 28 flexible the adjustment and movement, respectively, of the plates 4 and 6 can be obtained without affecting the proper relation of the parts.

While the invention is not limited to any particular mechanism for advancing the
 45 plates 5 and 6, I have illustrated for this purpose cams 30, fixed to the shaft 31 and having the superposed peripheral tappets 32 and 33, adapted, respectively, on the rotation of said cams in the direction of the arrow, Fig.
 50 2, to engage the levers 34 and 35 near the free ends of said levers, the latter being fulcrumed intermediate their ends to the top 2 and connected at their opposite ends to the links 36 and 37 by means of screws 36' and 37', passing
 55 through two of a series of holes 36'' and 37'' in the respective links, this form of joint being adjustable. The opposite ends of these two links are connected by the adjustable joints, preferably of the pin-and-slot kind, as
 60 at 40 and 40', with the two slides 16 and 17, respectively. On the rotation of the cams in the manner indicated the two tappets thereon will successively engage the levers 34 and 35 and rock the same about their axes, thereby
 65 advancing the clamping-plates 5 and 6 to press the sides and ends of the box into interlocking relation.

For the purpose of retracting the two slides I have illustrated a pair of coiled springs, as 45 and 46, connected, respectively, at their
 70 opposite ends to the links 36 and 37 and to the L-shaped brackets 47 and 48, secured to the upper side of the table.

While the invention is not limited to any particular form of mechanism for rotating the
 75 cam-shaft 31, I have illustrated frictional driving mechanism, which is thrown into and out of operative relation by means within easy reach of the machine attendant. The shaft 31 carries at its lower end a beveled friction-
 80 wheel 50, adapted to be engaged by a cooperating friction-wheel 51, secured to one end of the shaft 52, the opposite end of said shaft carrying a friction-wheel 53, cooperating with the friction-wheel 54, secured at one end of the
 85 shaft 55. The shaft 55 is carried by hangers 56 and 57, secured to the under side of the table-top, and the hanger 57 is mounted for reciprocation, whereby the friction-wheel 54 can be thrown into and out of engagement with the
 90 friction-wheel 53, thereby to operate the shaft 52 and through the intermediate connections the cam 30, and consequently the two reciprocatory plates 5 and 6. The hanger 57 has
 95 near its opposite ends the longitudinal slots 58 and 59, through which the screws 58' and 59' pass to secure the hanger in place and also permit of the reciprocating movement hereinbefore alluded to. The shaft 55 carries
 100 also a driver 60, represented as a pulley connected by belting with a suitable motor. (Not shown.)

For the purpose of operating the reciprocatory hanger 57 to throw the driving mechanism into and out of operative relation any
 105 convenient means may be employed, the treadle 61, fulcrumed to the feed-table and connected suitably with said hanger, being shown for this purpose. The treadle 61 is connected by the link 62 with the lever 63,
 110 fulcrumed to the offset 64 on the under side of the feed-table, the other arm of the lever being jointed to the link 65, which in turn is connected with the reciprocatory hanger.

The treadle 61 is held in its uppermost position, as shown in Fig. 3, by means of a spring, as 66, connected, respectively, with the lever 63 and with the feed-table, it being
 115 evident also that the spring holds the friction coupling-wheel 54 out of contact with the co-
 120 operating wheel 53.

When the several parts of the box are in proper position, the attendant depresses the foot-lever, thereby throwing the wheel 54 into
 125 peripheral contact with its mate, whereby the cams 30 will be operated through the intermediate connections and the plates 5 and 6 will be advanced. When the said plates have reached the end of their advancing move-
 130 ment, the attendant will release the treadle, which is immediately returned to its initial position by the spring 66, after which the two springs 45 and 46 will return the levers 34 and 35 to their initial positions to subse-

quently repeat the operation, the completed box being removed when the two plates 5 and 6 have commenced to return. In practice the attendant will place the ends of the box against the plates 4 and 6, where they are held by suction created by the suction apparatus hereinbefore specified. Afterward the attendant will place the remaining sections of the box in contact with the faces of the plates 3 and 5, after which the machine will be started in operation in the manner hereinbefore set forth.

The cams 30 are independently adjustable on their shaft 31, so that their positions can be varied to alternate the times of contact of the tappets 32 and 33 with the levers 34 and 35, respectively, for the purpose of making boxes of different sizes, and said cams are held in their adjusted position by the nut 31' on the threaded upper reduced end of the shaft, and which nut when turned home tightly locks the two cams in place.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described my invention, I claim—

1. In a box-forming machine, the combination with a former including two reciprocatory plates, of a lever connected with each plate, a driving-shaft, and means carried by the driving-shaft and adjustable with respect thereto engaging the levers to actuate them at different points of rotation of the driving-shaft and at different correlative periods, substantially as described.

2. In a box-forming machine, the combination with a former comprising movable plates and adjustably-fixed plates, the movable plates lying at an angle to each other and to the adjustably-fixed plates, a suction apparatus connected with a movable plate, a suction apparatus connected with a fixed plate opposite said movable plate, and means for operating the movable plates.

3. In a box-forming machine, the combination with a former consisting of two fixed plates and two movable plates, the movable plates lying at an angle to each other and to the adjacent fixed plates, suction apparatus carried by opposite fixed and movable plates serving to hold the sections of a box thereagainst, and adjustable means for giving said movable plates different correlative movements.

4. In a box-forming machine, the combination with a former consisting of two adjustably-fixed plates and two movable and laterally-adjustable plates, the movable plates lying at an angle to each other and the adjacent fixed plates, suction apparatus carried by opposite fixed and movable plates and serving to hold the sections of a box thereagainst, and

means for successively operating said movable plates.

5. In a box-forming machine, the combination with a former including movable and laterally-adjustable plates and adjustably-fixed plates, the movable plates lying at an angle to each other and to the adjacent fixed plates, a suction apparatus carried by opposite fixed and movable plates and adapted to hold a box-section thereagainst, and means for operating the movable plates.

6. In a box-forming machine, the combination with a former including laterally-adjustable fixed and movable plates, a suction apparatus serving to hold the box-sections against certain of said plates, adjustable means for moving each movable plate at different periods with respect to the other, driving mechanism for said plate-moving means, and manually-operated means for throwing said driving mechanism into and out of operative relation with its plate-moving means.

7. In a box-forming machine, the combination with a former consisting of two fixed plates and two movable plates, the movable plates lying at an angle to each other and to the adjacent fixed plate, a main suction-pipe having flexible connections connected with opposite fixed and movable plates and serving to hold the sections of a box thereagainst, and adjustable means for giving said movable plates different correlative movements.

8. In a box-forming machine and in combination with a former including a series of plates provided with rests for the box-sections and one of which is reciprocatory, means for operating said reciprocatory section, and a suction apparatus serving to hold certain sections of the box against certain of the plates.

9. In a box-forming machine, the combination with a former including two reciprocatory plates, of a lever connected with each plate, a driving-shaft, and means carried by the driving-shaft and adjustable thereon for actuating said levers at different periods of rotation of the drive-shaft, substantially as described.

10. In a box-forming machine, in combination with a former, including two reciprocatory plates, of levers connected with the respective plates, a driving-shaft, and independently-adjustable cams carried by the said shaft.

11. In a box-forming machine, and in combination with a former, including two reciprocatory plates, levers connected with the respective plates, a driving-shaft, cams adjustably carried by said driving-shaft, and superposed peripheral tappets carried by the respective cams and each adapted to engage a lever.

12. In a box-forming machine, and in combination with a former, including two reciprocatory plates, levers connected with the respective plates, coiled springs connected with said levers, a driving-shaft, and a plurality

of devices independently adjustable with respect to the driving-shaft carried by said shaft and operable to actuate said levers at different periods of rotation of the drive-shaft.

- 5 13. In a box-forming machine, and in combination with a former, including two reciprocatory plates, slides connected with the plates, guideways for said slides, two levers, bars connected respectively with the levers
10 and with the slides, a driving-shaft, a plurality of devices independently adjustable with

respect to the driving-shaft carried by said shaft, and adapted to actuate each lever at different periods of rotation of the drive-shaft, and springs secured to said bars. 15

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES H. BUMP.

Witnesses:

GEORGE BRIGGS,
EBENEZER J. ORMSBEE.